



Avaya Solution & Interoperability Test Lab

Application Notes for VTech Hospitality SIP Corded 2-Line S1220 Telephone Version 02.3.31.02 with Avaya Communication Server 1000 Release 7.5 – Issue 1.0

Abstract

These Application Notes describe a solution comprised of Avaya Communication Server 1000 SIP Line Release 7.5 and VTech Hospitality SIP Corded 2-Line S1220 telephone.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These application notes provide detailed configurations of Avaya Communication Server 1000 SIP Line Release 7.5 and the VTech Hospitality SIP Corded 2-line S1220 telephone version 02.3.31.02. During the compliance test, the VTech S1220 telephone was tested with non-SIP, digital, and SIP endpoints using the CS1000 release 7.5. All the applicable telephony feature test cases of release 7.5 SIP Line were executed on the VTech S1220 telephone, where applicable, to ensure that they interoperate with CS 1000.

2. General Test Approach and Test Results

The general test approach was to have the VTech S1220 telephone register to the CS1000 SIP Line gateway successfully. From the CS1000 telephone clients/users, calls were placed to and from the VTech S1220 telephone. Other telephony features such as busy, hold, DTMF, MWI and codec negotiation were also exercised.

2.1. Interoperability Compliance Testing

The focus of this testing was to verify that the VTech S1220 SIP telephone was able to interoperate with the CS 1000 SIP Line Server. The following areas were tested:

- Registration of the VTech S1220 SIP telephone to the CS1000 SIP Line Gateway.
- Call establishment of VTech S1220 SIP telephone with CS1000 SIP and non-SIP telephones.
- Telephony features: Basic calls, conference, transfer, DTMF (dual tone multi frequency) RFC2833, SIP Info and INBAND transmission, voicemail with Message Waiting Indication (MWI) notification, busy, hold, speed dial, ring again, make set busy, DND, Call Waiting and busy/no answer.
- PSTN calls over PRI trunk.
- Codec negotiation – G.711 and G.729.

2.2. Test Results

The objectives outlined in the **Section 2.1** were verified. The following observations were made during the compliance testing:

- Avaya has not performed audio performance testing or reviewed the VTech S1220 telephone compliance to required industry standards.
- VTech SIP S1220 telephone is basically the SIP 3rd phone so it needs to be set as SIP 3rd and also requires the SIP 3rd license.
- The VTech SIP S1220 Local Forward Busy feature which is set on the phone locally can be enabled. However it will be not used for the busy call test since when the phone is in busy status the Server Call Forward Busy feature of CS1000 SIP Line will take place before it can be executed by the phone. It is recommended to set the call forward busy in the CS 1000 SIP Line server.
- It is highly recommended to disable class of service for the media security when provisioning SIP user account for the VTech phone on the Call Server to avoid some unexpected behaviors.

- The VTech SIP Corded 2-Line S1220 telephone is only able to register to the CS1000 SIP Line server with port 5060. It cannot use any other ports.
- The VTech 2-Line S1220 phone supports Call Waiting in case there is only one SIP account (or one real Line) configured. If there are two SIP accounts (or two real Lines) configured, the Call Waiting can be configured on Line 1 by setting forward call on busy to the Line 2 and the Line 2 has to be in idle

2.3. Support

For technical support for the VTech SIP S1220 telephone, please contact VTech Communication Inc technical support as shown below:

Telephone: 1-800-595-9511

Website: www.vtechphones.com

3. Reference Configuration

Figure 1 illustrates the test configuration used during the compliance testing between the Avaya CS1000 and the VTech SIP S1220 telephone.

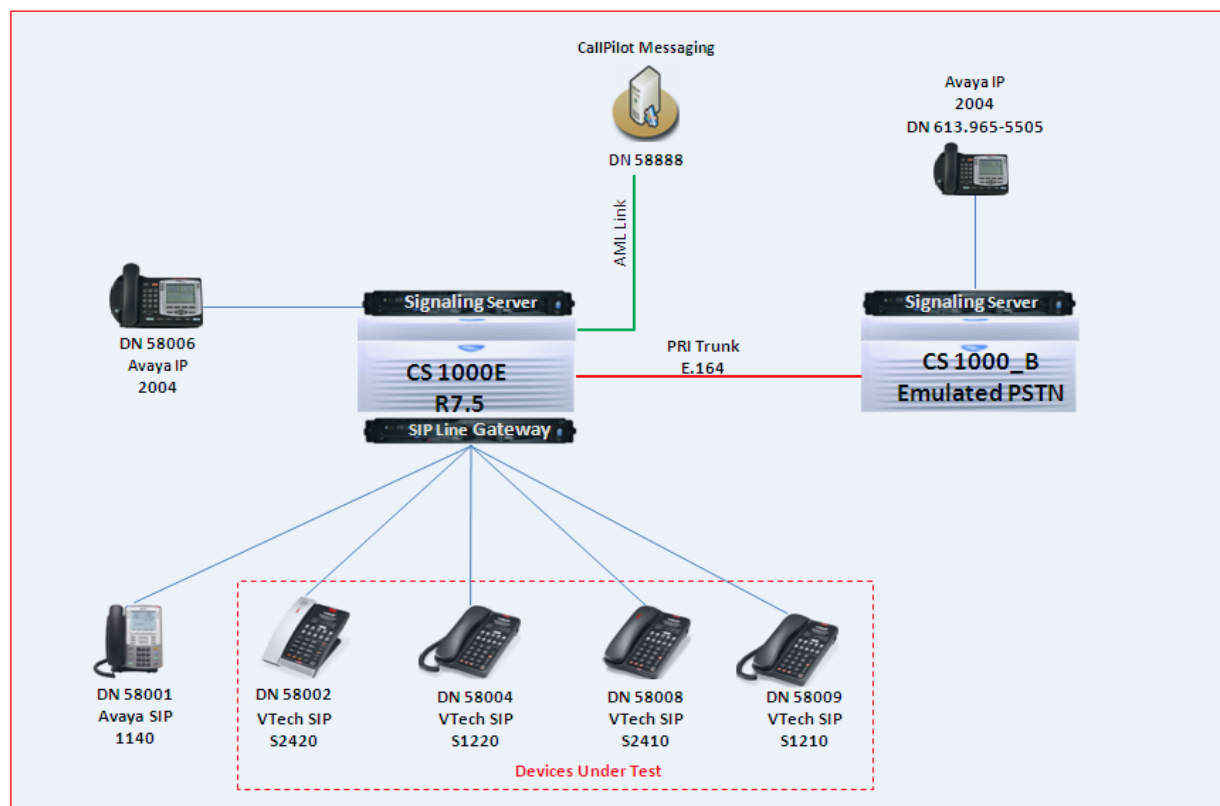


Figure 1: Network Configuration Diagram

4. Equipment and Software Validated

The following equipment and software was used during the lab testing:

Equipment	Software Version
Avaya CS1000E	Call Server (CPPM): 7.50Q Signaling Server (CPPM): 7.50.17
Avaya CallPilot® Messaging System	5.0.1
Avaya IP Soft Phone 2050	3.04.0003
Avaya IP Phone 1140	0625C6O
Avaya IP Phone 2004P2	0692D93
Avaya IP Phone 2002P2	0604DC5
Avaya SIP 1140	02.02.21.00
VTech SIP Hospitality 2-Line Cordless S2420	SIP_02.3.31.02
VTech SIP Hospitality 1-Line Cordless S1410	SIP_02.3.31.02
VTech SIP Hospitality 2-Line Corded S1220	SIP_02.3.31.02
VTech SIP Hospitality 1-Line Corded S1210	SIP_02.3.31.02

5. Configure Communication Server 1000 SIP Line Gateway

This section describes the steps to configure the Avaya CS1000 SIP Line using CS 1000 Element Manager. A command line interface (CLI) option is available to provision the SIP Line application on the CS 1000 system. For detailed information on how to configure and administer the CS 1000 SIP Line, please refer to the **Section 9 [1]**.

The following is the summary of tasks needs to be done for configuring the CS 1000 SIP Line:

- Log in to Unified Communications Management (UCM) and Element Manager (EM).
- Enable SIP Line Service and Configure the Root Domain.
- Create SIP Line Telephony Node.
- Create D-Channel for SIP Line.
- Create an Application Module Link (AML).
- Create a Value Added Server (VAS).
- Create a Virtual Trunk Zone.
- Create a Route Data Block (RDB).
- Create SIP Line Virtual Trunks.
- Create SIP Line phones.

5.1. Prerequisite

This document assumes that the CS1000 SIP Line server has been:

- Installed with CS 1000 Release 7.5 Linux Base.
- Joined CS 1000 Release 7.5 Security Domain.
- Deployed with SIP Line Application.

The following packages need to be enabled in the key code. If any of these features have not been enabled, please contact your Avaya account team or Avaya technical support at

<http://www.avaya.com>.

Package Mnemonic	Package #	Descriptions	Package Type	Applicable market
SIP_LINES	417	SIP Line Service package	New package	Global
FFC	139	Flexible Feature Codes	Existing package	Global
SIPL_AVAYA	415	Avaya SIP Line package	Existing package	Global
SIPL_3RDPARTY	416	Third-Party SIP Line Package	Existing package	Global

5.2. Log in to Unified Communications Management (UCM) and Element Manager (EM)

Use the Microsoft Internet Explorer browser to launch CS 1000 UCM web portal at <http://<IP Address or FQDN>> where <IP address or FQDN> is the UCM Framework IP address or FQDN for UCM server.

Log in with the username/password which was defined during the primary security server configuration, the UCM home page appears as shown in the **Figure 2** below.

The screenshot displays the Avaya Unified Communications Management (UCM) Home Page for CS 1000 Release 7.5. The page header includes the Avaya logo, the title 'Avaya Unified Communications Management', and links for 'Help' and 'Logout'. Below the header, the 'Host Name' is 'car2-sipl-ucm.bwwdev.com', the 'Software Version' is '02.20-SNAPSHOT(0000)', and the 'User Name' is 'admin'. The main section is titled 'Elements' and contains a search bar with 'Search' and 'Reset' buttons. Below the search bar are 'Add...', 'Edit...', and 'Delete' buttons. A table lists the elements, with columns for 'Element Name', 'Element Type', 'Release', 'Address', and 'Description'. The element 'EM on cpppm3' is highlighted with a red circle. The table also includes a checkbox for each element.

