



>BUSINESS MADE **SIMPLE**

NORTEL

Communication Server 1000 RIs 5.x and 6.0 Configuration Guide: Verizon Business SIP Trunking

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Introduction

This document provides a typical network deployment of Communication Server 1000 (CS1000) utilizing the Verizon Business SIP Trunking product offering. This document should serve as general guideline only, since it is not possible to document every possible variation of configuration. For more information on the Verizon Business SIP Trunking Engineering and Implementation, please contact your local Verizon CPE Specialist.

The CS 1000E system is configured as a SIP gateway endpoint on the Verizon Business network. The enterprise customer may require an additional signaling server for each SIP gateway that will be deployed as SIP trunking to the carrier.

The CS1000 in this configuration does not use a CS 1000 SIP Redirect or Proxy for Carrier SIP trunking, but rather the SIP Virtual Gateway is simply provisioned with the SBC as the static SIP endpoint of the SIP Trunk.

Features

This section lists supported and unsupported features when the CS 1000 is used on the Broadsoft SIP network as tested in the Verizon Certification lab.

Features Supported

Basic calls G711 and G729

Calling line (number) identification presentation (CLIP)

Calling line (number) identification restriction (CLIR)

DTMF (RFC2833)

Call hold

Call transfer (Blind and consultative transfers)

Call conference

Call forward

Call Redirection to Voice Mail on CS1K

Fax: **R5.0:** Not Supported

R5.5: G.711 only for CS1000 analog lines, G.711/T.38 using SIP ATA

R6.0: G.711 and T.38

See R6 software requirements and Appendix C for FAX implementation

QoS - DIFFSERV must be ENABLED and configured to use 28 (DSCP 40) for control packets and 46 (DSCP 46) for voice packets.



Applications Tested

CS1000 Call Pilot – in main or expansion cabinet
Verizon IP Toll Free
Verizon IP Contact Center/IVR

Caveats

G.711 for fax and G.729 (for voice) codecs must be ENABLED, with a Voice Payload of 20ms
Secure Audio (SAVP) not supported by some endpoints in Verizon network.

T.38 Fax Support is provided for CS1000 R6 only. See **Appendix C** for additional details.

Ring back Issues with Unattended Transfers - An unattended transfer is one in which the party initiating the transfer hangs up prior to answer by the party to whom the call is being transferred. When 2 phones are in an active call on the CS 1000 and one of those phones performs an unattended transfer to an endpoint on the Verizon network that does not support SIP UPDATE with SDP, the CS 1000 phone remaining on the call will not hear ring back prior to answer.



System Software

Installation of the software listed below is CRITICAL to allow for correct operation.

CS 1000 Release 5.00W

Call Server: 5.00W plus latest DEPLIST

Signaling Server: SSE 5.00.31 plus the latest DEPLIST as well as the ***following additional patches:***

Note – CS 1000 R5.00W support with OCS has been clarified in bulletin 2008008981: “Nortel Communication Server 1000 Interoperability with Microsoft OCS 2007 and Microsoft Exchange 2007 Unified Messaging”. If a patch listed below conflicts with an OCS required patch, please see the bulletin for the recommended action.

Latest DEPLIST will include the following critical patches as of the writing of this document:

MPLR23632 (**superseded by merge MPLR24319 in DEPLIST**) Null values should be allowed for Public E.164/National or Subscriber fields

MPLR24687 (**superseded by merge patch MPLR24692 in DEPLIST**) CS1K fails to negotiate codec on re Invite

MPLR24983 (**superseded by merge MPLR25218 in DEPLIST**) CS1K wrong use of SIP Update

MPLR26378 - CS1K sends out UPDATE even if 100rel is not supported by far-end

Patches required that are currently NOT in the DEPLIST

MPLR22452 – SIP GW patch to remove outbound MCDN from SIP messaging

MPLR24605 (**superseded by MPLR24803**) - SIP: Incorrect port usage on sent SIP messages

MPLR22968 – PI: SIP: TO/FROM URI Incorrect - Replace domain population in the FROM field to the Node IP Address of the Signaling Server.

MPLR25981 – SIP: added capability to GW to handle 400 Bad Request message when received from network.

MPLR25529 - SIP: Partial support of DIVERSION



CS 1000 Release 5.50J

Call Server: 5.50J plus latest DEPLIST

Latest DEPLIST will include the following critical patches as of the writing of this document:

MPLR26378 - CS1K sends out UPDATE even if 100rel is not supported by far-end

Signaling Server: SSE 5.50.12 plus latest DEPLIST as well as the **following additional patches:**

MPLR23632 - Null values should be allowed for Public E.164/National or Subscriber fields

MPLR25946 - SIP GW patch to remove outbound MCDN from SIP messaging

MPLR22968 – PI: SIP: TO/FROM URI Incorrect - Replace domain population in the FROM field to the Node IP Address of the Signaling Server.

MPLR25981 – SIP: added capability to GW to handle 400 Bad Request message when received from network.

MPLR25529 - SIP: Partial support of DIVERSION

CS 1000 Release 6.00W

Call Server: 6.00 plus latest DEPLIST

Signaling Server: SSE 6.00.18 with Service Updates (SU) at the **nortel-cs1000-vtrk-6.00.18.065-096.i386.000.ntl** or higher revision required.

The following SIP GW “Activation” patches:

MPLR27408 – Removal of SIP Session Timer

MPLR22968 – PI: SIP: TO/FROM URI changes - replace domain population in the FROM field, History Info/Diversion Header to the Node IP Address of the Signaling Server

MPLR25946 – SIP GW patch to remove outbound MCDN from SIP messaging

MPLR25529 - SIP: Partial support of DIVERSION

MPLR25981 – SIP: added capability to GW to handle 400 Bad Request message when received from network.

MPLR29422 - Blind transfer fails, when UPDATE is not supported and far end sends 183 + sdp

MPLR30800 – T.38 enhancements to handle mixed G711/T38 capability call flows

MGC load ware: MGCCBD02.lw or higher version

Deployment Options

There are a number of possible engineering options to consider when deployed SIP based trunking. The two main considerations that affect hardware and patching are redundancy and Private Networking requirements.

ISP1100 servers are shown in the diagrams below, but COTS and CP-PM servers can be used as well.

Figure 1 below depicts the simplest deployment model, utilizing one or more Signaling Servers to provide Telephone Proxy and SIP GW capability. The single Node configuration would have TPS and SIP GW applications enabled for all servers in the Node. The engineering rules for co-resident TPS and SIP GW would apply. Patching on the Signaling Servers would consist of the current DEPLIST plus the required patches to support Verizon SIP Trunking. Private Networking to other Nortel products or Nortel Developer Partner products is **not** supported due the changes the Verizon specific patches introduce to the SIP signaling.

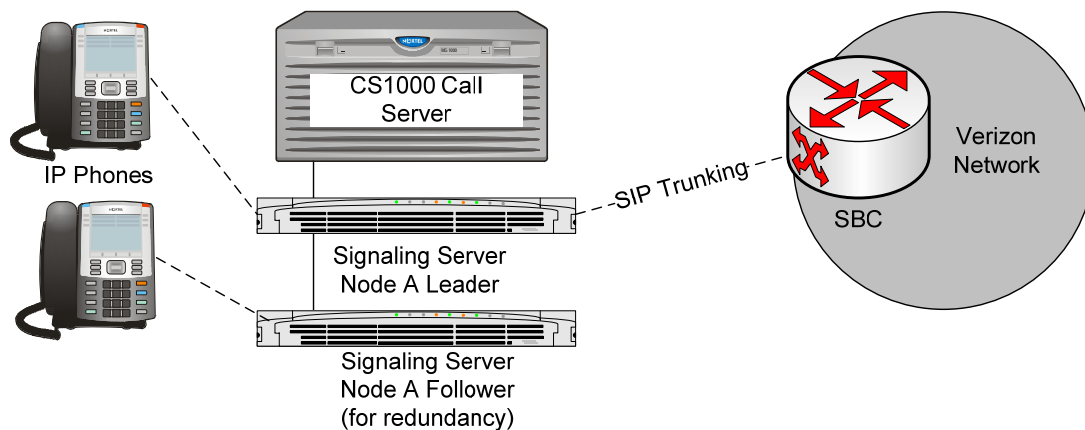


Figure 1 - Stand-Alone Communication Server and Nortel-Verizon Business Sip Trunking

In environments that will experience call rates that would exceed the co-resident TPS/SIP GW engineering recommendations, the TPS and SIP GW functionality must be split apart into different Nodes. See Figure 2 as an example where Node A is configured for TPS and is patched with the current DEPLIST. Node B is configured with SIP GW only and is patched with the current DEPLIST plus the patches required to support Verizon SIP Trunking.

Note: When creating a new Node on a separate Sig Server, remember to configure a dedicated D-Channel for each Node to communicate to the Call Server.

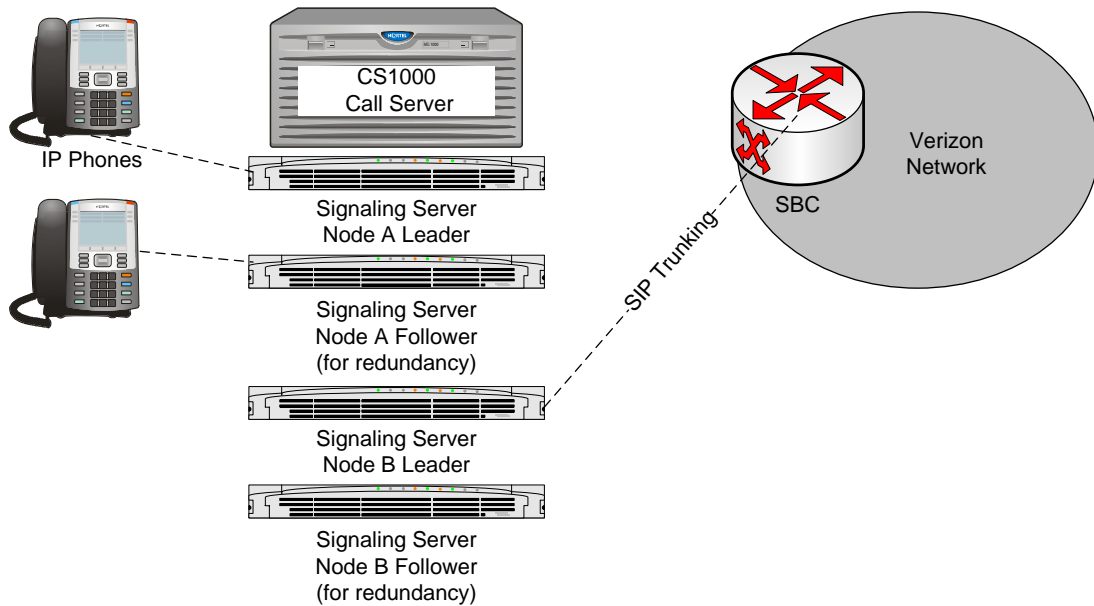


Figure 2 - Stand-Alone Communication Server and Nortel-Verizon Business Sip Trunking for High Call Volume

The deployment options become more complex when additional Call Servers or SIP Applications are introduced behind the CS1K., such as SIP DECT, OCS, ICP etc.

See Figure 3 for an example utilizing SIP Private Networking to a BCM and a SRG.

Node A is configured for TPS and SIP GW, and patched with the current DEPLIST. Node B is configured with SIP GW only and is patched with the current DEPLIST plus the patches required to support Verizon SIP Trunking.

Note: A deployment using SIP Public trunking and H.323 Private Networking is not recommended due to limitations that occur when translating between the 2 protocols.

Note: When creating a new Node on a separate Sig Server, remember to configure a dedicated D-Channel for each Node to communicate to the Call Server.

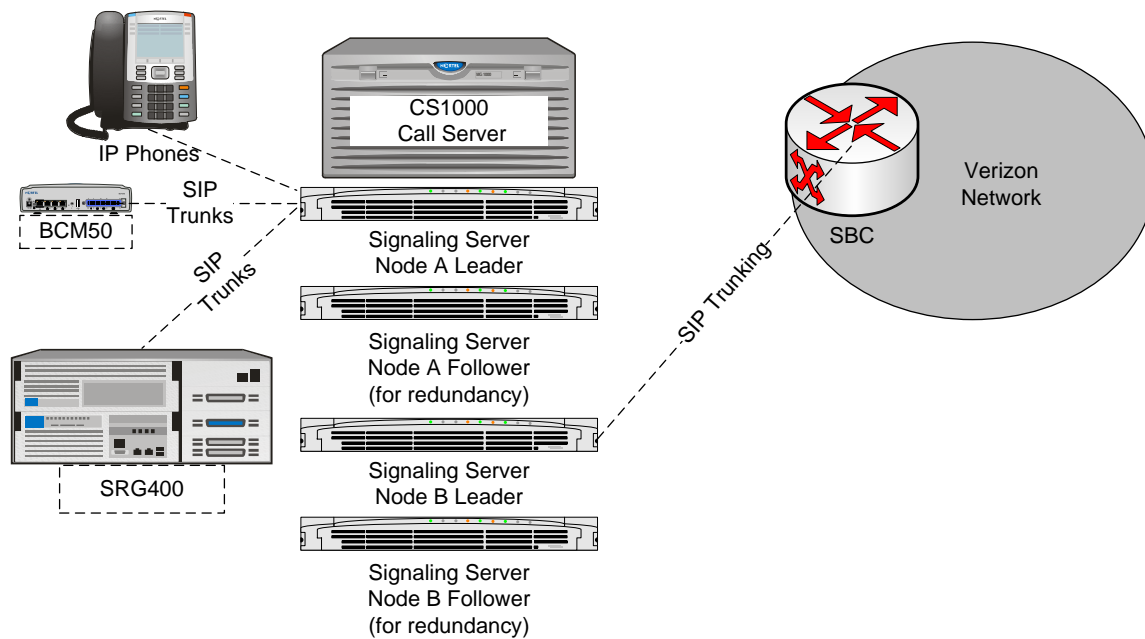
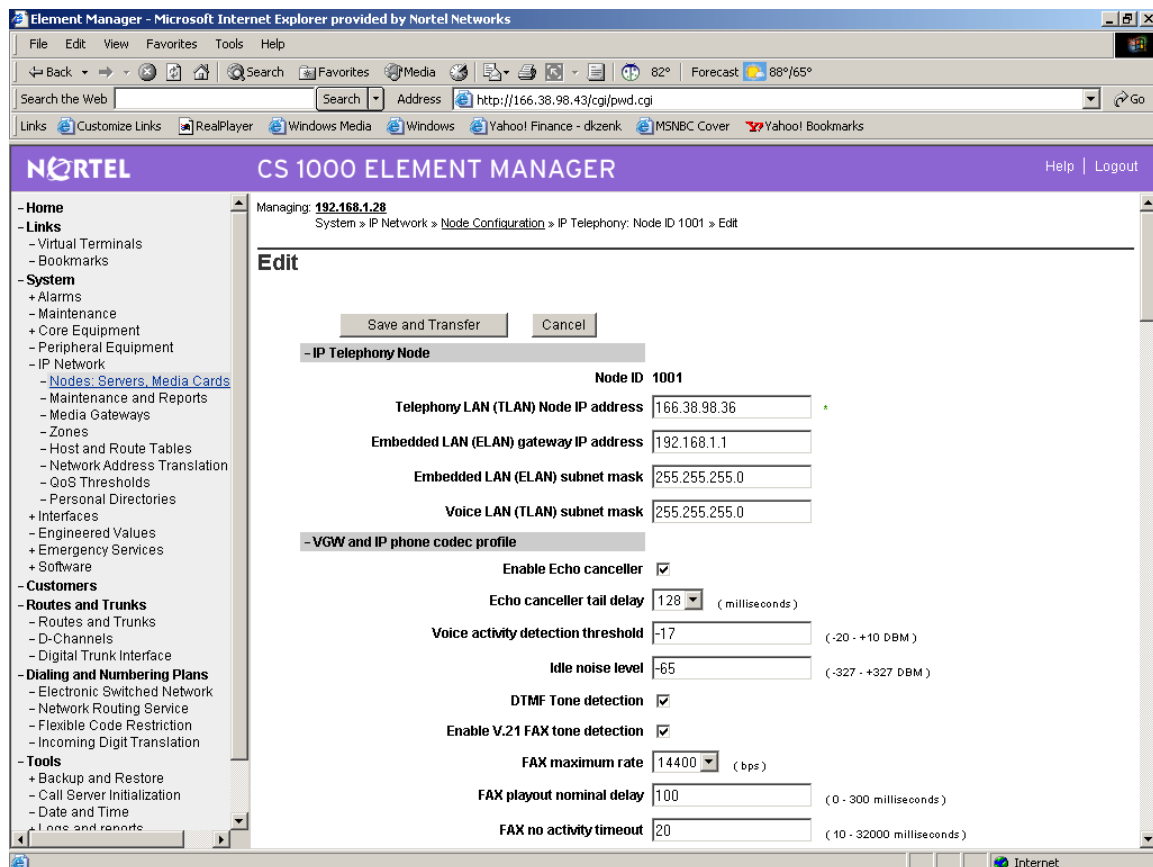


