



Avaya Solution & Interoperability Test Lab

A Sample Configuration of Avaya IP Office IP Trunks with Nortel Succession 1000 - Issue 1.0

Abstract

These Application Notes present a sample configuration for a network comprised of an Avaya IP406v2 Office Server and a Nortel Succession 1000. The focus is on the Avaya IP Office configuration for the H.323 Trunks and the corresponding Nortel Succession configuration of IP Peer Networking and Virtual Trunks. Using this configuration, Nortel Digital Telephones, Nortel IP Telephones, and Nortel IP Software Phones can call (and be called by) Avaya Digital Telephones, Avaya IP Telephones, and Avaya IP Softphones. Screens that describe the detailed status and communication paths of active calls are presented to reinforce the understanding of the configuration.

1. Introduction

These Application Notes present a sample configuration for an IP Trunk between an Avaya IP406v2 Office Server and a Nortel Succession 1000. **Figure 1** depicts the network used to verify these Application Notes. The data network is kept simple to focus on the relevant call routing and H.323 IP Trunk configuration.

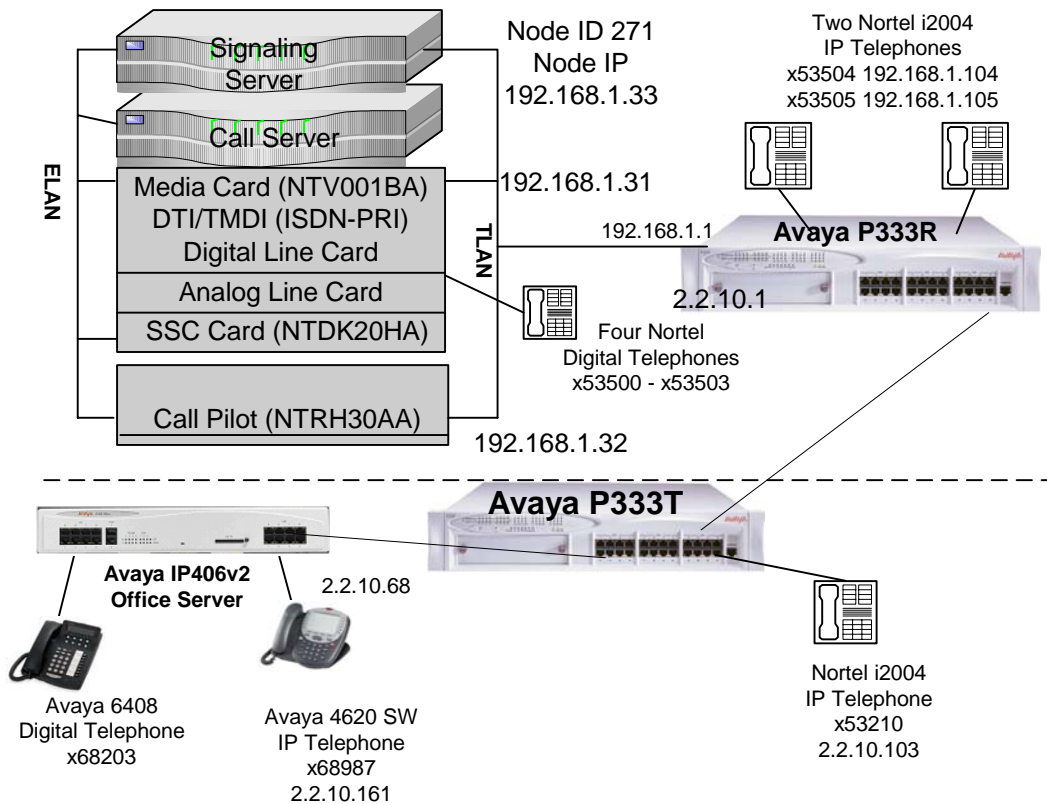


Figure 1: Network Overview

Unique ranges of extensions were associated with the Nortel Succession (53xxx) and the Avaya IP Office (68xxx). The Avaya IP Office routed 53xxx extensions to the Nortel Succession via its short code feature. The Nortel Succession routed 68xxx numbers to the Avaya IP Office via its Coordinated Dial Plan (CDP) feature. Both servers were passed 5-digit Called Party Numbers over the IP Trunks.

Basic call features, including conference, transfer and hold were tested between the systems. Calling Party Number was displayed on calls in each direction. Voice media traffic was configured to be sent to and from the IP406v2 Office Server.

2. Equipment and Software Validated

The following equipment and software were used for this sample configuration.

Equipment	Version Information
Avaya IP Office IP406v2	3.0(37)
Avaya 4620SW IP Telephone	2.0.3
Avaya 6408 Digital Telephones	N/A
Nortel Succession Signaling Server	SSE 2.11.3
Nortel Succession Call Server (NTDK20HA)	Version 2121 Release 3
Nortel Succession Voice Gateway Media Card (Single Slot 24 port NTV001BA card)	Firmware Release 6.7
Nortel i2004 IP Telephone (Registered to Succession)	0603B59
Nortel i2050 Software Phone (Registered to Succession)	1.4.0 Build 346
Nortel M3904 and M3904 Digital Telephones	N/A

Table 1 – Equipment Version Information

3. Configuring Avaya IP Office IP406v2

This section presents configuration steps for the Avaya IP Office using the IP Office Manager. Wizard interfaces are also available as an alternative. It is assumed that the reader has networking access and permissions to configure the IP406v2 and that necessary hardware has been installed.

Step 1: From the Manager configuration tree, double-click **System** and then select the **LAN1** tab to change or note the IP Office LAN1 interface **IP Address**. Select **OK**.

The screenshot shows the 'System Configuration : 00E00701A61A' dialog box with the 'LAN1' tab selected. The dialog has several tabs: System, LAN1, DNS, Voicemail, Telephony, Gatekeeper, LDAP, and SNMP. The LAN1 tab is active, showing the following fields and options:

- IP Address:** 2.2.10.68
- Number Of DHCP IP Addresses:** 200
- IP Mask:** 255.255.255.0
- DHCP Mode:** Radio buttons for Server, Disabled (selected), Dialin, and Client.
- RIP Mode:** Radio buttons for None (selected), Listen Only (Passive), RIP 1, RIP 2 Broadcast (RIP 1 Compatibility), and RIP 2 Multicast.

At the bottom of the dialog are three buttons: OK, Cancel, and Help.

Step 2: Add the H.323 line for calls to the Nortel Succession.

Step 2(a): Select the **Line** entry, and right-click in the right-hand pane to add a **New** line. Assign a unique **Line Number** and **Incoming Group ID** and **Outgoing Group Id**. The number of channels setting should be equal to the number of route members assigned on the Succession side and within the constraints of the available bandwidth.

The screenshot shows a window titled "IP Line" with three tabs: "Line", "ShortCodes", and "VoIP". The "Line" tab is selected. The window contains the following fields and values:

Field	Value
Line Number	53
Telephone Number	
Number Of Channels	2
Outgoing Channels	2
Prefix	
Voice Channels	2
Data Channels	2
Incoming Group ID	53
TEI	0
Outgoing Group ID	53
National Prefix	0
International Prefix	00

At the bottom right of the window are three buttons: "OK", "Cancel", and "Help".

Step 2(b): Select the **VoIP** tab. Enter the Succession Server IP address as the **Gateway IP Address**. Set the **Compression Mode** to the preferred companding for this trunk, consistent with the Nortel Zone setting. Set **H.450 Support** to **None**. Select **Enable Faststart** and **Out of Band DTMF**. Select **OK**.

Successful test calls were made between systems using the Allow Direct Media Path capability, but some interworking issues were found with calls that originated on one system, routed through the other to return to another station on the originator.

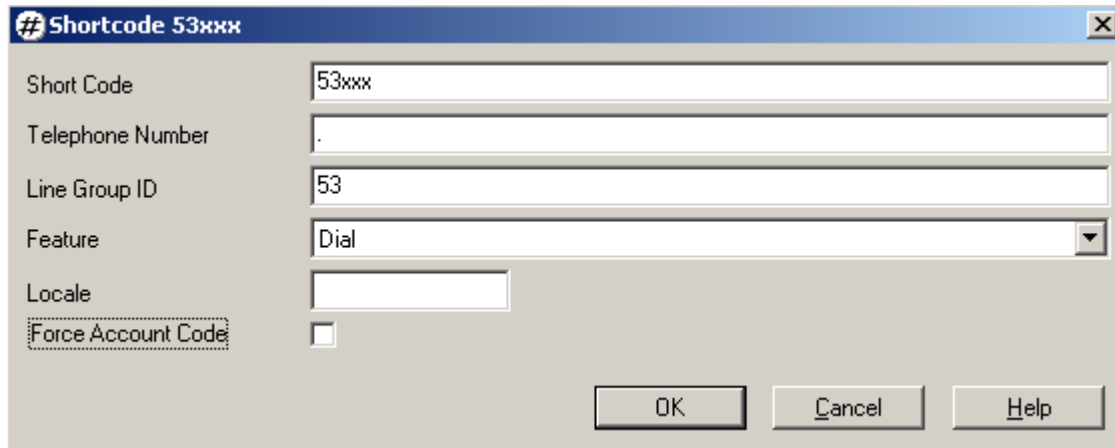
Generally, disabling this feature is recommended. The implication is that IP Office Voice Compression Modules (VCMs) must be engineered for these channels to ensure that there are sufficient VCM resources to handle both RTP channels on each call from Nortel to IP Office and from IP Office to the IP endpoint.

The screenshot shows the 'IP Line' configuration window with the 'VoIP' tab selected. The window contains the following fields and options:

- Gateway IP Address:** 192.168.1.33
- Voice Pkt. Size:** 0
- Compression Mode:** Automatic Selection
- H450 Support:** None
- Fax Transport Method:** (empty)
- Options:**
 - ☐ Silence Suppression
 - ☒ Enable Faststart
 - ☐ Local Hold Music
 - ☐ Local Tones
 - ☐ Enable RSVP
 - ☒ Out Of Band DTMF
 - ☐ Allow Direct Media Path
 - ☐ Voice Networking
 - ☐ Fax Transport Support

Buttons at the bottom: OK, Cancel, Help.

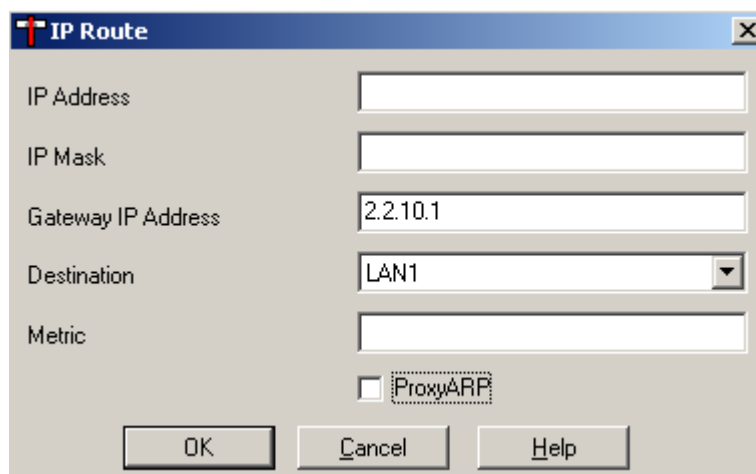
Step 3: Select Short Code and right-click in the right-hand pane to a **New Short Code** to direct calls to the Nortel Succession. As shown, this **Short Code** is configured with **53xxx** to match 5 digit dialed numbers beginning with 53. The **Telephone Number “.”** symbol instructs the IP Office to send all of the dialed digits. **Line Group ID 53** matches the Outgoing Line Group ID configured for the line in step 2. Select **OK**.



The screenshot shows a dialog box titled "# Shortcode 53xxx". It contains the following fields and controls:

- Short Code:** Text box containing "53xxx".
- Telephone Number:** Text box containing ".".
- Line Group ID:** Text box containing "53".
- Feature:** Dropdown menu set to "Dial".
- Locale:** Empty text box.
- Force Account Code:** A checkbox that is currently unchecked.
- Buttons:** "OK", "Cancel", and "Help" buttons at the bottom right.

