



## Avaya Solution & Interoperability Test Lab

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# Application Notes for Configuring the Esna Office-LinX version 8.1 with Avaya Communication Server 1000 Release 7.5 - Issue 1.0

### Abstract

These Application Notes describe the procedure for configuring the Esna Office-LinX v8.1 to interoperate with the Avaya Communication Server 1000 Release 7.5.

The Office-LinX Enterprise Edition server connects to the Avaya Communication Server 1000 via SIP connectivity and provides unified communications features such as a greeting menu, user mailbox services, wake up services and transfer functionalities.

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

# 1. Introduction

These Application Notes describe the procedure for configuring the Esna Office-LinX v8.1 (Office-LinX) to interoperate with Avaya Communication Server 1000 (CS1000) Release 7.5.

The objective of this compliance testing is to verify that Office-LinX can connect via a SIP trunk to the CS1000 and provide unified communication services like greetings, messaging and transfer functionalities.

## 2. General Test Approach and Test Results

The general test approach was to place calls to Esna Office-LinX server, and the main objectives were to verify that the user can:

- Successfully establish calls to Office-LinX from/to the CS1000 end points.
- Successfully transfer from Office-LinX.
- Successfully leave messages for subscribers and to retrieve the same.

The Esna Office-LinX server was tested for serviceability and the objectives were to verify that:

- Office-LinX can successfully connect back after the Ethernet cable has been disconnected and connected back again.
- Office-LinX can successfully recover after a reboot.

### 2.1. Interoperability Compliance Testing

The interoperability compliance test included features and serviceability that operate via SIP connectivity. The focus of the compliance testing was primarily on verifying the interoperability between Office-LinX v8.1 and the Avaya CS1000 R7.5 so that the following features operate:

- CS1000 end points can access the Office-LinX pilot number.
- Office-LinX can access the CS1000 end points.
- Office-LinX provides messaging services to the CS1000 end points.
- Office-LinX can conduct transfer operations for the end points.

### 2.2. Test Results

All the relevant tests were executed and passed.

### 2.3. Support

Technical support for the Office-LinX solution can be obtained by contacting Esna:

- Email – [techsupp@esna.com](mailto:techsupp@esna.com)
- Phone – (905) 707-1234

### 3. Reference Configuration

Figure 1 illustrates the configuration used in these Application Notes. The solution configuration shows a setup of a CS1000 communicating to the Office-LinX via a Network Routing Server (NRS, also known as SIP Proxy Server) using a SIP trunk. The CS1000 has IP and SIP telephones connected as endpoints.

For interoperability, Office-LinX requires the use of the G.711MU codec, and transmission of DTMF tones using RFC2833.

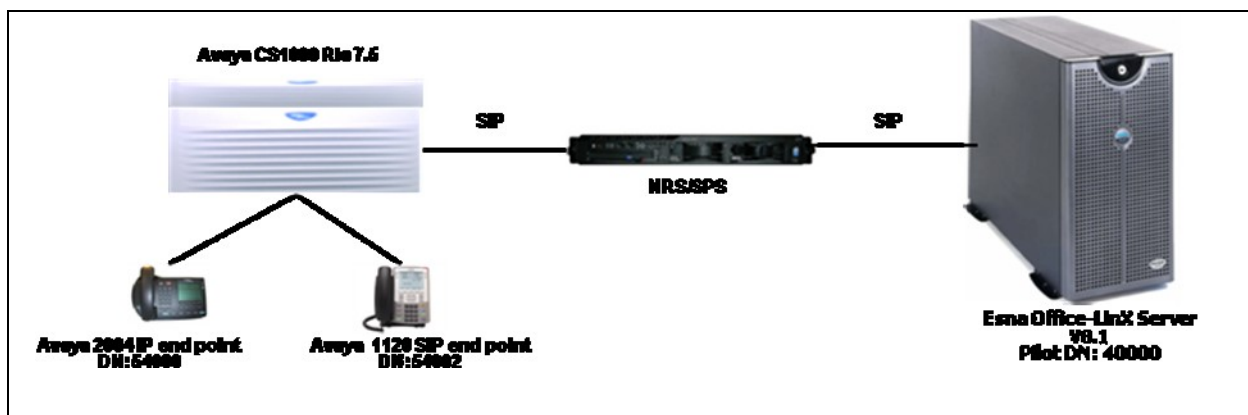


Figure 1: Solution Configuration

### 4. Equipment and Software Validated

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

Equipment	Software/Firmware
Avaya CS1000	SW Version : 7.50 Q
Avaya Telephones: i2004 (IP) 1120E (SIP)	0602B76 02.02.21.00
Avaya NRS/SPS	SW Version : 7.50 Q
Office-LinX Application Server	Windows XP Professional SP3
Office-LinX	SW Version 8.1.11.1330

### 5. Configure Avaya CS1000 Rls 7.5

This section describes the procedure for setting up CS1000. The steps include setting up

- Route, Route Line Block Index (RLB) and Distant Steering Code (DSC).
- NRS/SPS domain, End Points and Routing Information.
- Node properties.
- Endpoints/Telephones.

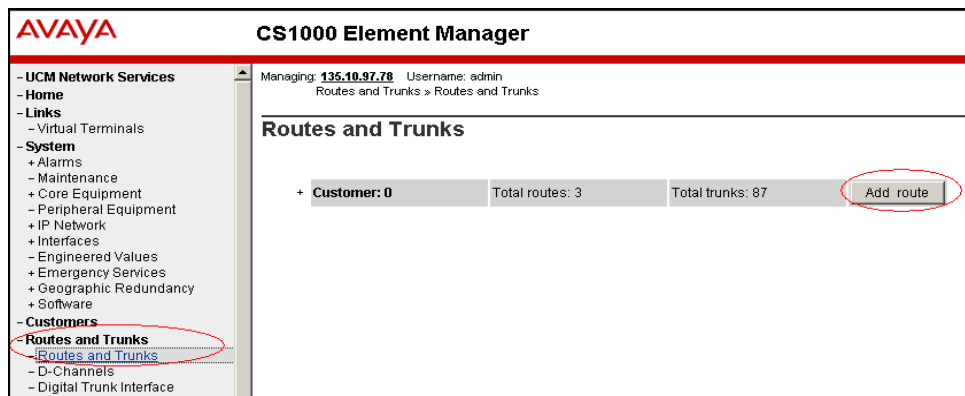
The values used in this guide may be unique to the example shown. User will have to use values unique to their site, where this solution is being deployed (e.g., site's IP address, extension numbers, etc).

CS1000 configurations can be performed through Unified Communications Manager (UCM), Element Manager (EM) and Command Line Interface (CLI).

## 5.1. Route, RLB and DSC Configuration

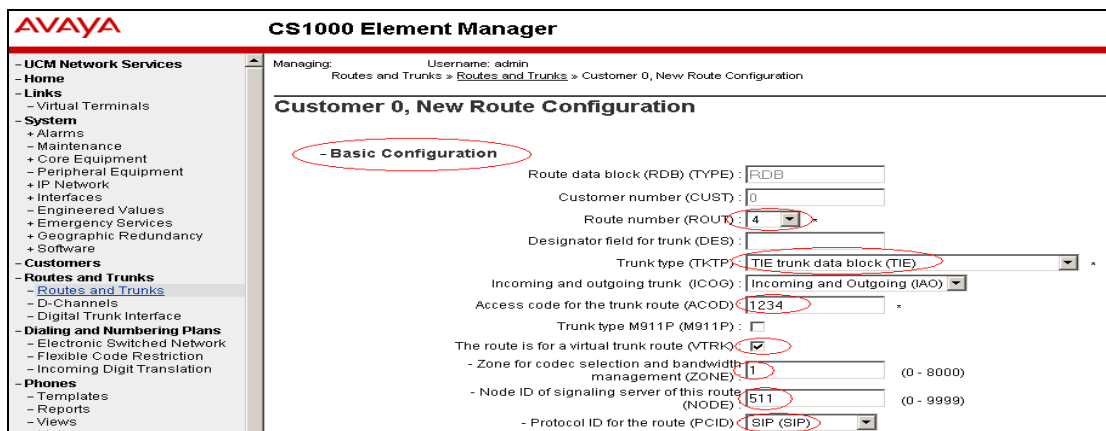
This section explains the steps to configure a Routing entry that will access the Office-LinX server from the CS1000 using the RLB and DSC values.

After logging into the UCM, click on the EM link of the respective CS1000 (Not Shown). In the EM, navigate to **Routes and Trunks > Routes and Trunks**. Click on **Add route** as shown in **Figure 2**.