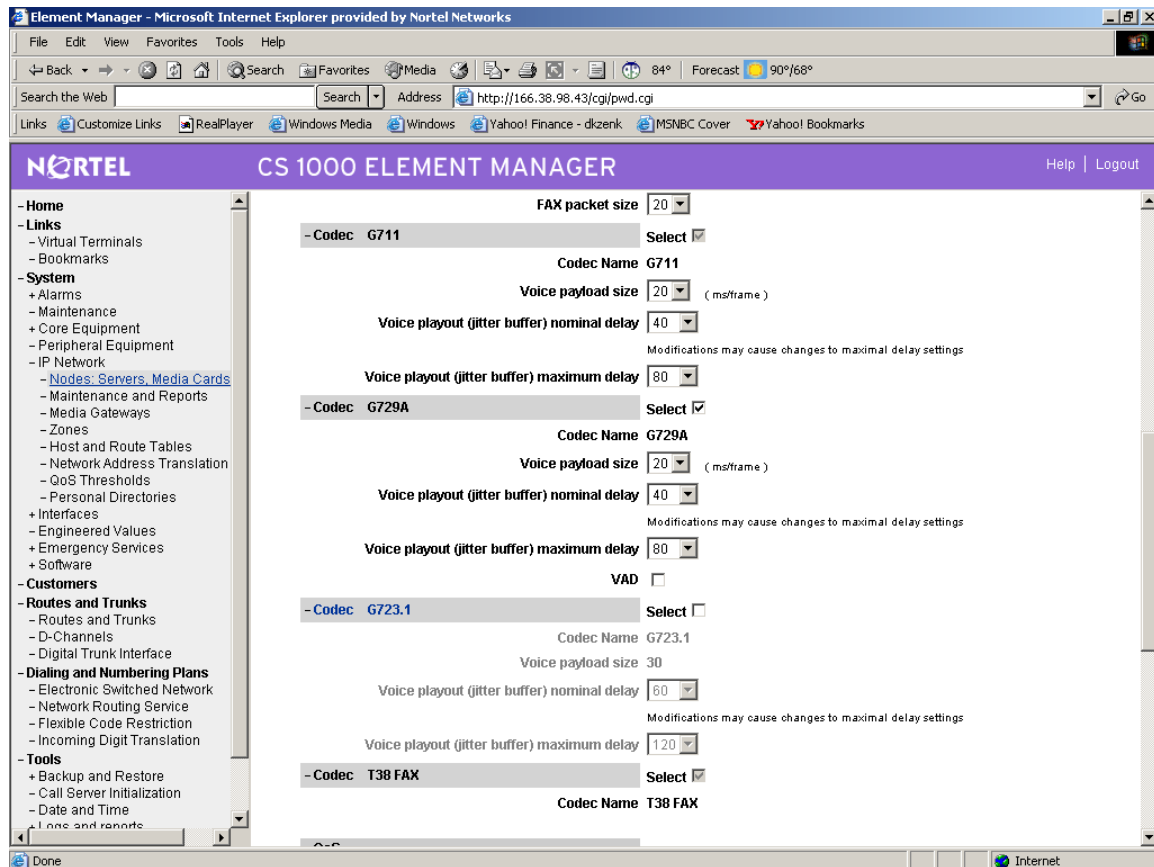
Figure 3 - Multiple Call Server with Tandem to Nortel-Verizon Business Sip Trunking

CS 1000 R5.x Configuration Details

The following screen shots show non-default changes made to the CS 1000 Node that is providing SIP Trunking to the Verizon network. If the CS 1000 is supporting both Private and Public trunking, these changes would be made on the Public Trunking Node.



As noted in Appendix C, Verizon is enabling T.38 Fax support in the network in 2011 and therefore to support this capability V.21 Tone Detection is ENABLED. There are also specific configuration requirements at the FAX TN. Please see the Appendix for details.



The Broadworks network supports both g.711 and g.729. A 20ms payload size is used.

Diff Serv is required for the network, and the default values in the system should be changed to 28 and 46.

When configuring the Layer 2/3 networking equipment on the T-Lan, program the ERS4500 or ERS2500 ports as a trusted site to pass the Dif_Serv code points to the network.

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 - Virtual Terminals
 - Bookmarks
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 - + Alarms
 - Maintenance
 - + Core Equipment
 - Peripheral Equipment
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 - Date and Time
 - Alarms and reports

+ Firmware

- SIP GW Settings

TLS Security

Security Policy Security Disabled

TLS Security Port 5061 (1 - 65535)

Client Authentication ☐

Re-negotiation ☐

X.509 Certificate Authentication ☐

Primary Proxy or Re-direct Server

Primary Proxy or Redirect (TLAN) IP address 166.34.84.89

Port 5070

Supports Registration ☐

Primary CDS Proxy or Re-direct server flag ☐

Transport Protocol UDP

Secondary Proxy or Re-direct Server

Secondary Proxy or Redirect (TLAN) IP address 0.0.0.0

Port 5070

Supports Registration ☐

Secondary CDS Proxy or Re-direct server flag ☐

Transport Protocol UDP

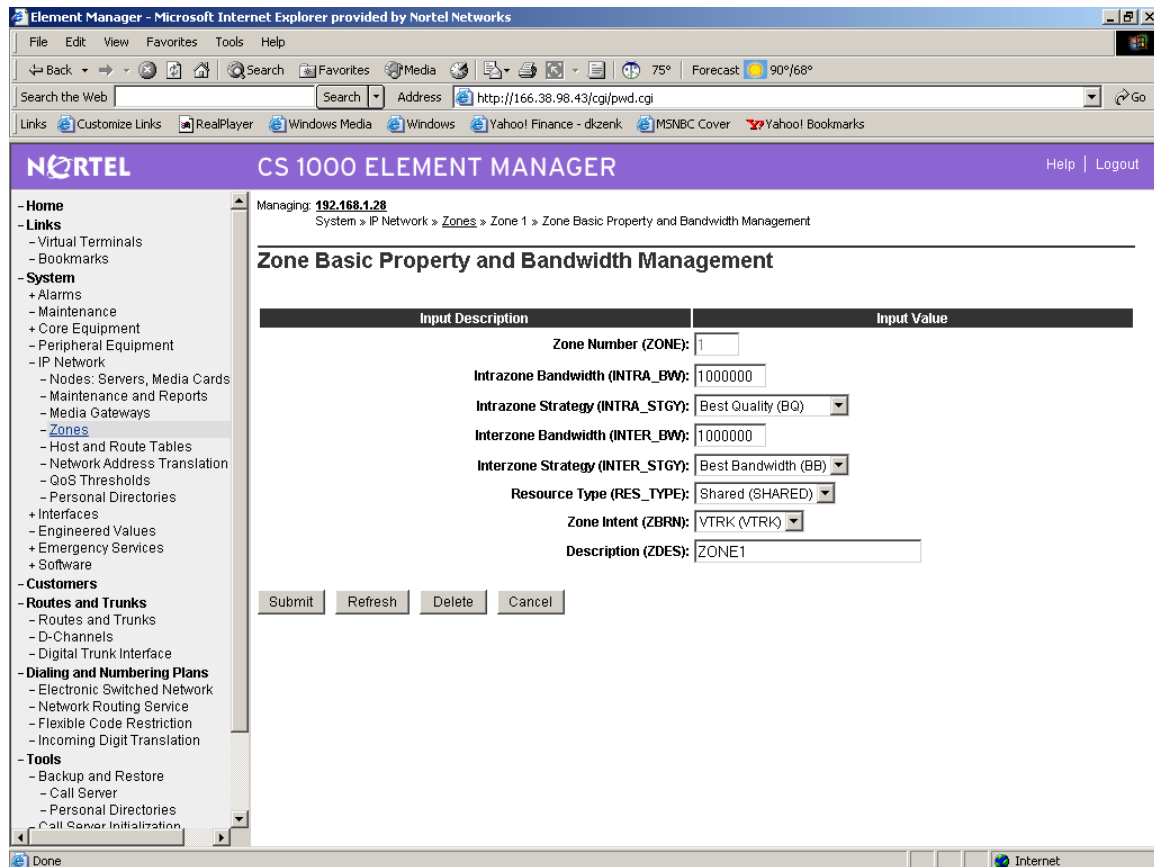
CLID Parameters

Country Code (CCC)

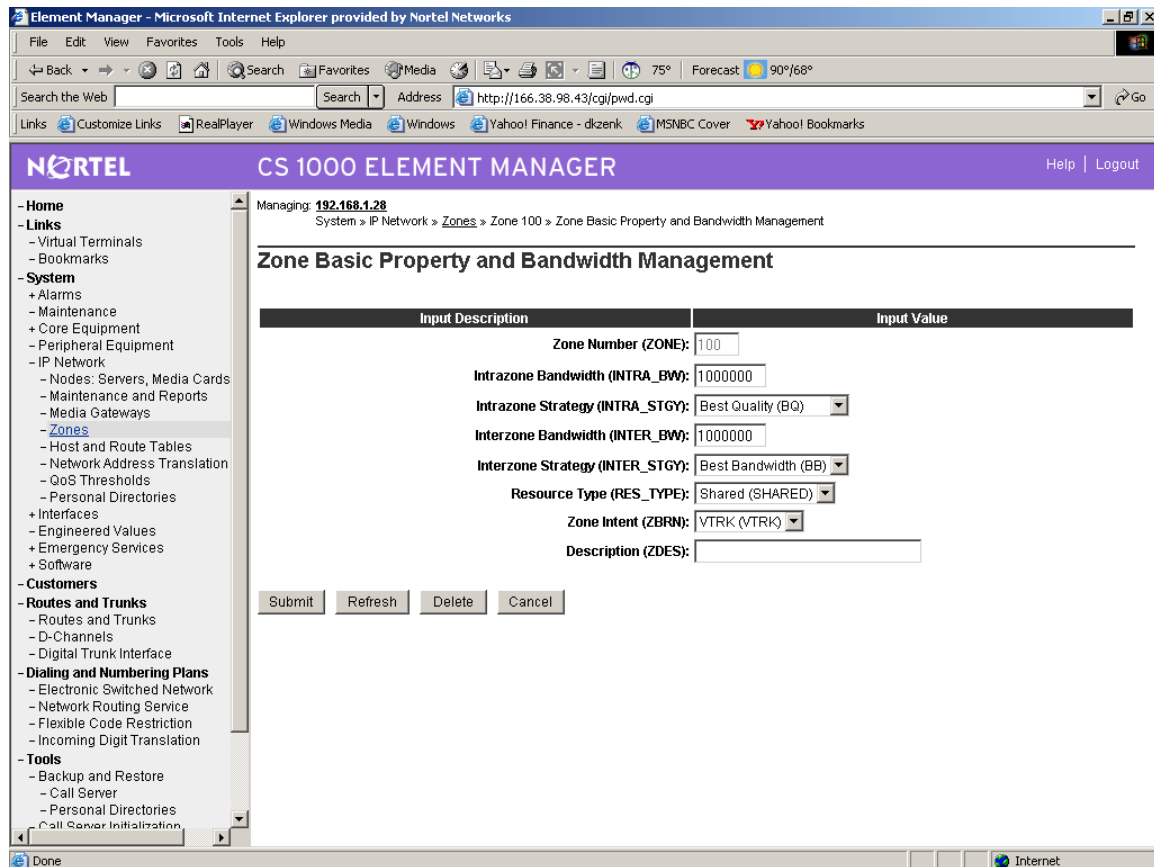
The primary Proxy server is the VzB SBC IP address in the cloud. All calls are routed to this SBC, within to the Broadworks network. The CS1000 will route to an IP address for the primary proxy. DNS is not supported for this entry. VzB also requires different port configuration, with NAT and ALG services fully operational on each port. An SBC can accommodate this requirement; each can be purchased through Nortel.

The SIP domain name is set to the Broadworks network, and is entered as a Fully Qualified Domain Name (FQDN). This FQDN is supplied by Verizon Business. NRS is not enabled on the CS1K Node as all calls are routed to the SBC for routing through basic BARS routing.

Not shown: In the SIP-URI Map, **NO** entries are to be put in the E.164 fields.



Default zone 0 is associated with the DSP's and the IP sets.



Zone 100 is used for the Verizon SIP trunks.

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Managing: **192.168.1.28**
Routes and Trunks > [Routes and Trunks](#) > Customer 0, Route 10 Property Configuration

Customer 0, Route 10 Property Configuration

- Basic Configuration

Input Description	Input Value
Route Data Block (RDB) (TYPE)	RDB
Customer number (CUST)	00
Route Number (ROUT)	10
Designator field for trunk (DES)	SIP TRK
Trunk Type (TKTP)	TIE
Incoming and Outgoing trunk (ICOG)	Incoming and Outgoing (IAO)
Access Code for the trunk route (ACOD)	4000
Trunk type M911P (M911P)	<input type="checkbox"/>
The route is for a virtual trunk route (VTRK)	<input checked="" type="checkbox"/>
- Zone for codec selection and bandwidth management (ZONE)	100 Range: 0 - 255
- Node ID of signaling server of this route (NODE)	1001 Range: 0 - 9999
- Protocol ID for the route (PCID)	SIP (SIP)
- Print Correlation ID in CDR for the route (CRID)	<input type="checkbox"/>
Integrated Services Digital Network option (ISDN)	<input checked="" type="checkbox"/>
- Mode of operation (MODE)	Route uses ISDN Signaling Link (ISLD)
- D channel number (DCH)	16 Range: 0 - 254

Done Internet

Basic SIP trunk route configuration using a different zone than the sets.

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 - + Login Options

Integrated Services Digital Network option (ISDN) ☒

- Mode of operation (MODE) Route uses ISDN Signaling Link (ISLD)

- D channel number (DCH) 16 Range: 0 - 254

- Interface type for route (IFC) Meridian M1 (SL1)

- Private Network Identifier (PNI) 00001 Range: 0 - 32700

- Network Calling Name Allowed (NCNA) ☒

- Network Call Redirection (NCRD) ☒

- Trunk Route Optimization (TRO) ☒

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

- Channel Type (CHTY) B-channel (BCH)

- Call Type for outgoing direct dialed TIE route (CTYP) Coordinated Dialing Plan (CDP)

- Insert ESN Access Code (INAC) ☐

- Integrated Service Access Route (ISAR) ☐

- Display of Access Prefix on CLID (DAPC) ☐

- Basic Route Options

Input Description	Input Value
Billing Number Required (BILN)	<input type="checkbox"/>
Call Detail Recording (CDR)	<input type="checkbox"/>
Controls or timers (CNTL)	<input type="checkbox"/>
Conventional (Tie trunk only) (CNVT)	<input type="checkbox"/>
Incoming DID Digit Conversion on this route (IDC)	<input type="checkbox"/>
MFC feature options (MFC_FEAT)	<input type="checkbox"/>

- Network Options

Input Description	Input Value
-------------------	-------------

Routing continued....

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MFC feature options (MFC_FEAT) ☐

- Network Options

Input Description	Input Value
Electronic Switched Network pad control (ESN)	<input type="checkbox"/>
Signaling arrangement (SIGO)	Standard (STD)
Route Class (RCLS)	Route Class marked as external (EXT)
Off-Hook Queuing (OHQ)	<input type="checkbox"/>
Off-Hook Queue Threshold (OHQT)	0
Call Back Queuing (CBQ)	<input type="checkbox"/>
Number of Digits (NDIG)	2
Authcode (AUTH)	<input type="checkbox"/>

- General Options

Input Description	Input Value
M1 is the only Controlling Party on incoming calls (CPDC)	<input type="checkbox"/>
Dial Tone on originating calls (DLTN)	<input type="checkbox"/>
Hold failure threshold (HOLD)	02 02 40
Trunk Access Restriction Group (TARG)	
Alternate trunk route for outgoing trunks (STEP)	Range: 0 - 511
Actual outgoing toll digits to be ignored for Code Restriction (OABS)	
Display IDC Name (DNAM)	<input type="checkbox"/>
Enable Equal Access Restrictions (EQAR)	<input type="checkbox"/>
ACD DNIS route (DNIS)	<input type="checkbox"/>
Include DNIS number in CDR records (DCDR)	<input type="checkbox"/>

Done Internet

Routing continued...