	Element Name	Element Type	Release	Address	Description
1	EM on car2-cores	CS1000	7.5	10.10.10.10	New element.
2	EM on car2-ssq-carrier	CS1000	7.5	10.10.10.10	New element.
3	EM on cpppm3	CS1000	7.5	10.10.10.10	New element.
4	car2-ssq-carrier.bwwdev.com (member)	Linux Base	7.5	10.10.10.10	Base OS element.
5	car2-sipl-ucm.bwwdev.com (primary)	Linux Base	7.5	10.10.10.10	Base OS element.
6	car2-mas.bwwdev.com (member)	Linux Base	7.5	10.10.10.10	Base OS element.
7	car2-cores.bwwdev.com (member)	Linux Base	7.5	10.10.10.10	Base OS element.
8	car2-sps.bwwdev.com (member)	Linux Base	7.5	10.10.10.10	Base OS element.
9	cpppm3.bwwdev.com (member)	Linux Base	7.5	10.10.10.10	Base OS element.
10	sin175.bwwdev.com (member)	Linux Base	7.5	10.10.10.10	Base OS element.

Figure 2: The UCM Home Page of CS 1000 Release 7.5

On the UCM home page, under the **Element Name** column, click on the EM name of CS 1000 system that needs to be configured, in this sample that is **cpppm3**. The CS 1000 Element Manager page appears as shown in **Figure 3** below.

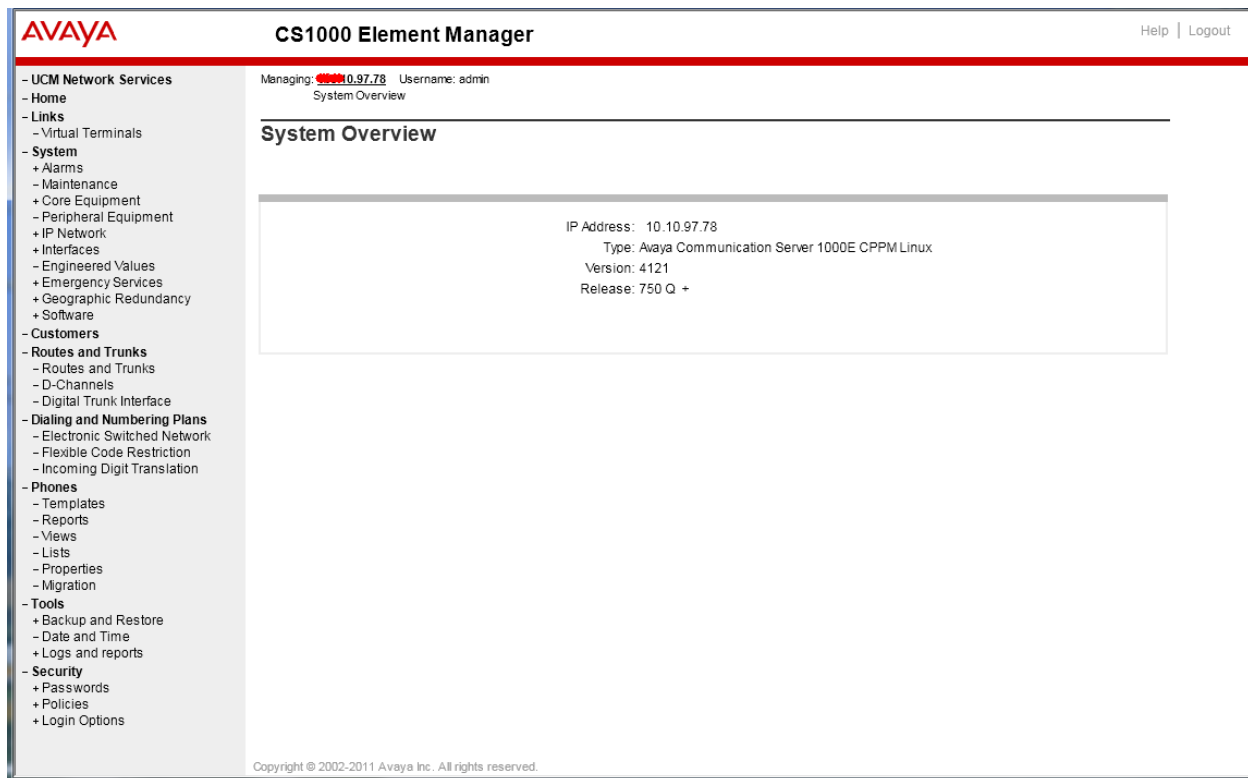


Figure 3: CS 1000 Release 7.5 EM Home Page

5.3. Enable SIP Line Service in the Customer Data Block

On the EM page, navigate to **Customers** on the left column menu; select the customer number to be enabled with SIP Line Service (not shown).

- Enable SIP Line Service by clicking on the **SIP Line Service** check box.
- Enter the prefix number in the **User agent DN prefix** text box as shown in **Figure 4**.

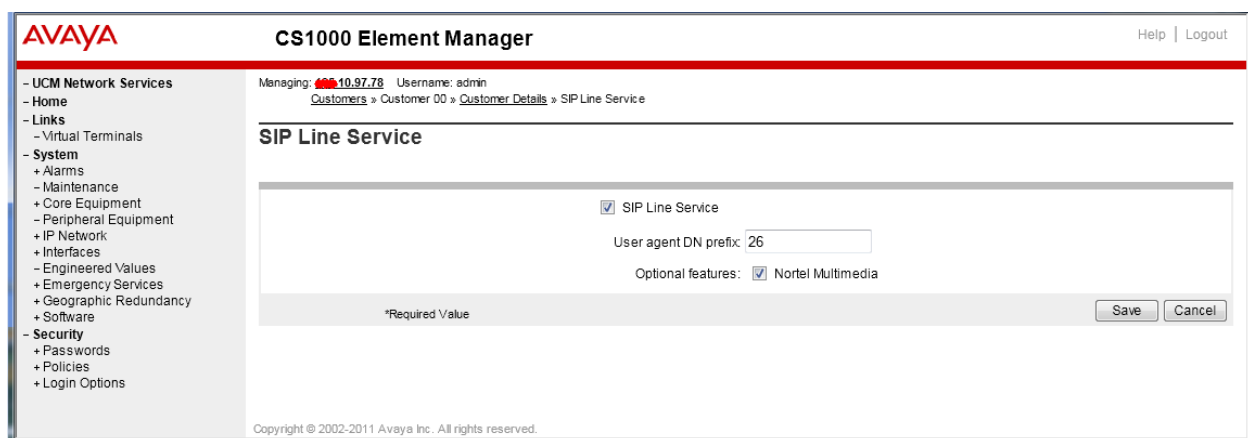


Figure 4: SIP Line Service in Customers Data Block

5.4. Add a new SIP Line Telephony Node

On the EM page, navigate to menu **System → IP Network → Nodes: Servers, Media Cards**. Click **Add** to add a new SIP Line Node to the IP Telephony Nodes. The new IP Telephony Node page appears as shown in **Figure 5**.

Enter the information as shown below:

- **Node ID** text box: 512 -> this is the node ID of SIP Line server.
- **Call Server IP Address** text box: 10.10.97.78.
- **Node IP Address** text box: 10.10.97.187 -> this is the IP address that SIP endpoint uses to register to.
- **Subnet Mask** text box: 255.255.255.192.
- **Embedded LAN (ELAN) Gateway IP Address** text box: 10.10.97.66.
- **Embedded LAN (ELAN) Subnet Mask** text box: 255.255.255.192.
- Check **SIP Line** check box to enable SIP Line for this Node.

The screenshot shows the 'New IP Telephony Node' configuration page in the AVAYA CS1000 Element Manager. The page is titled 'New IP Telephony Node' and includes a breadcrumb trail: 'System > IP Network > IP Telephony Nodes > New IP Telephony Node'. The page is divided into two main sections: 'Embedded LAN (ELAN)' and 'Telephony LAN (TLAN)'. The 'Embedded LAN (ELAN)' section contains fields for 'Gateway IP address' (10.10.97.65) and 'Subnet mask' (255.255.255.192). The 'Telephony LAN (TLAN)' section contains fields for 'Node IPv4 address' (10.10.97.187) and 'Subnet mask' (255.255.255.192). There is also a 'Node ID' field (512) and a 'Call server IP address' field (10.10.97.78). The 'Applications' section has checkboxes for 'SIP Line' (checked), 'UNISTIM Line Terminal Proxy Server (LTPS)', 'Virtual Trunk Gateway (SIPGW, H323Gw)', 'Personal Directory (PD)', and 'Presence Publisher'. The page includes a 'Next >' button and a 'Cancel' button. The sidebar on the left contains a tree view of the system configuration, and the top header shows the AVAYA logo and 'CS1000 Element Manager'.

Figure 5: Adding a New IP Telephony Node

- Click on the **Next** button to go to next page. The page, New IP Telephony Node with Node ID, will appear as shown in **Figure 6**.
- On the **Select to Add** drop down menu list, select the desired server to add to the node.
- Click the **Add** button
- Select the check box next to the newly added server, and click **Make Leader** (not shown).

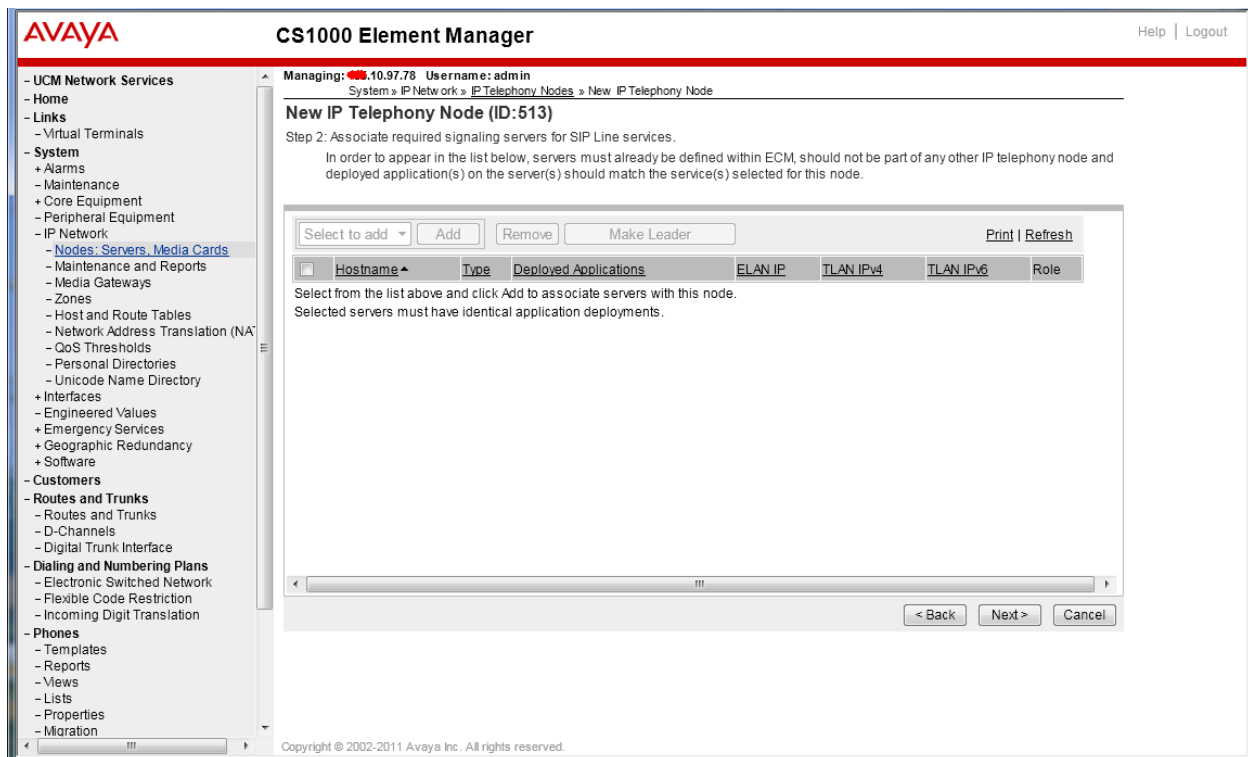


Figure 6: Adding a New IP Telephony Node (cont)

- Click on the **Next** button to go to next page. The **SIP Line Configuration Detail** page appears as shown in **Figure 7**.
- Enter SIP Line domain name in **SIP Domain name** text box, for example **sip175.com**.