**Figure 2: Adding Route**

**Figure 3** shows the configuration of the route being added. The values that are circled in red are to be configured by the user. The values shown are examples used during the solution testing.



**Figure 3: Route Configuration**

To configure the RLB using EM, navigate to **Dialing and Numbering Plans > Electronic Switched Network > Network Control & Services > Route List Block (RLB)** as shown in Figure 4.

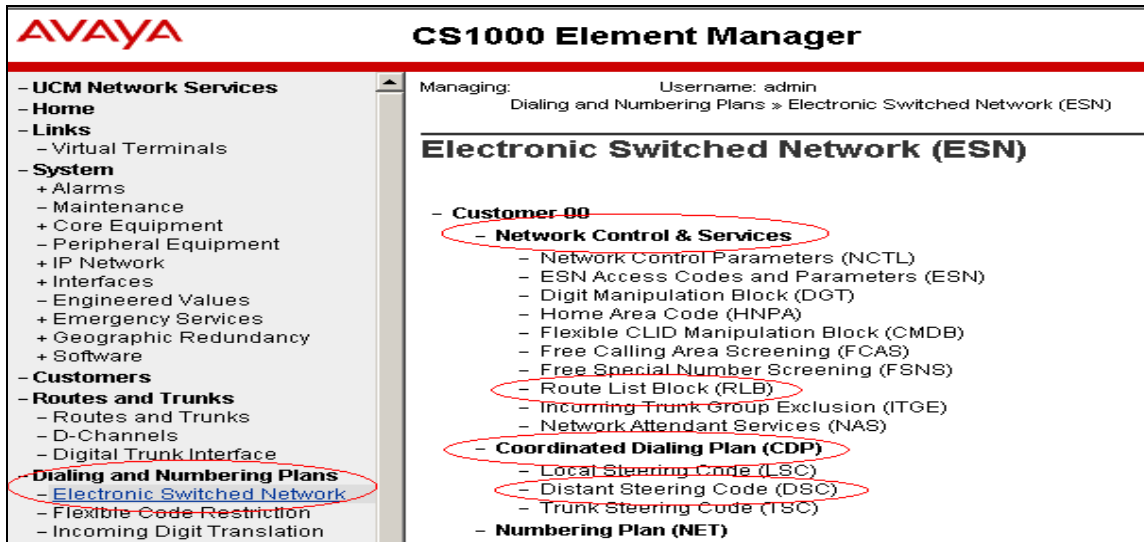


Figure 4: Accessing RLB

Enter the value of the route list index and click on **to Add** button to continue the configuration as shown in Figure 5. During the solution testing, the value of 7 was added.

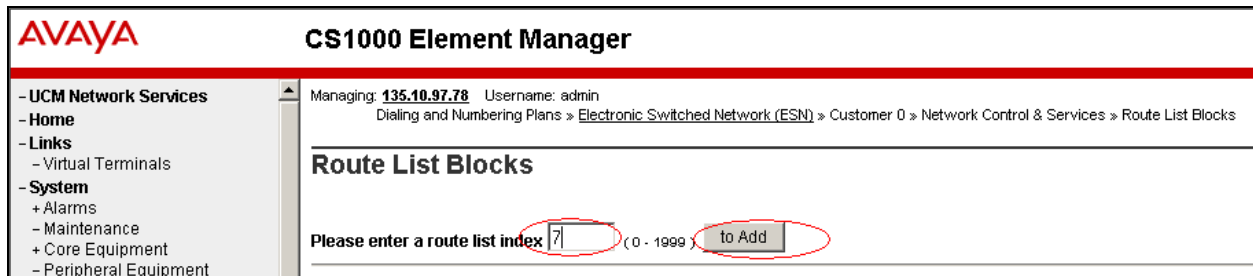


Figure 5: Adding RLB

Figure 6 shows the **Route Number 4** being selected to the RLB created. Route 4 is selected since it was the route number assigned while adding a route as shown in Figure 3 above.

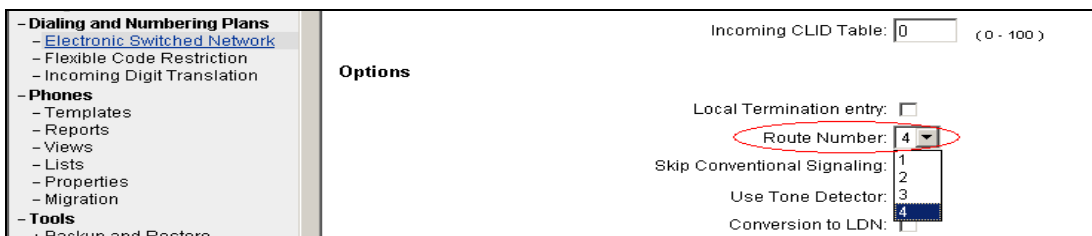
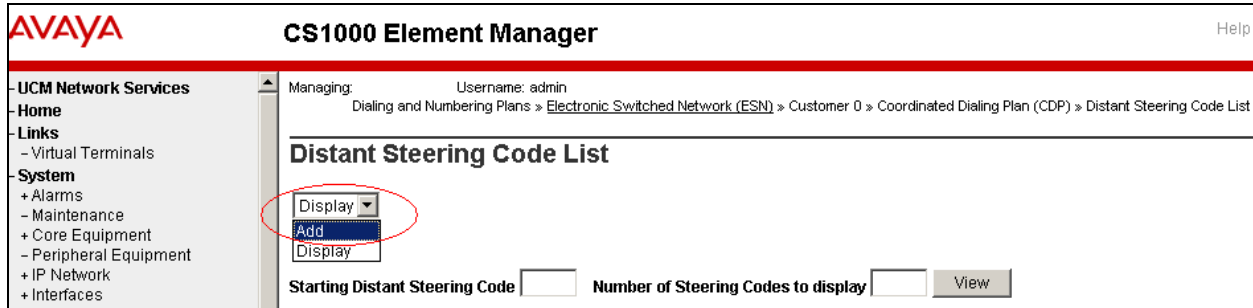


Figure 6: Selecting the configured Route to RLB

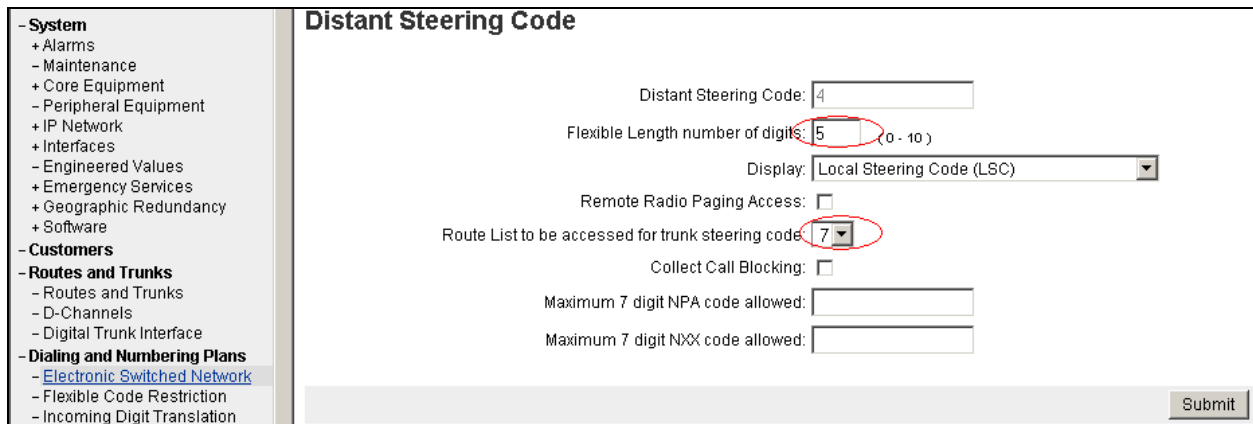
To configure the DSC using EM navigate to **Dialing and Numbering Plans > Electronic Switched Network > Coordinated Dialing Plan (CDP) > Distant Steering Code (DSC)** as shown in **Figure 4** above.

In the Distant Steering Code List page, select **Add** from the drop down list as shown in **Figure 7**.



**Figure 7: Adding a new DSC**

Enter the value of the DSC and click on the **to Add** button (Not Shown). As shown in **Figure 8** below, DSC value of **4** was added during the solution testing. The value **4** was configured since the pilot DN of the Office-LinX system was **40000**. **Flexible Length number of digits** identifies length of the directory number (DN). During solution testing value of **5** was configured. **Route List to be accessed for trunk steering code** is selected as **7** from the drop down list. This value is selected based on the RLB created as shown in **Figure 5** above.