Step 4: Select IP Route and right-click in the right-hand pane to add a **New IP Route** to direct packets to the Nortel Succession subnet. In this configuration, the default route is sufficient. All packets that are otherwise not routable are sent to the default gateway of 2.2.10.1 as shown. The **Gateway IP Address** is **2.2.10.1** and it is reachable through the **LAN1** interface.



The screenshot shows a dialog box titled "IP Route". It contains the following fields and controls:

- IP Address:** Empty text box.
- IP Mask:** Empty text box.
- Gateway IP Address:** Text box containing "2.2.10.1".
- Destination:** Dropdown menu set to "LAN1".
- Metric:** Empty text box.
- ProxyARP:** A checkbox that is currently unchecked.
- Buttons:** "OK", "Cancel", and "Help" buttons at the bottom.

4. Nortel Succession Configuration

This section illustrates the relevant Nortel configuration used to verify these Application Notes. Please consult the Nortel Networks product documentation referenced in Section 8 for additional

Nortel's IP Peer Networking can use an H.323 Gatekeeper to manage a numbering plan for the network. For the simple network depicted in **Figure 1**, the numbering plan associated with the Avaya IP Office devices has the form 68xxx. The Succession Call Server can be configured to steer calls of the form 68xxx to an IP Virtual Trunk using the Coordinated Dial Plan (CDP) feature. The Succession Gatekeeper, co-resident on the Succession Signaling Server in this configuration, can similarly be configured to direct dialed digits of the form 68xxx to the Avaya IP Office. In these Application Notes, the Avaya IP Office is configured as a "non-RAS endpoint" in the Nortel Succession Gatekeeper.

The configuration steps below follow the order specified by the procedures in Reference [1]. Configuration will be performed using the “Element Manager”, accessed via a web browser.

Login to Element Manager - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media Print View

Address http://192.168.1.33/cgi/pwd.cgi?c=Pubkey&h=context/admin/login&l=en

NORTEL NETWORKS™

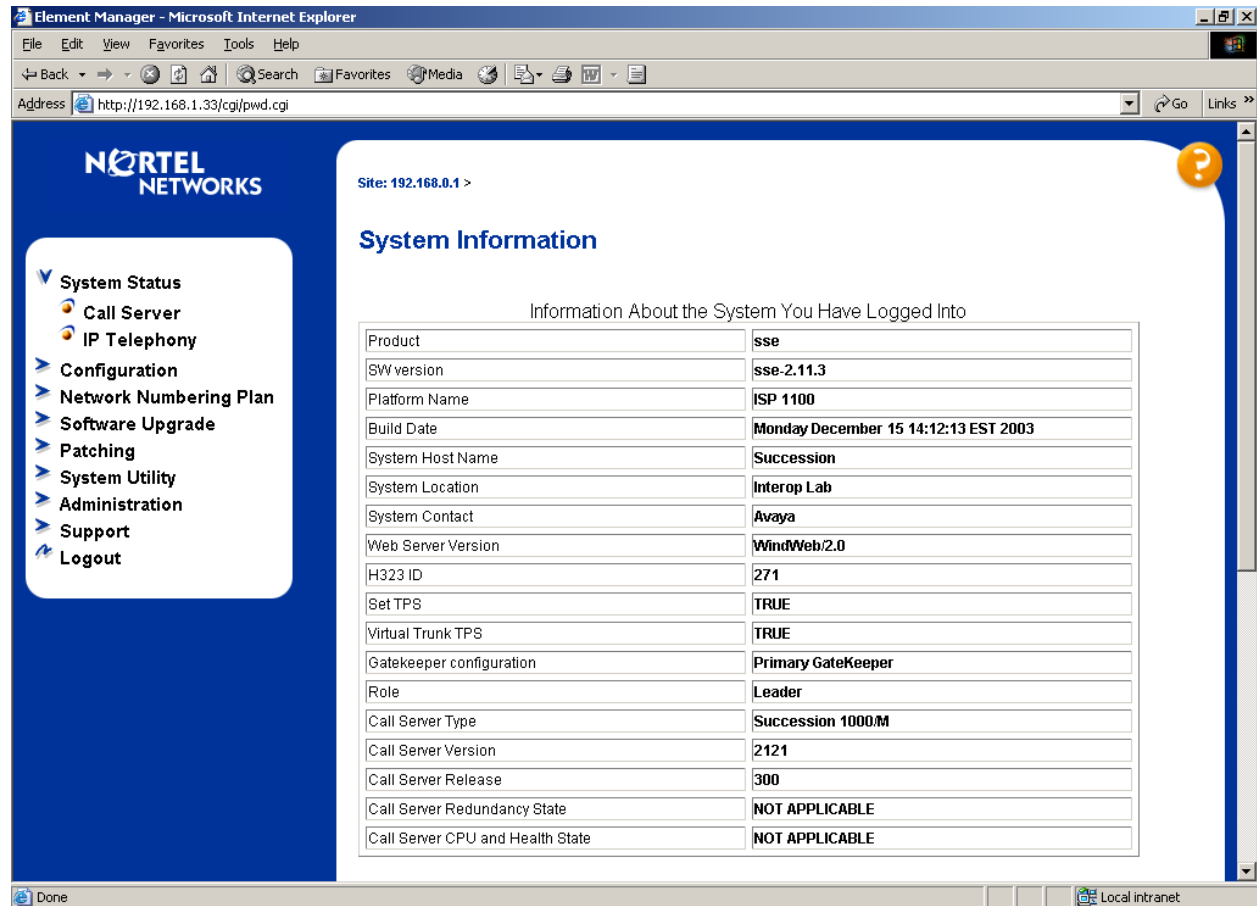
Element Manager

User ID

Password

CS IP Address

Step 2: The System Information page is displayed as shown below. Note that this Succession Signaling Server is the “Primary Gatekeeper” and has the role of “Leader”. The left side of this screen will be referred to as the Navigation Tree.

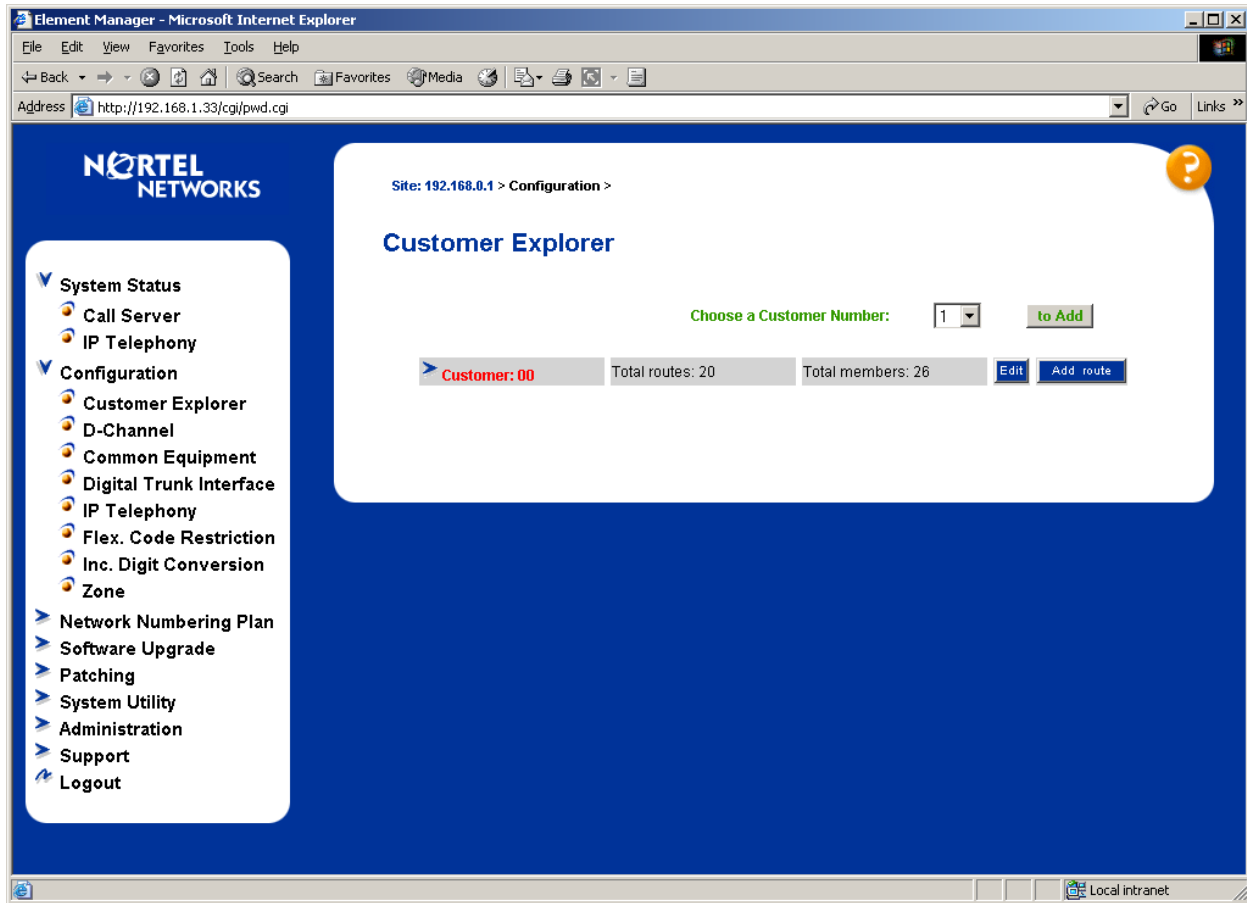


The screenshot shows the Nortel Networks Element Manager web interface. The browser window is titled "Element Manager - Microsoft Internet Explorer" and the address bar shows "http://192.168.1.33/cgi/pwd.cgi". The page has a blue header with the Nortel Networks logo and a site identifier "Site: 192.168.0.1 >". The main content area is titled "System Information" and contains a table of system information. On the left, there is a navigation tree with the following items: System Status, Call Server, IP Telephony, Configuration, Network Numbering Plan, Software Upgrade, Patching, System Utility, Administration, Support, and Logout. The table of system information is titled "Information About the System You Have Logged Into" and contains the following data:

Product	sse
SW version	sse-2.11.3
Platform Name	ISP 1100
Build Date	Monday December 15 14:12:13 EST 2003
System Host Name	Succession
System Location	Interop Lab
System Contact	Avaya
Web Server Version	WindWeb/2.0
H323 ID	271
Set TPS	TRUE
Virtual Trunk TPS	TRUE
Gatekeeper configuration	Primary GateKeeper
Role	Leader
Call Server Type	Succession 1000/M
Call Server Version	2121
Call Server Release	300
Call Server Redundancy State	NOT APPLICABLE
Call Server CPU and Health State	NOT APPLICABLE

Step 3: Configure the Customer Data Block.

Step 3(a): Select **Configuration** → **Customer Explorer** from the Navigation Tree.



Step 3(b): Click the **Edit** button associated with the customer. Click **Feature Packages**.