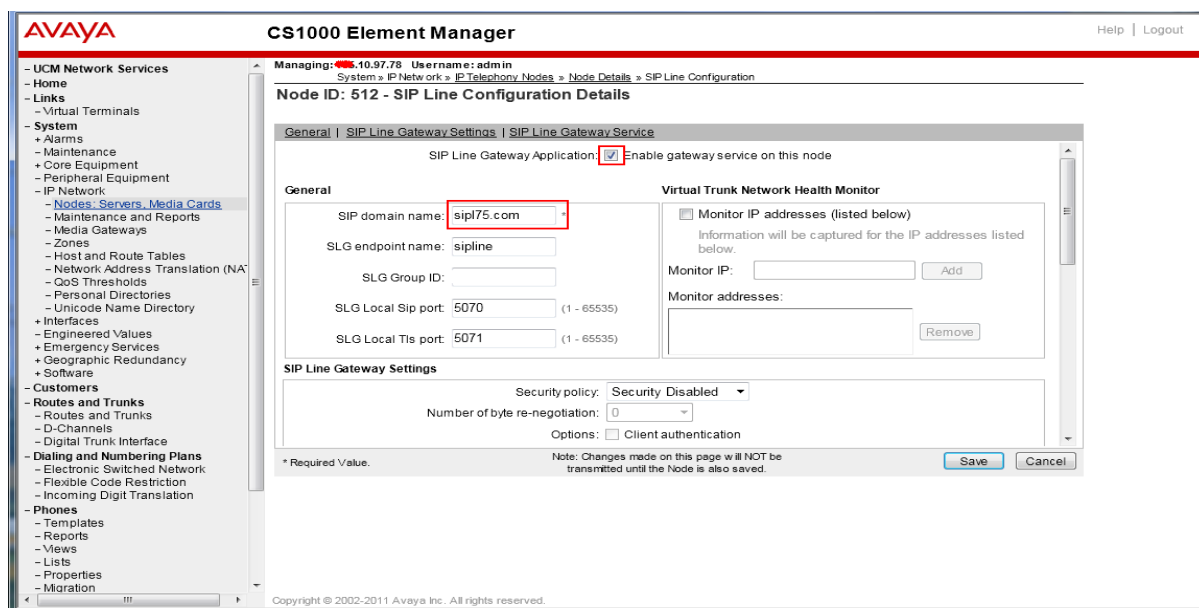


Figure 7: Adding a new IP Telephony Node (cont)

- Under the **SIP Line Gateway Services** section, select **MO** from the **SLG Role** list.
- From the **SLG Mode** list, select **S1/S2** (SIP Proxy Server 1 and Server 2), see **Figure 8**.

AVAYA CS1000 Element Manager

Managing: 10.97.78 Username: admin

System » IP Network » IP Telephony Nodes » Node Details » SIP Line Configuration

Node ID: 512 - SIP Line Configuration Details

General | SIP Line Gateway Settings | SIP Line Gateway Service

SIP Line Gateway Service

Branch / GR Office Settings:

SLG role: MO

SLG mode: S1/S2

MO SLG IPv4 address: 0.0.0.0

The IP address can have either IPv4 or IPv6 format based on the value of "TLAN address type"

MO SLG IPv6 address:

MO SLG port: 5070 (1 - 65535)

MO SLG transport: TCP

GR SLG IPv4 address: 0.0.0.0

The IP address can have either IPv4 or IPv6 format based on the value of "TLAN address type"

GR SLG IPv6 address:

GR SLG port: 5070 (1 - 65535)

* Required Value.

Note: Changes made on this page will NOT be transmitted until the Node is also saved.

Save Cancel

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Figure 8: Adding a new IP Telephony Node (cont)

- Click **Next**. The **Confirm new Node details** page appears (not shown).
- Click on the **Transfer Now** button and then The **Synchronize Configuration Files (Node ID 512)** page appears.
- Click **Finish** and wait for the configuration to be saved. The **Node Saved** page appears, see **Figure 9**.

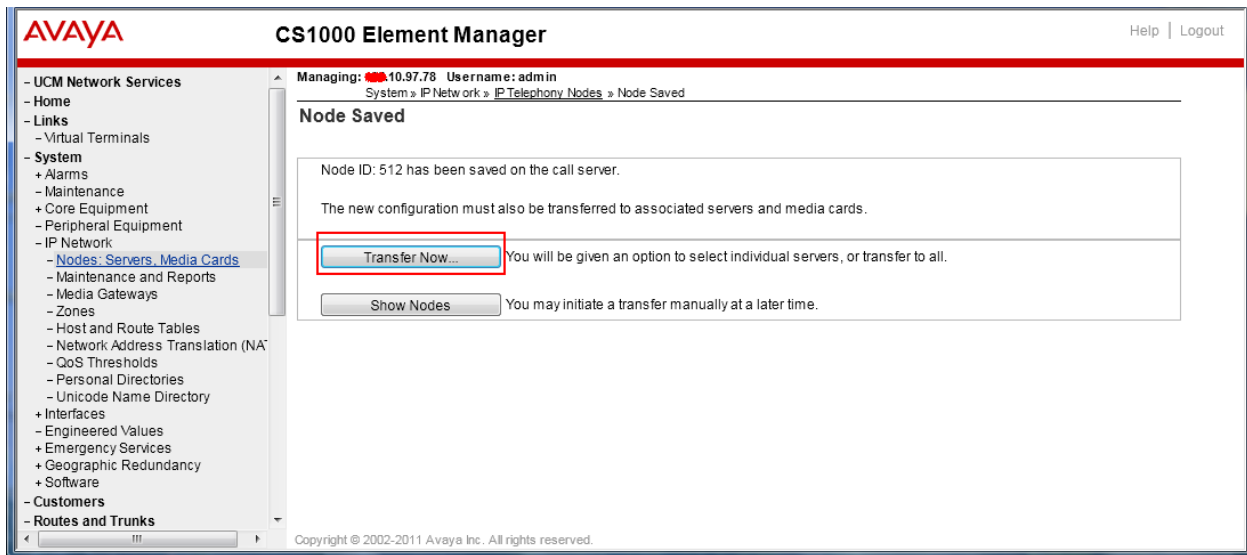


Figure 9: Node Saved with Transfer Configuration

- Select the SIP Line server that associated with changes and then click on the **Start Sync** button to transfer the configuration files to the selected servers, see **Figure 10**.

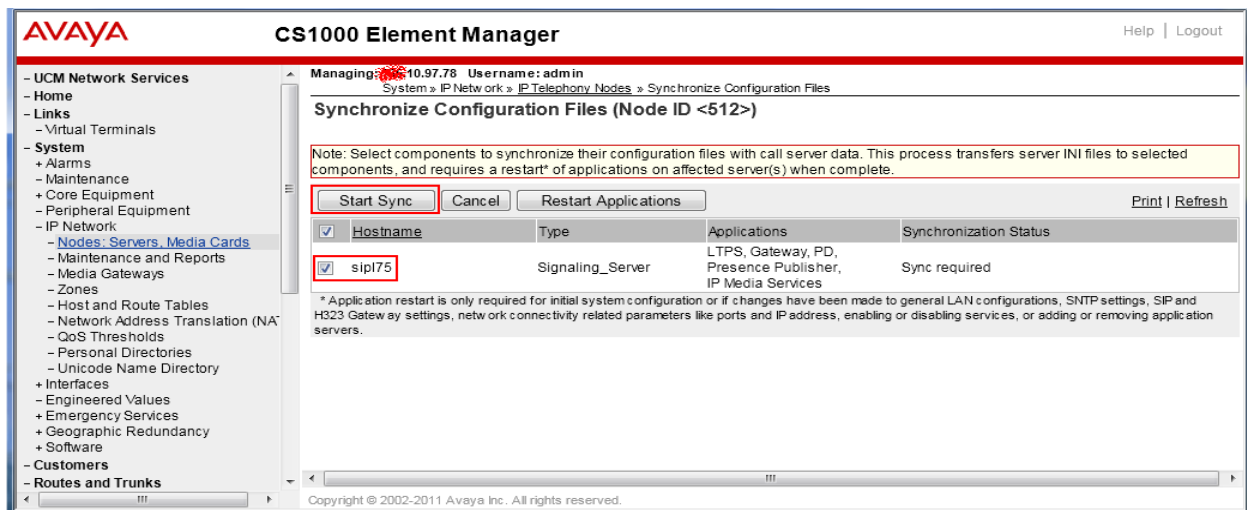


Figure 10: Synchronize Configuration Files

Note: The first time a new Telephony Node is added and transferred to the call server, the SIP Line services need to be restarted. To restart the SIP Line services, log in as administrator to the command line interface of the SIP Line server and issue the command: **appstart restart**.

5.5. Create a D-Channel for SIP Line

On the EM page, on the left column menu navigate to **Routes and Trunks -> D-Channels**. Under the **Configuration** section as shown in **Figure 11**, enter a number in the **Choose a D-Channel Number** field, and click on the **to Add** button.