**Figure 8: DSC configuration**

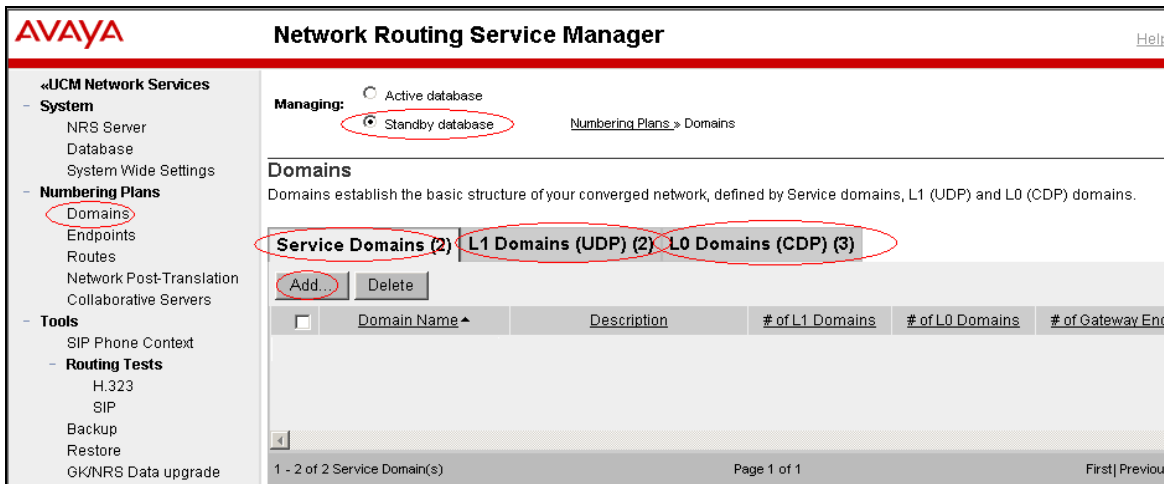
For additional information on Route, RLB and DSC configuration, refer to **Section 9[1]**.

## 5.2. NRS/SPS domain, End Points, Routing Information Configuration

This section explains the configuration of NRS/SPS that will be required to facilitate communication between the CS1000 and Office-LinX.

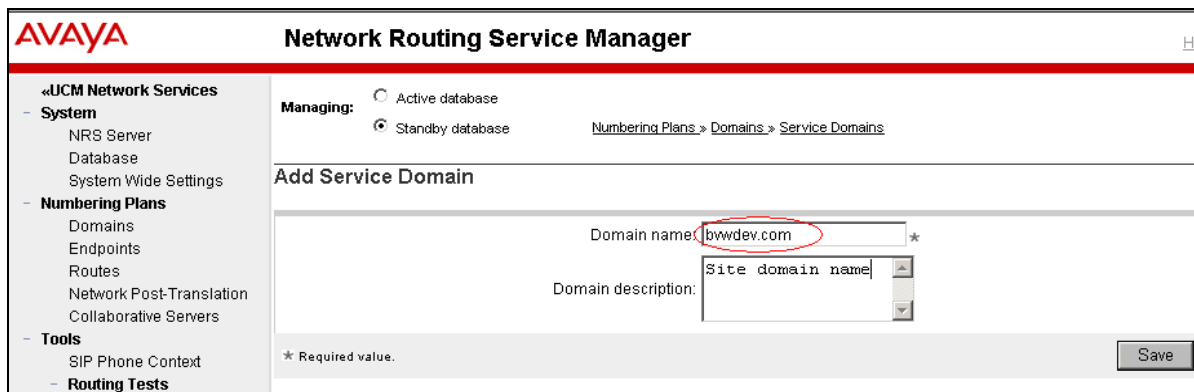
NRS/SPS can be accessed from the UCM and then selecting the required NRS/SPS element (Not Shown). When the NRS/SPS is being configured, it is to be noted that the database has to be in Standby mode.

To configure a service domain in the NRS/SPS navigate to **Numbering Plans > Domains > Service Domains**. Click on the **Add** button to start adding a domain. Refer to **Figure 9** below.



**Figure 9: Accessing NRS/SPS to add Service Domain**

Populate the **Domain name** field with a name as shown in **Figure 10**. In the solution example **bwvdev.com** is the Domain name.



**Figure 10: Adding Domain Name.**

Similar to the steps shown in **Figure 9** and **10** above, **L1** and **L0 Domains** need to be added. In the solution example **UDP2** and **CDP2** was added to **L1** and **L0** respectively (Not shown).

While configuring endpoints, two endpoints need to be configured. The endpoints are configured for a CS1000 and Office-LinX system.

To configure an endpoint from the NRS/SPS element navigate to **Numbering Plans > Endpoints**. **Figures 11 and 12** show the endpoint being configured for the CS1000 system. During solution testing, **CS1K75** was the name given to the **End point name**, **Dynamic SIP endpoint** was selected as **SIP support** and the **SIP TCP** and **UDP transport enabled** boxes were checked.

The screenshot shows the Avaya Network Routing Service Manager interface. On the left is a navigation menu with categories: «UCM Network Services, - System (NRS Server, Database, System Wide Settings), - Numbering Plans (Domains, Endpoints, Routes, Network Post-Translation, Collaborative Servers), and - Tools. The 'Endpoints' option under 'Numbering Plans' is circled in red. The main area shows 'Managing:' with 'Standby database' selected. A breadcrumb trail reads 'Numbering Plans > Endpoints > Gateway Endpoint'. Below this is the title 'Edit Gateway Endpoint bwvdev.com / udp2 / cdp2 )'. The configuration fields are: 'End point name:' with the value 'CS1K75' (circled in red), 'Description:' with the value 'CS1K 7.5 remote system', and 'Trust Node:' with a checked checkbox.

**Figure 11: CS1000 Endpoint configuration**

This screenshot continues the configuration for the endpoint. The left navigation menu shows 'Collaborative Servers', '- Tools (SIP Phone Context), and '- Routing Tests (H.323, SIP, Backup, Restore, GK/NRS Data upgrade). The 'SIP' option under 'Routing Tests' is circled in red. The configuration fields include: 'Private Special number 2 dialing code length:' (empty), 'Static endpoint address type:' set to 'IP version 4', 'Static endpoint address:' (empty), 'H.323 support:' set to 'H.323 not supported', 'SIP support:' set to 'Dynamic SIP endpoint' (circled in red), 'SIP mode:' with 'Proxy Mode' selected, 'SIP TCP transport enabled:' with a checked checkbox, 'SIP TCP port:' set to '5060', 'SIP UDP transport enabled:' with a checked checkbox, and 'SIP UDP port:' set to '5060'.

**Figure 12: CS1000 Endpoint configuration continued**



Figures 13 and 14 show the endpoint configuration of the Office-LinX system where End point name is esna and SIP support is Static SIP endpoint. The Static endpoint address is the IP address of the Office-LinX system. SIP TCP and UDP transport enabled boxes are also checked.

The screenshot shows the Avaya Network Routing Service Manager interface. On the left is a navigation menu with categories: «UCM Network Services», System (NRS Server, Database, System Wide Settings), Numbering Plans (Domains, Endpoints, Routes, Network Post-Translation, Collaborative Servers), and Tools. The main area is titled 'Edit Gateway Endpoint bwvdev.com / udp2 / cdp2'. It shows 'Managing' options: Active database (unselected) and Standby database (selected). There are links for 'Numbering Plans > Endpoints > Gateway Endpoint'. The configuration fields are: End point name: esna (circled in red), Description: For TOL testing, and Trust Node: checked.