Element Manager - Microsoft Internet Explorer

Address: http://192.168.1.33/cgi/pwd.cgi

Site: 192.168.0.1 > Configuration > Customer Explorer >

Customer 00 Property Configuration

Basic Configuration

Input Description	Input Value
Customer Data Block (CDB) (TYPE)	CDB Read Only
Customer number (CUST)	00 Read Only
ANI Attendant Billing number (ANAT)	111
ANI Listed Directory Number (ANLD)	1111
Options (OPT)	Edit
Feature options (FTR_DATA)	
Listed Directory Number options (LDN_DATA)	
ISDN and ESN Networking options (NET_DATA)	
Night service options (NIT_DATA)	
Feature Packages	

[Submit](#) [Refresh](#) [Delete](#) [Cancel](#)

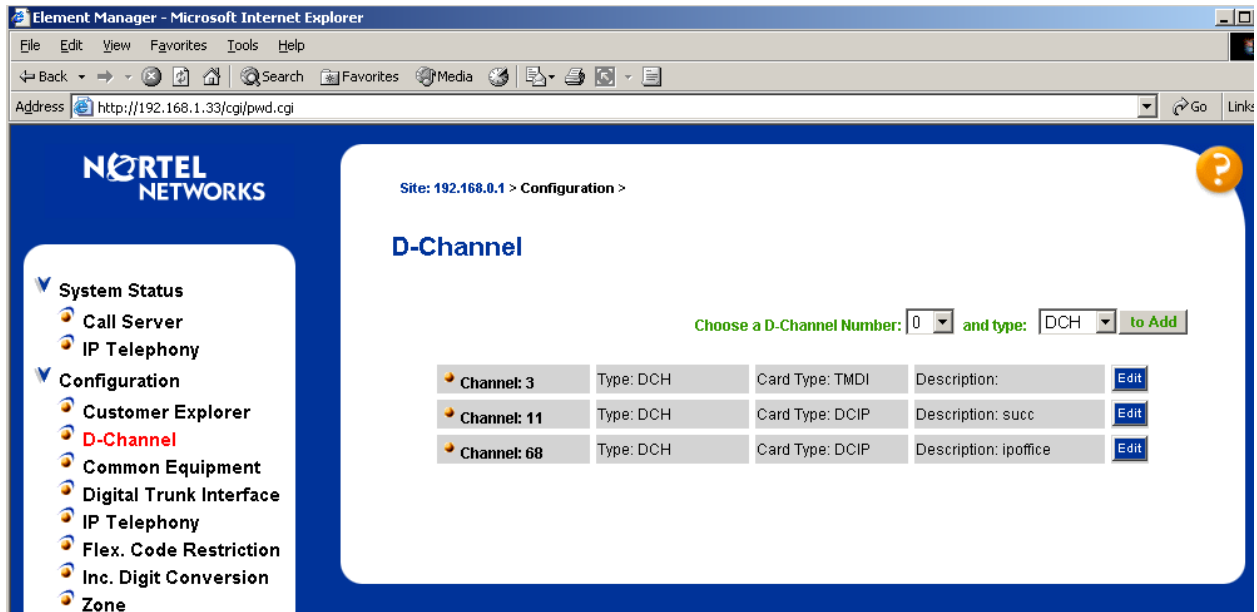
Step 3(c): Scroll down the resulting screen and select **Integrated Services Digital Network Package: 145**. Check the **Integrated Services Digital Network (ISDN)** checkbox, as shown below. Scroll to the bottom of the page and click the **Submit** button.

Integrated Services Digital Network Package: 145

Input Description	Input Value
> Dial Access Prefix on CLID table entry option (DAPC)	
Integrated Services Digital Network (ISDN)	
- Virtual Private Network Identifier (VPNI)	<input type="text" value="0"/> Range: 1 - 16383
- Private Network Identifier (PNI)	<input type="text" value="0"/> Range: 1 - 16383
- Node DN (PINX_DN)	<input type="text"/>
- Multi-location Business Group (MBG)	<input type="text" value="0"/> Range: 0 - 65535
- Business Sub Group Consult-only (BSGC)	<input type="text" value="65535"/> Range: 0 - 65535
- Prefix 1 (PFX1)	<input type="text"/>
- Prefix 2 (PFX2)	<input type="text"/>
- Home Number Plan Area code (HNPA)	<input type="text"/> Range: 200 - 999
- Prefix for Central Office (HNXX)	<input type="text"/> Range: 100 - 9999
- Local steering code (LSC)	<input type="text"/>
- Calling Number Type (CNTPT)	CLID feature displays the set's Prime DN (PDN) ▾
- Redirection Count for ISDN calls (RCNT)	<input type="text" value="5"/>
- CLID information for incoming/outgoing calls (OCLI)	No manipulation is done (NO) ▾
- Public Service Telephone Networks (PSTN)	<input type="checkbox"/>
> Flexible Services	
- Network Attendant Service	Package: 152
- Flexible Numbering Plan	Package: 159 -- Unequipped To Order
- Traffic Monitoring	Package: 160
	Package: 168 -- Unequipped To Order

Step 4: Configure the D-Channel.

Step 4(a): Select **Configuration → D-Channel** from the Navigation Tree. The resulting screen will depend on whether any D-Channels have been previously configured. In the screen capture below, D-Channels 3, 11 and 68 have been previously configured. D-Channel **68** is associated with the IP trunk to the Avaya IP Office system. The text below is written as if the D-Channel had not been previously configured.



Step 4(b): In the **Choose a D-Channel Number** drop-down, select an unused D-Channel number and click the **to Add** button. From the **D-channel Card Type (CTYP)** drop-down field, select **D-Channel is over IP (DCIP)**. From the **User (USR)** drop-down, select **Integrated Services Signaling Link Dedicated (ISLD)**. From the **Interface type for D-channel (IFC)** drop-down, select **Meridian Meridian1 (SL1)**.

Site: 192.168.0.1 > Configuration > D-Channel >

D-Channel 68 Property Configuration

Basic Configuration

Input Description	Input Value	
Action Device And Number (ADAN) (TYPE)	DCH	Read Only
D channel Card Type (CTYP)	DCIP	Read Only
Designator (DES)	ipoffice	
Recovery to Primary (RCVP)	<input type="checkbox"/>	
User (USR)	Integrated Services Signaling Link Dedicated (ISLD)	
Interface type for D-channel (IFC)	Meridian Meridian1 (SL1)	
D-Channel PRI loop number (DCHL)		Read Only
Primary Rate Interface (PRI)		more PRI
Secondary PRI2 loops (PRI2)		
Meridian 1 node type (SIDE)	Slave to the controller (USR)	
Release ID of the switch at the far end (RLS)	25	
Central Office switch type (CO_TYPE)	100% compatible with Bellcore standard (STD)	
Integrated Services Signaling Link Maximum (ISLM)	382	Range: 1 - 382

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

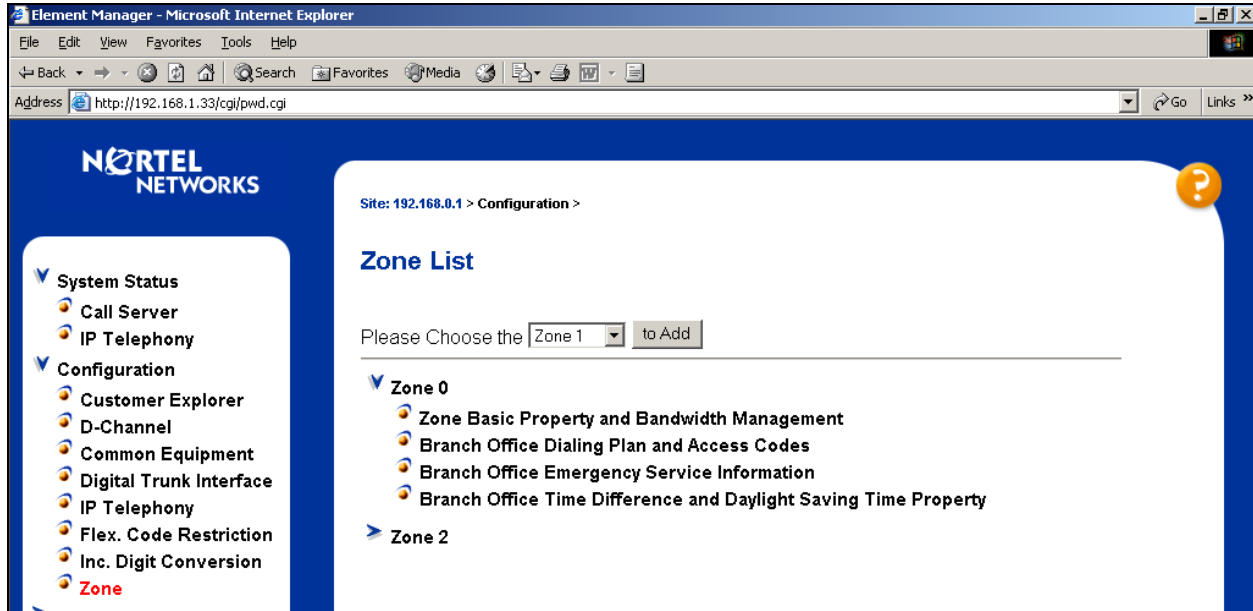
Step 4(c): Optionally, to set the “Remote Capabilities”, click on **Basic options (BSCOPT)** followed by the **Edit** button next to **Remote Capabilities (RCAP)**. A screen showing parameters such as Network Name Display method is displayed. Scroll down and check the box for **Network name Display method 2 (ND2)** (not shown). Click the **Return – Remote Capabilities** button at the bottom of the page, followed by the **Submit** button to save the changes.

Step 5: Configure Zones

Step 5(a): Nortel Succession's Zones are used for bandwidth management. A zone must be configured prior to the virtual route.

Select **Configuration** → **Zone** from the Navigation Tree.

Choose an unused zone number from the drop-down, and click **to Add**, or select one of the previously defined zones to expand the menu, as shown for Zone 0. **Zone 68** will be associated with the IP route to the Avaya IP Office.



Step 5(b): From the **Zone Basic Property and Bandwidth Management** page, observe the options. The **Intrazone Strategy** has been left at the default value of **Best Quality (BQ)**. From the **Interzone Strategy** drop-down, the value **Best Bandwidth (BB)** has been selected. This approach is similar to the Avaya configuration in Section 3. All other parameters are shown with their default values. Enter text in the **Description** field if desired, and click the **Submit** button.

Input Description	Input Value
Zone Number (ZONE):	2
Intrazone Bandwidth (INTRA_BW):	10000
Intrazone Strategy (INTRA_STGY):	Best Quality (BQ)
Interzone Bandwidth (INTER_BW):	10000
Interzone Strategy (INTER_STGY):	Best Bandwidth (BB)
Resource Type (RES_TYPE):	Shared (SHARED)
Branch Office Support (ZBRN):	<input type="checkbox"/>
Description (ZDES):	TOS8300

Step 6: Configure the Virtual Route.

Step 6(a): Select **Configuration → Customer Explorer** from the Navigation Tree.

Step 6(b): The figure below reflects the Route configuration after this step was completed. Click the **Add route** button associated with the customer.

Under **Basic Configuration**, select a **Route Number** from the drop-down. In these Application Notes, route number **68** is associated with the IP virtual route to the Avaya IP Office. From the **Trunk Type (TKTP)** drop-down, select **TIE Trunk Data Block (TIE)**. Once “TIE” is selected, additional options appear. Check the box: **The route is for a virtual trunk route (VTRK)**. Enter a zone number (e.g., **2**) in the **Zone for codec selection and bandwidth management (ZONE)** field. Enter the node id (e.g., **271**) in the **Node ID of signaling server for this route (NODE)** field. Confirm the auto-filled **Protocol ID for the route (PCID)** is set to **H323 (H323)**. Check the boxes for **Integrated Services Digital Network option (ISDN)** and **Network Calling Name Allowed (NCNA)**. In the **Mode of operation (MODE)** drop-down, select **Route uses ISDN Signaling Link (ISLD)**. Enter the D-channel number configured previously (e.g., **68**). Scroll to the top of the page and enter an **Access code for the trunk route (ACOD)**. Other options can be left at their default settings. When finished, click the **Submit** button.

Input Description	Input Value
Route Data Block (RDB) (TYPE)	RDB Read Only
Customer number (CUST)	00 Read Only
Route Number (ROUT)	68 Read Only
Designator field for trunk (DES)	IPOFFICE
Trunk Type (TKTP)	TIE Read Only
Incoming and Outgoing trunk (ICOG)	Incoming and Outgoing (IAO)
Access Code for the trunk route (ACOD)	6101
The route is for a virtual trunk route (VTRK)	
- Zone for codec selection and bandwidth management (ZONE)	002 Range: 0 - 255
- Node ID of signaling server of this route (NODE)	271 Range: 0 - 9999
- Protocol ID for the route (PCID)	H323 (H323)
Integrated Services Digital Network option (ISDN)	
- Mode of operation (MODE)	Route uses ISDN Signaling Link (ISLD)
- D channel number (DCH)	68 Range: 0 - 159
- Interface type for route (IFC)	Meridian M1 (SL1)
- Private Network Identifier (PNI)	00000 Range: 0 - 32700

Step 7: Configure Virtual Trunks

Step 7(a): The figure below reflects the Route configuration after this step was completed.

Select **Configuration** → **Customer Explorer** from the Navigation Tree. Select the customer to expand the list of routes. Click the **Add Trunk** button beside the desired route (e.g., **68**).