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- Advanced Configurations

Input Description	Input Value
Allow last Re-directing Number (ARDN)	ARDN (NO)
ANI identifier number (ANTK)	
Auto terminate (AUTO)	<input type="checkbox"/>
Maximum number of CNI digits (CLEN)	1
North American Distinctive Ringing for incoming calls (DRNG)	<input type="checkbox"/>
Home Local Number (HLCL)	
Home National Number (HNTN)	
In-Band Automatic Number Identification route (IANI)	<input type="checkbox"/>
Internal/external definition (IDEF)	Use network info (NET)
Insert (INST)	
Manual Outgoing trunk route (MANO)	<input type="checkbox"/>
Manual Route (MNL)	<input type="checkbox"/>
Music On-Hold (MUS)	<input type="checkbox"/>
North American Toll scheme (NATL)	<input checked="" type="checkbox"/>
Off-Hook Timer Delay (OHTD)	<input type="checkbox"/>
Protocol Selection (PSEL)	DM-DM Protocol Selection (DMDM)
Port Type at far end (PTYP)	Analog TIE trunks (ATT)
Route traffic information in ACD Reports (RACD)	<input type="checkbox"/>
Route Number (RTN)	Range: 0 - 511
Satellite used for trunk route (SAT)	<input type="checkbox"/>
Selected Access Restriction Group (SARG)	

Done Internet

Routing continued...

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Insert (INST)

Manual Outgoing trunk route (MANO) ☐

Manual Route (MNL) ☐

Music On-Hold (MUS) ☐

North American Toll scheme (NATL) ☒

Off-Hook Timer Delay (OHTD) ☐

Protocol Selection (PSEL) DM-DM Protocol Selection (DMDM)

Port Type at far end (PTYP) Analog TIE trunks (ATT)

Route traffic information in ACD Reports (RACD) ☐

Route Number (RTN) Range: 0 - 511

Satellite used for trunk route (SAT) ☐

Scheduled Access Restriction Group (SGRP) 0 Range: 0 - 999

Special Service List number (SSL)

Standard Signaling Type (STYP) Standard Data (SDAT)

CPP/CPPO flag for incoming non-ISDN trunk call tandemed to this trunk route (TCPP) ☐

Tone Detector required (TDET) ☐

Tromboning (TRMB) ☒

Tone Table number (TTBL) 0

Answer an Attendant Extended Call over VNS immediately on the incoming bearer trunk (VRAT) ☐

Submit Refresh Delete Cancel

Done Internet

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Managing: **192.168.1.28**
Routes and Trunks > [Routes and Trunks](#) > Customer 0, Route 10, Trunk 1 Property Configuration

Customer 0, Route 10, Trunk 1 Property Configuration

- Basic Configuration

Input Description	Input Value
Trunk data block (TYPE)	IFTI
Terminal Number (TN)	096 0 02 00
Designator field for trunk (DES)	SIPTRK
Extended Trunk (XTRK)	VTRK
Route number, Member number (RTMB)	10 1
Level 3 Signaling (SIGL)	
Card Density (CDEN)	8D
Start arrangement Incoming (STRJ)	Immediate (IMM)
Start arrangement Outgoing (STRO)	Immediate (IMM)
Trunk Group Access Restriction (TGAR)	1
Channel ID for this trunk, (CHID)	1
Increase or decrease the member numbers (INC)	Increase channel and member number (YES)
Class of Service (CLS)	Edit

- Advanced Trunk Configurations

Input Description	Input Value
CTI trunk Monitoring and Control (AST)	<input type="checkbox"/>
Auto Terminate DN (ATDN)	

Done Internet

Standard SIP trunk configuration.

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 - Servers, Media Cards PEPs
- Customers
 - Routes and Trunks
 - Routes and Trunks
 - D-Channels
 - Digital Trunk Interface
 - Dialing and Numbering Plans
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 - Network Routing Service
 - Flexible Code Restriction
 - Incoming Digit Translation
- Tools
 - + Backup and Restore
 - Call Server Initialization
 - Date and Time
 - Logs and reports
- Security
 - + Passwords
 - + Login Options

Music Conference Loop (CFLP) Range: 0 - 159

Call Modification Features restriction (CMF) ☐

Digit Collection Ready (DTCR) ☐

Forced Charge Account (FCAR) ☐

Multifrequency digit level (MFL) 0

Multifrequency PAD (MFPD) ☐

Manual Directory Number (MNDN)

Network Class of Service group (NCOS) 0

Night Service Group number (NGRP) 0

Night Service directory number (NITE)

Pulse Code Modulation Law (PCML)

Pad Category table number for digital trunks (PDCA) 1

Private Line Directory Number (PRDN)

Signaling Category table number (SICA) 1

Answer and disconnect Supervision required (SUPN) ☒

Supervision Type (STYP) Polarity Insensitive Pack (PIP)

Step-by-step CO trunk (SXS) ☐

Termination Impedance (TIMP) 600 ohms (600)

Trunk Identifier (TKID)

Save Delete Cancel

Done Internet

SIP Trunk Configuration continued...

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File Edit View Favorites Tools Help

Search the Web [Search] Address http://166.38.98.43/cgi/pwd.cgi

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NORTEL CS 1000 ELEMENT MANAGER Help Logout

Managing: **192.168.1.28**
Routes and Trunks > **D-Channels** > D-Channels 16 Property Configuration

D-Channels 16 Property Configuration

- Basic Configuration

Input Description	Input Value
Action Device And Number (ADAN) (TYPE)	DCH
D channel Card Type (CTYP)	DCIP
Designator (DES)	SIPVerizon
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)	
Primary Rate Interface (PRI)	<input type="button" value="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)	4000 Range: 1 - 4000
Signaling Server Resource Capacity (SSRC)	1800 Range: 0 - 4000

- Basic options (BSCOPT)

- Primary D-channel for a backup DCH (PDCH)

- PINX customer number (PINX_CUST)

Done Internet

DCH configuration with Meridian 1 simulation for the far end.

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 - + Login Options

- Basic options (BSCOPT)

- Primary D-channel for a backup DCH (PDCH) [Dropdown]
- PINX customer number (PINX_CUST) [Dropdown]
- Progress signal (PROG) [Dropdown]
- Calling Line Identification (CLID) [Dropdown]
- Output request Buffers (OTBF) 32
- D-channel transmission Rate (DRAT) 56 kb/s when LCMT is AMI (56K)
- Channel Negotiation option (CNEG) No alternative acceptable, exclusive. (1)
- Remote Capabilities (RCAP) Edit

- Change protocol timer value (TIMR)

- How long Meridian 1 to wait for the response message when the QSIG outgoing call is in the U3 state (T310) 120
- Variable timer for received disconnect message on incoming calls (INC_T306) 2 Range: 0 - 240
- Variable timer for received disconnect message (OUT_T306) 30 Range: 0 - 240
- B channel Service messaging. (BSRV) ☐

- Advanced options (ADVOPT)

- Layer 3 call control message count per 5 second time interval (ISDN_MCNT) 300 Range: 60 - 350
- Number of Status Enquiry Messages sent within 128 ms (SEMT) 1
- Map channel number to timeslots on a PRI2 loop (QCHID) ☒

+ H323 Overlap Signaling Settings (H323)

- Overlap Timer (OVL.T) [Dropdown]
- Multilocation Business Group Allowed (MBGA) ☐
- Network Attendant Service Allowed (NASA) ☐

Link Access Protocol for D-channel

Done Internet

D-Channel configuration continued....

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- + Login Options

128 ms (SEMT)

- Map channel number to timeslots on a PRI2 loop (QCHID) ☒

+ H323 Overlap Signaling Settings (H323)

- Overlap Timer (OVLTI)

- Multilocation Business Group Allowed (MBGA) ☐

- Network Attendant Service Allowed (NASA) ☐

+ Link Access Protocol for D-channel (LAPD)

- Feature Packages

- Digital Private Network Signaling System 1 Package: 123 -- Unequipped To Order

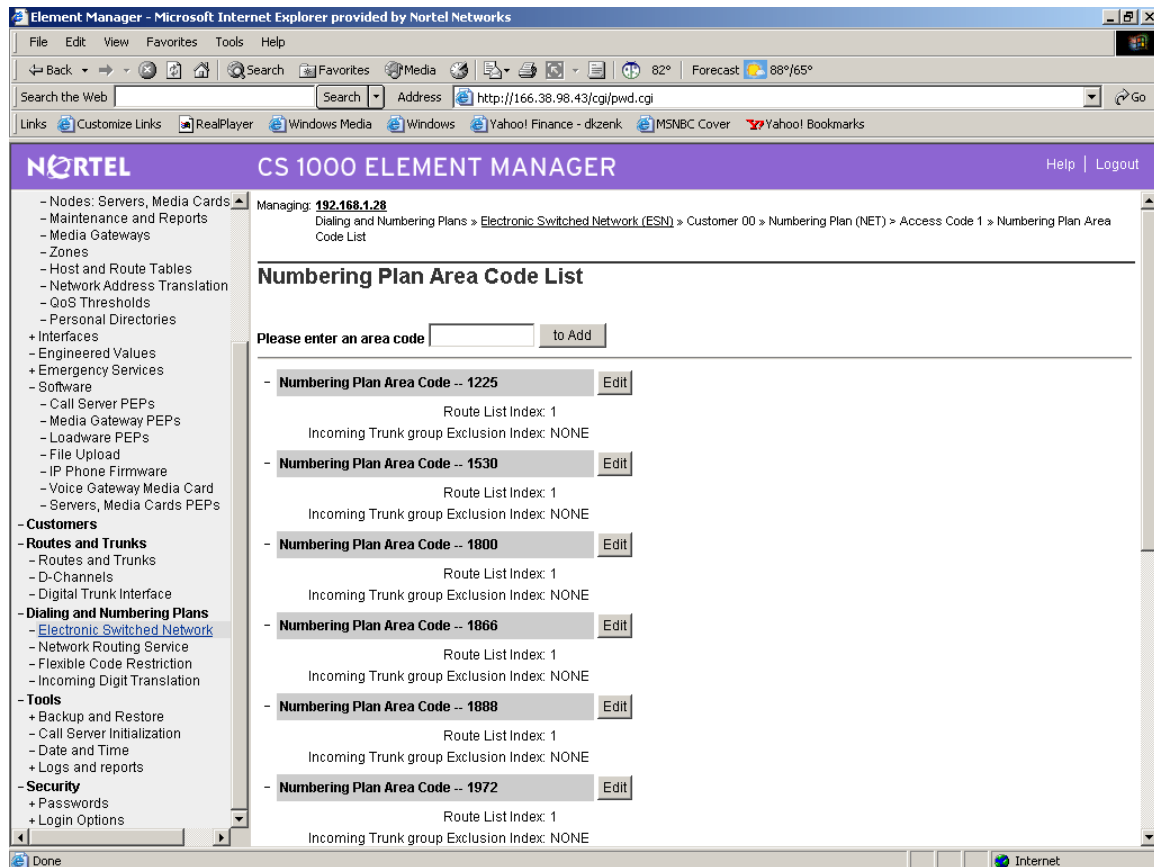
- Virtual Network Services Package: 183

Input Description	Input Value
Virtual Network Services Network Signalling option (VNSIG)	<input type="checkbox"/>
Virtual Network Services Maximum (VNSM)	<input type="text"/> Range: 1 - 300
Virtual Network Services Customer number (VNSC)	<input type="text"/> 0
Virtual Network Services Private Network Identifier (VNSPI)	<input type="text"/> Range: 0 - 32700
Virtual Network Services Network Call Party Name Display (VCNA)	<input type="checkbox"/>
Virtual Network Services Network Call Redirection (VCRD)	<input type="checkbox"/>
Trunk Route Optimization before answer available for VNS (VTRO)	<input type="checkbox"/>

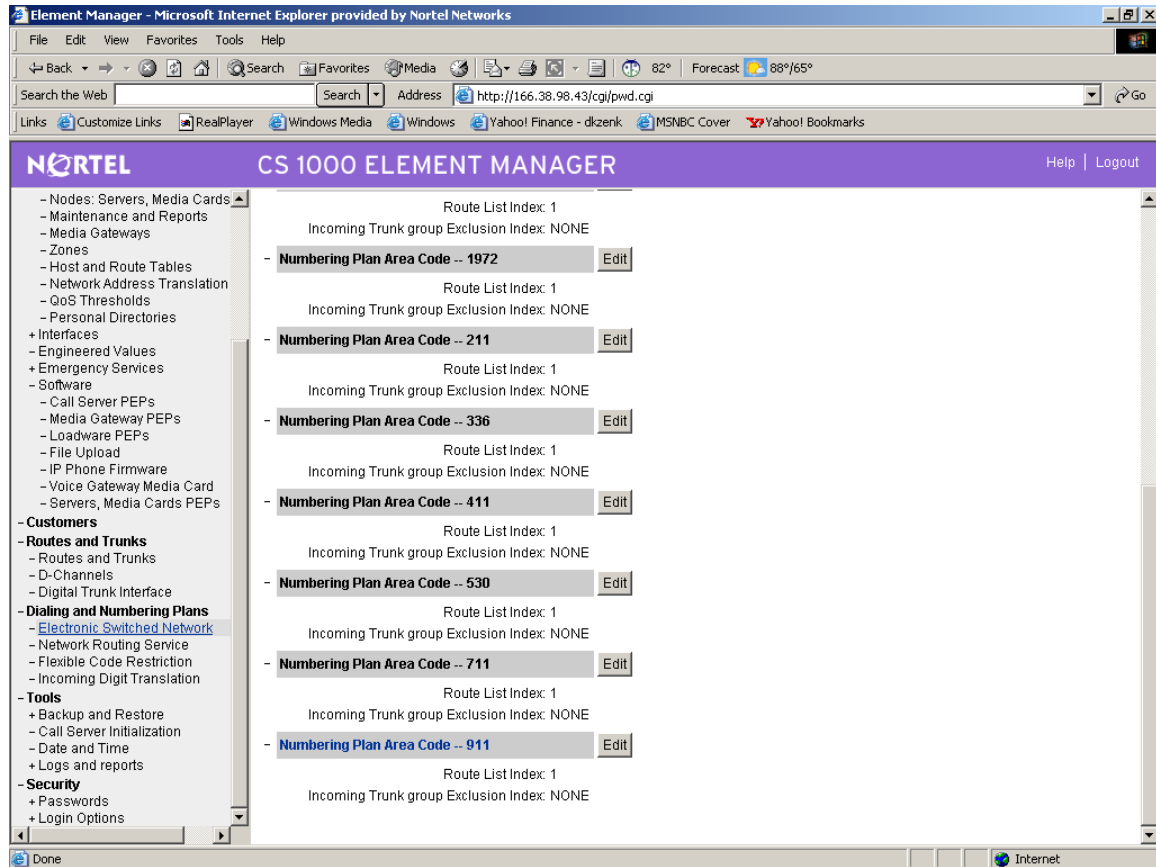
Submit Refresh Delete Cancel

Internet

D-Channel configuration continued....



Very basic BARS program to simply pass all digits out to the gateway.



Dialing plan continued...



CS 1000 R6.0 Configuration Details

The following screen shots show non-default changes made to the CS 1000 Node that is providing SIP Trunking to the Verizon network. If the CS 1000 is supporting both Private and Public trunking, these changes would be made on the Public Trunking Node.

For the lab equipment, a CS1000E was configured with 2 COTS servers for IPT (Node 1001) and 2 COTS servers for IPCC (Node 1002). Each node is configured for redundancy with a leader and follower Signaling Server.

Verizon IP Toll Free, Contact Center and EMEA Deployments

The configuration guidelines are the same for Verizon IP Toll Free (IPT), Verizon IP Contact Center (IPCC) and EMEA configurations with the exception of the SIP proxy address and domain.

The screenshot displays the Nortel CS 1000 Element Manager web interface within a Microsoft Internet Explorer browser. The address bar shows a secure connection to the Element Manager. The interface includes a left-hand navigation menu with categories like UCM Network Services, Links, System, Customers, and Routes and Trunks. The main content area is titled 'IP Telephony Nodes' and shows a table of configured nodes.

Node ID	Components	Enabled Applications	ELAN IP	TLAN IP	Status
1001	2	LTPS, PD, Gateway (SIPGw)	-	172.16.3.37	Synchronized
1002	2	LTPS, Gateway (SIPGw)	-	172.16.3.20	Synchronized

Below the table, there are checkboxes for 'Nodes' (checked) and 'Component Servers and Cards' (unchecked). The interface also includes buttons for 'Add...', 'Import...', 'Export...', and 'Delete', along with 'Print' and 'Refresh' links.