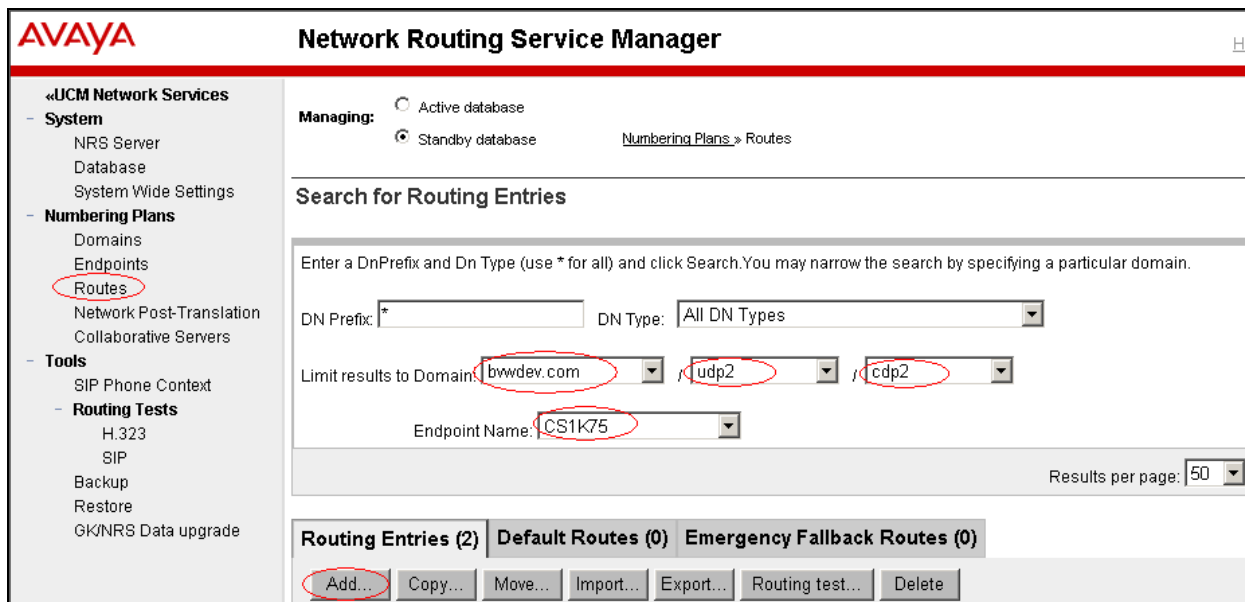
Figure 13: Office-LinX Endpoint configuration

This screenshot continues the configuration from Figure 13. The left navigation menu is expanded to 'Tools' > 'Routing Tests'. The configuration fields are: Private Special number 2 dialing code length: (empty), Static endpoint address type: IP version 4, Static endpoint address: 10.10.10.1 (circled in red), H.323 support: H.323 not supported, SIP support: Static SIP endpoint (circled in red), SIP mode: Proxy Mode (selected), SIP TCP transport enabled: checked (circled in red), SIP TCP port: 5060, SIP UDP transport enabled: checked (circled in red), and SIP UDP port: 5060.

Figure 14: Office-LinX Endpoint configuration continued

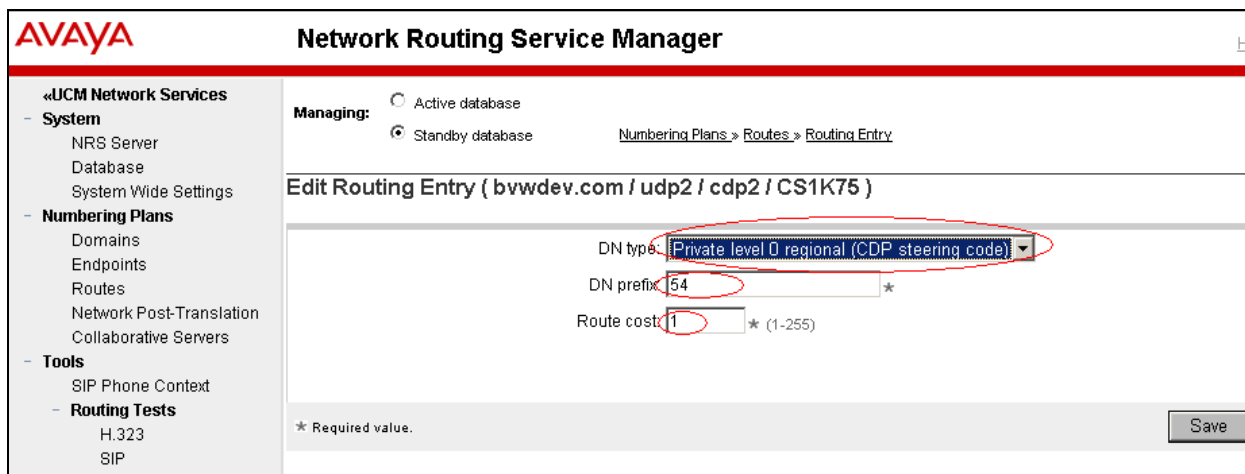
While configuring routing information for the endpoints, two routes need to be configured. The routes are configured for a CS1000 and Office-LinX system.

To configure a route from the NRS/SPS element navigate to **Numbering Plans > Routes**. For the **Limit results to Domain** fields, select the service, L1 and L0 domains as **bwvdev.com**, **udp2** and **cdp2** respectively. Select the endpoint name as **CS1K75**. Click on **Add** button to add a route to the CS1000 endpoint as shown in **Figure 15**.



**Figure 15: Adding Routing Entry for CS1000**

Select **Private level 0 regional (CDP steering code)** for DN type. For DN prefix, **54** was configured since the DN range used in the solution test for CS1000 is **54xxx**. **Route cost** is configured as **1** in the solution test. Refer to **Figure 16** for the configuration screen.



**Figure 16: Routing Entry configuration for CS1000**

Figures 17 and 18 show the routes being added to the Office-LinX endpoint, where the Endpoint Name is esna and the DN prefix value is 4 since the Office-LinX DN range used in the solution test was 4xxxx.

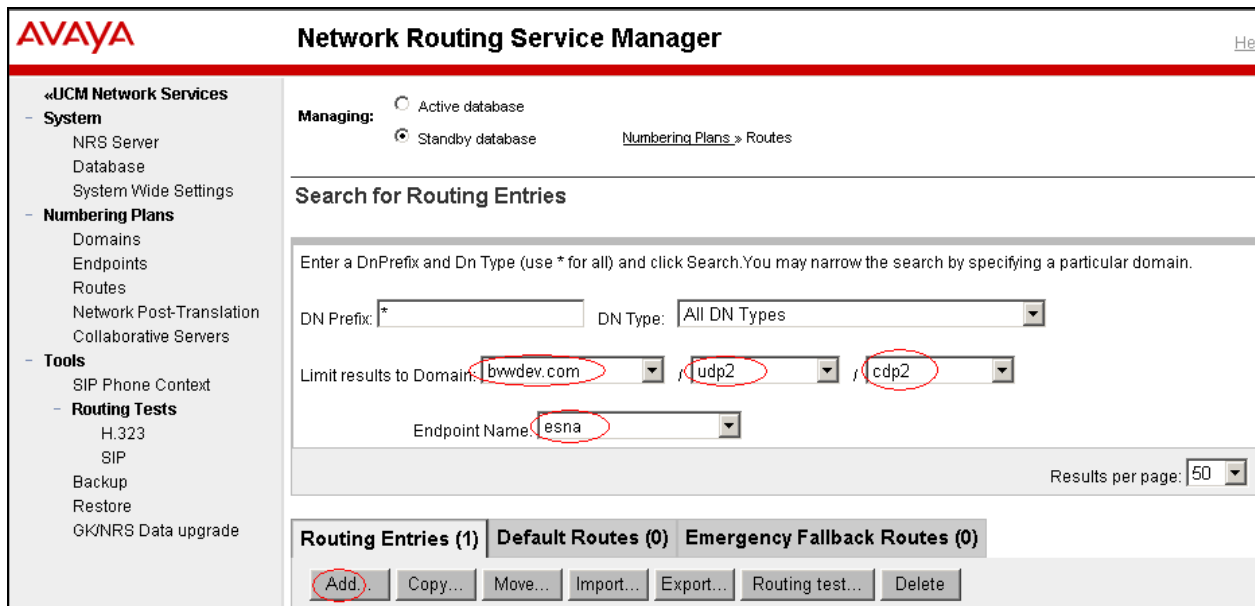


Figure 17: Adding Routing Entry for Office-LinX

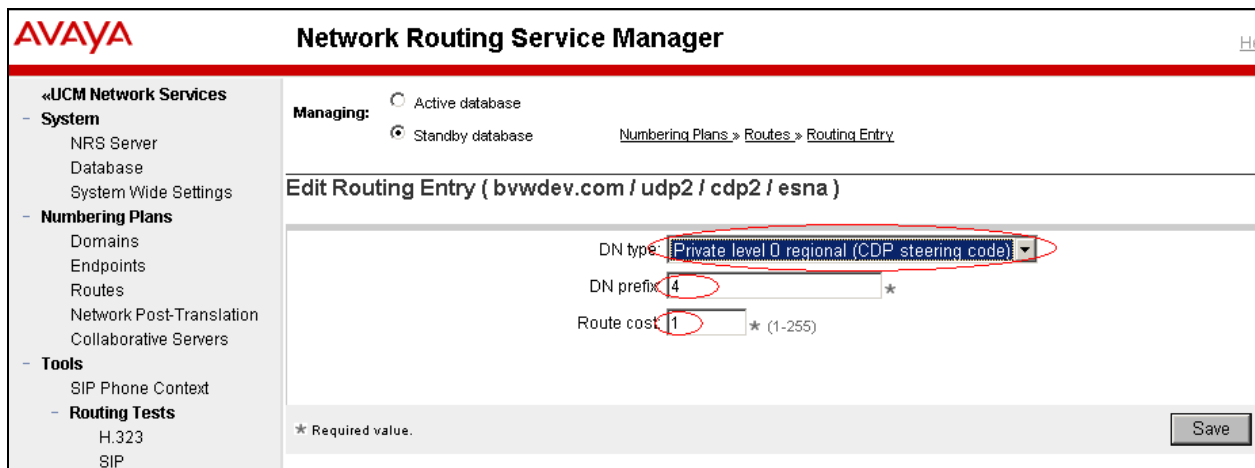


Figure 18: Routing Entry configuration for Office-LinX

After completion of the NRS/SPS configuration navigate to **System > Database** and click on the **Cut Over** button and then the **Commit** button (Not shown). The database can now be put back into Active mode.