In the **Trunk data block (TYPE)** drop-down, select **IP Trunk (IPTI)**. In the **Terminal Number (TN)** field, enter an unused TN (e.g., **062 03**). Consult [1] for a discussion of TN numbers and virtual loops for IP terminals and trunks. In the **Extended Trunk (XTRK)** drop-down, select **Virtual trunk (VTRK)**. In the **Route Number, Member number (RTMB)** field, enter the configured route from Section 5.5 followed by a space and the configured trunk member (e.g., **68 1**). Fill the remaining fields according to customer preference. Repeat this procedure for each trunk member. Alternatively, to add multiple trunk members in a single operation, use the **Multiple Trunk Input Number (MTINPUT)** drop-down. When finished, click the **Submit** button.

Element Manager - Microsoft Internet Explorer

Address: http://192.168.1.33/cgi/pwd.cgi

Site: 192.168.0.1 > Configuration > Customer Explorer >

Customer 00, Route 68, Member 1 Property Configuration

Basic Configuration

Input Description	Input Value	
Trunk data block (TYPE)	<input type="text" value="IPTI"/>	Read Only
Terminal Number (TN)	<input type="text" value="062 0 00 03"/>	Read Only
Designator field for trunk (DES)	<input type="text" value="IPOFFICE"/>	
Extended Trunk (XTRK)	<input type="text" value="Virtual trunk (VTRK)"/>	
Customer number (CUST)	<input type="text" value="0"/>	Read Only
Route number, Member number (RTMB)	<input type="text" value="68 1"/>	*
Card Density (CDEN)	<input type="text" value="8D"/>	Read Only
Start arrangement Incoming (STRI)	<input type="text" value="Immediate (IMM)"/>	
Start arrangement Outgoing (STRO)	<input type="text" value="Immediate (IMM)"/>	
Trunk Group Access Restriction (TGAR)	<input type="text" value="1"/>	
Channel ID for this trunk. (CHID)	<input type="text" value="29"/>	Range: 1 - 382
Increase or decrease the member numbers (INC)	<input type="text" value="Increase channel and member number (YES)"/>	
Class of Service (CLS)	<input type="button" value="Edit"/>	

Advanced Trunk Configurations

* Mandatory fields of current configuration

Step 7(b): The following Customer Explorer screen shows the results after two virtual trunk members have been added to route 68. Configure the same number of virtual trunk members in Succession as configured in the corresponding Avaya IP Office H.323 line (shown in Section 3).

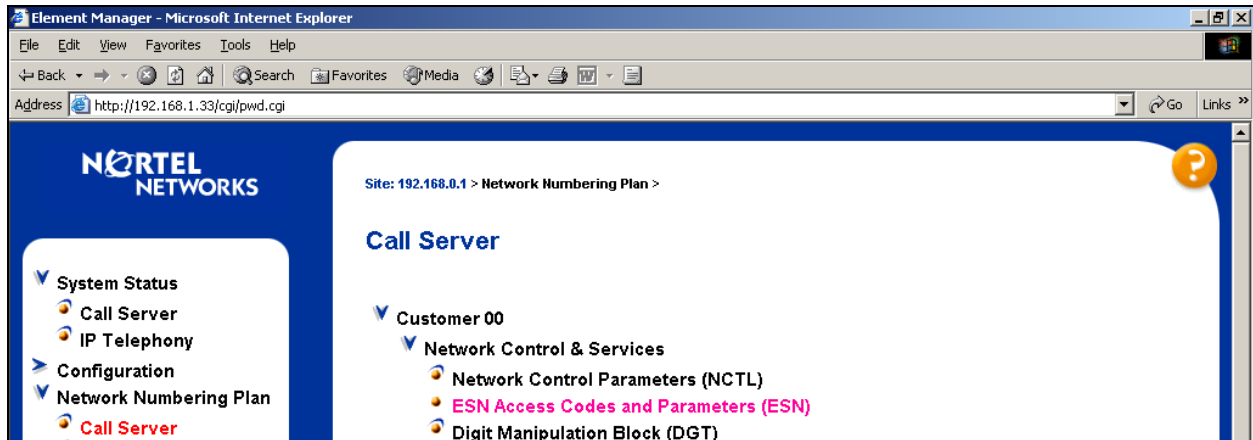
The screenshot shows the Nortel Networks Element Manager interface in a Microsoft Internet Explorer browser window. The address bar shows the URL: <http://192.168.1.33/cgi/pwd.cgi>. The interface has a blue header with the Nortel Networks logo and a left-hand navigation menu. The main content area displays a list of routes and their associated virtual trunk members.

Route	Type	Description	Actions
Route: 4	Type: TIE	Description: NONE	Edit Add trunk
Route: 5	Type: TIE	Description: NONE	Edit Add trunk
Route: 6	Type: DID	Description: NONE	Edit Add trunk
Route: 7	Type: WAT	Description: NONE	Edit Add trunk
Route: 8	Type: WAT	Description: NONE	Edit Add trunk
Route: 9	Type: WAT	Description: NONE	Edit Add trunk
Route: 11	Type: TIE	Description: SUCC	Edit Add trunk
Route: 40	Type: MUS	Description: NONE	Edit Add trunk
Route: 41	Type: AWR	Description: NONE	Edit Add trunk
Route: 42	Type: RAN	Description: NONE	Edit Add trunk
Route: 43	Type: RAN	Description: NONE	Edit Add trunk
Route: 44	Type: PAG	Description: NONE	Edit Add trunk
Route: 50	Type: FEX	Description: NONE	Edit Add trunk
Route: 51	Type: FEX	Description: NONE	Edit Add trunk
Route: 52	Type: FEX	Description: NONE	Edit Add trunk
Route: 68	Type: TIE	Description: IPOFFICE	Edit Add trunk
Member: 1	TN: 062 0 00 03	Description: IPOFFICE	Edit Multi - Del
Member: 2	TN: 062 0 00 04	Description: IPOFFICE2	Edit

Step 8: Enable Desired Networking Options for the Call Server

Step 8(a): These Application Notes use the Coordinated Dialing Plan (CDP) feature to steer calls from the Nortel Succession to the IP Trunk to Avaya IP Office. The Nortel CDP feature together with the Avaya IP Office Uniform Dial Plan (UDP) feature enable Nortel and Avaya telephone users to dial 5-digit extensions to reach one another. Of course, other numbering plan options are also possible.

To ensure that CDP is enabled, select **Network Numbering Plan → Call Server** from the Navigation Tree. Select **ESN Access Codes and Parameters (ESN)**.



Step 8(b): Scroll down to the bottom of the resulting screen and check **Coordinated Dialing Plan Feature for this customer (CDP)**. Scroll to the bottom of the page and click **Submit**.

Element Manager - Microsoft Internet Explorer

Address: http://192.168.1.33/cgi/pwd.cgi

NORTEL NETWORKS

System Status
Configuration
Network Numbering Plan
Call Server
Gatekeeper
Software Upgrade
Patching
System Utility
Administration
Support
Logout

Routing Controls (RTCL): ☐

Check for Trunk Group Access Restrictions (TGAR): ☐

NCOS Map (NMAP):
(items separated by a space)

Maximum number of Supplemental Digit restriction blocks (MXSD): 999

Maximum number of Incoming Trunk Group exclusion tables (MXIX): 100

Maximum number of Free Calling area screening tables (MXFC): 100

Maximum number of Free Special number screening tables (MXFS): 100

One or two digit NARS/BARS Access Code 1 (AC1): 9

NARS/BARS Dial Tone after dialing AC1 or AC2 access codes (DLTN): ☒

Expensive Route Warning Tone (ERWT): ☒

Expensive Route Delay Time (ERDT): 6

Extended Time of Day schedule (ETOD):

Maximum number of LOC codes (NARS only) (MXLC): 999

Maximum number of Special Common Carrier entries (MSCC):

One or two digit NARS Access Code 2 (AC2):

Coordinated Dialing Plan feature for this customer (CDP): ☒

Maximum number of Steering Codes (MXSC): 100

Done Local intranet

Step 8(c): The default parameters for Network Control must be turned on. From the Navigation Tree, select **Network Numbering Plan** → **Call Server**. Select **Network Control Parameters (NCTL)**.

Element Manager - Microsoft Internet Explorer

Address: http://192.168.1.33/cgi/pwd.cgi

NORTEL NETWORKS

System Status
Call Server
IP Telephony
Configuration
Network Numbering Plan
Call Server

Site: 192.168.0.1 > Network Numbering Plan >

Call Server

Customer 00

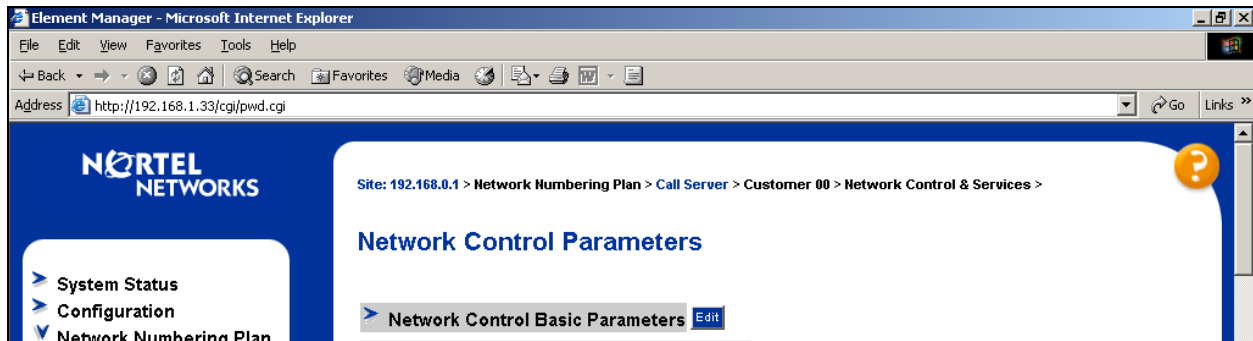
Network Control & Services

Network Control Parameters (NCTL)

ESN Access Codes and Parameters (ESN)

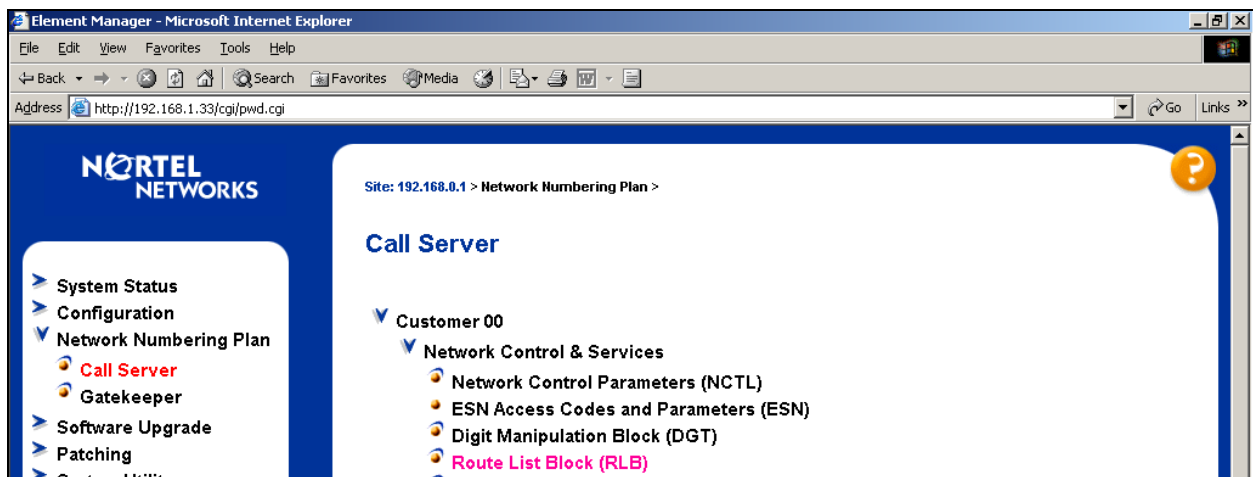
Digit Manipulation Block (DGT)

Step 8(d): Select the **Edit** button next to **Network Control Basic Parameters**. On the resulting page, click the **Submit** button to accept the default parameters.



Step 9: Configure the Route List Block

Step 9(a): Configure the Route List Block that will be used to route calls over the virtual trunk route. From the Navigation Tree, select **Network Numbering Plan** → **Call Server**. Next, select **Route List Block**.