Nortel CS 1000 ELEMENT MANAGER

Managing: 192.168.1.39 Username: donz
System » IP Network » IP Telephony Nodes

Node Details (ID: 1001 - LTPS, PD, Gateway (SIPGw))

Node ID: 1001 * (0-9999)
 Call Server IP Address: 192.168.1.39 *
Telephony LAN (TLAN)
 Node IP Address: 172.16.3.37 *
 Subnet Mask: 255.255.255.0 *
Embedded LAN (ELAN)
 Gateway IP address: 192.168.1.39 *
 Subnet Mask: 255.255.255.0 *
IP Telephony Node Properties
 • Voice Gateway (VGW) and Codecs
 • Quality of Service (QoS)
 • LAN
Applications (click to edit configuration)
 • SIP Line
 • Terminal Proxy Server (TPS)
 • Gateway (SIPGw)

* Required Value. [Save] [Cancel]

Associated Signaling Servers & Cards

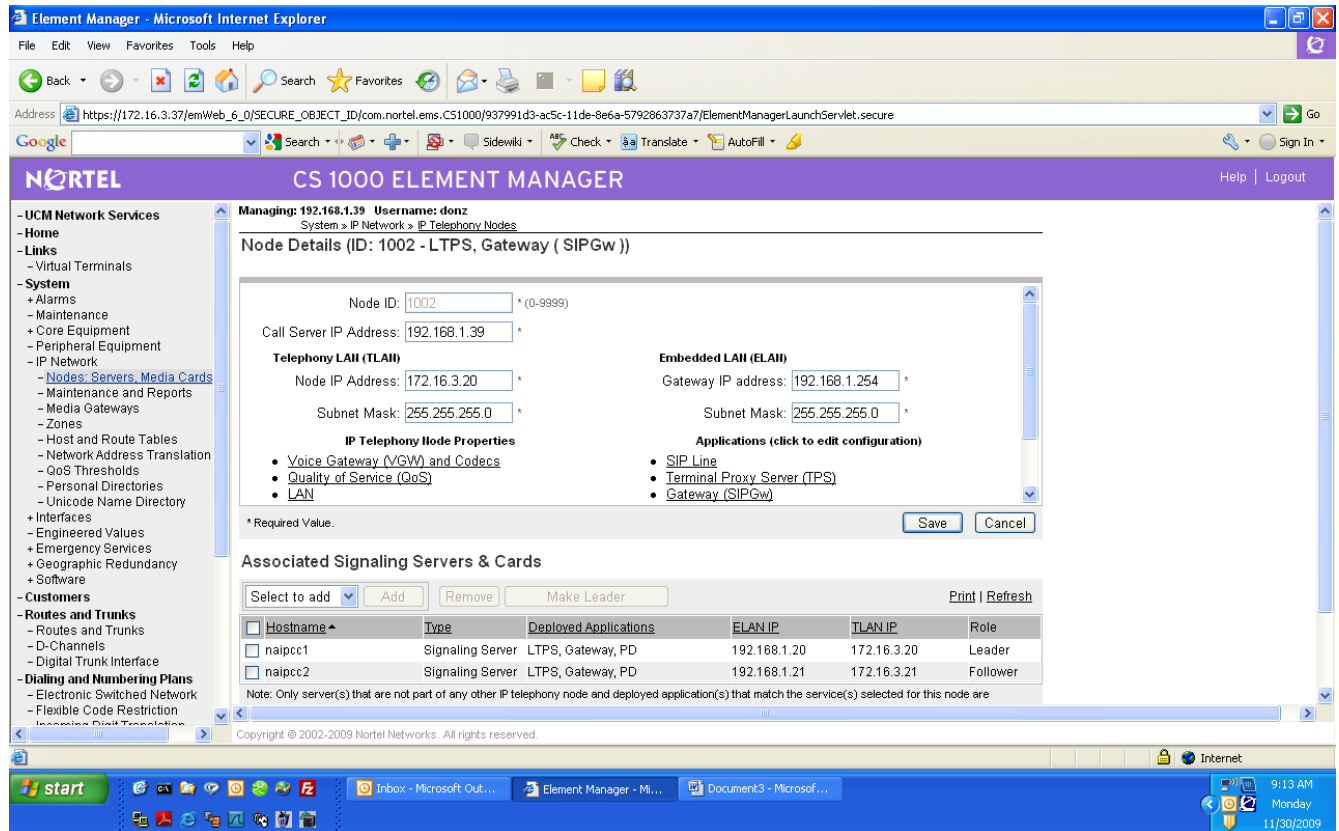
Select to add [Add] [Remove] [Make Leader] [Print] [Refresh]

Hostname	Type	Deployed Applications	ELAN IP	TLAN IP	Role
<input type="checkbox"/> nasipcots	Signaling Server	LTPS, Gateway, PD	192.168.1.31	172.16.3.37	Leader
<input type="checkbox"/> nasipcpm	Signaling Server	LTPS, Gateway, PD	192.168.1.40	172.16.3.39	Follower

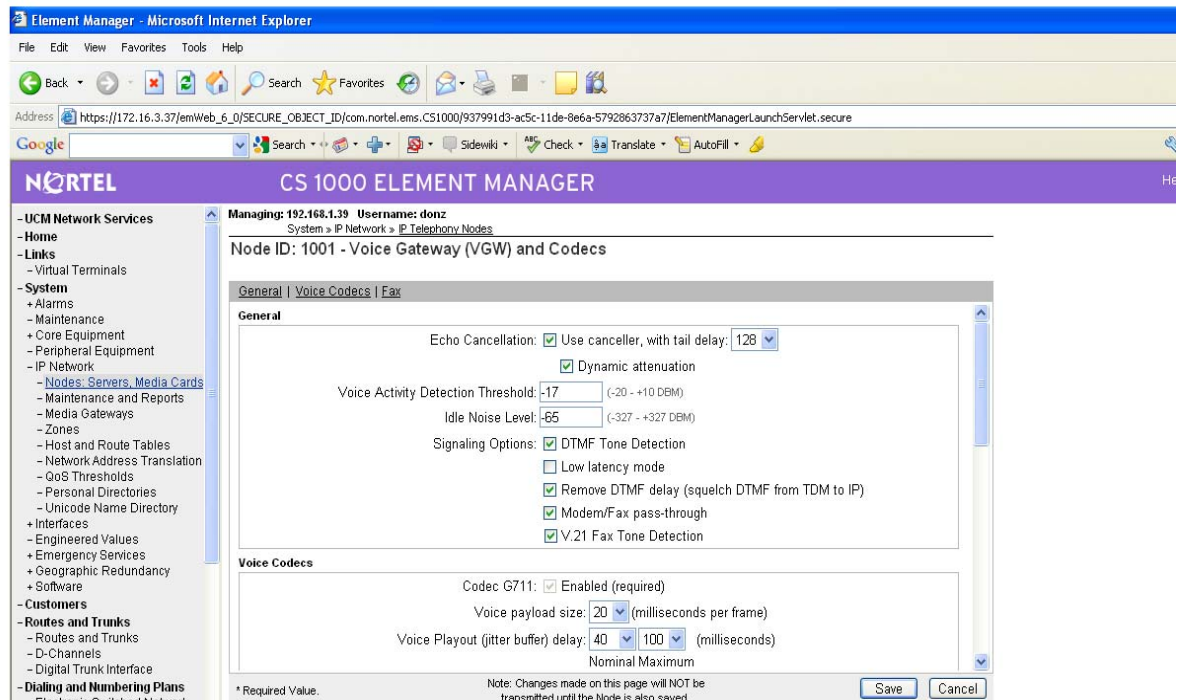
Note: Only server(s) that are not part of any other IP telephony node and deployed application(s) that match the service(s) selected for this node are

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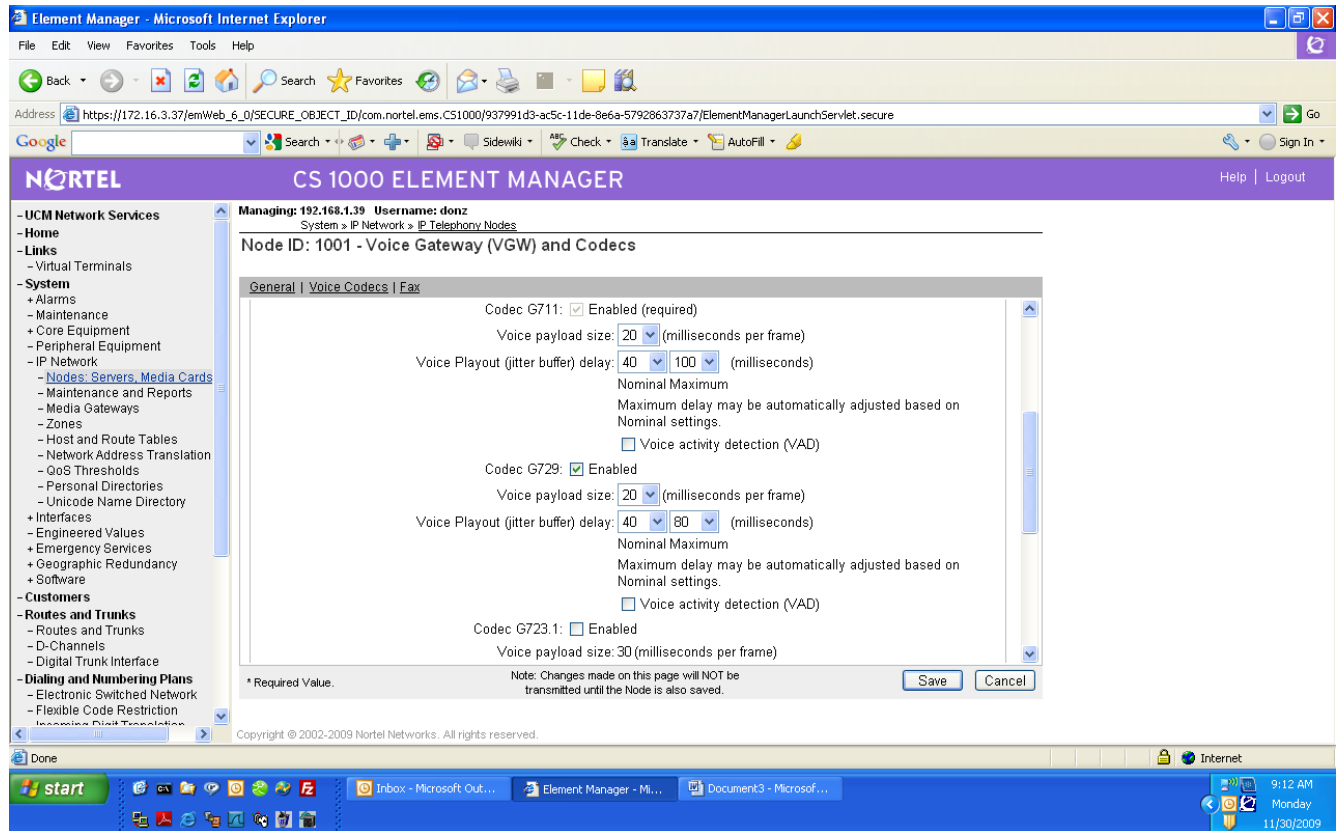
IPT Node with leader and follower Signaling Server.



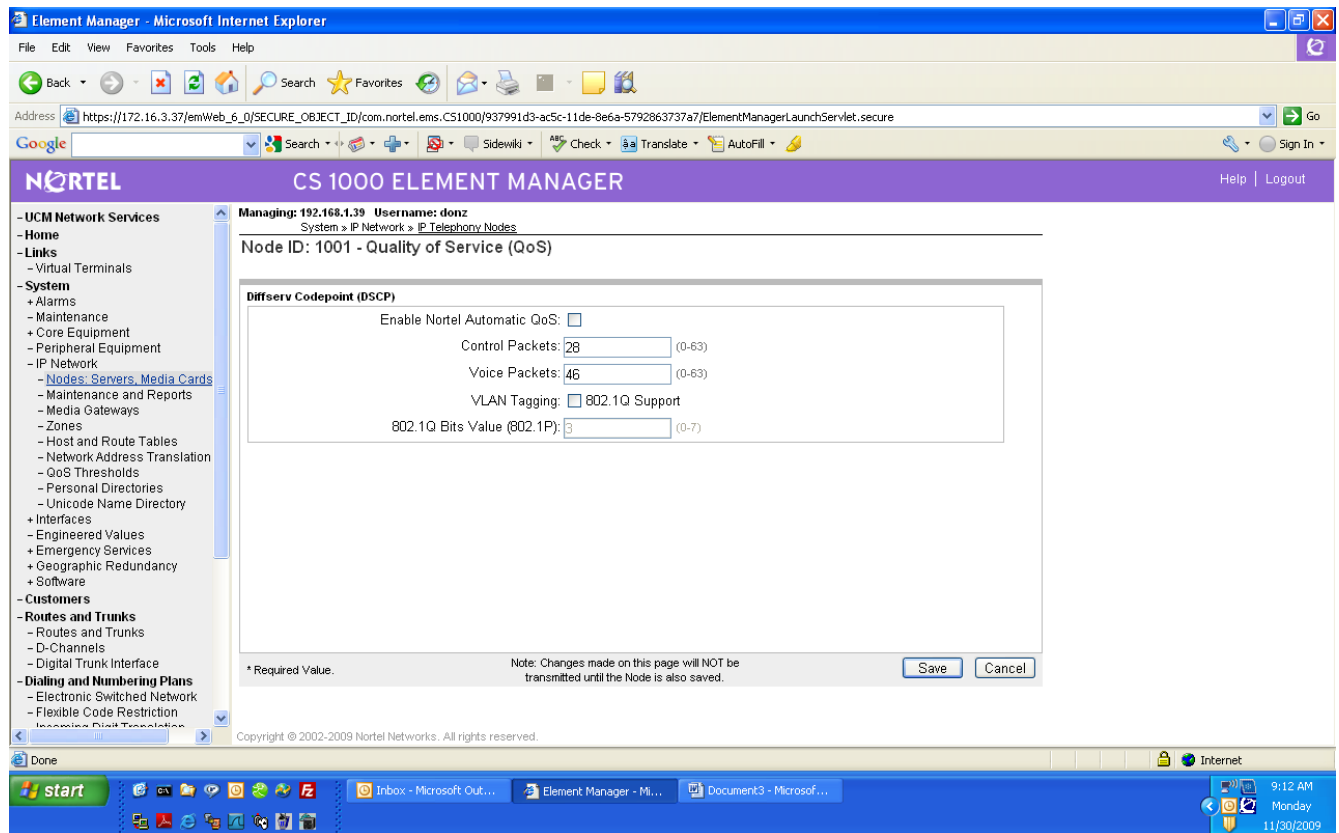
IPCC Node with leader and follower Signaling Server.



As noted in Appendix C, Verizon is enabling T.38 Fax support in the network in 2011 and therefore to support this capability V.21 Tone Detection is ENABLED. There are also specific configuration requirements at the FAX TN. Please see Appendix C for details.