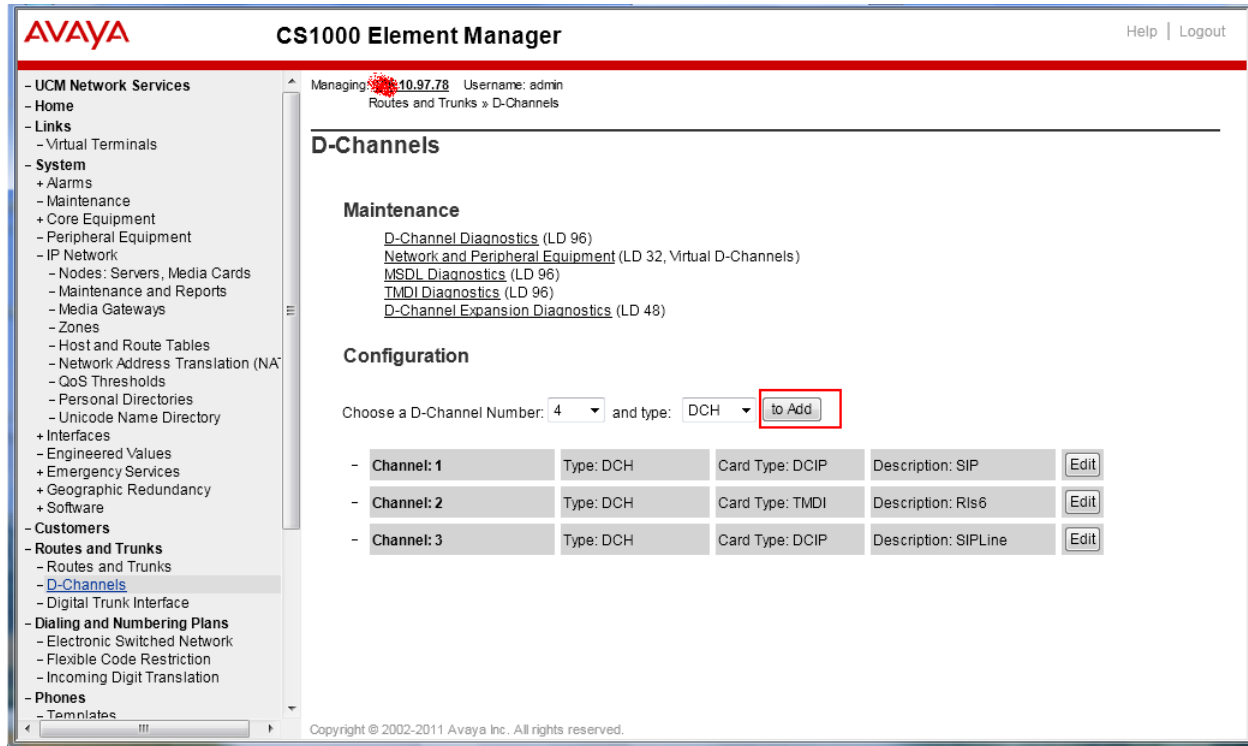


Figure 11: D-Channels configuration page

- The **D-Channels xx Property Configuration** page appears as shown in **Figure 12**.
- From the **Interface type for D-channel (IFC)** list, select **Meridian Meridian1 (SL1)**.
- Leave the other fields at default values.

AVAYA **CS1000 Element Manager** Help | Logout

Managing: 10.97.78 Username: admin
Routes and Trunks » D-Channels » D-Channels 3 Property Configuration

D-Channels 3 Property Configuration

- Basic Configuration

Input Description	Input Value
Action Device And Number (ADAN):	DCH
D channel Card Type:	DCIP
Designator:	SIPLine
Recovery to Primary:	<input type="checkbox"/>
PRI loop number for Backup D-channel:	
User:	Integrated Services Signaling Link Dedicated (ISLD) *
Interface type for D-channel:	Meridian Meridian1 (SL1)
Country:	ETS 300 =102 basic protocol (ETSI)
D-Channel PRI loop number:	
Primary Rate Interface:	<input type="button" value="more PRI"/>
Secondary PRI2 loops:	
Meridian 1 node type:	Slave to the controller (USR)
Release ID of the switch at the far end:	7
Central Office switch type:	100% compatible with Bellcore standard (STD)
Integrated Services Signaling Link Maximum:	4000 Range: 1 - 4000
Signalling server resource capacity:	3700 Range: 0 - 3700

[+ Basic options \(BSCOPT\)](#)
[+ Advanced options \(ADVOPT\)](#)
[+ Feature Packages](#)

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Figure 12: SIP Line D-Channel Property Configuration

- Click on the **Basic options (BSCOPT)** link. The **Basic options (BSCOPT)** list expands (not shown).
- Click on **Edit** to configure **Remote Capabilities (RCAP)**. The **Remote Capabilities Configuration detail page** will appear as shown in Figure 13.
- Select the **Message waiting interworking with DMS-100 (MWI)** check box.
- Select the **Network name display method 2 (ND2)** check box.
- At the bottom of the **Remote Capabilities Configuration** page, click **Return - Remote Capabilities** to return the **D-Channel xx Property Configuration** page.

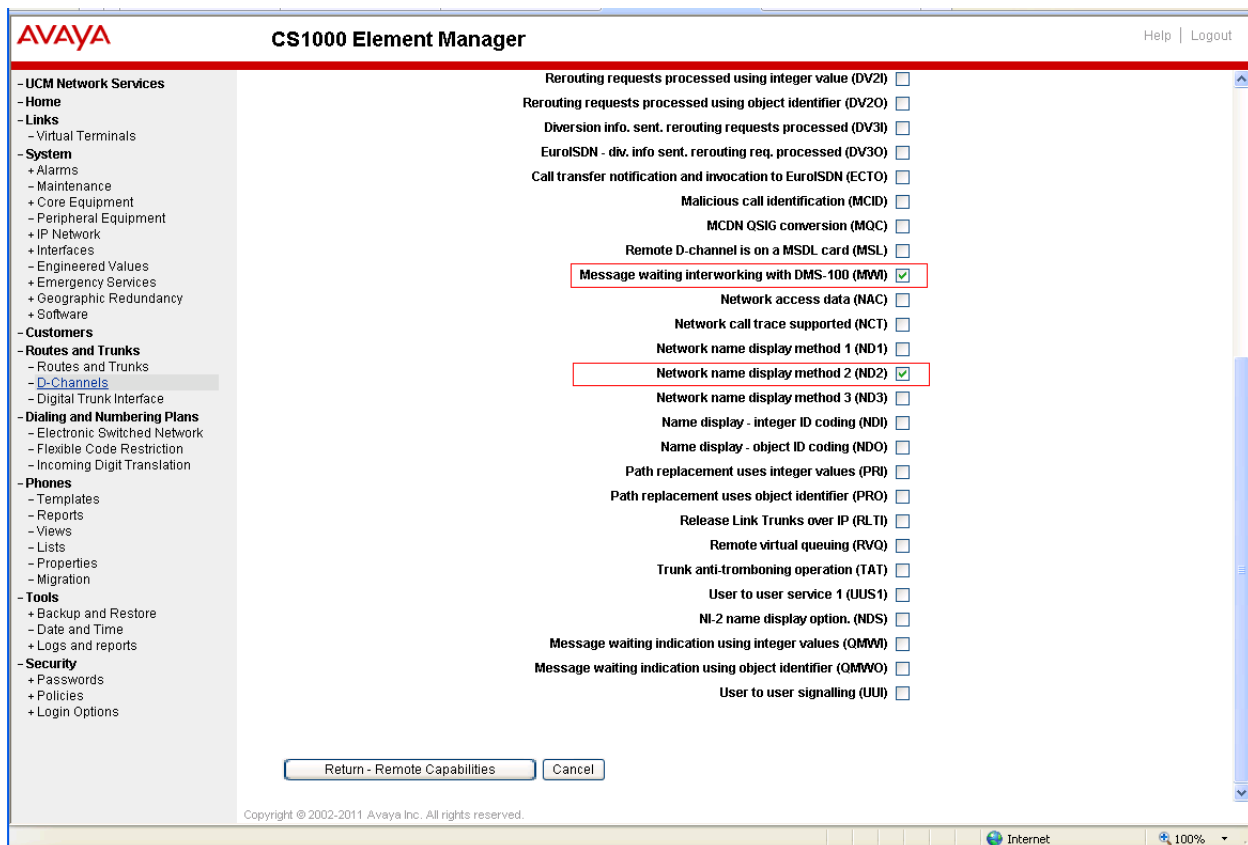


Figure 13: SIP Line D-Channel RCAP Configuration Details

- **Message Waiting Interworking with DMS-100 (MWI)** must be enabled to support voice mail notification on SIP Line endpoints.
- **Network Name Display Method 2 (ND2)** must be enabled to support name display between SIP Line endpoints.
- Other check boxes are left unchecked.

Click on the **Submit** button of the D-Channel Property Configuration page to save changes.

5.6. Create an Application Module Link (AML)

On the EM page, navigate to **System -> Interfaces -> Application Module Link**, click on the **Add** button to add a new Application Module Link (not shown). The **New Application Module Link** page appears as shown in **Figure 14**.

Enter an AML port number in the **Port number** text box. The AML of SIP Line Service can use a port from 32 to 127. In this case, SIP Line Service is configured to use port 33.

Click on the **Save** button to complete adding the AML link, and to save the configuration.

The screenshot shows the CS1000 Element Manager web interface. The left sidebar contains a navigation tree with categories like UCM Network Services, Links, System, and Interfaces. The 'Application Module Link' option under 'Interfaces' is selected. The main content area is titled 'New Application Module Link'. It contains the following fields and controls:

- Port number:** A dropdown menu with the value '33' selected. A note '(16 - 127)' is displayed next to it.
- AML over ELAN:** A checkbox that is currently unchecked.
- Description:** A text input field containing the text 'For SIPLine'.
- Link control system parameters:** A checkbox that is currently unchecked.
- Maximum octets:** A dropdown menu with the value '512' selected. A note '(per HDLC frame)' is displayed next to it.
- Save and Cancel buttons:** Located at the bottom right of the form.

A red box highlights the 'Save' button. A red box also highlights the 'Port number' dropdown menu.

Figure 14: Adding a new AML

On the EM page, navigate to **System -> Interfaces -> Value Added Server** and click on the **Add** button to add a new VAS.

Enter a number in the **Value added server ID** field, in this example **33** was used. In the **Ethernet LAN Link** drop down list, select the AML number of ELAN that was created in the **Section 5.6**.

Avaya CS1000 Element Manager

Help | Logout

Managing: 10.97.78 Username: admin
System » Interfaces » Value Added Server » Add Value Added Server » Ethernet Link

Ethernet Link

Value added server ID: 33 (16 - 127)
Ethernet LAN Link: 33
ELAN port configured in ADAN

Application security: ☐
Interval: 1
Time interval for checking the link for overload in five second increments

Message count threshold: 9999 (10 - 9999)

* Required value.

Save Cancel

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KP; Reviewed:
SPOC 10/14/2011

5.8. Create a Virtual Trunk Zone

On the EM page, navigate to menu **System -> IP Network -> Zones**. The **Zones** page appears on the right, in this page select **Bandwidth Zones** link.