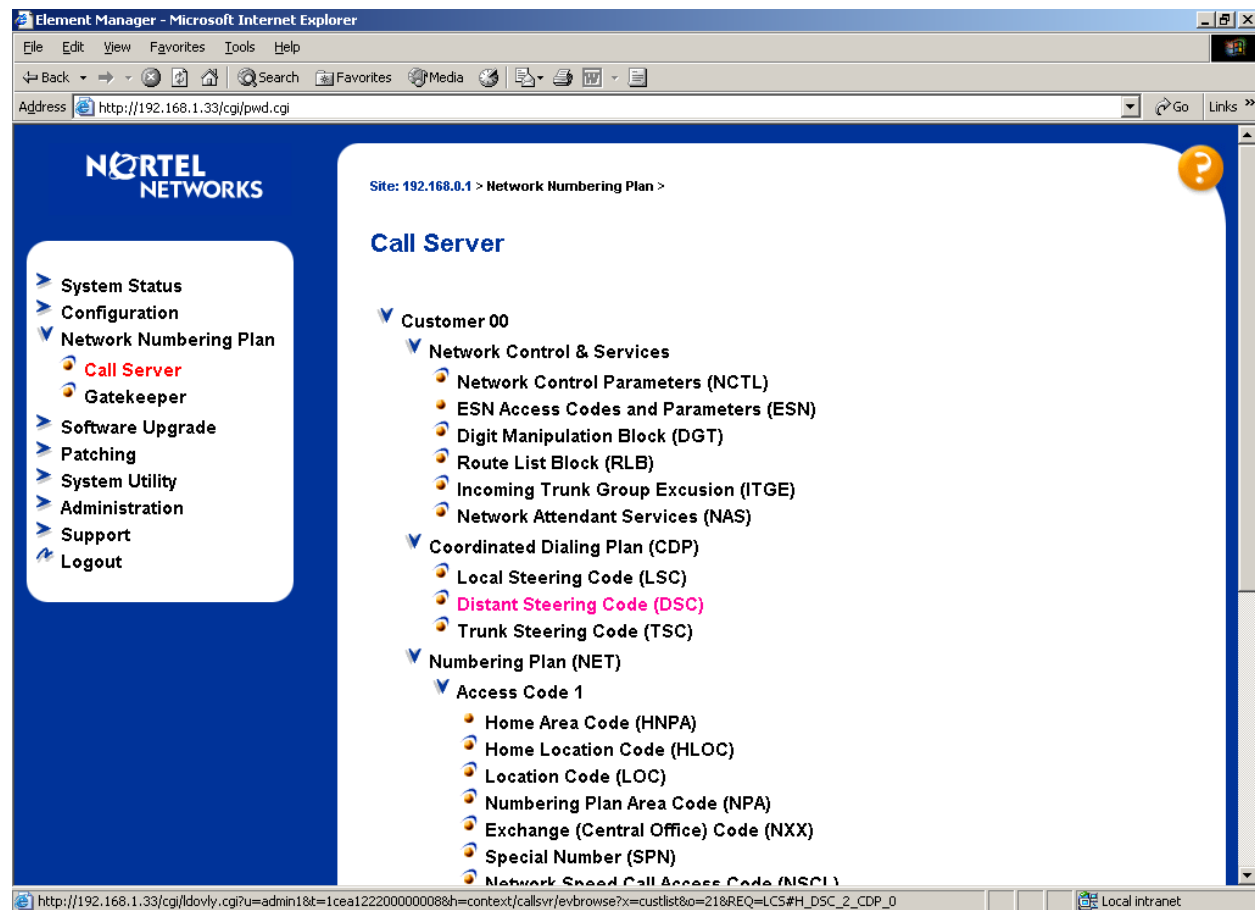
Step 9(b): In the resulting **Route List Blocks** page, enter an unused route list block index in the text box and click the **to Add** button. Route List Block Index **68** will be associated with the IP trunk to the Avaya IP Office.

Step 9(c): In the **Route Number (ROUT)** drop-down, select the appropriate route (e.g., **68**). Other parameters can be set according to customer preference or left at their default values. Click the **Submit** button.

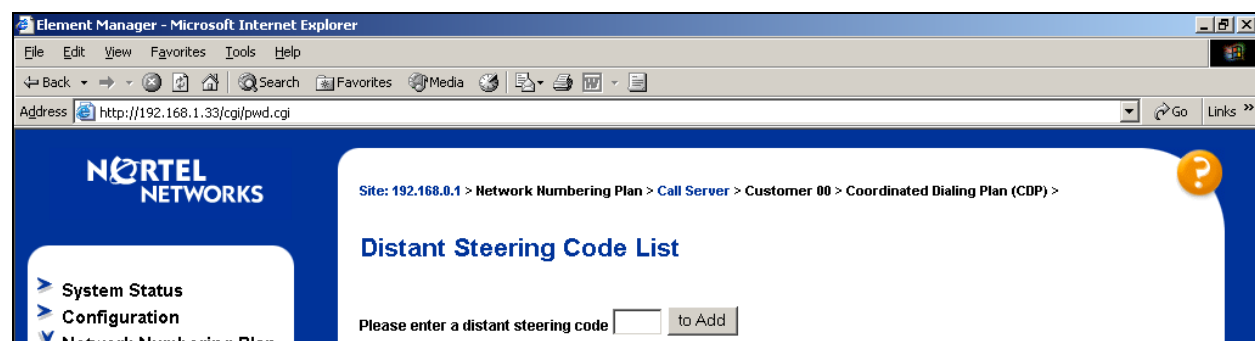
Input Description	Input Value
Entry Number for the Route List (ENTR):	0
Local Termination entry (LTER):	<input type="checkbox"/>
Route Number (ROUT):	68
Skip Conventional Signaling (SCNV):	<input type="checkbox"/>
Use Tone Detector (TDET):	<input type="checkbox"/>
Time of Day Schedule (TOD):	0
Entry is a VNS Route (VNS):	<input type="checkbox"/>
Conversion to LDN (CNV):	<input type="checkbox"/>
Expensive Route (EXP):	<input type="checkbox"/>
Facility Restriction Level (FRL):	0
Digit Manipulation Index (DMI):	0
ISL D-Channel Down Digit Manipulation Index (ISDM):	0
Free Calling Area Screening Index (FCI):	0
Free Special Number Screening Index (FSNI):	0
Business Network Extension Route (BNE):	<input type="checkbox"/>
Strategy on Congestion (SBOC):	No Reroute (NRR)
QSIG Alternate Routing Causes (COPT):	QSIG Alternate Routing Cause 1
ISDN Drop Back Busy (IDBB):	Drop Back Disabled (DBD)
ISDN Off-Hook Queuing Option (IOHQ):	<input type="checkbox"/>
Off-Hook Queuing Allowed (OHQ):	<input type="checkbox"/>
Call Back Queuing Allowed (CBQ):	<input type="checkbox"/>

Step 10: Configure Steering Codes

Step 10(a): From the Navigation Tree, select **Network Numbering Plan** → **Call Server**. Under the Coordinated Dialing Plan heading, select **Distant Steering Code (DSC)**.



Step 10(b): Enter the leading digits of a CDP number (e.g., **68**) in the **Please enter a distant steering code** text box, and click the **to Add** button.



Step 10(c): In the **Flexible Length number of digits (FLEN)** text box, enter the number of digits used in the CDP. In these Application Notes, a 5-digit dialing plan is illustrated. In the **Route List to be accessed for trunk steering code (RLI)** drop-down, select the appropriate route (e.g., **68**). Click the **Submit** button.

Element Manager - Microsoft Internet Explorer

Address: http://192.168.1.33/cgi/pwd.cgi

Site: 192.168.0.1 > Network Numbering Plan > Call Server > Customer 00 > Coordinated Dialing Plan (CDP) > Distant Steering Code List >

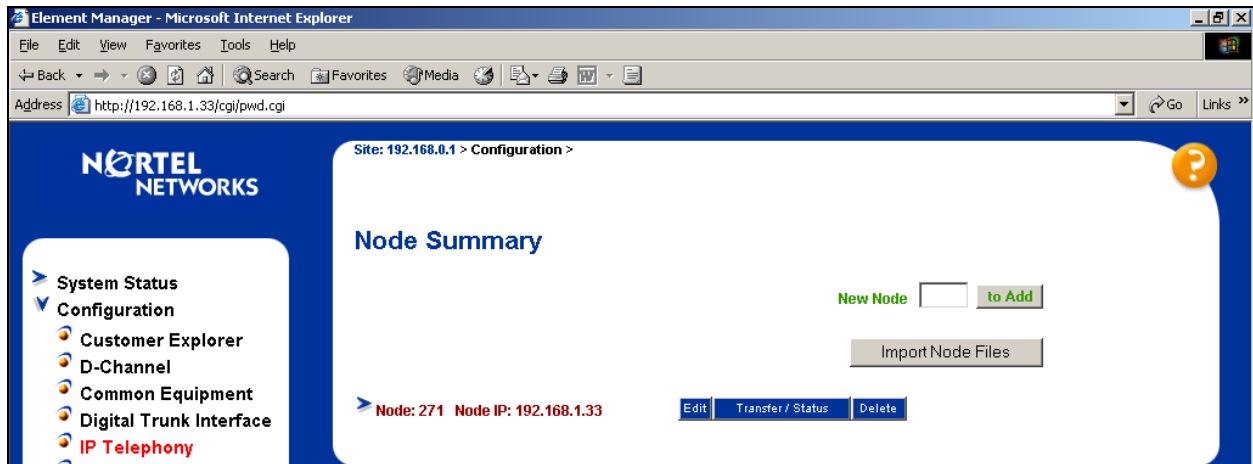
Distant Steering Code

Input Description	Input Value
Distant Steering Code (DSC):	68
Flexible Length number of digits (FLEN):	5
Display (DSP):	Local Steering Code (LSC)
Remote Radio Paging Access (RRPA):	<input type="checkbox"/>
Route List to be accessed for trunk steering code (RLI):	68
Collect Call Blocking (CCBA):	<input type="checkbox"/>
maximum 7 digit NPA code allowed (NPA):	
maximum 7 digit NXX code allowed (NXX):	

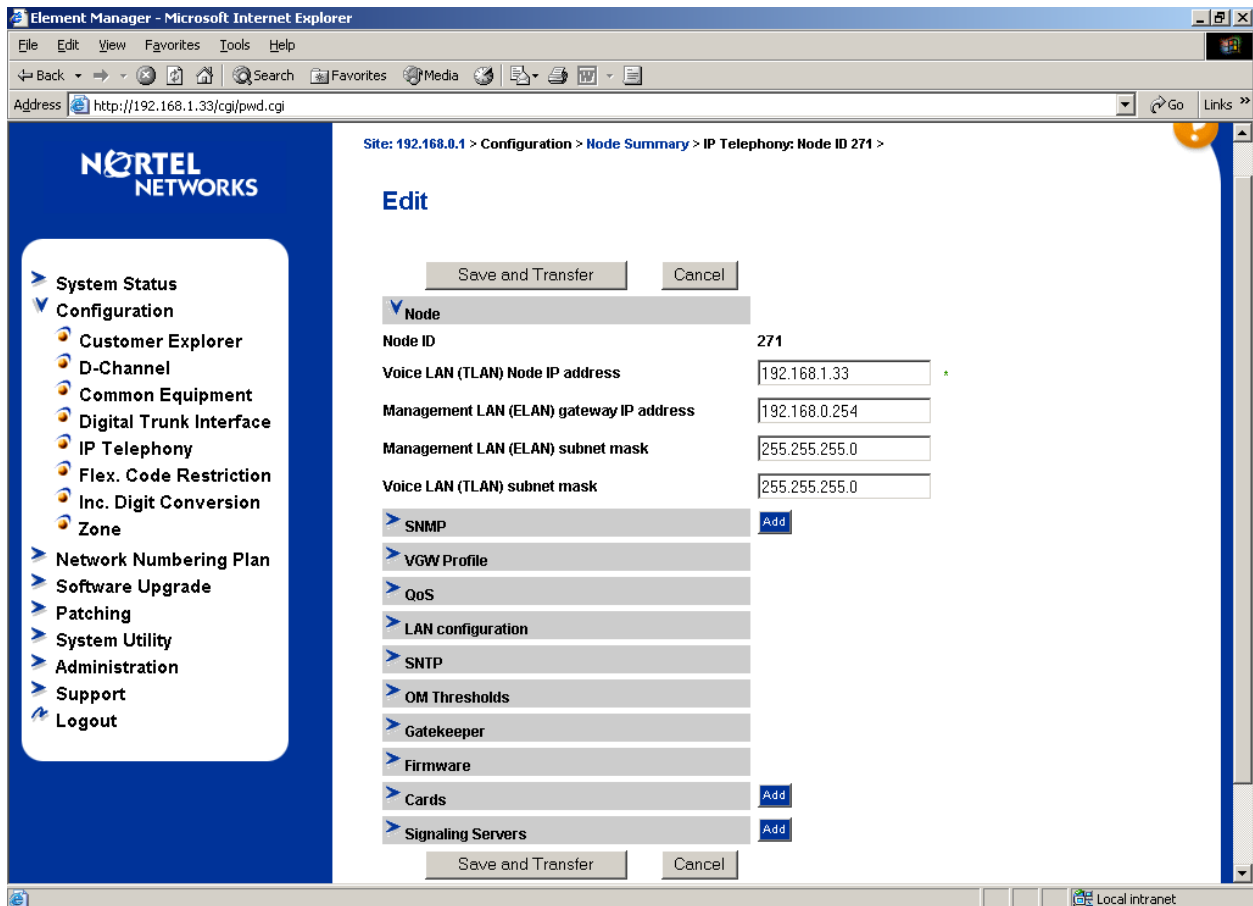
Submit Refresh Delete Cancel

Step 11: Configure Codecs

Step 11(a): From the Navigation Tree, select **Configuration** → **IP Telephony**.