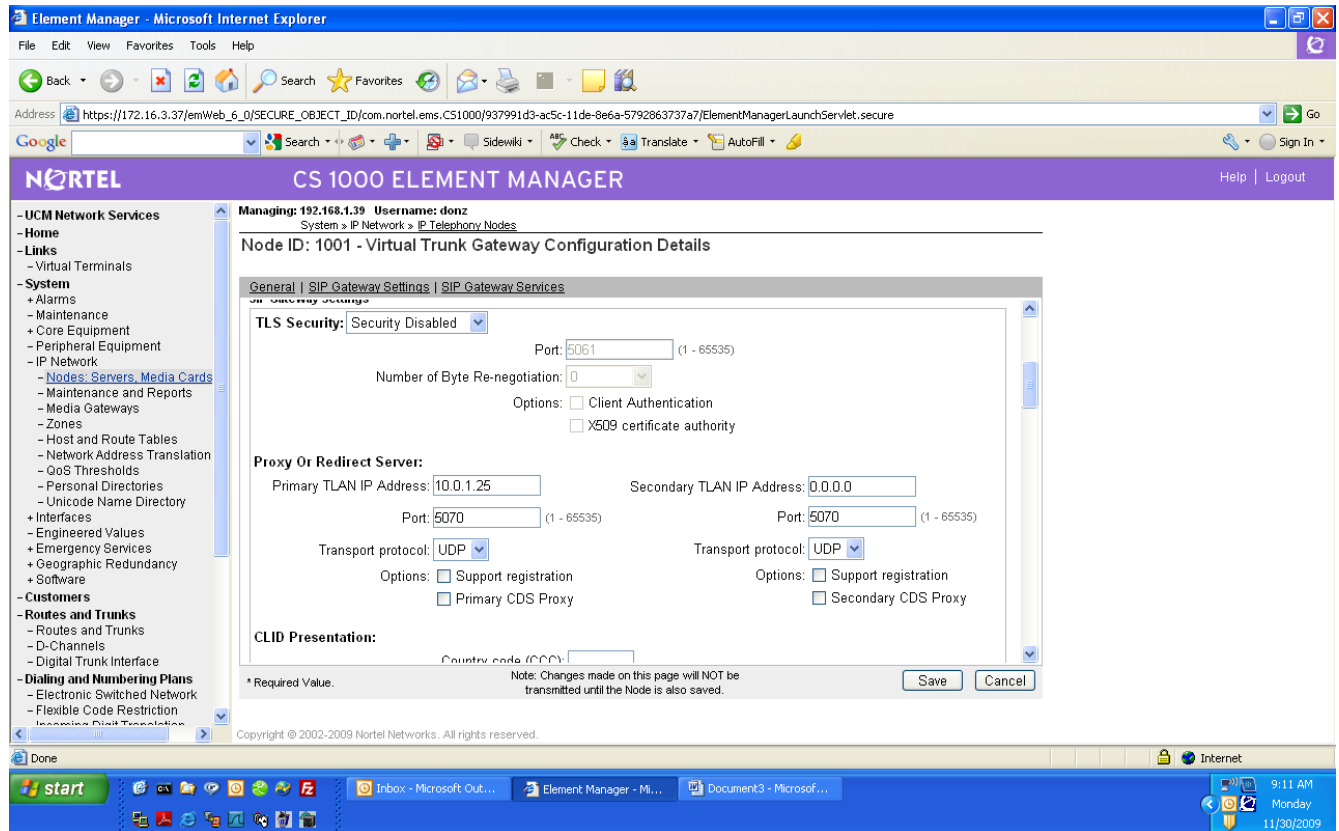


The Broadworks network supports both g.711 and g.729. A 20ms payload size is used.

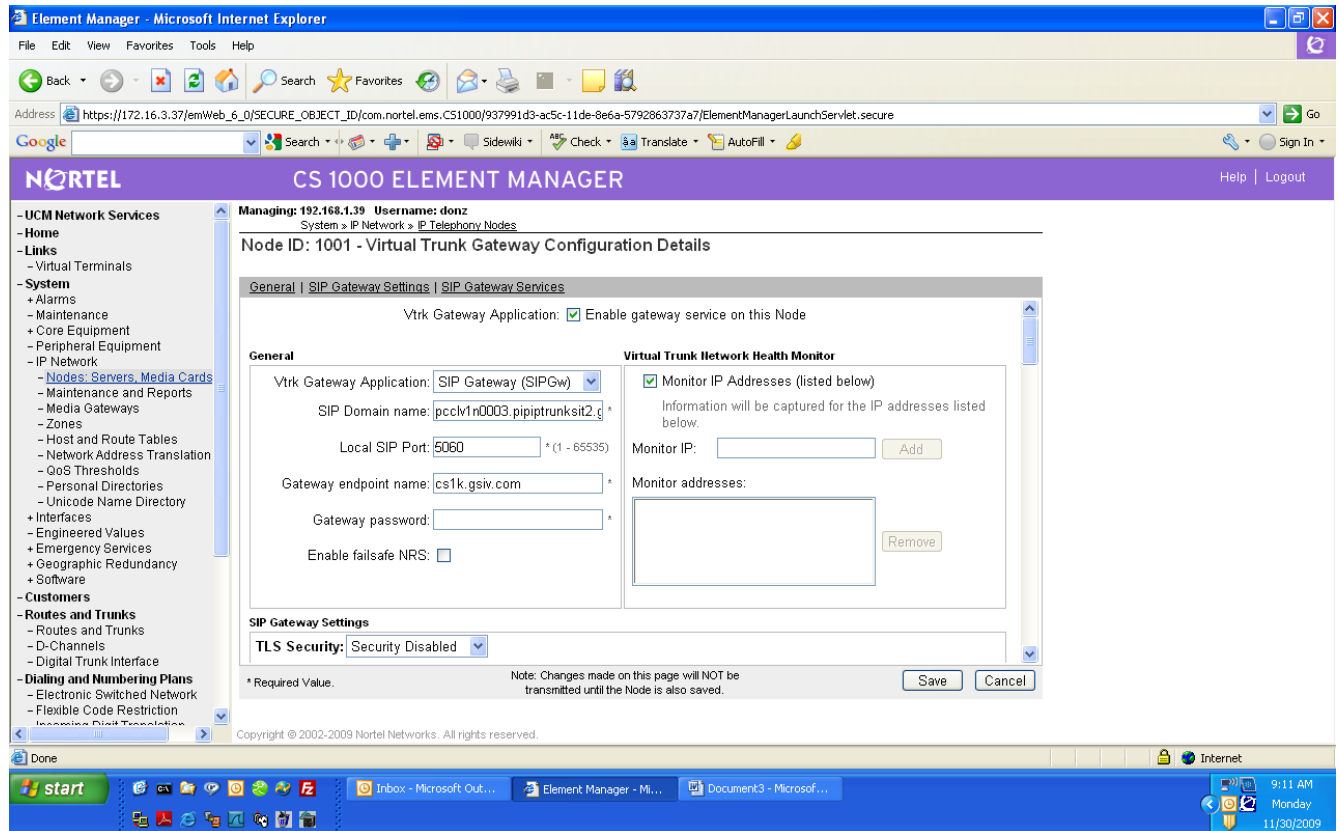


Diff Serv is required for the network, and the default values in the system should be changed to 28 and 46.

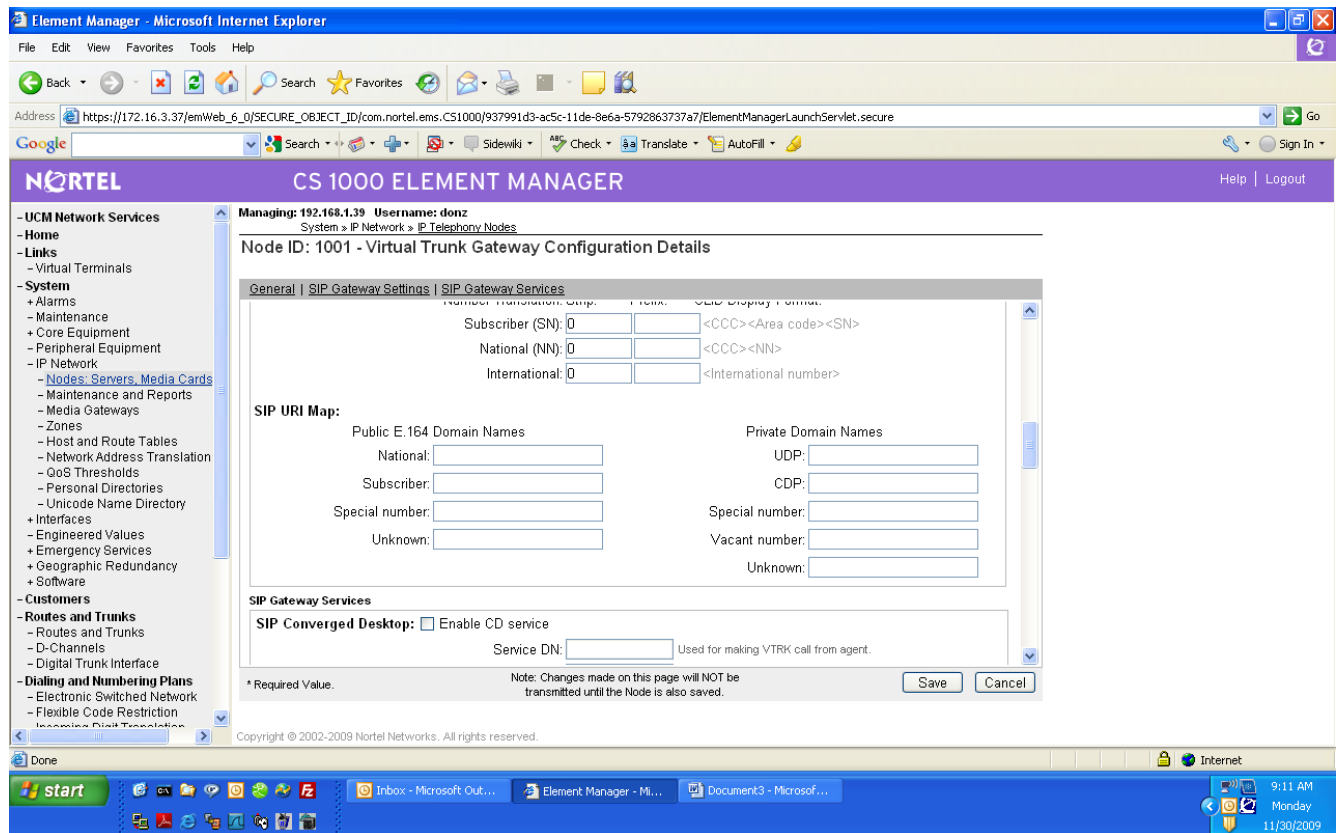
When configuring the Layer 2/3 networking equipment on the T-LAN, program the ERS4500 or ERS2500 ports as a trusted site to pass the Dif_Serv code points to the network.



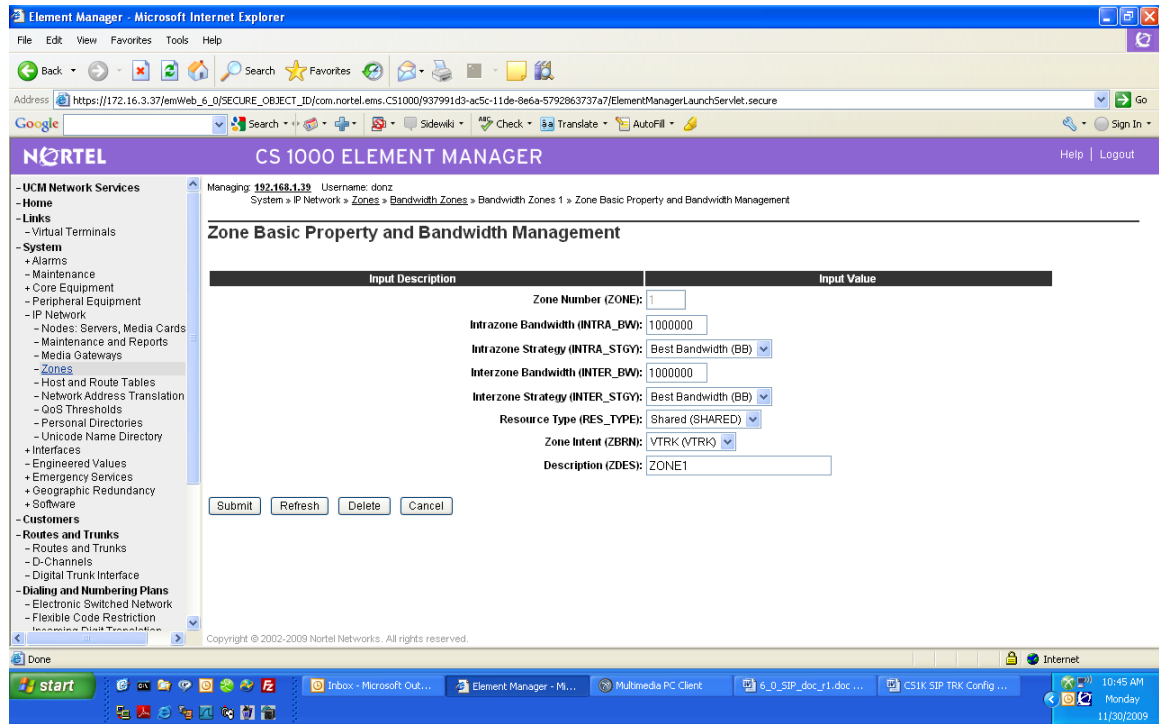
The primary Proxy server is the VzB SBC IP address in the cloud. All calls are routed to this SBC, within to the Broadworks network. The CS1000 will route to an IP address for the primary proxy. DNS is not supported for this entry. VzB also requires different port configuration, with NAT and ALG services fully operational on each port. An SBC can accommodate this requirement; each can be purchased through Nortel.



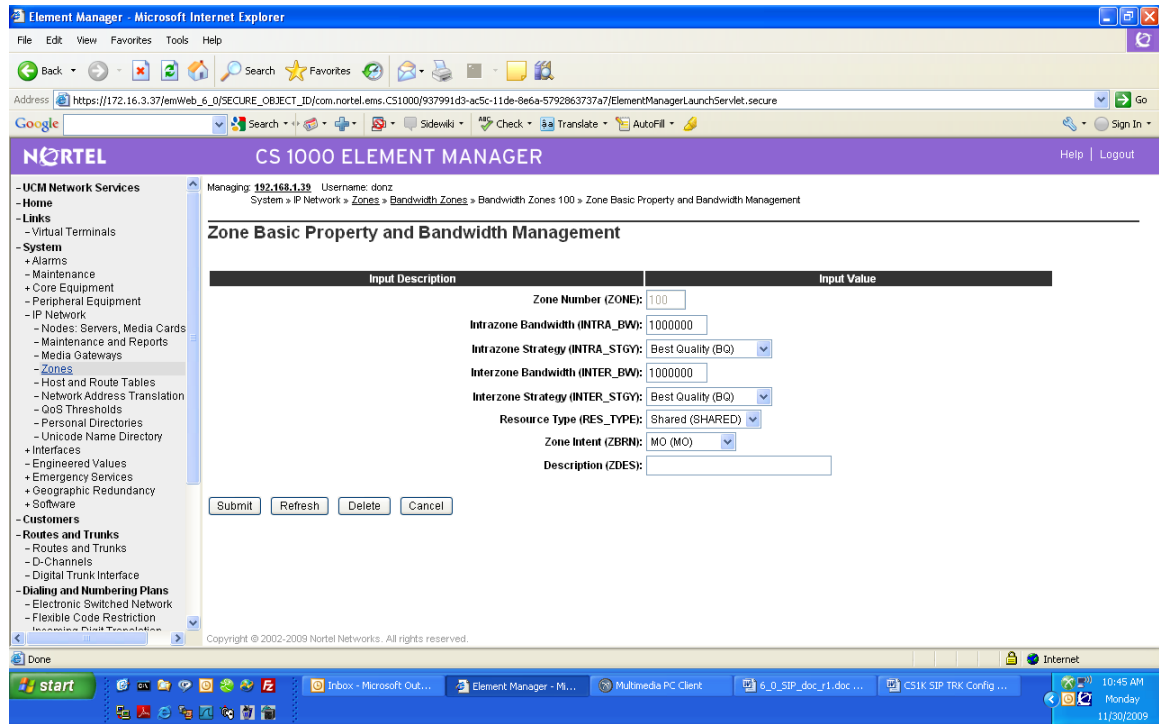
The SIP domain name is set to the Broadworks network, and is entered as a Fully Qualified Domain Name (FQDN). This FQDN is supplied by Verizon Business. NRS is not enabled on the CS1K Node as all calls are routed to the SBC for routing through basic BARS routing.



In the SIP-URI Map, **NO** entries are to be put in the E.164 fields.



Default zone 1 used for the Verizon SIP trunks.



Zone 100 is associated with the DSP's and the IP sets.

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Managing: **192.168.1.28**
Routes and Trunks > [Routes and Trunks](#) > Customer 0, Route 10 Property Configuration

Customer 0, Route 10 Property Configuration

- Basic Configuration

Input Description	Input Value
Route Data Block (RDB) (TYPE)	RDB
Customer number (CUST)	00
Route Number (ROUT)	10
Designator field for trunk (DES)	SIP TRK
Trunk Type (TKTP)	TIE
Incoming and Outgoing trunk (ICOG)	Incoming and Outgoing (IAO)
Access Code for the trunk route (ACOD)	4000
Trunk type M911P (M911P)	<input type="checkbox"/>
The route is for a virtual trunk route (VTRK)	<input checked="" type="checkbox"/>
- Zone for codec selection and bandwidth management (ZONE)	100 Range: 0 - 255
- Node ID of signaling server of this route (NODE)	1001 Range: 0 - 9999
- Protocol ID for the route (PCID)	SIP (SIP)
- Print Correlation ID in CDR for the route (CRID)	<input type="checkbox"/>
Integrated Services Digital Network option (ISDN)	<input checked="" type="checkbox"/>
- Mode of operation (MODE)	Route uses ISDN Signaling Link (ISLD)
- D channel number (DCH)	16 Range: 0 - 254

Done Internet

Basic SIP trunk route configuration using a different zone than the sets.