For additional information on NRS/SPS configuration, refer to **Section 9[1]**.

### 5.3. Node IP (SIP Gateway) Configuration

This section only describes the configuration of the SIP Gateway application running on the CS1000 signaling server. In the solution test, Node ID **511** is configured, that has the SIP Gateway application enabled on it. For additional information on Nodes configuration refer to **Section 9[1]**.

To configure the SIP Gateway from EM, navigate to **System > IP Network > Nodes: Servers, Media Cards** and click on the **Node ID 511** as shown in **Figure 19** below.

The screenshot shows the AVAYA CS1000 Element Manager interface. The left sidebar contains a navigation tree with the following items: UCM Network Services, Home, Links, Virtual Terminals, System (circled), Alarms, Maintenance, Core Equipment, Peripheral Equipment, IP Network (circled), Nodes: Servers, Media Cards (circled), Maintenance and Reports, Media Gateways, Zones, and Host and Route Tables. The main content area is titled 'IP Telephony Nodes' and shows a table with columns: Node ID, Components, Enabled Applications, and ELAN IP. The table contains two rows: Node ID 511 (circled) with 1 component and applications 'LTSP, Gateway ( SIPGw, H323Gw )', and Node ID 512 with 1 component and application 'SIP Line'. Below the table are checkboxes for 'Nodes', 'Component servers and cards', and 'IPv6 address'.

**Figure 19: Accessing IP Telephony Nodes**

Click on the link **Gateway (SIPGw & H323Gw)** link as shown in **Figure 20** below.

The screenshot shows the AVAYA CS1000 Element Manager interface for 'Node Details (ID: 511 - LTSP, Gateway ( SIPGw, H323Gw ))'. The left sidebar is the same as in Figure 19. The main content area shows configuration fields for 'Subnet mask' and 'Node IPv6 address'. Below these are two sections: 'IP Telephony Node Properties' with a list of applications including 'Voice Gateway (VGW) and Codecs', 'Quality of Service (QoS)', 'LAN', and 'SNTP'; and 'Applications (click to edit configuration)' with a list including 'SIP Line', 'Terminal Proxy Server (TPS)', 'Gateway (SIPGw & H323Gw)' (circled), and 'Personal Directories (PD)'.

**Figure 20: Accessing SIP and H323 Gateway**

In the General section enter the **SIP domain name** as **bwvdev.com** as configured in **Figure 10** above, **Local SIP port** as **5060**, **Gateway endpoint name** as **CS1K75** as configured in **Figure 11** above and **Application node ID** as **511** as configured in **Figure 19** above. Refer to **Figure 21** below.

**AVAYA CS1000 Element Manager**

Managing: Username: admin  
System » IP Network » IP Telephony Nodes » Node Details » Virtual Trunk Gateway Configuration

Node ID: 511 - Virtual Trunk Gateway Configuration Details

General | SIP Gateway Settings | SIP Gateway Services | H.323 Gateway Settings

Vtrk gateway application:  Enable gateway service on this node

**General**

Vtrk gateway application: SIPGw and H.323Gw

SIP domain name: bwvdev.com \*

Local SIP port: 5060 \* (1 - 65535)

Gateway endpoint name: CS1K75 \*

Gateway password: \*

H.323 ID: CS1K75 \*

Application node ID: 511 \* (0-9999)

**Virtual Trunk Network Health Monitor**

Monitor IP addresses (listed below)  
Information will be captured for the IP addresses listed below.

Monitor IP:  Add

Monitor addresses:  Remove

**Figure 21: Configuration of General Fields**

**Figure 22** shows the **Primary TLAN IP address**, which is the IP address of the NRS/SPS server. **Support registration** and **Primary CDS proxy** boxes are checked.

**AVAYA CS1000 Element Manager**

Managing: Username: admin  
System » IP Network » IP Telephony Nodes » Node Details » Virtual Trunk Gateway Configuration

Node ID: 511 - Virtual Trunk Gateway Configuration Details

General | SIP Gateway Settings | SIP Gateway Services | H.323 Gateway Settings

Primary TLAN IP address: 10.10.10.10  
The IP address can have either IPv4 or IPv6 format based on the value of "TLAN address type"

Port: 5060 (1 - 65535)

Transport protocol: TCP

Options:  Support registration  
 Primary CDS proxy

**Figure 22: Configuring the NRS/SPS IP Address**

Figure 23 shows the SIP URI Map configuration where the CDP field is configured as cdp2.udp2.

The screenshot shows the AVAYA CS1000 Element Manager interface. The left sidebar contains a navigation tree with categories like UCM Network Services, System, and Customers. The main content area is titled 'Node ID: 511 - Virtual Trunk Gateway Configuration Details'. Under the 'SIP URI Map' section, there are two columns: 'Public E.164 domain names' and 'Private domain names'. The 'CDP' field in the 'Private domain names' column is highlighted with a red circle and contains the text 'cdp2.udp2'. Other fields include National, Subscriber, Special number, and Unknown for both public and private domains.

Figure 23: Configuring SIP URI Map Fields

Figure 24 shows the Microsoft Unified Messaging configuration where the MWI application DN is configured as 40000. This is the pilot DN being used to reach the Office-LinX during the solution testing. CDP is the selected for MWI dialing plan.

The screenshot shows the AVAYA CS1000 Element Manager interface for Microsoft Unified Messaging configuration. The left sidebar is the same as in Figure 23. The main content area is titled 'Node ID: 511 - Virtual Trunk Gateway Configuration Details'. Under the 'Microsoft Unified Messaging' section, the 'MWI application DN' field is highlighted with a red circle and contains the value '40000'. The 'MWI dialing plan' dropdown menu is also highlighted with a red circle and is set to 'CDP'. Other fields include Home location code, Country code (CCC), Area code, and Number translation options.

Figure 24: Configuring Microsoft Unified Messaging Fields

Figure 25 shows the Subscriber Access Service number and Auto Attendant Service number configured. The values 40000 and 40005 are example values used during solution testing.

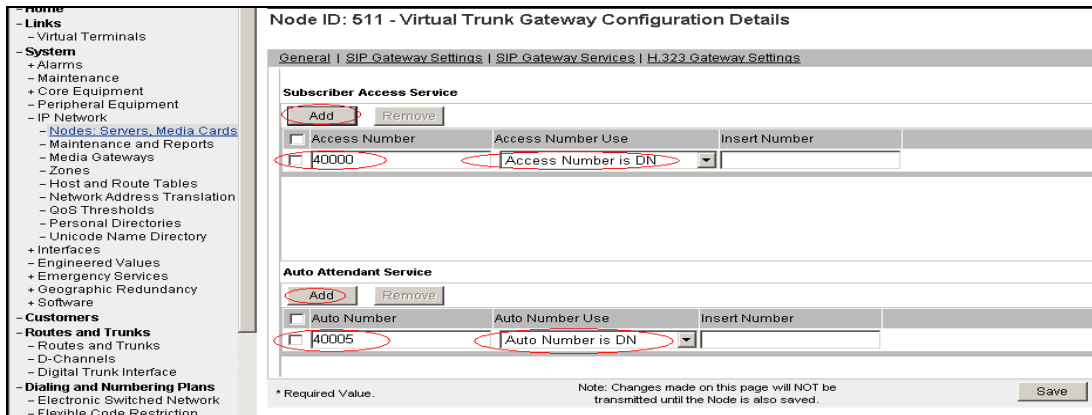


Figure 25: Configuring Subscriber Access Service and Auto Attendant Service Fields

Note: Configurations explained in Figures 24 and 25 are important. If these fields are not configured, the Office-LinX receives the SIP Message Header with Content-Type: multipart/mixed which Office-LinX does not currently support. This will therefore cause the solution to fail to accept calls with multipart/mixed message bodies. Office-LinX requires Content-Type: application/sdp.