Step 11(b): Click the **Edit** button. The Edit page displays, illustrating the basic configuration of the node.



Step 11(c): Click **VGW Profile.** Select the check boxes for the desired codecs. In these Application Notes, G729A is illustrated for calls between Avaya and Nortel users.

NORTEL NETWORKS

- System Status
- Configuration
 - Customer Explorer
 - D-Channel
 - Common Equipment
 - Digital Trunk Interface
 - IP Telephony
 - Flex. Code Restriction
 - Inc. Digit Conversion
 - Zone
- Network Numbering Plan
- Software Upgrade
- Patching
- System Utility
- Administration
- Support
- Logout

Management LAN (ELAN) gateway IP address: 192.168.0.254

Management LAN (ELAN) subnet mask: 255.255.255.0

Voice LAN (TLAN) subnet mask: 255.255.255.0

SNMP: Add

VGW Profile

Enable Echo canceller: ☒

Echo canceller tail delay: 128

Voice activity detection threshold: -17 Range: -20 to +10

Idle noise level: -65 Range: -327 to +327

DTMF Tone detection: ☒

Enable V.21 FAX tone detection: ☒

FAX maximum rate (lips): 14400

FAX playout nominal delay: 100 Range: 0 to 300

FAX no activity timeout: 20 Range: 10 to 32000

FAX packet size: 30

Codec	Selection
Codec G711	Select <input checked="" type="checkbox"/>
Codec G729A	Select <input checked="" type="checkbox"/>
Codec G729AB	Select <input type="checkbox"/>
Codec G723.1	Select <input type="checkbox"/>
Codec G711 CLEAR CHANNEL	Select <input checked="" type="checkbox"/>
Codec T38 FAX	Select <input checked="" type="checkbox"/>

Step 11(d): Click on each codec if additional special configuration of the codec is desired. The following screen shows the expanded view for G729A, although all values are left at their defaults. When finished, scroll to the bottom of the screen, and click the **Save and Transfer** button. A series of pages may display, indicating the progress and result of the operation.

The screenshot shows the 'Element Manager - Microsoft Internet Explorer' window. The address bar displays 'http://192.168.1.33/cgi/pwd.cgi'. The left sidebar contains a navigation menu with the following items: System Status, Call Server, IP Telephony, Configuration (expanded), Customer Explorer, D-Channel, Common Equipment, Digital Trunk Interface, IP Telephony, Flex. Code Restriction, Inc. Digit Conversion, Zone, Network Numbering Plan, Software Upgrade, Patching, System Utility, Administration, Support, and Logout. The main content area displays the configuration for the G729A codec. It includes a table of codecs with 'G711' and 'G729A' selected. Below this, the 'G729A' configuration is shown with fields for 'Voice payload size (ms/frame)' (20), 'Voice playout (jitter buffer) nominal delay' (40), and 'Voice playout (jitter buffer) maximum delay' (80). A note states 'Changing the value above may cause automatic adjustment'. The 'VAD' section is also visible. At the bottom, there are 'Save and Transfer' and 'Cancel' buttons. A footer note reads '*Mandatory fields of current configuration'.

Codec	Select
G711	<input checked="" type="checkbox"/>
G729A	<input checked="" type="checkbox"/>

Codec Name: G729A

Voice payload size (ms/frame): 20

Voice playout (jitter buffer) nominal delay: 40

Changing the value above may cause automatic adjustment

Voice playout (jitter buffer) maximum delay: 80

Changing the value above may cause automatic adjustment

VAD: ☐

Codec	Select
G729AB	<input type="checkbox"/>
G723.1	<input type="checkbox"/>
G711 CLEAR CHANNEL	<input checked="" type="checkbox"/>
T38 FAX	<input checked="" type="checkbox"/>

QoS

LAN configuration

SNTP

OM Thresholds

Gatekeeper

Firmware

Cards: Add

Signaling Servers: Add

Save and Transfer Cancel

*Mandatory fields of current configuration

Step 12: Verify the Gatekeeper and Signaling Server Configuration

Step 12(a): Although a thorough treatment of installation and configuration of the Gatekeeper software is beyond the scope of these Application Notes, this section presents the essential Gatekeeper configuration used in the network of **Figure 1**.

From the Navigation Tree, select **Configuration → IP Telephony**. From the resultant **Node Summary** web page, click **Edit**.

Click on **Gatekeeper** to expand the options. As can be seen from the screen below, the **Primary gatekeeper IP address** is set to **192.168.1.30**, which is the TLAN IP address of the Succession Signaling Server running the Gatekeeper application. Note that the IP address entered into this field is not the Node IP address.

The screenshot displays the Nortel Networks Element Manager web interface in a Microsoft Internet Explorer browser window. The address bar shows the URL <http://192.168.1.33/cgi/pwd.cgi>. On the left, a navigation tree is visible with the following structure:

- System Status
 - Call Server
 - IP Telephony
- Configuration
 - Customer Explorer
 - D-Channel
 - Common Equipment
 - Digital Trunk Interface
 - IP Telephony (highlighted)
 - Flex. Code Restriction
 - Inc. Digit Conversion
 - Zone
- Network Numbering Plan
- Software Upgrade
- Patching
- System Utility
- Administration
- Support
- Logout

The main content area shows the configuration for the Gatekeeper. The 'Gatekeeper' option in the left sidebar is expanded. The configuration fields are as follows:

Configuration Field	Value	Range
Management LAN (ELAN) gateway IP address	192.168.0.254	
Management LAN (ELAN) subnet mask	255.255.255.0	
Voice LAN (TLAN) subnet mask	255.255.255.0	
SNMP	Add	
VGW Profile		
QoS		
LAN configuration		
SNTp		
OM Thresholds		
Gatekeeper		
Primary gatekeeper IP address	192.168.1.30	
Alternate gatekeeper IP address	0.0.0.0	
Primary Network Connect Server IP address	192.168.1.30	
Primary Network Connect Server Port number	16500	Range: 1024 to 65535
Alternate Network Connect Server IP address	0.0.0.0	
Alternate Network Connect Server Port number	16500	Range: 1024 to 65535
Primary Network Connect Server timeout	10	Range: 1 to 30
Firmware		
Cards	Add	
Signaling Servers	Add	

At the bottom of the configuration area, there are two buttons: 'Save and Transfer' and 'Cancel'.

Step 12(b): Click on **Signaling Servers**, and then click on the appropriate signaling server properties. The screen below illustrates the configuration for the network in **Figure 1**. Observe the **set Terminal Proxy Server (TPS)** and **virtual trunk TPS** are **enabled**, and the **H323 ID** is the text string **271**. This is the primary gatekeeper. If configuration is being performed rather than simply observed, click the **Save and Transfer** button at the bottom of the screen, and reboot the Signaling Server.

In these Application Notes, a simple Gatekeeper database is configured to cause dialed digits of the form 68xxx to be routed to the Avaya IP Office. The approach can be generalized for any numbering plan. The Avaya IP Office will be defined as a “non-RAS endpoint”. This section will describe only those aspects of the Gatekeeper configuration that are relevant to the communication with the Avaya IP Office.

When the Avaya system is added as a non-RAS endpoint, no H.323 “Location Request” (LRQ) will be sent before initiating call setup.

The screenshot shows the Element Manager web interface in Microsoft Internet Explorer. The browser address bar shows `http://192.168.1.33/cgi/pwd.cgi`. The interface has a blue sidebar on the left with the Nortel Networks logo and a menu. The main content area shows a list of configuration categories on the left and a detailed configuration form for the 'Signaling Server 192.168.0.3 Properties' on the right.

Left Sidebar Menu:

- System Status
 - Call Server
 - IP Telephony
- Configuration
 - Customer Explorer
 - D-Channel
 - Common Equipment
 - Digital Trunk Interface
 - IP Telephony
 - Flex. Code Restriction
 - Inc. Digit Conversion
 - Zone
 - Network Numbering Plan
 - Software Upgrade
 - Patching
 - System Utility
 - Administration
 - Support
 - Logout

Main Configuration Form: Signaling Server 192.168.0.3 Properties

Role	Leader
Management LAN (ELAN) IP address	192.168.0.3
Management LAN (ELAN) MAC address	00:02:b3:f1:ce:c0
Voice LAN (TLAN) IP address	192.168.1.30
Voice LAN (TLAN) gateway IP address	192.168.1.1
H323 ID	271
Enable set TPS	<input checked="" type="checkbox"/>
Enable virtual trunk TPS	<input checked="" type="checkbox"/>
Gatekeeper configuration	Pr GK
System name	Succession
System location	Interop Lab
System contact	Avaya

Buttons at the bottom: **Save and Transfer**, **Cancel**, **Remove**.

Step 13: Gatekeeper Database Configuration

Step 13(a): Log in to the Gatekeeper configuration web page using the Element Manager. From the Navigation Tree, select **Network Numbering Plan** → **Gatekeeper**.

Site: 192.168.0.1 > Network Numbering Plan >

Gatekeeper configuration

Please enter the Gatekeeper IP Address then press button " Next > "

Input description	Input value
Gatekeeper IP Address:	192.168.1.30

Next >

Step 13(b): Click the **Next** button. When the Login window displays, enter an appropriate **User Name** and **Password** and click **OK**. A welcome page similar to the following will display.

Welcome to Succession 3.0

Welcome to Succession 3.0

Software Version	2.11.03
Hardware Platform	ISP1100 Signaling Server
Web Server Version	WindWeb/2.0

Gatekeeper

Gatekeeper Role	Primary Gatekeeper
Gatekeeper Status	Gatekeeper Active
Alternate GK IP	0.0.0.0
Alternate GK Status	No Alternate Gatekeeper configured

Step 13(c): The Gatekeeper maintains two databases. Configuration changes are made to the standby database. When configuration is completed on the standby database, the standby database can be cutover to become the active database.

To configure a CDP domain, select **GK Standby DB Admin → CDP Domains → Create** from the Navigation Tree. Enter a CDP Domain Name (e.g., **CDP_271**) and click the **Create** button.

The screenshot shows the Gatekeeper Admin web interface in Microsoft Internet Explorer. The browser title is "Gatekeeper - 192.168.1.30 - Admin - Microsoft Internet Explorer". The page has a blue header with the "NORTEL NETWORKS" logo. On the left is a navigation tree with the following items: "GK Active DB Admin", "GK Standby DB Admin" (selected), "Database Actions", "Test Numbering Plan", "Configuration Summary", "Database Restore", and "System Wide Settings". The main content area is titled "Create CDP domain" and contains a section labeled "CDP domain information". This section has a text input field for "CDP Domain Name" with the value "CDP_271" entered, and a "Create" button below it.