On the **Bandwidth Zones** page, click on the **Add** button, the **Zone Basic Property and Bandwidth Management** page appears as shown in **Figure 16**.

Enter a zone number in the **Zone Number (Zone)** field and in the **Zone Intent (ZBRN)** drop down menu select **VTRK (VTRK)**.

Leave other fields as default values and click on the **Save** button to complete adding the Zone.

Note: Repeat the step above to create another zone for the SIP Line phone; however remember to select **MO**, instead of VTRK in the field **Zone Intent**.

The screenshot displays the AVAYA CS1000 Element Manager interface. The main window is titled "Zone Basic Property and Bandwidth Management". It features a table with two columns: "Input Description" and "Input Value". The table contains the following entries:

Input Description	Input Value
Zone Number (ZONE):	4 (1 - 8000)
Intrazone Bandwidth (INTRA_BW):	1000000 (0 - 10000000)
Intrazone Strategy (INTRA_STGY):	Best Quality (BQ)
Interzone Bandwidth (INTER_BW):	1000000 (0 - 10000000)
Interzone Strategy (INTER_STGY):	Best Quality (BQ)
Resource Type (RES_TYPE):	Shared (SHARED)
Zone Intent (ZBRN):	MO (MO)
Description (ZDES):	

Below the table, there is a note: "* Required value." and two buttons: "Save" and "Cancel". The sidebar on the left contains a tree view with the following items:

- UCM Network Services
- Home
- Links
- Virtual Terminals
- System
 - + Alarms
 - Maintenance
 - + Core Equipment
 - Peripheral Equipment
 - IP Network
 - Nodes: Servers, Media Cards
 - Maintenance and Reports
 - Media Gateways
 - **Zones**
 - Host and Route Tables
 - Network Address Translation (NAT)
 - QoS Thresholds
 - Personal Directories
 - Unicode Name Directory
 - Interfaces
 - Application Module Link
 - Value Added Server
 - Property Management System
 - Engineered Values
 - + Emergency Services
 - + Geographic Redundancy
 - + Software

The footer of the window displays the copyright information: "Copyright © 2002-2011 Avaya Inc. All rights reserved."

Figure 16: Adding a new Zone for Virtual Trunk

5.9. Create a SIP Line Route Data Block (RDB)

On the EM page, navigate to the menu **Routes and Trunks** -> **Routes and Trunks**; the **Routes and Trunks** page appears (not shown). In this page, click on the **Add route** button next to the customer number that the route will belong to.

The **Customer ID, New Route Configuration** page appears, expand the **Basic Configuration** tab, and enter values below and as shown in **Figure 17** and **18**.

- **Route Number (ROUT):** 3
- **Trunk type(TKTP):** TIE
- **Incoming and Outgoing trunk (ICOG):** IAO
- **Access Code for Trunk group (ACOD):** enter a number for ACOD, for example 757.
- **The route is for a virtual trunk route (VTRK):** Checked.
- **Zone for codec selection and bandwidth management (ZONE):** 4, this is the Virtual trunk zone number that created in the **Section 4.8**.
- **Node ID of signaling server of this route (NODE):** 512, this is the node ID of the SIP Line.
- **Protocol ID for the route (PCID):** SIP Line (SIPL).
- **Integrated services digital network option (ISDN):** checked.
- **Mode of operation (MODE):** Route uses ISDN Signaling Link (ISLD).
- **D channel number (DCH):** 4, the D-channel number that was created in the **Section 4.5**.
- **Interface type for route (IFC):** Meridian M1 (SL1).
- **Network calling name allowed (NCNA):** checked.
- **Channel type (CHTP):** B-channel (BCH).
- **Call type for outgoing direct dialed TIE route (CTYP):** CDP.
- **Calling Number dialing plan (CNDP):** CDP.

Leave default values for The **Basic Route Options, Network Options, General Options, and Advanced Configurations** sections.

Click the **Submit** button to complete adding the route and save configuration.

AVAYA CS1000 Element Manager Help | Logout

- UCM Network Services
 - Home
 - Links
 - Virtual Terminals
 - System
 - + Alarms
 - Maintenance
 - + Core Equipment
 - Peripheral Equipment
 - + IP Network
 - + Interfaces
 - Engineered Values
 - + Emergency Services
 - + Geographic Redundancy
 - + Software
 - Customers
 - Routes and Trunks
 - Routes and Trunks
 - D-Channels
 - Digital Trunk Interface
 - Dialing and Numbering Plans
 - Electronic Switched Network
 - Flexible Code Restriction
 - Incoming Digit Translation
 - Phones
 - Templates
 - Reports
 - Views
 - Lists
 - Properties
 - Migration
 - Tools
 - + Backup and Restore
 - Date and Time
 - + Logs and reports

- Basic Configuration

Route data block (RDB) (TYPE):

Customer number (CUST):

Route number (ROUT):

Designator field for trunk (DES):

Trunk type (TKTP):

Incoming and outgoing trunk (ICOG):

Access code for the trunk route (ACOD):

Trunk type M911P (M911P): ☐

The route is for a virtual trunk route (VTRK): ☒

- Zone for codec selection and bandwidth management (ZONE): (0 - 8000)

- Node ID of signaling server of this route (NODE): (0 - 9999)

- Protocol ID for the route (PCID):

Integrated services digital network option (ISDN): ☒

- Mode of operation (MODE):

- D channel number (DCH): (0 - 254)

- Interface type for route (IFC):

- Private network identifier (PNI): (0 - 32700)

- Network calling name allowed (NCNA): ☒

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Internet 100%

Figure 117: SIP Line Route Configuration

AVAYA CS1000 Element Manager Help | Logout

- UCM Network Services
 - Home
 - Links
 - Virtual Terminals
 - System
 - + Alarms
 - Maintenance
 - + Core Equipment
 - Peripheral Equipment
 - + IP Network
 - + Interfaces
 - Engineered Values
 - + Emergency Services
 - + Geographic Redundancy
 - + Software
 - Customers
 - Routes and Trunks
 - Routes and Trunks
 - D-Channels
 - Digital Trunk Interface
 - Dialing and Numbering Plans
 - Electronic Switched Network
 - Flexible Code Restriction
 - Incoming Digit Translation
 - Phones
 - Templates
 - Reports
 - Views
 - Lists
 - Properties
 - Migration
 - Tools
 - + Backup and Restore
 - Date and Time

- Basic Route Options

Private network identifier (PNI): (0 - 32700)

Network calling name allowed (NCNA): ☒

Network call redirection (NCRD): ☐

Recognition of DT12 ABCD FALT signal for ISL (FALT): ☐

- Channel type (CHTY):

- Call type for outgoing direct dialed TIE route (CTYP):

- Insert ESN access code (INAC): ☐

- Integrated service access route (ISAR): ☐

- Display of access prefix on CLID (DAPC): ☐

- Mobile extension route (MBXR): ☐

- Mobile extension outgoing type (MBXOT):

- Mobile extension timer (MBXT): (0 - 8000 milliseconds)

Calling number dialing plan (CNDP):

Attendant announcement (ATAN):

Billing number required (BILN): ☐

Call detail recording (CDR): ☐

North American toll scheme (NATL): ☒

Controls or timers (CNTL): ☐

Conventional (Tie trunk only) (CNVT): ☐

Incoming DID digit conversion on this route (IDC): ☐

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Internet 100%

Figure 18: SIP Line Route Configuration (cont)

5.10. Create SIP Line Virtual Trunks

On the EM page, navigate to **Routes and Trunks -> Routes and Trunks** and select the **Add route** button beside to the route was created in the **Section 5.9** above to create new trunks.

The **Customer ID, Route ID, and Trunk type TIE trunk data block** page appears as shown in **Figure 19**, enter values for fields as shown below:

- **Multiple trunk input number (MTINPUT):** 32 -> create 32 trunks.
- **Auto increment member number:** checked.
- **Trunk data block (TYPE):** IP Trunk (IPTI).
- **Terminal Number (TN):** 100 0 2 0 -> enter the first TN of a range TN.
- **Member number:** 33, this is ID of trunk, just enter the first ID for first trunk, next ID will be automatically created and incremented.
- **Start arrangement Incoming:** Immediate (IMM).
- **Start arrangement Outgoing:** Immediate (IMM).
- **Trunk Group Access Restriction (TGAR):** 1.
- **Channel ID for this trunk:** 33, this ID should be the same with the ID of Member Number.

Click on the **Class of Service** button and assign following class of services (not shown):

- **Media security:** Media Security Never (MSNV).
- **Restriction level:** Unrestricted.

Leave other fields at default values and click on the **Return Class of Service** button to return to the **Trunk type TIE trunk data block** page.

Click on the **Save** button to complete adding virtual trunks for SIP Line.

The screenshot displays the AVAYA CS1000 Element Manager web interface. The left sidebar contains a navigation menu with categories like UCM Network Services, Links, System, Customers, Routes and Trunks, and Tools. The main content area is titled 'Customer 0, Route 3, Trunk type TIE trunk data block'. It features a 'Basic Configuration' section with various input fields and dropdown menus for setting up a virtual trunk. At the bottom, there is an 'Advanced Trunk Configurations' section and 'Save' and 'Cancel' buttons.

AVAYA CS1000 Element Manager

Managing: 10.97.78 Username: admin
Routes and Trunks » Routes and Trunks » Customer 0, Route 3

Customer 0, Route 3, Trunk type TIE trunk data block

- Basic Configuration

Multiple trunk input number: 32 Range: 2 - 3700
Auto increment member number: ☒
Trunk data block: IP Trunk (IPTI)
Terminal number: 100 0 2 0 *
Designator field for trunk: SIPLINE
Extended trunk: VTRK
Member number: 33 *
Level 3 Signaling:
Card density: Octal Density (8D)
Start arrangement Incoming: Immediate (IMM)
Start arrangement Outgoing: Immediate (IMM)
Trunk group access restriction:
Channel ID for this trunk: 33
Class of Service: Edit

+ Advanced Trunk Configurations

* Required value.