## 5.4. Endpoint/Telephone Configuration

This section explains the provisioning of an endpoint/telephone that was configured for the solution testing. Endpoint/Telephone can be configured using the CLI of the CS1000 from overlay LD 11/20. Refer to Section 9[1] for further information regarding add/configuration of endpoints/telephones.

In Figure 26, values that are shown in red are to be configured by the user. The FDN and HUNT value of 40000 was used during the solution testing as the pilot DN of the Office-LinX system.

```

FDN 40000
TGAR 0
LDN NO
NCOS 1
SCRP 0
RMPG 0
SCI 0
SSU
LNRS 16
XLST
SCPW
SFLT NO
CAC_MFC 0
CLS_ UNR FBA WTA LPR MTD FNA HTA TDD HFA CRPD
MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD SLKD CCSD SWD LNA CNDA
CFTD SFA MRD DDV CNID CDCA MSID DAPA BFED RCBD
ICDA CDMA LLCN MCTD CLBD AUTU
GPUD DPUD DND A CFXA ARHD CLTD ASCD
CPFA CPTA ABDA CFHD FICD N AID BUZZ AGRD MOAD
UDI RCA HBTD AHD IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
DRDD EXRO
USMD USRD ULAD CCBD RTDD RBDD RBHD PGND FLXD FTTC DNDY DNO3 MCBN
FDSD NOV D VOLA V OUD CDMR PRED RECD MCDD TS7D SBMD
KEM2 MSNV FRA PRCH MUTA MWT DVL D CROD ELCD
CPND LANG ENG
RCC 0
HUNT 40000

```

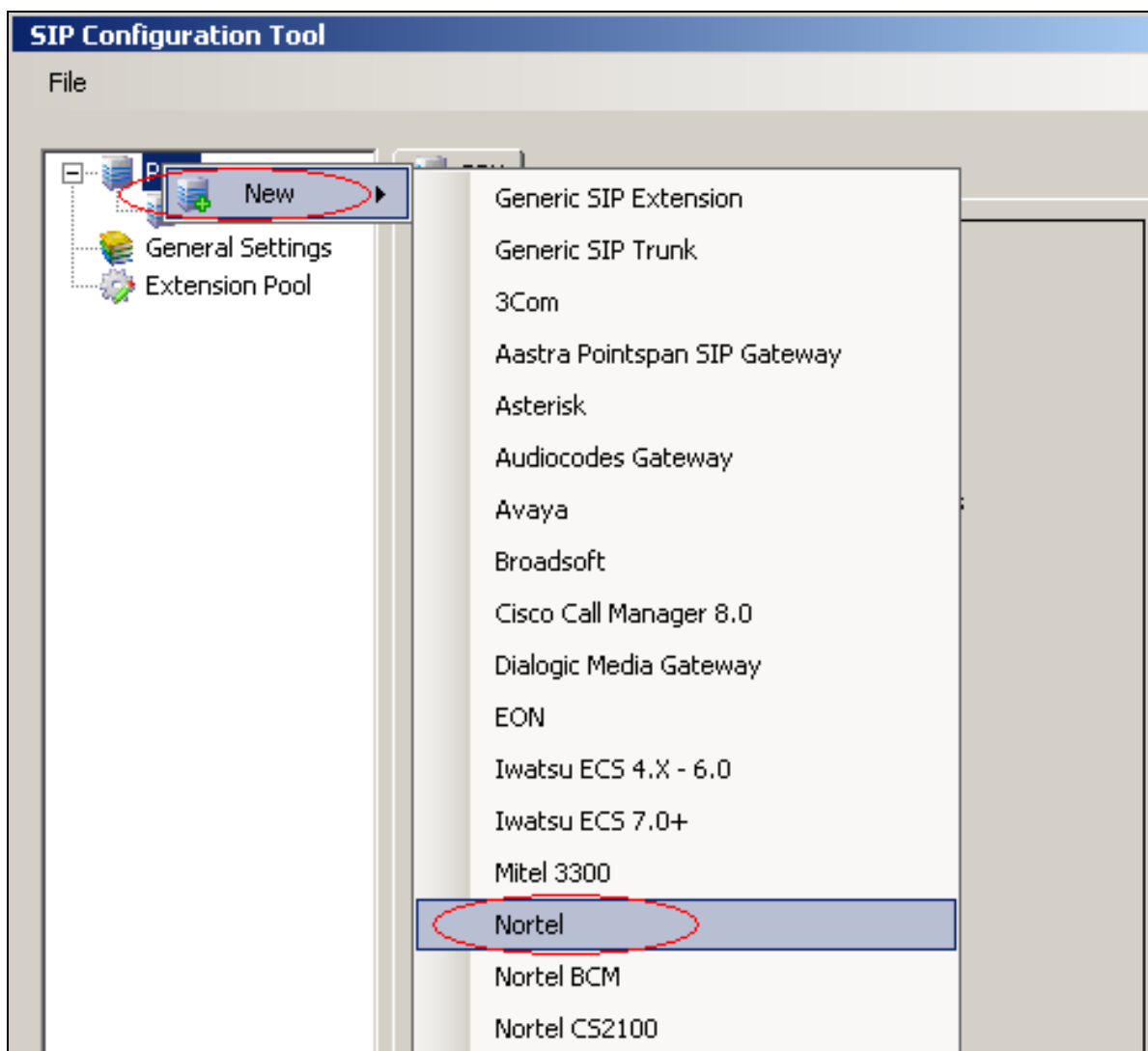
Figure 26: Configuring an Endpoint/ Telephone

## 6. Configuring the Esna Office-LinX server

Office-LinX installation is covered in referenced product documentation. During the install, the PBX template for Nortel CS1000 may be selected providing the majority of configuration pre-defined. This section only describes the interface configuration as a reference for verification, so that the Office-LinX can communicate to the CS1000. For further details on the Office-LinX configuration steps not covered in this document, refer to **Section 9[2]**.

The integration of Office-LinX with CS1000 is done from the Office-LinX's **SIP Configuration Tool**. Access the **SIP Configuration Tool** from the Office-LinX server by navigating to **Start > All Programs > Office-LinX > SIP Configurator** (Not shown).

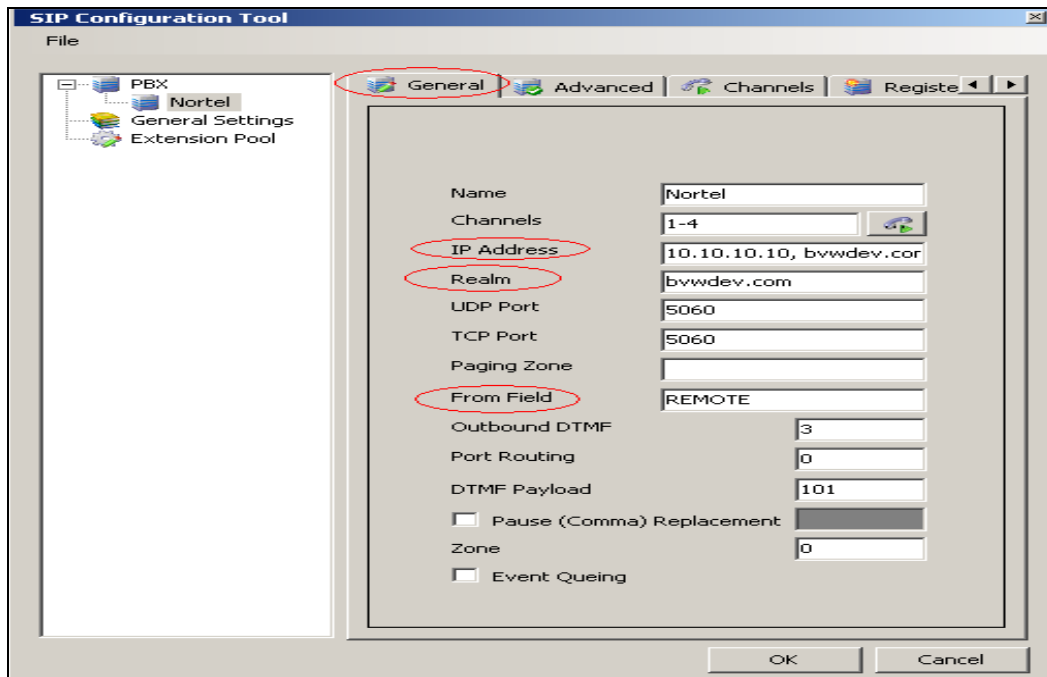
**Figure 27** shows the **SIP Configuration** tool where a New PBX is added. During the solution testing **Nortel** was added as the PBX.