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Integrated Services Digital Network option (ISDN) ☒

- Mode of operation (MODE) Route uses ISDN Signaling Link (ISLD)

- D channel number (DCH) 16 Range: 0 - 254

- Interface type for route (IFC) Meridian M1 (SL1)

- Private Network Identifier (PNI) 00001 Range: 0 - 32700

- Network Calling Name Allowed (NCNA) ☒

- Network Call Redirection (NCRD) ☒

- Trunk Route Optimization (TRO) ☒

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

- Channel Type (CHTY) B-channel (BCH)

- Call Type for outgoing direct dialed TIE route (CTYP) Coordinated Dialing Plan (CDP)

- Insert ESN Access Code (INAC) ☐

- Integrated Service Access Route (ISAR) ☐

- Display of Access Prefix on CLID (DAPC) ☐

- Basic Route Options

Input Description	Input Value
Billing Number Required (BILN)	<input type="checkbox"/>
Call Detail Recording (CDR)	<input type="checkbox"/>
Controls or timers (CNTL)	<input type="checkbox"/>
Conventional (Tie trunk only) (CNVT)	<input type="checkbox"/>
Incoming DID Digit Conversion on this route (IDC)	<input type="checkbox"/>
MFC feature options (MFC_FEAT)	<input type="checkbox"/>

- Network Options

Input Description	Input Value
-------------------	-------------

Done Internet

Routing continued....

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MFC feature options (MFC_FEAT) ☐

- Network Options

Input Description	Input Value
Electronic Switched Network pad control (ESN)	<input type="checkbox"/>
Signaling arrangement (SIGO)	Standard (STD)
Route Class (RCLS)	Route Class marked as external (EXT)
Off-Hook Queuing (OHQ)	<input type="checkbox"/>
Off-Hook Queue Threshold (OHQT)	0
Call Back Queuing (CBQ)	<input type="checkbox"/>
Number of Digits (NDIG)	2
Authcode (AUTH)	<input type="checkbox"/>

- General Options

Input Description	Input Value
M1 is the only Controlling Party on incoming calls (CPDC)	<input type="checkbox"/>
Dial Tone on originating calls (DLTN)	<input type="checkbox"/>
Hold failure threshold (HOLD)	02 02 40
Trunk Access Restriction Group (TARG)	
Alternate trunk route for outgoing trunks (STEP)	Range: 0 - 511
Actual outgoing toll digits to be ignored for Code Restriction (OABS)	
Display IDC Name (DNAM)	<input type="checkbox"/>
Enable Equal Access Restrictions (EQAR)	<input type="checkbox"/>
ACD DNIS route (DNIS)	<input type="checkbox"/>
Include DNIS number in CDR records (DCDR)	<input type="checkbox"/>

Done Internet

Routing continued...

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- Advanced Configurations

Input Description	Input Value
Allow last Re-directing Number (ARDN)	ARDN (NO)
ANI identifier number (ANTK)	
Auto terminate (AUTO)	<input type="checkbox"/>
Maximum number of CNI digits (CLEN)	1
North American Distinctive Ringing for incoming calls (DRNG)	<input type="checkbox"/>
Home Local Number (HLCL)	
Home National Number (HNTN)	
In-Band Automatic Number Identification route (IANI)	<input type="checkbox"/>
Internal/external definition (IDEF)	Use network info (NET)
Insert (INST)	
Manual Outgoing trunk route (MANO)	<input type="checkbox"/>
Manual Route (MNL)	<input type="checkbox"/>
Music On-Hold (MUS)	<input type="checkbox"/>
North American Toll scheme (NATL)	<input checked="" type="checkbox"/>
Off-Hook Timer Delay (OHTD)	<input type="checkbox"/>
Protocol Selection (PSEL)	DM-DM Protocol Selection (DMDM)
Port Type at far end (PTYP)	Analog TIE trunks (ATT)
Route traffic information in ACD Reports (RACD)	<input type="checkbox"/>
Route Number (RTN)	Range: 0 - 511
Satellite used for trunk route (SAT)	<input type="checkbox"/>
Selected Access Restriction Group (SARG)	

Done Internet

Routing continued...

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Insert (INST)

Manual Outgoing trunk route (MANO) ☐

Manual Route (MNL) ☐

Music On-Hold (MUS) ☐

North American Toll scheme (NATL) ☒

Off-Hook Timer Delay (OHTD) ☐

Protocol Selection (PSEL) DM-DM Protocol Selection (DMDM)

Port Type at far end (PTYT) Analog TIE trunks (ATT)

Route traffic information in ACD Reports (RACD) ☐

Route Number (RTN) Range: 0 - 511

Satellite used for trunk route (SAT) ☐

Scheduled Access Restriction Group (SGRP) 0 Range: 0 - 999

Special Service List number (SSL)

Standard Signaling Type (STYP) Standard Data (SDAT)

CPP/CPPO flag for incoming non-ISDN trunk call tandemed to this trunk route (TCPP) ☐

Tone Detector required (TDET) ☐

Tromboning (TRMB) ☒

Tone Table number (TTBL) 0

Answer an Attendant Extended Call over VNS immediately on the incoming bearer trunk (VRAT) ☐

Submit Refresh Delete Cancel

Done Internet

Routing continued.....

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NORTEL CS 1000 ELEMENT MANAGER Help Logout

Managing: **192.168.1.28**
Routes and Trunks > [Routes and Trunks](#) > Customer 0, Route 10, Trunk 1 Property Configuration

Customer 0, Route 10, Trunk 1 Property Configuration

- Basic Configuration

Input Description	Input Value
Trunk data block (TYPE)	IFTI
Terminal Number (TN)	096 0 02 00
Designator field for trunk (DES)	SIPTRK
Extended Trunk (XTRK)	VTRK
Route number, Member number (RTMB)	10 1
Level 3 Signaling (SIGL)	[Dropdown]
Card Density (CDEN)	8D
Start arrangement Incoming (STRJ)	Immediate (IMM)
Start arrangement Outgoing (STRO)	Immediate (IMM)
Trunk Group Access Restriction (TGAR)	1
Channel ID for this trunk, (CHID)	1
Increase or decrease the member numbers (INC)	Increase channel and member number (YES)
Class of Service (CLS)	Edit

- Advanced Trunk Configurations

Input Description	Input Value
CTI trunk Monitoring and Control (AST)	<input type="checkbox"/>
Auto Terminate DN (ATDN)	[Input Field]

Standard SIP trunk configuration.

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- Nodes: Servers, Media Cards
 - Maintenance and Reports
 - Media Gateways
 - Zones
 - Host and Route Tables
 - Network Address Translation
 - QoS Thresholds
 - Personal Directories
- + Interfaces
 - Engineered Values
 - Emergency Services
 - Software
 - Call Server PEPs
 - Media Gateway PEPs
 - Loadware PEPs
 - File Upload
 - IP Phone Firmware
 - Voice Gateway Media Card
 - Servers, Media Cards PEPs
- Customers
 - Routes and Trunks
 - Routes and Trunks
 - D-Channels
 - Digital Trunk Interface
 - Dialing and Numbering Plans
 - Electronic Switched Network
 - Network Routing Service
 - Flexible Code Restriction
 - Incoming Digit Translation
 - Tools
 - + Backup and Restore
 - Call Server Initialization
 - Date and Time
 - Logs and reports
 - Security
 - + Passwords
 - + Login Options

Music Conference Loop (CFLP) Range: 0 - 159

Call Modification Features restriction (CMF) ☐

Digit Collection Ready (DTCR) ☐

Forced Charge Account (FCAR) ☐

Multifrequency digit level (MFL) 0

Multifrequency PAD (MFPD) ☐

Manual Directory Number (MNDN)

Network Class of Service group (NCOS) 0

Night Service Group number (NGRP) 0

Night Service directory number (NITE)

Pulse Code Modulation Law (PCML)

Pad Category table number for digital trunks (PDCA) 1

Private Line Directory Number (PRDN)

Signaling Category table number (SICA) 1

Answer and disconnect Supervision required (SUPN) ☒

Supervision Type (STYP) Polarity Insensitive Pack (PIP)

Step-by-step CO trunk (SXS) ☐

Termination Impedance (TIMP) 600 ohms (600)

Trunk Identifier (TKID)

Save Delete Cancel

Done Internet

SIP Trunk Configuration continued...

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NORTEL CS 1000 ELEMENT MANAGER Help Logout

Managing: **192.168.1.28**
Routes and Trunks > D-Channels > D-Channels 16 Property Configuration

D-Channels 16 Property Configuration

- Basic Configuration

Input Description	Input Value
Action Device And Number (ADAN) (TYPE)	DCH
D channel Card Type (CTYP)	DCIP
Designator (DES)	SIPVerizon
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)	
Primary Rate Interface (PRI)	<input type="button" value="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)	4000 Range: 1 - 4000
Signaling Server Resource Capacity (SSRC)	1800 Range: 0 - 4000

- Basic options (BSCOPT)

- Primary D-channel for a backup DCH (PDCH)

- PINX customer number (PINX_CUST)

DCH configuration with Meridian 1 simulation for the far end.

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 - Flexible Code Restriction
 - Incoming Digit Translation
- Tools
 - + Backup and Restore
 - Call Server Initialization
 - Date and Time
 - Logs and reports
- Security
 - + Passwords
 - + Login Options

- Basic options (BSCOPT)

- Primary D-channel for a backup DCH (PDCH)
- PINX customer number (PINX_CUST)
- Progress signal (PROG)
- Calling Line Identification (CLID)
- Output request Buffers (OTBF)
- D-channel transmission Rate (DRAT)
- Channel Negotiation option (CNEG)
- Remote Capabilities (RCAP)

- Change protocol timer value (TIMR)

- How long Meridian 1 to wait for the response message when the QSIG outgoing call is in the U3 state (T310)
- Variable timer for received disconnect message on incoming calls (INC_T306) Range: 0 - 240
- Variable timer for received disconnect message (OUT_T306) Range: 0 - 240
- B channel Service messaging. (BSRV) ☐

- Advanced options (ADVOPT)

- Layer 3 call control message count per 5 second time interval (ISDN_MCNT) Range: 60 - 350
- Number of Status Enquiry Messages sent within 128 ms (SEMT)
- Map channel number to timeslots on a PRI2 loop (OCHID) ☒

+ H323 Overlap Signaling Settings (H323)

- Overlap Timer (OVL.T)
- Multilocation Business Group Allowed (MBGA) ☐
- Network Attendant Service Allowed (NASA) ☐

- Link Access Protocol for D-channel

D-Channel configuration continued....

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- Network Routing Service
- Flexible Code Restriction
- Incoming Digit Translation
- Tools
- + Backup and Restore
- Call Server Initialization
- Date and Time
- Logs and reports
- Security
- + Passwords
- + Login Options

128 ms (SEMT)

- Map channel number to timeslots on a PRI2 loop (QCHID) ☒

+ H323 Overlap Signaling Settings (H323)

- Overlap Timer (OVLTI)

- Multilocation Business Group Allowed (MBGA) ☐

- Network Attendant Service Allowed (NASA) ☐

+ Link Access Protocol for D-channel (LAPD)

- Feature Packages

- Digital Private Network Signaling System 1 Package: 123 -- Unequipped To Order

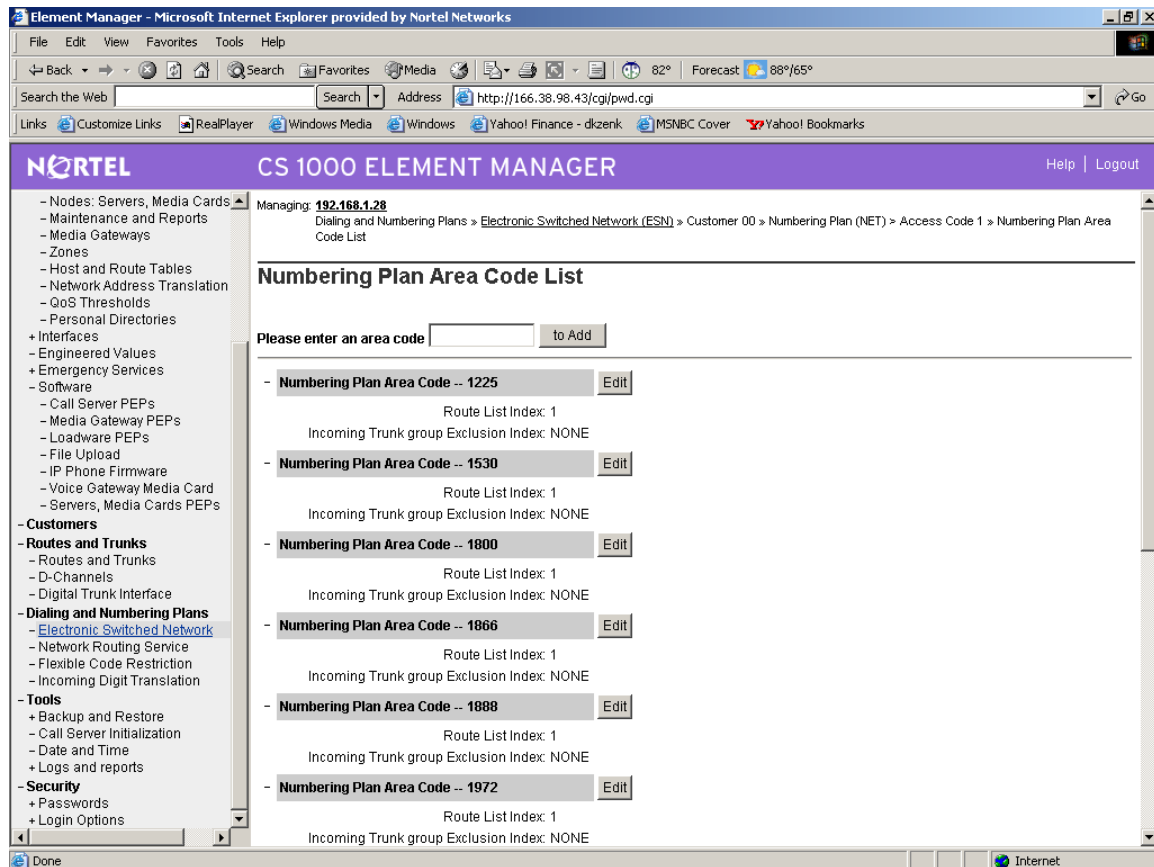
- Virtual Network Services Package: 183

Input Description	Input Value
Virtual Network Services Network Signalling option (VNSG)	<input type="checkbox"/>
Virtual Network Services Maximum (VNSM)	<input type="text"/> Range: 1 - 300
Virtual Network Services Customer number (VNSC)	<input type="text"/> 0
Virtual Network Services Private Network Identifier (VNSPI)	<input type="text"/> Range: 0 - 32700
Virtual Network Services Network Call Party Name Display (VCNA)	<input type="checkbox"/>
Virtual Network Services Network Call Redirection (VCRD)	<input type="checkbox"/>
Trunk Route Optimization before answer available for VNS (VTRO)	<input type="checkbox"/>

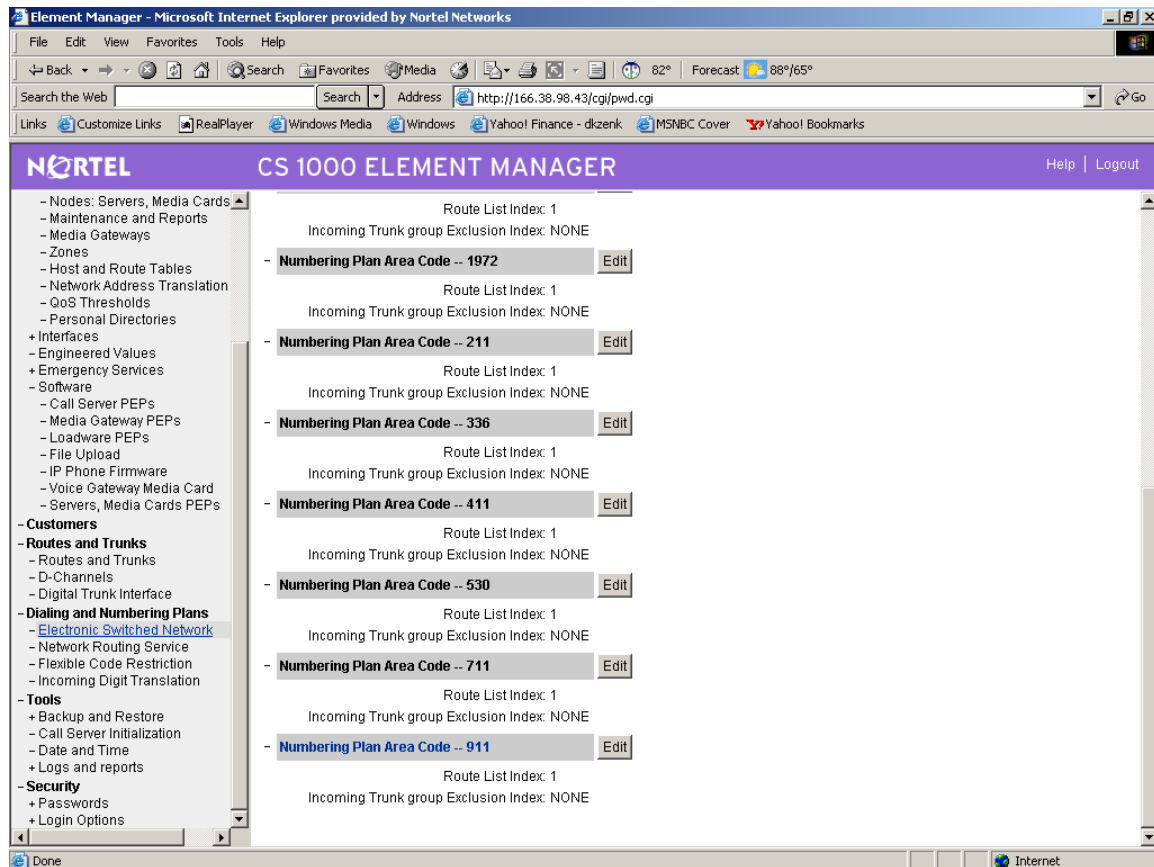
Submit Refresh Delete Cancel

Internet

D-Channel configuration continued....