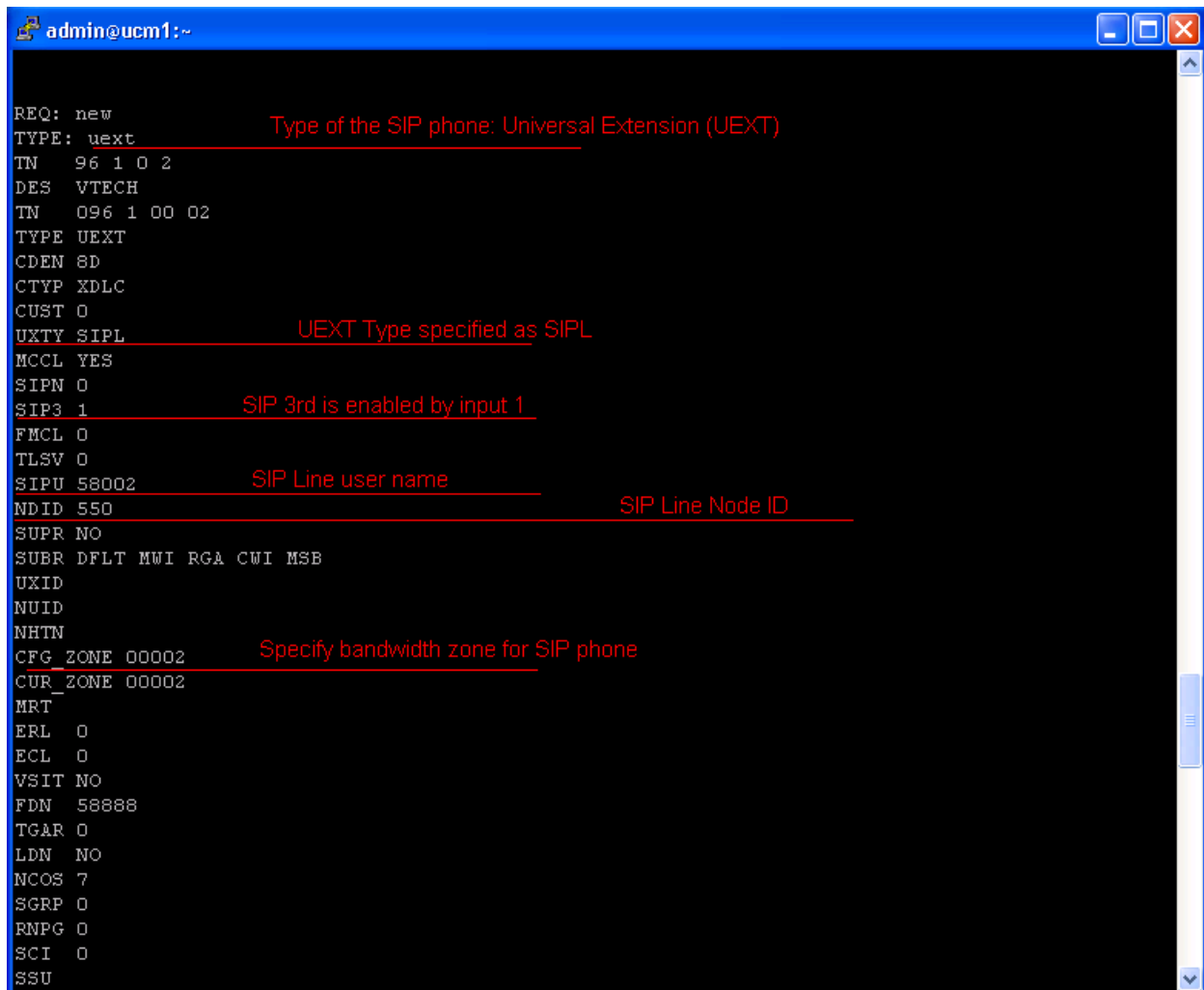
Save Cancel

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Figure 19: Adding virtual trunks for SIP Line Trunk

5.11. Create a SIP Line Phone

To create a SIP Line phone on the Call Server, log in as administrator using the command line interface (CLI) and issue the overlay (LD) 20, the example values with some important values explained as shown in Figure 20 and 21 below.



```
admin@ucm1:~
REQ: new
TYPE: uext
TN 96 1 0 2
DES VTECH
TN 096 1 00 02
TYPE UEXT
CDEN 8D
CTYP XDLC
CUST 0
UXTY SIPL
MCCL YES
SIPN 0
SIP3 1
FMCL 0
TLSV 0
SIPU 58002
NDID 550
SUPR NO
SUBR DFLT MWI RGA CWI MSB
UXID
NUID
NHTN
CFG_ZONE 00002
CUR_ZONE 00002
MRT
ERL 0
ECL 0
VSIT NO
FDN 58888
TGAR 0
LDN NO
NCOS 7
SGRP 0
RNPG 0
SCI 0
SSU
```

Type of the SIP phone: Universal Extension (UEXT)

UEXT Type specified as SIPL

SIP 3rd is enabled by input 1

SIP Line user name

SIP Line Node ID

Specify bandwidth zone for SIP phone

Figure 20: Creating a new sip user in Call Server

```
admin@ucm1::~
XLST
SCPM 1234          Set the password for SIP user
SFLT NO
CAC_MFC 0
CLS UNR FBD WTA LPR MTD FND HTD TDD HFD CRPD
MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD SLKD CCSD SWA LND CNDA
CFTA SFD MRD DDV CNID CDCA MSID DAPA BFED RCBF
ICDD CDMD LLCN MCTD CLBD AUTU
GPUD DPUD DNDA CFKA ARHD CLTD ASCD
CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD
UDI RCC HBTB AHA IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
DRDD EXRO
USMD USRD ULAD CCBF RTDD RBDD RBHD PGND OCBF FLXD FTTC DNDY DNO3 MCBN
FDSD NOVD VOLA VOUD CDMR PRED RECD MCDD TS7D SBMD ELMD
MSNV FRA PKCH MWTD DVLD CROD ELCD
CPND_LANG ENG
RCO 0
EFD
HUNT 58008
EHT 58888
LHK 0
PLEV 02
PUID
UPWD
DANI NO
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
MLNG ENG
DNDR 0
KEY 00 SCR 58002 0 MARP          Assign the DN for SIP user
    CPND
        CPND_LANG ROMAN
        NAME VTECH 58002          The name displayed on received phone
        XPLN 13
        DISPLAY_FMT FIRST, LAST
    01 HOT U 2658002 MARP 0      Key 1 hot U with prefix 26 as defined in customer data block
    02
    03 CWT                      Call Waiting key
```

Figure: Creating a new sip user in Call Server (cont)

6. Configure VTech Corded 2-Line S1220 Phone

This section describes how to access the VTech S1220 SIP endpoint web interface and configure the S1220 for testing. For more information on how to configure the VTech S1220, please refer to the document in the **Section 9[2]**.

6.1. Login VTech S1220 phone

This section shows how to log in to the home page of VTech S1220 to manage and configure the phone.

Open the web browser, in the address field enter the IP address of VTech S1220 phone: <http://ipaddress> and the VTech S1220 login page will appear as shown in **Figure 20**. Enter the username and its default password.

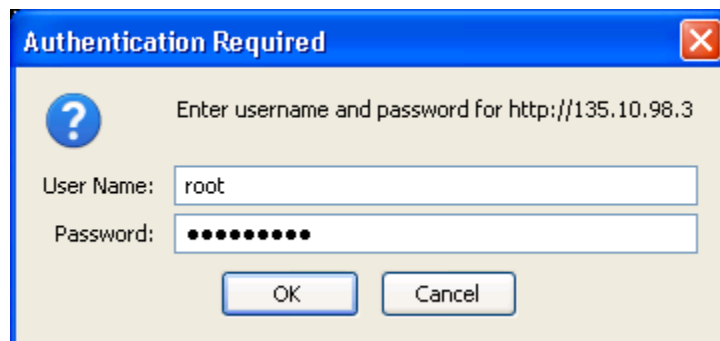


Figure 20: VTech S1220 Login Screen

Click the **OK** button, the homepage of VTech S1220 appears as in **Figure 21** below.