**Figure 27: Adding new PBX**

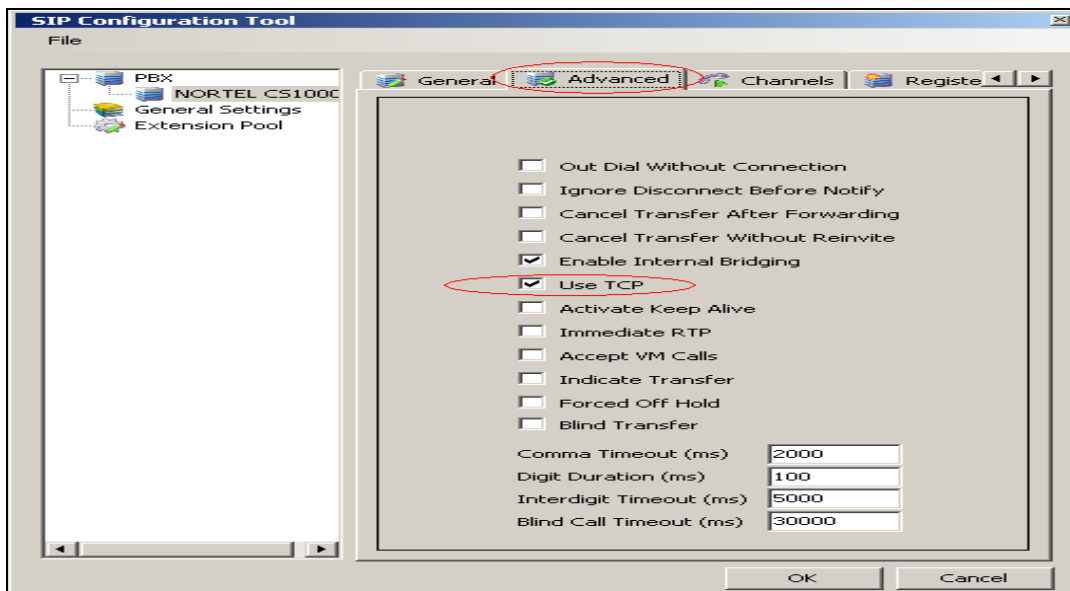


**Figure 28** shows the **General** tab of the **SIP Configuration Tool**. Fields circled in red are to be populated by user. The **IP Address** field is populated with the IP address of the NRS/SPS along with its domain name. Enter the domain name in the **Realm** field and Remote in the **From Field**.



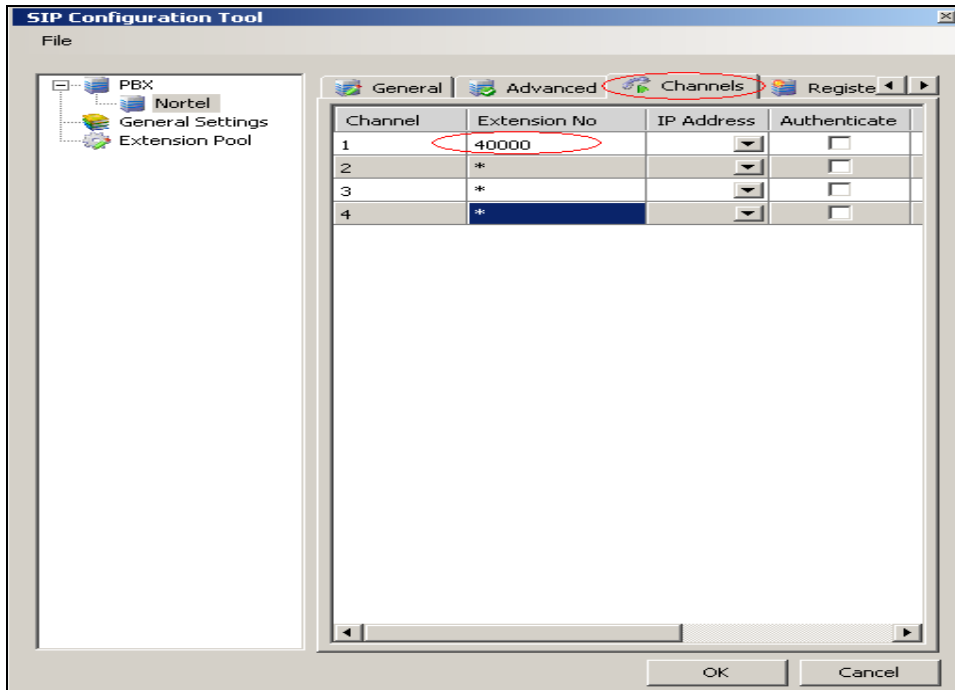
**Figure 28: General Configuration**

**Figure 29** shows the **Advanced** tab configuration of the **SIP Configuration Tool** where the **Use TCP** box is checked.



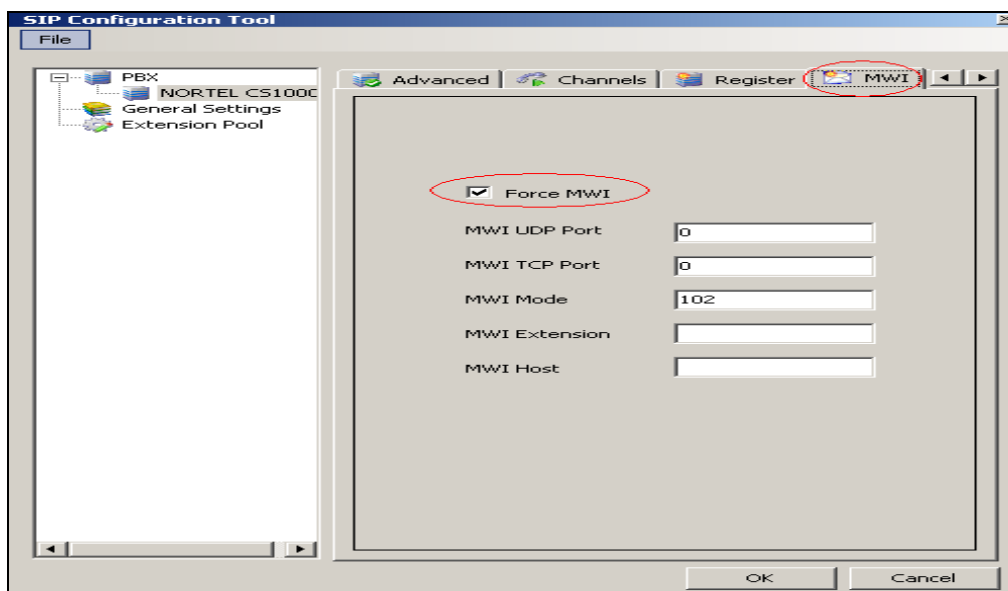
**Figure 29: Advanced Configuration**

**Figure 30** shows the pilot DN of the Office-LinX being configured in the **Channels** tab of the **SIP Configuration Tool**. During solution testing, **40000** were configured as the Office-LinX's pilot DN.