Step 13(d): To add the IP Office as a “non-RAS endpoint”, select **GK Standby DB Admin → H323 Endpoints → Add non-RAS Endpoint** from the Navigation Tree. Enter a descriptive name in the **Legacy Alias Name** field, and enter the IP Address of the Avaya IP Office in the **Legacy IP address** field. In this case, the name **ipoffice** is used, and the IP address of the IP Office is **2.2.10.68**, as shown. Click the **Create Legacy** button.

The screenshot shows the Gatekeeper Admin web interface in Microsoft Internet Explorer. The browser title is "Gatekeeper - 192.168.1.30 - Admin - Microsoft Internet Explorer". The page has a blue header with the "NORTEL NETWORKS" logo. On the left is a navigation tree with the following items: "Database Restore", "System Wide Settings" (selected), "View System Wide Settings", "System Wide Number Prefixes", "RRQ Time To Live Interval", "Alternate Gatekeeper State", "Gatekeeper Alias Name", "Database/Reg. Sync Poll", "GK Zones", "CDP Domains" (selected), "Create", and "Modify / Delete". The main content area is titled "Add Non-RAS Endpoint" and contains a section labeled "Endpoint Information". This section has three fields: "Legacy Alias Name" with the value "ipoffice", "Legacy IP address" with the value "2.2.10.68", and "CDP Domain Name" with a dropdown menu showing "CDP_271". A "Create Legacy" button is located at the bottom of the section.

Step 13(e): Next, configure the numbering plan entries that will be associated with this endpoint. From the Navigation Tree, select **GK Standby DB Admin → Numbering Plan Entries → Create**. From the **Endpoint** drop-down, select the appropriate name (e.g., **ipoffice**). Click the **Select** button.

The screenshot shows the 'Select an Endpoint to add an Entry' page in the Gatekeeper Admin interface. On the left is a navigation tree with 'System Wide Settings' expanded, showing options like 'View System Wide Settings', 'System Wide Number Prefixes', 'RRQ Time To Live Interval', 'Alternate Gatekeeper State', 'Gatekeeper Alias Name', 'Database/Reg. Sync Poll', and 'GK Zones'. The main content area has the title 'Select an Endpoint to add an Entry'. Below the title is a 'Select' section with an 'Endpoint' label and a dropdown menu currently showing 'ipoffice'. A 'Select' button is located below the dropdown.

Step 13(f): In the Number text box, enter the leading digits of the dialed number to be directed to the Avaya IP Office. In these Application Notes, all numbers of the form 68xxx are directed to the non-RAS endpoint named **ipoffice**. The default for the **Type** field can be retained. Click the **Create** button.

The screenshot shows the 'Add Entry' page in the Gatekeeper Admin interface. The navigation tree on the left now shows 'GK Zones' expanded, with 'CDP Domains' and 'H323 Endpoints' also visible. The main content area is titled 'Add Entry'. It contains two sections: 'Endpoint Information' and 'Numbering Plan Entries'. The 'Endpoint Information' section is a table with the following data:

Alias Name	ipoffice
CDP Domain Name	CDP_271
Legacy IP address	2.2.10.68
Default Country Code Prefix	None
Private Number Prefix	None
Public Number Prefix	None

Below this table is the 'Numbering Plan Entries' section, which contains three input fields: 'Number' with the value '68', 'Type' with a dropdown menu showing 'privateNumber.localNumber [CDP]', and 'EntryCost' with the value '1'. A 'Create' button is located at the bottom of this section.

Step 14: Test the Standby Database

Step 14(a): Before making the standby database the active database, it may be desirable to test the numbering plan. From the Navigation Tree, select **GK Standby DB Admin → Test Numbering Plan**. In the **Number Query** text box, enter the extension of an Avaya telephone, such as **68567**. In the **Origination Endpoint** drop-down, select the endpoint corresponding to the Nortel Succession devices (e.g., **271**). Click the **Query** button.

The screenshot shows the Gatekeeper Admin web interface in Microsoft Internet Explorer. The browser title is "Gatekeeper - 192.168.1.30 - Admin - Microsoft Internet Explorer". The page has a blue header with the "NORTEL NETWORKS" logo. On the left is a navigation tree with categories like "Configuration" and "System Wide Settings". The main content area is titled "Enter Numbering Plan Translation Query Parameters for Standby Database". It contains a form with the following fields:

Enter Numbering Plan Translation Query Parameters	
Number Query	68567
Type	privateNumber.localNumber [CDP]
Originating Endpoint	271

Below the form is a blue "Query" button.

Step 14(b): A screen similar to the following should display, indicating that the call will be directed to the Avaya IP Office.

The screenshot shows the Gatekeeper Admin web interface displaying the "Numbering Plan Translation Results". The browser title is "Gatekeeper - 192.168.1.30 - Admin - Microsoft Internet Explorer". The page has a blue header with the "NORTEL NETWORKS" logo. On the left is a navigation tree. The main content area is titled "Numbering Plan Translation Results". It contains two sections:

Query Parameters

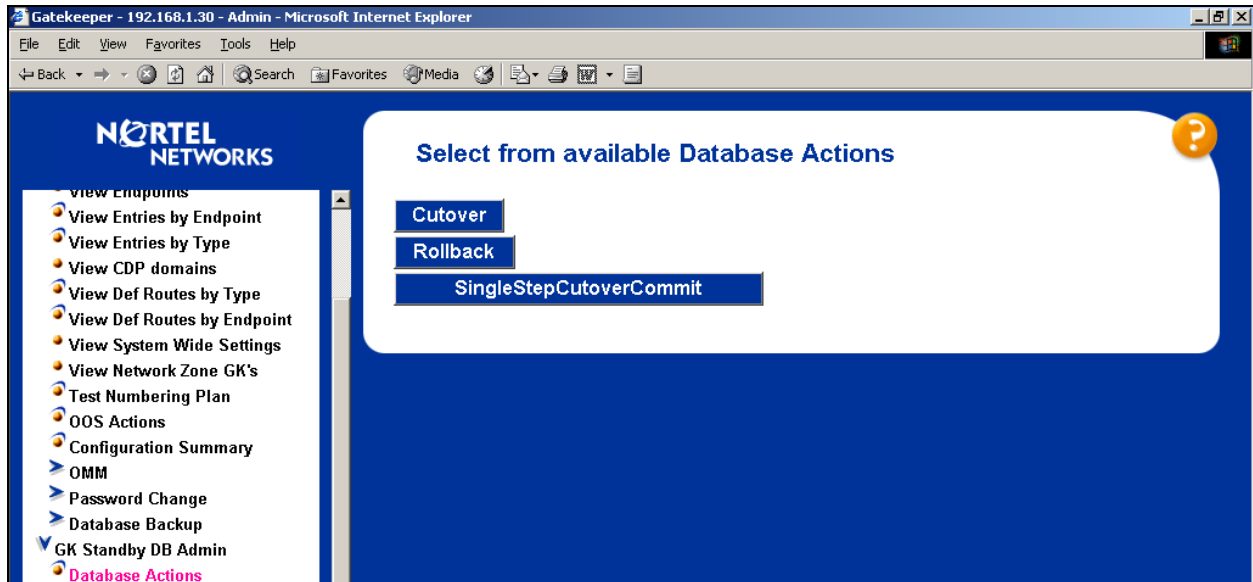
Number Query	68567
Type	privateNumber.localNumber [CDP]
Originating Endpoint	271
Registration Status	Registered
Tandem Endpoint	None

Numbering Plan Translation Results

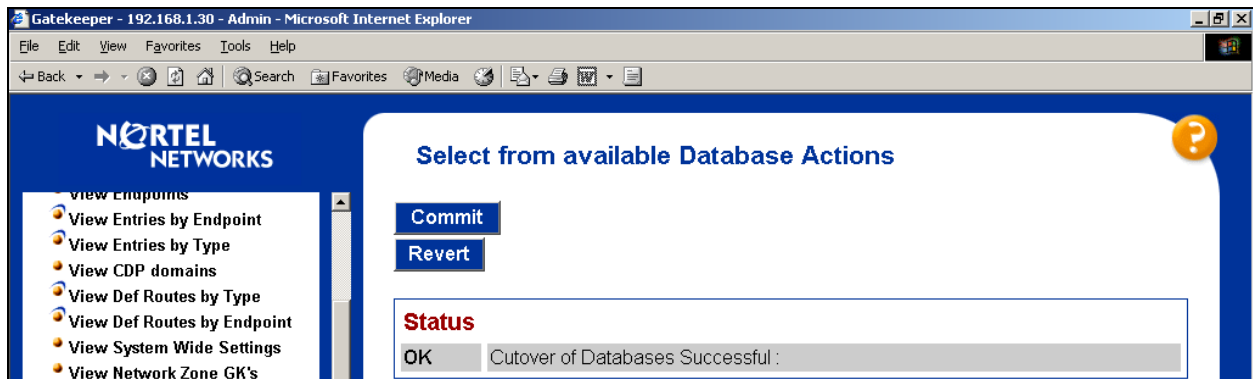
Alias Name	Registration Status	Number	Cost Factor
ipoffice	Legacy Endpoint	68	1

Step 15: Cutover the Standby Database

Step 15(a): When satisfied that the standby database is properly configured, the standby database can be made the active database. From the Navigation Tree, select **GK Standby DB Admin** → **Database Actions**.



Step 15(b): To swap the active and standby databases, retaining the uniqueness of each, click the **Cutover** button. To make the standby database active and also synchronize the databases so that the primary and standby databases are identical, click the **SingleStepCutoverCommit** button. In the example below, the **Cutover** button was used.



Step 15(c): Before making calls, it may be desirable to check the active database. Similar procedures to those described previously may be used to test the active database after cutover. From the Navigation Tree, select **GK Active DB Admin** → **Test Numbering Plan**, and follow the procedures used for testing the standby database.

5. Verify Connectivity

Verification of the configuration described in these Application Notes included:

- Calls between Nortel IP telephones and Software Phones controlled by the Nortel Succession and Avaya IP Telephones and Softphones registered to the Avaya IP Office. Successful calls can be made in both directions across the IP Trunk using either G.729A or G.711MU. Nortel and Avaya endpoints transmit voice media directly to each other.
- Calls between Nortel IP telephones and Software Phones controlled by the Nortel Succession and Avaya digital telephones connected to the Avaya IP Office. Successful calls can be made in both directions using G.711MU or G.729A. This result may be extrapolated to other non-IP devices connected to the IP Office (e.g., analog telephones, PSTN trunks, etc.).
- Calls from Nortel IP telephones and Nortel digital telephones into Voicemail Pro configured on the Avaya IP Office. After the welcome announcement prompts the caller for the conference password, digits pressed on any of the Nortel telephone keypads (to enter the conference password) are processed properly. This verification is included to show that Avaya applications requiring DTMF collection can collect the digits using out-of-band signaling from the IP Trunk interface to the Nortel server.
- Calls from Avaya IP Telephones, Avaya IP Softphones, and Avaya digital telephones interacting with the Call Pilot voice messaging system of the Nortel Succession. Digits pressed on the Avaya telephone keypads are processed properly by the Nortel voice messaging application. This verification is included to show that Nortel applications requiring DTMF can collect the digits using out-of-band signaling from the IP Trunk interface to the Avaya server.
- Call progress tone (e.g., ringback) to the originator of calls is heard when appropriate in all cases
- Calling party number can be displayed for calls in either direction:
 - For calls from an Avaya telephone to a Nortel telephone, the Nortel telephone can display the number of the Avaya caller, provided the Avaya server is provisioned to send this information. The screen capture from the Nortel i2050 Software Phone in Section 7.5 illustrates the calling number of the Avaya caller.
 - For calls from a Nortel telephone to an Avaya telephone, the Avaya telephone can display the calling party number, when sent by the Nortel Succession. The screen capture from the Avaya IP Softphone in Section 7.5 illustrates the calling number of the Nortel caller.

6. Detailed Information for Active Calls

To reinforce the understanding of the configuration, the following subsections show detailed status for representative calls.