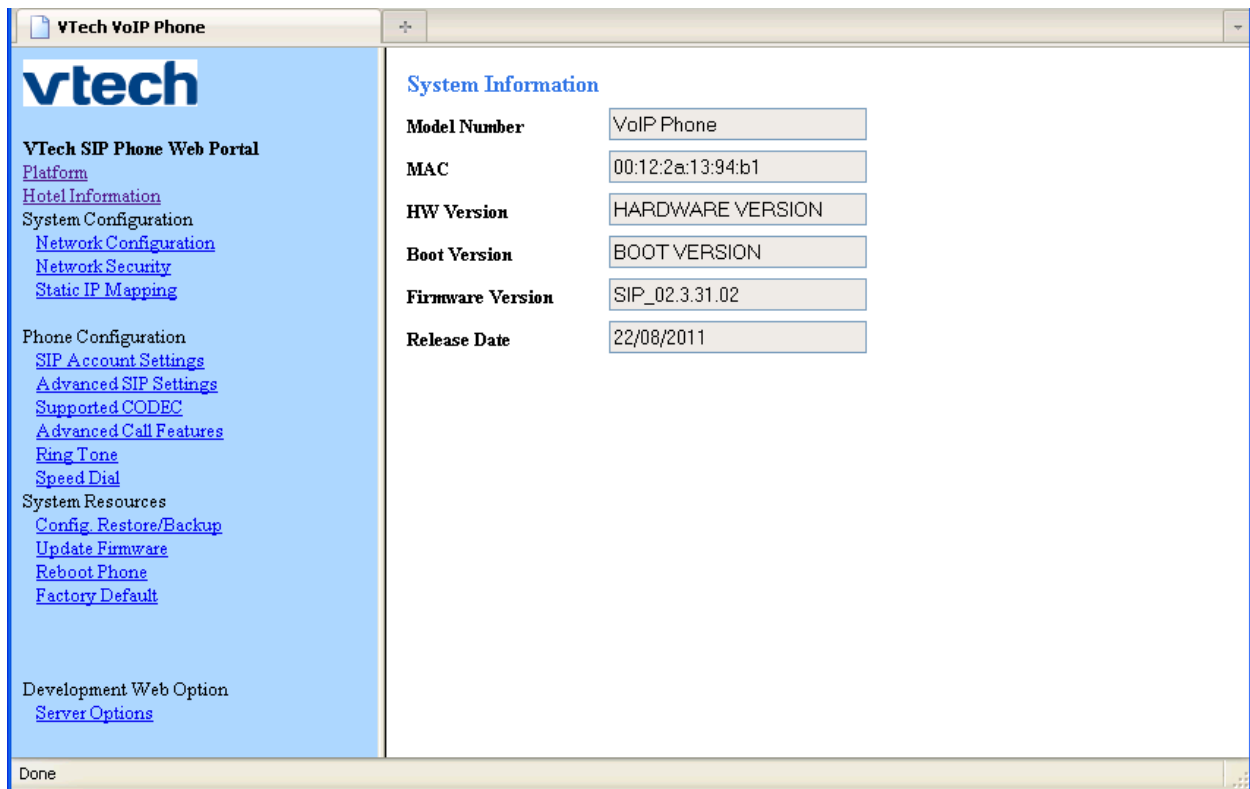


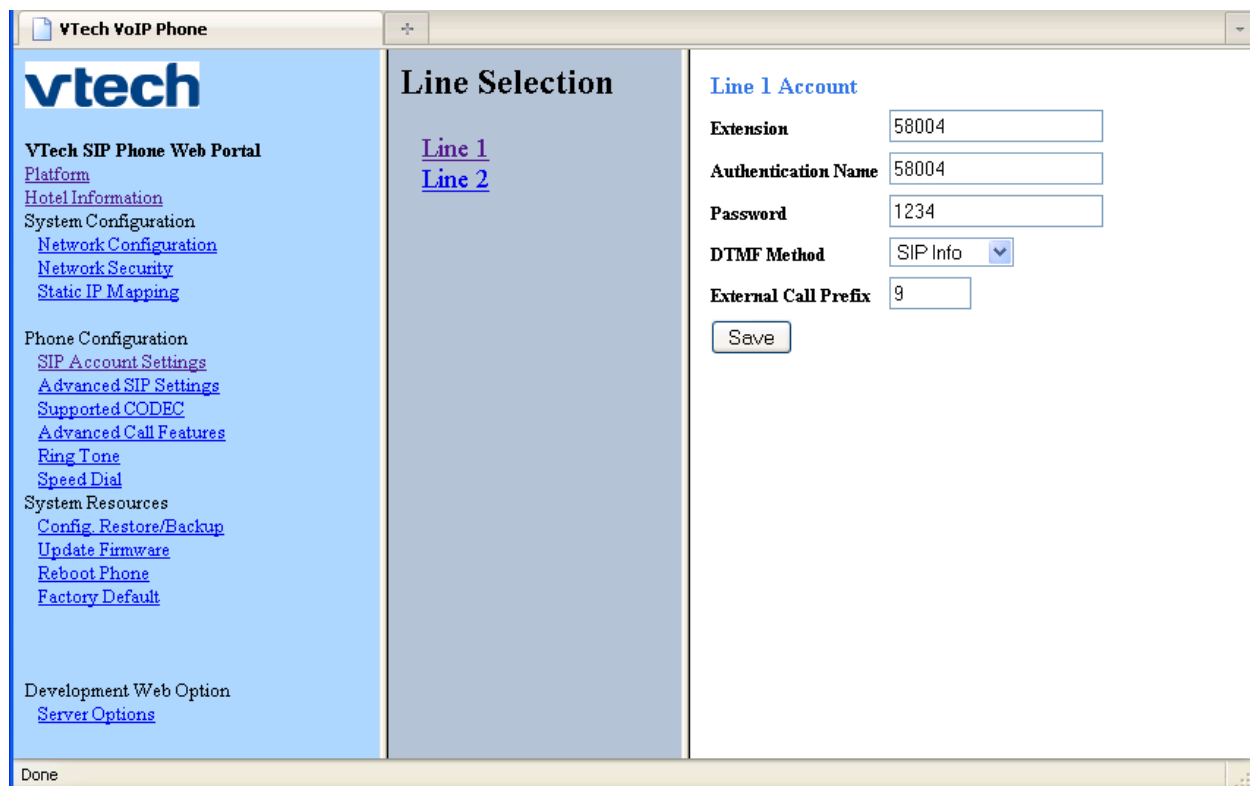
Figure 21: Home page of VTech S1220 phone

6.2. Configure registration for VTech S1220

This section shows how to configure the VTech S1220 telephone to register with the CS1000 SIP Line gateway.

On left-hand side of the homepage (see **Figure 21**), click on the **SIP Account Settings** link, the **Line Selection** appears in the middle of the page, click on the **Line 1** link, the Line 1 Account appears as shown in **Figure 22**. Enter extension number in the **Extension** field, user name in the **Authentication Name**, password in the **Password** field, and select DTMF Method in the dropdown list. Keep the External Call Prefix as default value since the CS1000 SIP Line doesn't use this field to route the call.

Click on the **Save** button to save changes.



The screenshot shows the VTech VoIP Phone web portal. The left sidebar contains a navigation menu with links for Platform, Hotel Information, System Configuration, Network Configuration, Network Security, Static IP Mapping, Phone Configuration, SIP Account Settings, Advanced SIP Settings, Supported CODEC, Advanced Call Features, Ring Tone, Speed Dial, System Resources, Config Restore/Backup, Update Firmware, Reboot Phone, Factory Default, and Development Web Option. The main content area is titled 'Line Selection' and has two links: 'Line 1' and 'Line 2'. The 'Line 1' link is selected, and the 'Line 1 Account' configuration page is displayed. This page contains fields for Extension (58004), Authentication Name (58004), Password (1234), DTMF Method (SIP Info), and External Call Prefix (9). A 'Save' button is located at the bottom of the form.

Figure 22: Line Configuration of VTech S1220

Click on the **Advanced SIP Settings** link, the Advanced SIP Settings page appears in the right-hand side of the page as shown in **Figure 23**. Enter the SIP Line domain sip170.com and port 5060 in the **Registrar Server Address: Port** field, the Node IP address of SIP Line server 135.10.97.133 in the **Proxy Server Address: Port**, UDP in the **SIP Transport** field, ENABLE in the **Prack** field and keep other fields as the default.

Click on the **Save** button to save the changes.

The screenshot shows the 'Advanced SIP Settings' page of a VTech VoIP Phone web portal. The left sidebar contains a navigation menu with links for Platform, Hotel Information, System Configuration, Network Configuration, Network Security, Static IP Mapping, Phone Configuration, SIP Account Settings, Advanced SIP Settings (selected), Supported CODEC, Advanced Call Features, Ring Tone, Speed Dial, System Resources, Config Restore/Backup, Update Firmware, Reboot Phone, Factory Default, Status, DECT, Development Web Option, and Server Options. The main content area displays various SIP settings with input fields and dropdown menus. A 'Save' button is located at the bottom of the settings list.

Setting	Value
Registrar Server Address : Port	sip170.com : 5060
Proxy Server Address : Port	135.10.97.133 : 5060
Message Waiting Server	: 5060
Backup Registrar Server	DISABLE
Backup Registrar Server Address : Port	:
Backup Registrar Retrieval Count	2
SIP Transport	UDP
Registration Timeout (sec)	300
Registration Retrieval Limit (attempt)	10
Message Waiting Subscribe Timeout (sec)	300
Prack	ENABLE
Dial Plan	*xxxxxx# x.T
Interdigit Timeout (sec)	5
On Hold Timeout (min)	15

Save

Figure 23: The Advanced SIP Settings of VTech S1220 phone

For every change on the VTech phone, the phone needs to be rebooted to take effect. To reboot the phone, click on the **Reboot Phone** link, the Reboot button appears on the right-hand side of the page as shown in **Figure 24**, click on the **Reboot** button and wait for 60 seconds until the page of the phone is refreshed and displayed again. The process of rebooting phone has been completed and the phone is able to use.

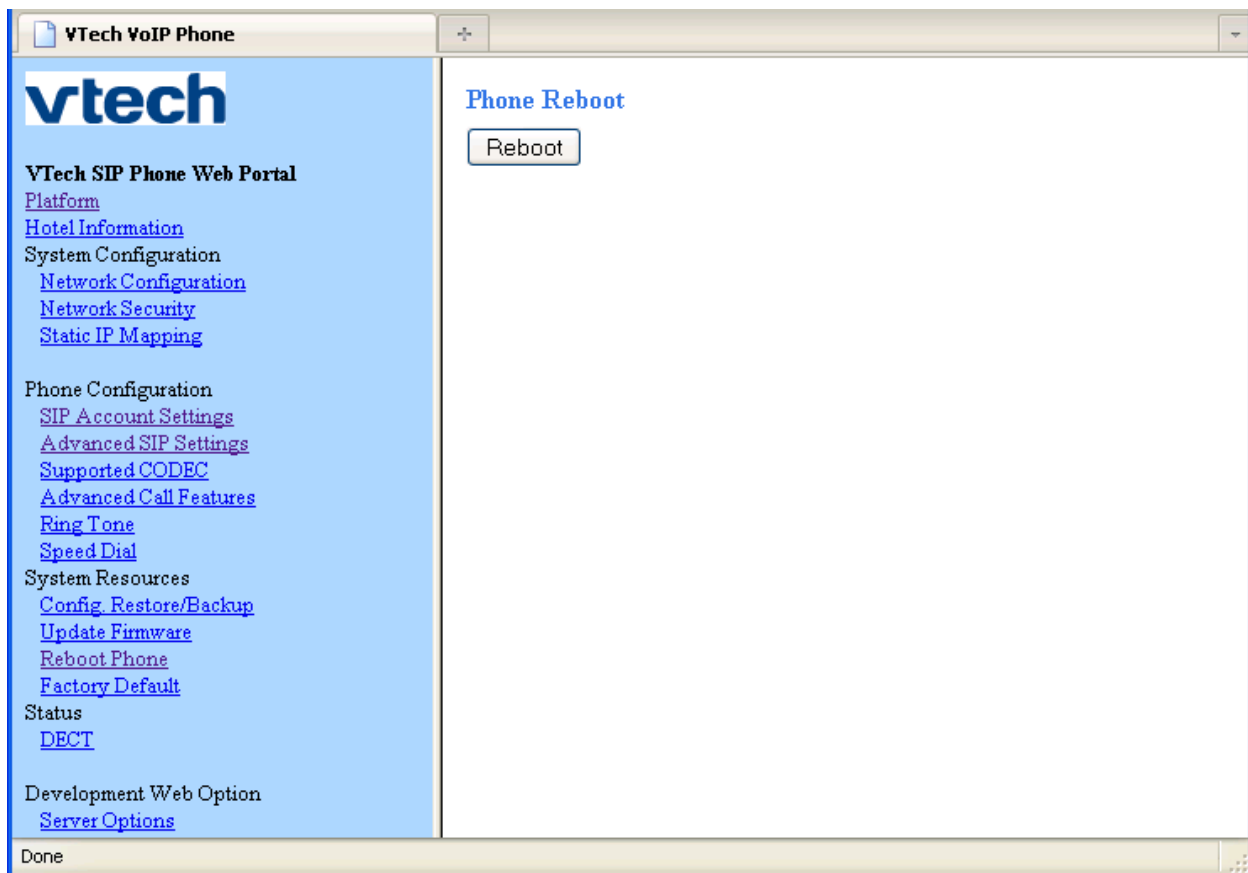


Figure 24: VTech S1220 Phone Reboot page

6.3. Local Call Forward Settings

This section shows how to configure “Local Call Forward” such as Call Forward All calls, Call forward busy and Call Forward No Answer on the VTech S1220 telephone.

On the homepage of VTech S1220 (see **Figure 21**), click on the **Advanced Call Features** link select the line in **Line Selection** page and the **Call Setting** page appears as shown in **Figure 25**. Select the call forward type in the **Call Forward Mode** field and enter the forward number in the **Call Forward Number** field.