Very basic BARS program to simply pass all digits out to the gateway.



Dialing plan continued...



Call Server Configuration

Overlay 15 - Customer Data Block

The following CDB print out represents the CS 1000 R5.x and R6.0 lab systems used. This configuration is very basic and will require customization for the specific customer requirements for other features and services.

```

REQ: prt                                IDBZ NO
TYPE: cdb                              PBUZ 02 10
CUST 0                                ICI 00
                                      ICI 01
                                      ICI 02
                                      ICI 03
                                      ICI 04
                                      ICI 05
                                      ICI 06
                                      ICI 07
                                      ICI 08
                                      ICI 09
                                      RICI
TYPE CDB                              AWU_DATA
CUST 00                              AWU YES
AML_DATA                             ATRC NO
  OPT DNX                             RANF
  VSID                                RAN1 000
  GP02                                RAN2 000
  GP03                                LA11 000
  GP04                                LA12 000
  GP05                                LA21 000
  GP06                                LA22 000
  GP07                                LA31 000
  GP08                                LA32 000
  GP09                                LA41 000
  GP10                                LA42 000
  GP11                                LA51 000
  GP12                                LA52 000
  GP13                                R2BN 00 00
  GP14                                R2ED 00 00
  GP15                                NRWU 5
ANI_DATA                             TAWU 3
  ANAT 111                           WUD NO
  ANLD 1111                           STE NO
  M911_PANI NO                        CAS_DATA
ATT_DATA                             CAS NO
  OPT AHD BIND BIXA BLA              CCS_DATA
    DNX IC1 XTG IDP XLF XBL          CCRS UNR
    FKA MWUD LOD                     ECC1 UNR
    REA SYD ATDA                     ECC2 UNR
  ATDN 5                             CNCS
  NCOS 0                             PELK NO
  CWUP NO                            CDR_DATA
  CWCL 0 0                           CDR YES
  CWTM 0 0                           IMPH NO
  CWBZ NO NO                         OMPH NO
  EFLL 0                             AXID NO
  MATT NO                            TRCR NO
  RTIM 30 30 30                     CDPR NO
  ATIM 0                             ECDR NO
  AQTT 30
  AODN
  SPVC 00
    SBLF NO
  RTSA RSAD
  SACP NO
  ABDN NO
  IRFR NO
  XRFR NO

```

```

BDI NO
PORT 2
BCAP NO
CHLN 0
FCAF NO
FCR_DATA
NFCR YES
MAXT 2
OCB1 255
OCB2 255
OCB3 255
IDCA NO
FFC_DATA
CCRS UNR
SCPL 0
FFCS NO
STRL 0
STRG
ADLD 0
FTR_DATA
**DAPC**PREFIX TABLE NO: 01 **

UNKN**INTL**NATL**ESP**LOCL**ELOC**
ECDP**
UNKN*
E164*          900    91
This is to use the callers list and
redial the number without having to
modify the list.
PRIV*
E163*          900    91
TELX*
X121*
NATL*

OPT AHD BIND BIXA BLA CFO CFRA
COX CPA CTD DBD DNX DSX
HTU HVD XBL IC1 IDP XLF
IHD XTG FKA LOD LRA MCI
MWUD PVCD REA RND
RTR RTD ROX SBD SYD
TTAD VOBA CWRD HLPD HRLD
CXOD
DGRP 10
IRNG NO
PKND 2
DNDL NO
SPRE 2
PREO 0
BPSS NO
SRCD 1234
EEST NO
EESD NO
TTBL 0
MUS NO
ALDN
RECD NO
PORT 0
STCB NO
NSCP NO
MDCD NO
NAUT NO

```

```

IDEF NO
MTAR NO
LEND NO
MSCD NO
CPCI NO
CONF_DSP
CNFFIELD NO
CNF_NAME CONF
INTFIELD NO
INT_NAME I
EXTFIELD NO
EXT_NAME E
BSFE NO
ASPCT 010
FXS NO
DFLT_LANG ENG
STS_MSG
MSG01 Please leave message
MSG02 Back to work
MSG03 In a meeting
MSG04 On a conference call
MSG05 At lunch
MSG06 Busy call
MSG07 Out of the office today
MSG08 On a business trip
MSG09 Project deadline today
MSG10 Will reply after
VO_ALO NO
PCA OFF
TPDN
BFS_CFW YES
VO_CUR_ZONE_ZDM NO
VO_CUR_ZONE_TD NO
IMS_DATA
IMS YES
IMA YES
APL NONE
UST NO
APL NONE
UMG NO
APL NONE
INT_DATA
ACCD OVF OVF OVF ATN
CTVN OVF OVF OVF ATN
MBNR OVF OVF OVF ATN
CTRC OVF NAP OVF NAP
CLDN NAP OVF NAP NAP
NINV OVF OVF OVF ATN
NITR OVF OVF OVF ATN
NRES OVF OVF OVF ATN
NBLK OVF OVF OVF ATN
RCLE ATN OVF ATN ATN
CONG OVF
LLT OVF
DNDT BSY
ESAM OVF
LDN_DATA
OPT XLDN
DLDN NO
LDN0 4444
LDN1
LDN2

```

LDN3	CNTC
LDN4	NATC
LDN5	INTC
ICI 00	NIT_DATA
ICI 01	NIT1 7700
ICI 02	TIM1
ICI 03	NIT2
ICI 04	TIM2
ICI 05	NIT3
ICI 06	TIM3
ICI 07	NIT4
ICI 08	TIM4
ICI 09	ENS NO
MON_DATA	OAS_DATA
USBM NO	ODN0
MPO_DATA	ODN1
FMOP	ODN2
RGNA STD STD	ODN3
AOCS DIS DIS	ODN4
RCY1 04	ODN5
RCY2 04	ODN6
RALL NO	ODN7
CDTO 14	ODN8
IFLS NO	ODN9
MHLD NO	ASTM 30
PCDS	HDOPT 0
CNFD 1	HDTM 30
TGLD 2	RDR_DATA
DISD 3	OPT CFO CFRA PVCD CWRD MCI
CCDO NO	FNAD HNT
AFCO NO	FNAT HNT
ACNS NO	FNAL HNT
NET_DATA	CFTA NO
OPT RTD	CCFWDN
AC1 INTL NPA SPN NXX LOC	CFN0 4
AC2	CFN1 4
FNP YES	CFN2 4
ISDN YES	DFN0 4
VPNI 1	DFN1 4
PNI 1	DFN2 4
PINK_DN	DNDH NO
MBG 0	MDID YES
BSGC 65535	NDID YES
PFX1	MWFB YES
PFX2	TRCL 0
HLOC	CRT0 00 00 00 00
LSC	CRT1 00 00 00 00
RCNT 5	CRT2 00 00 00 00
PSTN NO	CRT3 00 00 00 00
TNDM 15	DAY0
PCMC 15	DAY1
SATD 1	DAY2
OCLI NO	DAY3
DITI YES	HOLIDAY0
TRNX YES	HOLIDAY1
EXTT YES	HOLIDAY2
FTOP FRES	HOLIDAY3
VNR NO	ROA_DATA
NIT 8	OPT ROX
NAS_ATCL YES	RICI
NAS_ACTV NO	TIM_DATA
FOPT 14	FLSH 45

PHDT 30
DIND 30
DIDT 14
LDTT 6
BOTO 14
DBRC 60
RTIM 30 30 3
ATIM 0
AQTT 30
ADLD 0
NFNA 0
HWTT 300
NIT 8
FOPT 14
TST_DATA

TYPE RDB

CUST 00
ROUT 10
DES SIP TRK
TKTP TIE
M911P NO
ESN NO
CNVT NO
SAT NO
RCLS EXT
VTRK YES
ZONE 002
PCID SIP
CRID NO
NODE 200
DTRK NO
ISDN YES
MODE ISLD
DCH 16
IFC SL1
PNI 00001
NCNA YES
NCRD YES
TRO YES
FALT NO
CTYP CDP
INAC YES
ISAR NO
DAPC YES
TBL 1

This points to the table in the CDB.

MBXR NO
PTYP ATT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 4000
TCPP NO
TARG 01
CLEN 10
BILN NO

OABS
INST
ANTK
SIGO STD
STYP SDAT
ICIS YES
TIMR ICF 512
OGF 512
EOD 13952
DSI 34944
NRD 10112
DDL 70
ODT 4096
RGV 640
GRD 896
SFB 3
NBS 2048
NBL 4096
IENB 5
TFD 0
VSS 0
VGD 6
SST 5 0
NEDC ORG
FEDC ORG
CPDC NO
DLTN NO
HOLD 02 02 40
SEIZ 02 02
SVFL 02 02
DRNG NO
CDR NO
VRAT NO
MUS NO
MANO NO
OHQ NO
OHQT 00
CBQ NO
AUTH NO
TDET NO
TTBL 0
ATAN NO
OHTD NO
PLEV 2
ALRM NO
ART 0
SGRP 0
ARDN NO
AACR NO



Sample Fax Line configuration

```

DES  FAX1
TN   004 0 04 00  VIRTUAL
TYPE 500
CDEN 4D
CUST 0
ERL 00000
WRLS NO
DN   6664982 0      MARP
AST  NO
IAPG 0
HUNT
TGAR 0
LDN  NO
NCOS 7
SGRP 0
RNPG 0
XLST
SCI   0
CLS  UNR DTN FBD XFD WTA THFD FND
HTD  ONS
      LPR XRD CWD SWD MWD RMMD SMWD
LPD  XHD SLKD CCSD LND TVD
      CFTD SFD MRD C6D CNID CLBD AUTU
      ICDD CDMD LLCN EHTD MCTD
      GPUD DPUD CFXD ARHD OVDD AGTD
CLTD LDTD ASCD SDND
      MBXD CPFA CPTA DDGA NAMA MIND
      MCRD
      EXR0 SHL ABDD CFHD DNDY DNO3
      CWND USMD USRD BNRD RTDD RBDD
RBHD FAXD CNUD CNAD PGND FTTC
      CDMR MCDD T87D PKCH  MPTA
  
```

MPTA is a Release 5.5 feature to allow a fax/modem line to set up calls at G.711 when the network is defined as G.729.



Overlay 17 – Configuration Record

The following CFN print out represents the CS 1000 R5.x and R6.0 lab systems used.

```

TYPE CFN
ADAN HIST
  SIZE 5000
  USER MTC SCH BUG OSN
ADAN TTY 0
  CTYP CPSI
  DNUM 0
  PORT 0
  DES
  BPS 9600
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER MTC SCH BUG OSN
  XSM NO
  TTYLOG 0
  BANR YES
ADAN TTY 1
  CTYP MGC
  IPMG 0 0
  DNUM 1
  PORT 1
  DES
  BPS 1200
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER MTC SCH BUG OSN
  XSM NO
  TTYLOG 0
  BANR YES
ADAN TTY 2
  CTYP MGC
  IPMG 0 0
  DNUM 2
  PORT 2
  DES
  BPS 1200
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER CTY
  XSM NO
ADAN TTY 14
  CTYP PTY
  DNUM 14
  PORT 0
  DES
  FLOW NO
  USER MTC SCH BUG OSN
  XSM NO

TTYLOG 0
BANR YES
ADAN TTY 15
  CTYP PTY
  DNUM 15
  PORT 1
  DES
  FLOW NO
  USER MTC SCH BUG OSN
  XSM NO
  TTYLOG 0
  BANR YES
ADAN DCH 12
  CTYP TMDI
  MG_CARD 000 1 02
  PORT 1
  DES PRISIP
  USR PRI
  DCHL 53
  OTBF 32
  PARM RS232 DTE
  DRAT 64KC
  CLOK EXT
  IFC D100
  SIDE USR
  CNEG 1
  RLS ID 25
  RCAP
  MBGA NO
  OVLR NO
  OVLS NO
  T200 3
  T203 10
  N200 3
  N201 260
  K 7
ADAN DCH 16
  CTYP DCIP
  DES SIPVerizon
  USR ISLD
  ISLM 4000
  SSRC 1800
  OTBF 32
  NASA NO
  IFC SL1
  CNEG 1
  RLS ID 25
  RCAP MWI TAT
  MBGA NO
  H323
  OVLR NO
  OVLS NO
  PARM
  LPIB 3500
  HPIB 3500

```

500B 2000	REMQ
SL1B 160	SUPL V000 V096 V100 V104
NCR 20000	V108 V112
MGCR 25	SUPC
NCPU 1	SUPF
CFWS NO	XCT
PCML MU	CONF
ALRM YES	MGTDS IPMG IPMG_TYPE
ERRM ERR BUG AUD	126 000 0 MGC
DTRB 100	MGCONF IPMG PORTS
TMRK 128	IPMG_TYPE
FCDR OLD	127 000 0 30 MGC
PCDR NO	MFSD * 126
TPO NO	
TSO NO	DLOP NUM DCH FRM TMDI LCMT YALM
CLID NO	T1TE TRSH MG_CARD
DUR5 NO	PRI 053 24 ESF YES B8S FDL 0
MLDN YES	01 000 1 02
MARP YES	MISP MG_CARD
IPIE NO	EXT0 3PE
FRPT NEFR	EXT1 3PE
DCUS NULL	MCFN 011 MB
MSCL 255	OVLY
PMSI	SID 0
MANU PMS1	BKGD 044
PMCR 20	PBXH 01
PORT NONE	TODR 01
NDIS 20	DROL 030 034 038 044 135
OCAC NO	MID_SCPU NO
MTRO MR	MULTI_USER ON
SBA_ADM_INS 001	ATRN
SBA_USER 010	CODE 0
BCAP SPEECH	SOLR 12
IDLE_SET_DISPLAY NORTEL	ROLR +45.00
ICON YES	AOLR +45.00
MSEC OFF ← Audio Encryption off	TOLR -45.00
in the lab systems	AGCD NO
CEQU	VOLR NO
MPED 8D	HRLR +42.00
TERM	HTLR -44.00
REMO	ESA
TERD	LIS NONE
REMD	DYNAMIC_ELIN_TIMEOUT 180
TERQ	DYNAMIC_ELIN_REUSE YES



Appendix A - EMEA CS 1000

Release 5.x

An EMEA system was programmed and tested as installed in Germany. The DEP list and additional patches were the same as North American system. The main difference is using the different tones and cadences and the dial plan for country codes and international dialing.