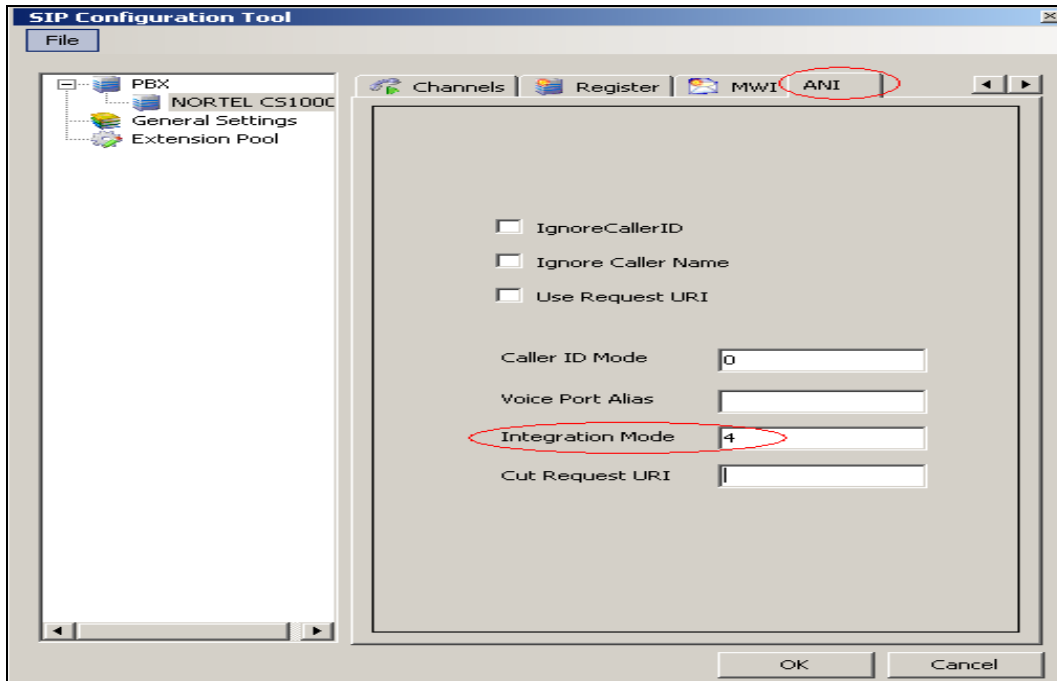
**Figure 30: Channels Configuration**

**Figure 31** shows the **Force MWI** box checked under the **MWI** tab of the **SIP Configuration Tool**.



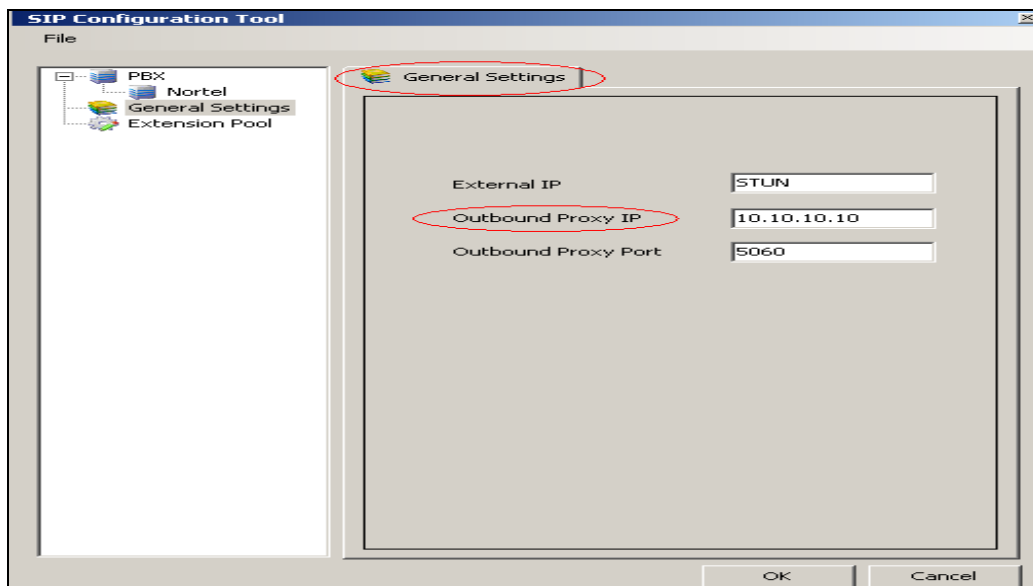
**Figure 31: MWI Configuration**

The integration mode number for Office-LinX to communicate with CS1000 is 4. This **Integration Mode** field can be configured from the **ANI** tab of the **SIP Configuration Tool** as shown in **Figure 32** below.



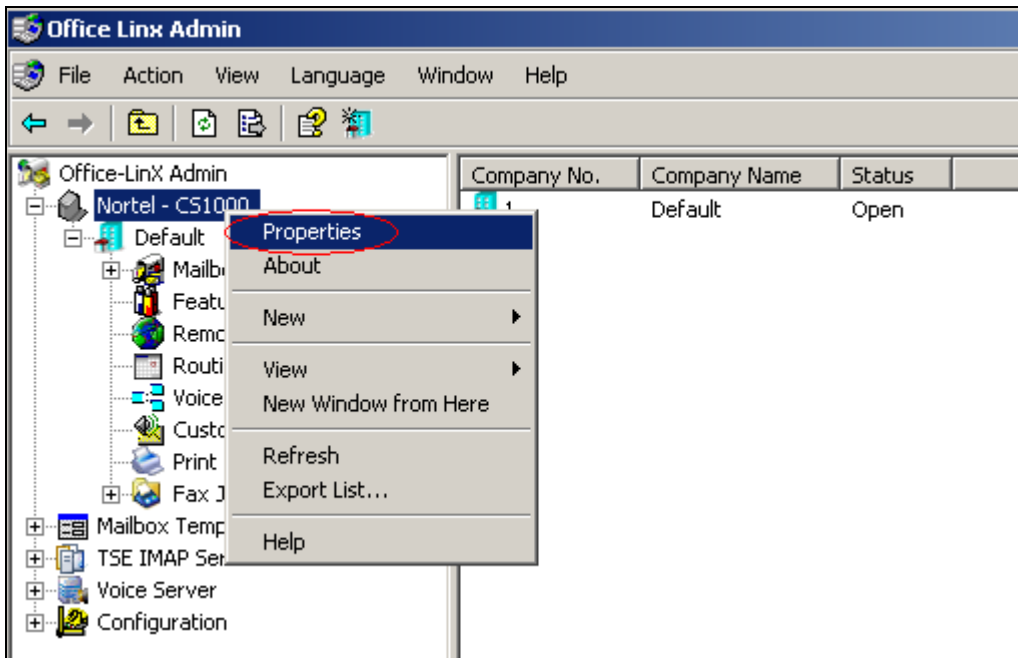
**Figure 32: ANI Configuration**

**Figure 33** shows the **General Settings** tab where the **Outbound Proxy IP** address is the IP address of the NRS/SPS.



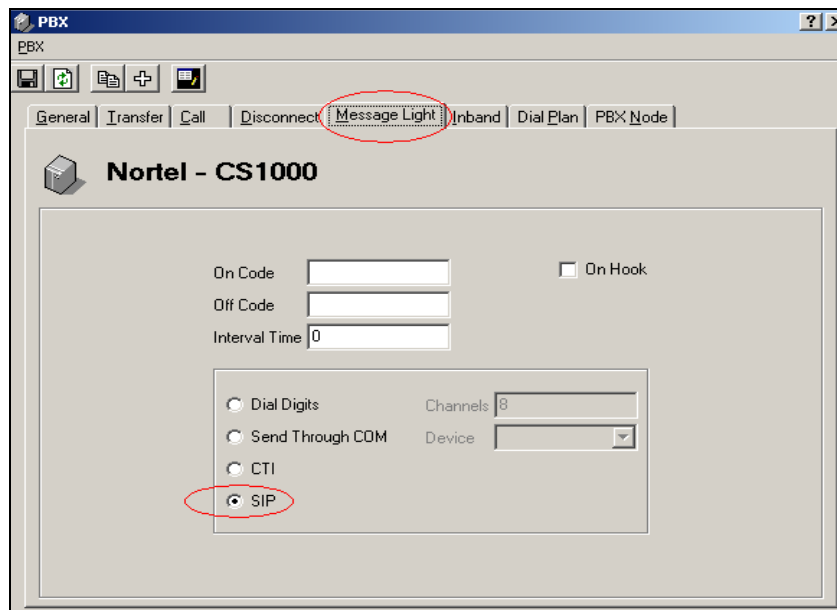
**Figure 33: Outbound Proxy IP configuration**

The Office-LinX needs to be configured for SIP to send Message Waiting Light indication to the PBX. To configure this feature access the **Office Linx Admin** screen by navigating **Start > All Programs > Office-LinX > Office Linx Admin** (Not Shown). Access the **Properties** of the PBX as shown in **Figure 34**.



**Figure 34: Accessing PBX Properties Screen**

Select the **SIP** radio button from the **Message Light** tab as shown in **Figure 35** below.



**Figure 35: Message Light Configuration**

## 7. Verification Steps

The following steps may be used to verify the integration:

- From the CS1000 end point, call the Office-LinX pilot DN 40000 and verify a general greeting is played.
- From Office-LinX server verify a CS1000 endpoint receives a wakeup call.
- Verify a call from a CS1000 endpoint to another CS1000 endpoint can be transferred via Office-LinX server.
- Verify the correct Office-LinX greeting messages are played depending on the status of the CS1000 endpoints.
- Verify a message/s can be left for a CS1000 endpoint and retrieved via Office-LinX server.

## 8. Conclusion

All of the executed test cases have passed and met the objectives outlined in **Section 2**. The Esna Office-LinX v8.1 software is considered compliant with Avaya CS1000 Rls 7.5.

## 9. Additional References

[1] Product documentation for Avaya products may be found at:

<https://support.avaya.com/css/Products/>

[2] Product documentation for Esna Office-LinX may be found at:

[http://www.esnatech.com/support/tech\\_index.htm](http://www.esnatech.com/support/tech_index.htm)

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