Click the **Save** button to save the changes.

Note:

- The “Server Call Forward Always” is set for the VTech phone on the CS 1000 Call Server must be disabled, so that “Local Call Forward Always” on the VTech S1220 can be affected.
- The VTech S1220 telephone supports 3 types of call forward: Always, On Busy, and On No Answer.

The screenshot displays the VTech VoIP Phone web portal interface. On the left is a navigation menu with categories: VTech SIP Phone Web Portal (containing links for Platform, Hotel Information, System Configuration, Network Configuration, Network Security, and Static IP Mapping), Phone Configuration (containing links for SIP Account Settings, Advanced SIP Settings, Supported CODEC, Advanced Call Features, Ring Tone, and Speed Dial), System Resources (containing links for Config Restore/Backup, Update Firmware, Reboot Phone, and Factory Default), Status (containing a link for DECT), and Development Web Option (containing a link for Server Options). The main content area is titled 'Line Selection' and shows two links: 'Line 1' and 'Line 2'. To the right of this is the 'Call Settings - Line 1' section, which includes a 'Call Forward Mode' dropdown menu set to 'Always', a 'Call Forward Number' text input field containing '58888', and a 'DND' checkbox which is currently unchecked. A 'Save' button is located below these fields. The bottom status bar of the browser window shows the word 'Done'.

Figure 25: Call Settings section of VTech S1220 telephone

6.4. Codec settings

This section shows how to configure the Codec on the VTech S1220 phone.

On the homepage of VTech S1220 (see **Figure 21**), click on the **Supported CODEC** link and select the line in **Line Selection** page and the **Audio Setting - Line** page appears as shown in **Figure 26**. Click on the list supported audio codec in the **Audio Codec 1** field and select the desired codec for the first choice codec, repeat the same procedure for the Audio Codec 2, 3, and 4. Click on the **Save** button to save changes.

Note: It is recommended to have the audio codec G711u or G711a presented in one of 4 Audio Codec choices. For example, in case the audio codec G729 is selected as first choice in the Audio Codec 1, maintain the audio codec G711u and G711a in the second and third choice.

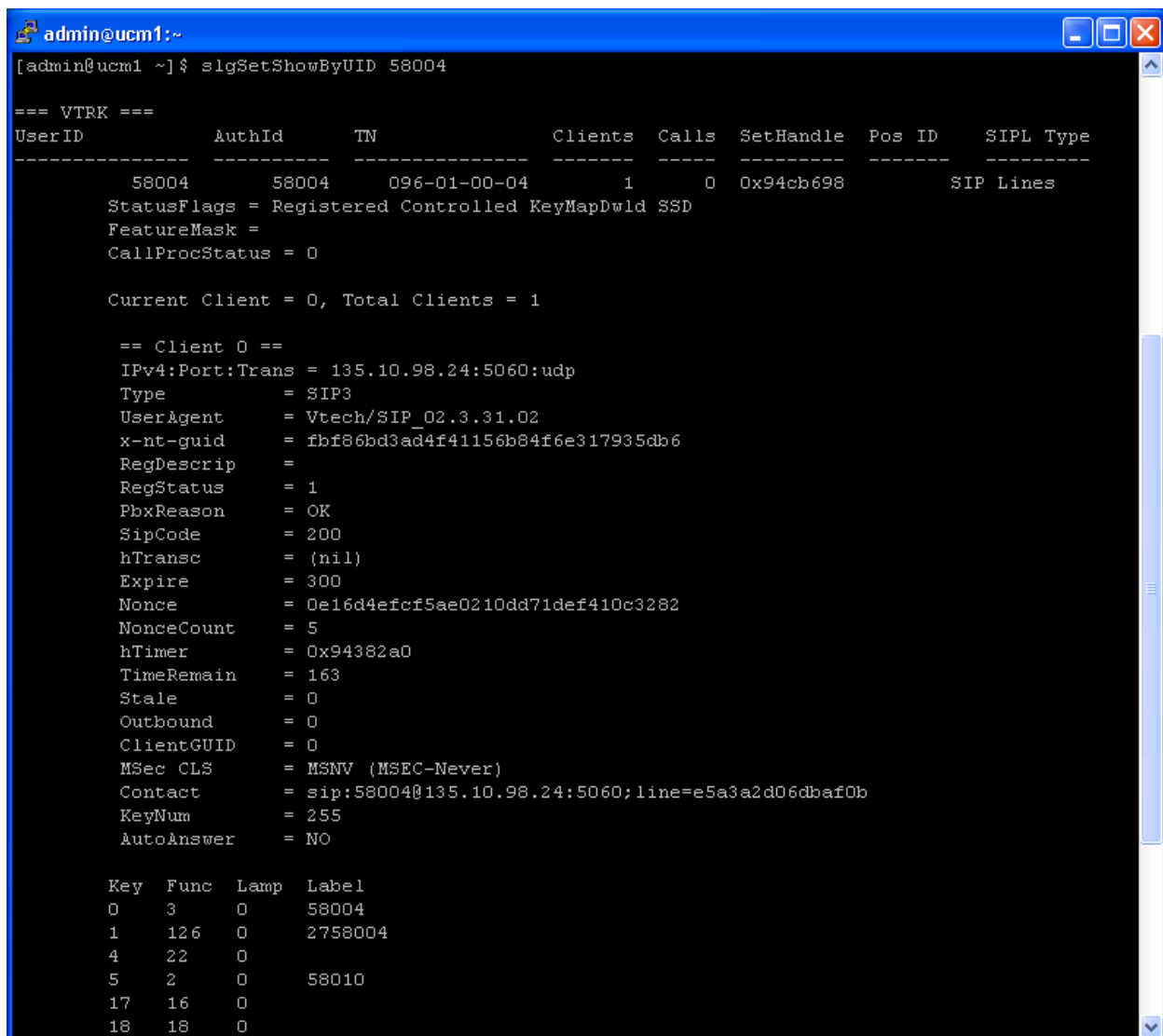
The screenshot displays the VTech VoIP Phone web portal interface. The left sidebar contains a navigation menu with links for Platform, Hotel Information, System Configuration, Network Configuration, Network Security, Static IP Mapping, Phone Configuration, SIP Account Settings, Advanced SIP Settings, Supported CODEC, Advanced Call Features, Ring Tone, Speed Dial, System Resources, Config Restore/Backup, Update Firmware, Reboot Phone, Factory Default, Development Web Option, and Server Options. The main content area is titled 'Line Selection' and shows 'Line 1' and 'Line 2' as selectable options. The 'Audio Settings - Line 1' section is active, showing four audio codec selection fields: Audio Codec 1 (G.729), Audio Codec 2 (G.711u), Audio Codec 3 (G.711a), and Audio Codec 4 (G.722). A 'Save' button is located below these fields. The status bar at the bottom indicates 'Done'.

Figure 25: Audio Setting – Line of VTech S1220 phone

7. Verification Steps

This section includes some steps that can be followed to verify the configuration.

- Verify that the VTech SIP Corded S1220 telephone registers successfully with the CS 1000 SIP Line Gateway server and Call Server by using the CS 1000 Linux command line and CS 1000 Call Server overlay LD 32.
 - Log in to the SIP Line server as an administrator.
 - Issue command “slgSetShowByUID [userID]” where userID is SIP Line user’s ID being checked. Figure below shows the detail of user 58004 as registered to the CS1000 SIP Line server.



```
admin@ucm1:~$ slgSetShowByUID 58004

=== VTRK ===
UserID      AuthId      TN           Clients  Calls  SetHandle  Pos ID  SIPL Type
-----
58004       58004       096-01-00-04 1        0      0x94cb698  SIP Lines
StatusFlags = Registered Controlled KeyMapDwld SSD
FeatureMask =
CallProcStatus = 0

Current Client = 0, Total Clients = 1

== Client 0 ==
IPv4:Port:Trans = 135.10.98.24:5060:udp
Type            = SIP3
UserAgent       = Vtech/SIP_02.3.31.02
x-nt-guid       = fbf86bd3ad4f41156b84f6e317935db6
RegDescrip      =
RegStatus       = 1
PbxReason       = OK
SipCode         = 200
hTransc         = (nil)
Expire          = 300
Nonce           = 0e16d4efcf5ae0210dd71def410c3282
NonceCount      = 5
hTimer          = 0x94382a0
TimeRemain      = 163
Stale           = 0
Outbound        = 0
ClientGUID      = 0
MSec CLS        = MSNV (MSEC-Never)
Contact         = sip:58004@135.10.98.24:5060;line=e5a3a2d06dbaf0b
KeyNum          = 255
AutoAnswer      = NO

Key  Func  Lamp  Label
0    3      0      58004
1    126    0      2758004
4    22     0      58010
5    2      0
17   16     0
18   18     0
```

- Log in to the call server using the admin account.

- Load overlay 32 and then issue command “stat [TN]” where TN is the SIP Line user’s TN being checked

```
>ld 32
NPR000
.stat 96 1 0 4
IDLE REGISTERED 00
```

- Place a call from and to the VTech SIP S1220 telephone and verify that the call is established with 2-way speech path.
- During the call, use capture tool (ethereal/wireshark) to capture SIP packets at the SIP Line server and SIP phones to make sure that all SIP request/response messages are correct.

8. Conclusion

All of the executed test cases have passed and met the objectives outlined in the **Section 2.1**, with some exceptions outlined in **Section 2.2**. The VTech Hospitality SIP Corded 2-Line S1220 version 02.3.31.02 is considered to be in compliance with Avaya Communication Server 1000 SIP Line System Release 7.5.

9. Additional References

Product documentation for the Avaya Communication Server 1000 products may be found at: <https://support.avaya.com/css/Products/>

Product documentation for the VTech Hospitality SIP Corded S1220 products may be found at: <http://www.vtechhotelphones.com>

[1] Avaya CS1000 Documents:

Avaya Communication Installation and Commissioning, Doc# NN43041-310, Issue 05.04, Date May 2011

Avaya Communication Server 1000 Unified Communications Management Common Services Fundamentals, Doc # NN43001-116, Issue 05.11, Date June 2011.

Avaya Communication Server 1000 Co-resident Call Server and Signaling Server Fundamentals, Doc # NN43001-509, Issue 03.02, Date June 2011

Avaya Communication Server 1000 Element Manager System Reference - Administration, Doc# NN43001-632, Issue 05.09, Date July 2011.

Avaya Communication Server 1000 SIP Line Fundamental, Doc# NN43001-508, Issue 03.03, Date November 2010

[2] VTech Hospitality SIP Corded Documents:

VTech SIP Cordless Series Master User Guide

VTech SIP Phone Configuration Guide

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