6.1. Avaya IP Telephone Calls Nortel IP Telephone

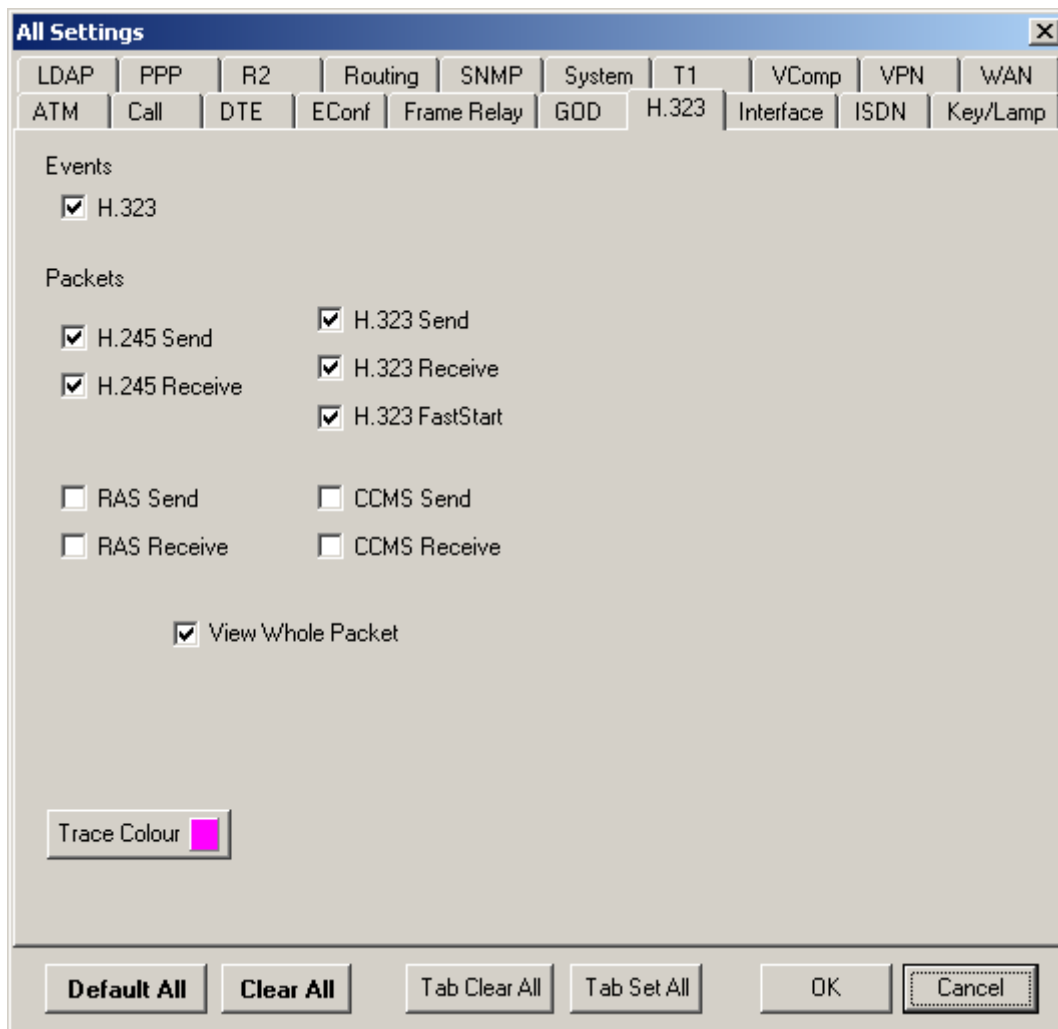
This section presents details for a call involving the Avaya 4620SW IP Telephone with IP address 2.2.10.161 (x68987) and the Nortel IP Telephone with IP address 2.2.10.90 (x53300). The Avaya IP telephones are registered with the IP Office, whose address is 2.2.10.68. Nortel IP telephones are registered with the Nortel Succession Node IP, whose address is 192.168.1.33. Allow Direct Media has been enabled on the IP Office line form so the media can flow directly between the IP telephones.

Observe audio path for the call, shown by a protocol analyzer trace, below. Voice Media “RTP” packets are sent directly between the Avaya and Nortel IP Phones.

Status	Record	Length	Time	Src. Address	Dest Addr	Protocol	Description
	1	78	15:21:17.525604705	2.2.10.90	2.2.10.161	ETHER IP UDP RTP	00-60-38-76-32-0E -> 00-04-0D-4B-D8-6F Proto=IP 2.2.10.90 -> 2.2.10.161 Id=9047 u5200 -> u9696 Payload=G.729 SeqNo=9532
	2	78	15:21:17.526677467	2.2.10.161	2.2.10.90	ETHER IP UDP RTP	00-04-0D-4B-D8-6F -> 00-60-38-76-32-0E Proto=IP 2.2.10.161 -> 2.2.10.90 Id=0149 u9696 -> u5200 Payload=G.729 SeqNo=12959
	3	78	15:21:17.545757266	2.2.10.90	2.2.10.161	ETHER IP UDP RTP	00-60-38-76-32-0E -> 00-04-0D-4B-D8-6F Proto=IP 2.2.10.90 -> 2.2.10.161 Id=9048 u5200 -> u9696 Payload=G.729 SeqNo=9533
	4	78	15:21:17.546832822	2.2.10.161	2.2.10.90	ETHER IP UDP RTP	00-04-0D-4B-D8-6F -> 00-60-38-76-32-0E Proto=IP 2.2.10.161 -> 2.2.10.90 Id=014a u9696 -> u5200 Payload=G.729 SeqNo=12960

Without “Allow Direct Media” enabled, two RTP streams would be seen – one between each IP Phone and the IP 406v2.

A protocol analyzer is also useful to trace the call setup messages between the IP Office and Nortel Succession to see, for example, if H.323 Call Setup Messages are being sent from one system to another when calls are not completing. The IP Office System Monitor application provides similar information. After running the System Monitor application and selecting the IP Office of interest, select **Filters** from the menu, the H.323 tab and enable the H.323 traces as shown before placing a test call.



For a call from Nortel Extension 53300 to IP Office Extension 68987 the relevant parameters can be seen in the beginning of the setup message as follows:

```
2980673mS H323Rx: src=2.2.10.68:1720
H323 Pcol=08(Q931) Reflen=2 ref=44B0(Remote)
Message Type = Setup
InformationElement = BearerCapability
0000 04 03 88 90 a5 .....
InformationElement = CallingPartyNumber
0000 6c 07 69 80 35 33 33 30 30 1.i.53300
InformationElement = CalledPartyNumber
0000 70 06 e9 36 38 39 38 37 p..68987
InformationElement = UU
```

Further down the Setup message, the faststart parameters show the priority ordered companding possibilities from the calling system.

The following screen shows the results of the Nortel **npmShow** command issued from a telnet session into the Nortel Succession Node IP.

```
oam> npmShow
Npm status: Active
Active GateKeeper: 192.168.1.30 (primary)
GateKeeper registration status: registered, TTL: 25 secs, re-register: 15 secs
Channels Busy / Idle / Total: 1 / 381 / 382
Stack version: RadVision 4.1.0.19
Channel tracing: -1
Signaling Server H323 ID : 271

Chan Direction CallState RxState TxState Codec AirTime FS
MS Fax DestNum RemoteIP
-----
29 Terminate Connected Connected Connected G_729A_20MS 405 yes
s no 53300 2.2.10.68
```

6.2. Status for Nortel IP Devices

The following commands can be executed from the CLI of the Succession Signaling Server. The following screen shows the registration of the Nortel IP Telephones shown in **Figure 1**, using the **isetShow** command from the CLI. Observe the registered status of the i2002, i2004, and i2050 Software Phone depicted in **Figure 1**.

```
oam> isetShow

Set Information
-----
IP Address      Type      RegType  State      Up Time      Set-TN
Regd-TN         HWID      FWVsn    UNIStimVsn SrcPort DstPort
-----
192.168.1.105   i2004     Regular  online     0 23:55:41   061-00
061-00         18000ae40829a26600 0602B59  2.8       5100      5000
192.168.1.103   i2002     Regular  online     0 23:32:49   061-01
061-01         18000ae40860fc6600 0603B59  2.8       5100      5000
2.2.10.90       i2004     Regular  busy       0 02:37:12   061-09
061-09         1800603876320e6600 0602B59  2.8       5100      5000
2.2.10.244      i2050     Regular  online     0 02:19:41   061-18
061-18         1800d0b78188236600 1100300  2.6       5100      5000

Total sets = 4
oam>
```

The following screen shows the status of the Terminal Proxy Server, using the “tpsShow” command available from the CLI.

```
oam> tpsShow
Node ID       : 271
Is master     : 1
Up time      : 7 days, 22 hours, 8 mins, 12 secs (684492 secs)
Platform     : ISP 1100
TPS Service  : Yes
IP TLAN      : 192.168.1.30
IP ELAN      : 192.168.0.3
ELAN Link    : Up
Sets Connected: 5
Sets Reserved : 0
oam>
```

The following screen shows the status of the virtual trunks, using the “vtrkShow” command. In this case, the command was executed with a call actively using one of the virtual trunks.

```
oam> vtrkShow
-----
-----
IND    TN    DCH  PROTOCOL  CHID  CUST  ROUTE  MEMB  ICOG  VoIP  ESN5  PRFX  SAT
NCOS  STATUS
-----
-----
  0  062-00  011  MCDN->EST  025   00   011   001   IO   H323   NO   ----  NO
00  SS PEND
  1  062-01  011  MCDN->EST  026   00   011   002   IO   H323   NO   ----  NO
00  SS PEND
  2  062-03  068  MCDN->EST  029   00   068   001   IO   H323   NO   ----  NO
00  CS BUSY
  3  062-04  068  MCDN->EST  030   00   068   002   IO   H323   NO   ----  NO
00  CS IDLE
-----
-----

VTRK State = Active
-----

VTRK Status = Enabled
-----
```

The following screen shows summary information on the status of the Succession Media Card, using the **itgcardshow** command available from the CLI of the Media Card (i.e., telnet to 192.168.1.31). In this case, the command was executed with a call actively using one of the virtual trunks.

```
IPL> itgCardShow

      Index      : 2
      Type       : EXUT
      Role       : Follower
      Node       : 271
      Leader IP  : 192.168.1.33
      Card IP    : 192.168.1.31
      Card TN    : Slot 14
      Card State : ENBL
      Uptime    : 7 days, 3 hours, 56 mins, 40 secs (619000 secs)
      Codecs    : G711Ulaw(default), G711Alaw, G729A, G729AB, G711CC, T38FAX
ELAN (ixpMac1) stat: 10 Mbps, Half duplex (Carrier OK)
TLAN (ixpMac0) stat: 100 Mbps, Full duplex (Carrier OK)

value = 1 = 0x1
```

The following screen shows summary information on the voice gateway status of the Succession Media Card, using the **vgwShow** command available from the CLI of the Media Card (i.e., telnet to 192.168.1.31). In this case, the command was executed with a call actively using one of the virtual trunks to the Avaya system.

```
IPL> vgwShow
VGW Service is: Enabled
Chan ChanState  DspMode  Codec      Tn      Reg AirTime      rxTsap
txTsap
-----
-----
      5 Busy      Voice      G.729AB-20 0x0c49 yes      1458      192.168.1.31:5210
      2.2.10.79:2122
value = 98 = 0x62 = 'b'
```

7. Conclusion

As illustrated in these Application Notes, Avaya IP Office can interoperate with Nortel Succession using H.323 Trunks, inclusive of basic calling and out-of-band DTMF signaling.

8. References

The following documents from the Succession Meridian Electronic Reference Library CD (Disk 1 of 2, NTLH91AA A0518482) contain information relevant to these Application Notes:

[1] *IP Peer Networking*, Document Number 553-3001-213.

[2] *Signaling Server: Installation and Configuration*, Document Number 553-3001-212

Avaya product documentation can be found at <http://support.avaya.com> including many Application Notes similar to this one at: <http://www.avaya.com/gcm/master-usa/en-us/resource>.

©2005 Avaya Inc. All Rights Reserved.

Avaya and the Avaya Logo are trademarks of Avaya Inc. All trademarks identified by ® and ™ are registered trademarks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners. The information provided in these Application Notes is subject to change without notice. The configurations, technical data, and recommendations provided in these Application Notes are believed to be accurate and dependable, but are presented without express or implied warranty. Users are responsible for their application of any products specified in these Application Notes.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya Solution & Interoperability Test Lab at interoplabnotes@list.avaya.com