TYPE CDB	PBUZ 02 10
CUST 00	ICI 00
AML_DATA	ICI 01
OPT DNX	ICI 02
VSID	ICI 03
GP02	ICI 04
GP03	ICI 05
GP04	ICI 06
GP05	ICI 07
GP06	ICI 08
GP07	ICI 09
GP08	RICI
GP09	AWU_DATA
GP10	AWU NO
GP11	CAS_DATA
GP12	CAS NO
GP13	CCS_DATA
GP14	CCRS UNR
GP15	ECC1 UNR
ANI_DATA	ECC2 UNR
ANAT 123	CNCS 0
ANLD 1234	PELK NO
M911_PANI NO	CDR_DATA
ATT_DATA	CDR NO
OPT AHD BIND BIXA BLA	CHLN 1
DNX ICI XTG IDP XLF XBL	FCAF NO
FKA MWUD LOD	FCR_DATA
REA SYD ATDA	NFCR NO
ATDN 0	IDCA NO
NCOS 0	FFC_DATA
CWUP NO	CCRS UNR
CWCL 0 0	SCPL
CWTM 0 0	FFCS NO
CWBZ NO NO	STRL 0
EFL 0	STRG
MATT NO	ADLD 0
RTIM 30 30 30	MFAC *
ATIM 0	FTR_DATA
AQTT 30	**DAPC**PREFIX TABLE NO: 00 **
AODN	
SPVC 00	UNKN**INTL**NATL**ESPN**LOCL**ELOC**
SBLF NO	ECDP**
RTSA RSAD	UNKN*
SACP NO	E164* 00 0
ABDN NO	PRIV*
IRFR NO	E163* 00 0
XRFR NO	TELX*
IDBZ NO	X121*

NATL*

DAPCPREFIX TABLE NO: 01 **

UNKN**INTL**NATL**ESPN**LOCL**ELOC**
ECDP**

UNKN*

E164* 900
90

This is to use the callers list and
redial the number without having to
modify the list.

PRIV*

E163*

TELX*

X121*

NATL*

OPT AHD BIND BIXA BLA CFO CFRA
COX CPA CTD DBD DNX DSX
HTU HVD XBL IC1 IDP XLF
IHD XTG FKA LOD LRA MCI
MWUD PVCD REA RND
RTR RTD ROX SBD SYD
TTAD VOBA CWRD HLPD HRLD
CXOD

DGRP 0

IRNG NO

PKND 1

DNDL NO

SPRE 2

PREO 0

BPSS NO

SRCD 1234

EEST NO

EESD NO

TTBL 1

MUS NO

ALDN

RECD NO

PORT 0

STCB NO

NSCP NO

MCDC NO

NAUT NO

IDEF NO

MTAR NO

LEND NO

MSCD NO

CPCI NO

CONF_DSP

CNFFIELD NO

CNF_NAME CONF

INTFIELD NO

INT_NAME I

EXTFIELD NO

EXT_NAME E

BSFE NO

ASPCT 000

FXS NO

DFLT_LANG GER

STS_MSG

MSG01 Nachricht hinterlassen

MSG02 Wieder erreichbar um:

MSG03 In einer Besprechung

MSG04 In Konferenzgesprch

MSG05 In der Mittagspause

MSG06 Besetzt, rufen Sie

MSG07 Heute nicht im Bro

MSG08 Auf Geschäftsreise

MSG09 Projekt-Termin heute

MSG10 Rufe zurck nach

VO_ALO NO

PCA OFF

TPDN

BFS_CFW YES

VO_CUR_ZONE_ZDM NO

VO_CUR_ZONE_TD NO

IMS_DATA

IMS NO

INT_DATA

ACCD OVF OVF OVF ATN

CTVN OVF OVF OVF ATN

MBNR OVF OVF OVF ATN

CTRC OVF NAP OVF NAP

CLDN NAP OVF NAP NAP

NINV OVF OVF OVF ATN

NITR OVF OVF OVF ATN

NRES OVF OVF OVF ATN

NBLK OVF OVF OVF ATN

RCLC ATN OVF ATN ATN

CONG OVF

LLT OVF

DNDT BSY

ESAM OVF

LDN_DATA

OPT XLDN

DLDN NO

LDN0 55411111

LDN1

LDN2

LDN3

LDN4

LDN5

ICI 00

ICI 01

ICI 02

ICI 03

ICI 04

ICI 05

ICI 06

ICI 07

ICI 08

ICI 09

MON_DATA

USBM NO

MPO_DATA

FMOP

RGNA STD STD

AOCS DIS DIS

RCY1 06

RCY2 04

RALL NO

CDTO 14

IFLS NO	ODN9
MHLD NO	ASTM 30
PCDS	HDOPT 0
CNFD 1	HDTM 30
TGLD 2	RDR_DATA
DISD 3	OPT CFO CFRA PVCD CWRD MCI
CCDO NO	FNAD HNT
AFCO NO	FNAT HNT
ACNS NO	FNAL HNT
NET_DATA	CFTA NO
OPT RTD	CCFWDN
AC1 INTL NPA SPN NXX LOC	CFN0 4
AC2	CFN1 4
FNP YES	CFN2 4
ISDN YES	DFN0 4
VPNI 1	DFN1 4
PNI 1	DFN2 4
PINK_DN	DNDH NO
MBG 0	MDID NO
BSGC 65535	NDID NO
PFX1	MWFB NO
PFX2	TRCL 0
HLOC	CRT0 00 00 00 00
LSC	CRT1 00 00 00 00
RCNT 5	CRT2 00 00 00 00
PSTN NO	CRT3 00 00 00 00
TNDM 15	DAY0
PCMC 15	DAY1
SATD 1	DAY2
OCLI NO	DAY3
DITI NO	HOLIDAY0
TRNX NO	HOLIDAY1
EXTT NO	HOLIDAY2
FTOP FTLY	HOLIDAY3
VNR NO	ROA_DATA
NIT 8	OPT ROX
NAS_ATCL YES	RICI
NAS_ACTV NO	TIM_DATA
FOPT 6	FLSH 45
CNTC	PHDT 30
NATC	DIND 30
INTC	DIDT 14
NIT_DATA	LDTT 6
NIT1	BOTO 14
TIM1	DBRC 60
NIT2	RTIM 30 30 30
TIM2	ATIM 0
NIT3	AQTT 30
TIM3	ADLD 0
NIT4	NFNA 0
TIM4	HWTT 300
ENS NO	NIT 8
OAS_DATA	FOPT 6
ODN0	TST_DATA
ODN1	
ODN2	
ODN3	
ODN4	
ODN5	
ODN6	
ODN7	
ODN8	



TYPE RDB

CUST 00
 ROUT 10
 DES SIP TRK
 TKTP TIE
 M911P NO
 ESN NO
 CNVT NO
 SAT NO
 RCLS EXT
 VTRK YES
 ZONE 002
 PCID SIP
 CRID NO
 NODE 200
 DTRK NO
 ISDN YES
 MODE ISLD
 DCH 16
 IFC SL1
 PNI 00001
 NCNA YES
 NCRD YES
 TRO YES
 FALT NO
 CTYP CDP
 INAC YES
 ISAR NO
 DAPC YES
 TBL 1
 MBXR NO
 PTYP ATT
 AUTO NO
 DNIS NO
 DCDR NO
 ICOG IAO
 SRCH LIN
 TRMB YES
 STEP
 ACOD 4000
 TCPP NO
 TARG 01
 CLEN 10
 BILN NO
 OABS
 INST
 ANTK

SIGO STD
 STYP SDAT
 ICIS YES
 TIMR ICF 512
 OGF 512
 EOD 13952
 DSI 34944
 NRD 10112
 DDL 70
 ODT 4096
 RGV 640
 GRD 896
 SFB 3
 NBS 2048
 NBL 4096
 IENB 5
 TFD 0
 VSS 0
 VGD 6
 SST 5 0
 NEDC ORG
 FEDC ORG
 CPDC NO
 DLTN NO
 HOLD 02 02 40
 SEIZ 02 02
 SVFL 02 02
 DRNG NO
 CDR NO
 VRAT NO
 MUS NO
 MANO NO
 OHQ NO
 OHQT 00
 CBQ NO
 AUTH NO
 TDET NO
 TTBL 1 Points to the new FTC table
 for German tones.
 ATAN NO
 OHTD NO
 PLEV 2
 ALRM NO
 ART 0
 SGRP 0
 ARDN NO
 AACR NO



Release 6.0

An EMEA system was programmed and tested as installed in Germany. The DEP list and additional patches were the same as North American system. The main difference is using the different tones and cadences and the dial plan for country codes and international dialing.

TYPE CDB	ICI 01
CUST 00	ICI 02
AML_DATA	ICI 03
OPT DNX	ICI 04
VSID	ICI 05
GP02	ICI 06
GP03	ICI 07
GP04	ICI 08
GP05	ICI 09
GP06	RICI
GP07	AWU_DATA
GP08	AWU NO
GP09	CAS_DATA
GP10	CAS NO
GP11	CCS_DATA
GP12	CCRS UNR
GP13	ECC1 UNR
GP14	ECC2 UNR
GP15	CNCS 0
ANI_DATA	PELK NO
ANAT 123	CDR_DATA
ANLD 1234	CDR NO
M911_PANI NO	CHLN 1
ATT_DATA	FCAF NO
OPT AHD BIND BIXA BLA	FCR_DATA
DNX IC1 XTG IDP XLF XBL	NFCR NO
FKA MWUD LOD	IDCA NO
REA SYD ATDA	FFC_DATA
ATDN 0	CCRS UNR
NCOS 0	SCPL
CWUP NO	FFCS NO
CWCL 0 0	STRL 0
CWTM 0 0	STRG
CWBZ NO NO	ADLD 0
EFLL 0	MFAC *
MATT NO	FTR_DATA
RTIM 30 30 30	**DAPC**PREFIX TABLE NO: 00 **
ATIM 0	
AQTT 30	UNKN**INTL**NATL**ESPN**LOCL**ELOC**
AODN	ECDP**
SPVC 00	UNKN*
SBLF NO	E164* 00 0
RTSA RSAD	PRIV*
SACP NO	E163* 00 0
ABDN NO	TELX*
IRFR NO	X121*
XRFR NO	NATL*
IDBZ NO	
PBUZ 02 10	**DAPC**PREFIX TABLE NO: 01 **
ICI 00	

UNKN**INTL**NATL**ESPN**LOCL**ELOC**
ECDP**

UNKN*

E164* 900

90

This is to use the callers list and
redial the number without having to
modify the list.

PRIV*

E163*

TELX*

X121*

NATL*

OPT AHD BIND BIXA BLA CFO CFRA
COX CPA CTD DBD DNX DSX
HTU HVD XBL IC1 IDP XLF
IHD XTG FKA LOD LRA MCI
MWUD PVCD REA RND
RTR RTD ROX SBD SYD
TTAD VOBA CWRD HLPD HRLD
CXOD

DGRP 0

IRNG NO

PKND 1

DNDL NO

SPRE 2

PREO 0

BPSS NO

SRCD 1234

EEST NO

EESD NO

TTBL 1

MUS NO

ALDN

RECD NO

PORT 0

STCB NO

NSCP NO

MCDC NO

NAUT NO

IDEF NO

MTAR NO

LEND NO

MSCD NO

CPCI NO

CONF_DSP

CNFFIELD NO

CNF_NAME CONF

INTFIELD NO

INT_NAME I

EXTFIELD NO

EXT_NAME E

BSFE NO

ASPCT 000

FXS NO

DFLT_LANG GER

STS_MSG

MSG01 Nachricht hinterlassen

MSG02 Wieder erreichbar um:

MSG03 In einer Besprechung

MSG04 In Konferenzgesprch

MSG05 In der Mittagspause

MSG06 Besetzt, rufen Sie

MSG07 Heute nicht im Bro

MSG08 Auf Geschäftsreise

MSG09 Projekt-Termin heute

MSG10 Rufe zurück nach

VO_ALO NO

PCA OFF

TPDN

BFS_CFW YES

VO_CUR_ZONE_ZDM NO

VO_CUR_ZONE_TD NO

IMS_DATA

IMS NO

INT_DATA

ACCD OVF OVF OVF ATN

CTVN OVF OVF OVF ATN

MBNR OVF OVF OVF ATN

CTRC OVF NAP OVF NAP

CLDN NAP OVF NAP NAP

NINV OVF OVF OVF ATN

NITR OVF OVF OVF ATN

NRES OVF OVF OVF ATN

NBLK OVF OVF OVF ATN

RCLN ATN OVF ATN ATN

CONG OVF

LLT OVF

DNDT BSY

ESAM OVF

LDN_DATA

OPT XLDN

DLDN NO

LDN0 5541111

LDN1

LDN2

LDN3

LDN4

LDN5

ICI 00

ICI 01

ICI 02

ICI 03

ICI 04

ICI 05

ICI 06

ICI 07

ICI 08

ICI 09

MON_DATA

USBM NO

MPO_DATA

FMOP

RGNA STD STD

AOCs DIS DIS

RCY1 06

RCY2 04

RALL NO

CDTO 14

IFLS NO

MHLD NO

PCDS

CNFD 1	HDTM 30
TGLD 2	RDR_DATA
DISD 3	OPT CFO CFRA PVCD CWRD MCI
CCDO NO	FNAD HNT
AFCO NO	FNAT HNT
ACNS NO	FNAL HNT
NET_DATA	CFTA NO
OPT RTD	CCFWDN
AC1 INTL NPA SPN NXX LOC	CFN0 4
AC2	CFN1 4
FNP YES	CFN2 4
ISDN YES	DFN0 4
VPNI 1	DFN1 4
PNI 1	DFN2 4
PINK_DN	DNDH NO
MBG 0	MDID NO
BSGC 65535	NDID NO
PFX1	MWFB NO
PFX2	TRCL 0
HLOC	CRT0 00 00 00 00
LSC	CRT1 00 00 00 00
RCNT 5	CRT2 00 00 00 00
PSTN NO	CRT3 00 00 00 00
TNDM 15	DAY0
PCMC 15	DAY1
SATD 1	DAY2
OCLI NO	DAY3
DITI NO	HOLIDAY0
TRNX NO	HOLIDAY1
EXTT NO	HOLIDAY2
FTOP FTLY	HOLIDAY3
VNR NO	ROA_DATA
NIT 8	OPT ROX
NAS_ATCL YES	RICI
NAS_ACTV NO	TIM_DATA
FOPT 6	FLSH 45
CNTC	PHDT 30
NATC	DIND 30
INTC	DIDT 14
NIT_DATA	LDTT 6
NIT1	BOTO 14
TIM1	DBRC 60
NIT2	RTIM 30 30 30
TIM2	ATIM 0
NIT3	AQTT 30
TIM3	ADLD 0
NIT4	NFNA 0
TIM4	HWTT 300
ENS NO	NIT 8
OAS_DATA	FOPT 6
ODN0	TST_DATA
ODN1	
ODN2	
ODN3	
ODN4	
ODN5	TYPE RDB
ODN6	CUST 00
ODN7	ROUT 10
ODN8	DES SIP TRK
ODN9	TKTP TIE
ASTM 30	M911P NO
HDOPT 0	ESN NO

CNVT NO	TIMR ICF 512
SAT NO	OGF 512
RCLS EXT	EOD 13952
VTRK YES	DSI 34944
ZONE 002	NRD 10112
PCID SIP	DDL 70
CRID NO	ODT 4096
NODE 200	RGV 640
DTRK NO	GRD 896
ISDN YES	SFB 3
MODE ISLD	NBS 2048
DCH 16	NBL 4096
IFC SL1	IENB 5
PNI 00001	TFD 0
NCNA YES	VSS 0
NCRD YES	VGD 6
TRO YES	SST 5 0
FALT NO	NEDC ORG
CTYP CDP	FEDC ORG
INAC YES	CPDC NO
ISAR NO	DLTN NO
DAPC YES	HOLD 02 02 40
TBL 1	SEIZ 02 02
	SVFL 02 02
	DRNG NO
	CDR NO
	VRAT NO
	MUS NO
	MANO NO
	OHQ NO
	OHQT 00
	CBQ NO
	AUTH NO
	TDET NO
	TTBL 1 Points to the new FTC table for German tones.
	ATAN NO
	OHTD NO
	PLEV 2
	ALRM NO
	ART 0
	SGRP 0
	ARDN NO
	AACR NO
MBXR NO	
PTYP ATT	
AUTO NO	
DNIS NO	
DCDR NO	
ICOG IAO	
SRCH LIN	
TRMB YES	
STEP	
ACOD 4000	
TCPP NO	
TARG 01	
CLEN 10	
BILN NO	
OABS	
INST	
ANTK	
SIGO STD	
STYP SDAT	
ICIS YES	

This points to the prefix table in the CDB for redial feature.



Appendix B - Addition of a Second CPE device (SIP GW Redundancy)

Introduction and Scope

This document provides an overview of testing between a Nortel CS1000E Customer Premise Equipment (CPE) system and the SIP Broadsoft Network to demonstrate failover capabilities. Calls signaled via the “Leader” CPE signaling device in the normal mode. In a failover mode, call processing was accomplished via the “Follower” CPE signaling device. Additionally, IP phones were programmed to register and load share with the Leader and re-register after seven seconds with the Follower in the failover mode. The supported configurations support exactly two non-registering CPE devices, where each CPE device is assigned a unique IP address. This configuration requires all lines to be served by either of the two CPE devices.

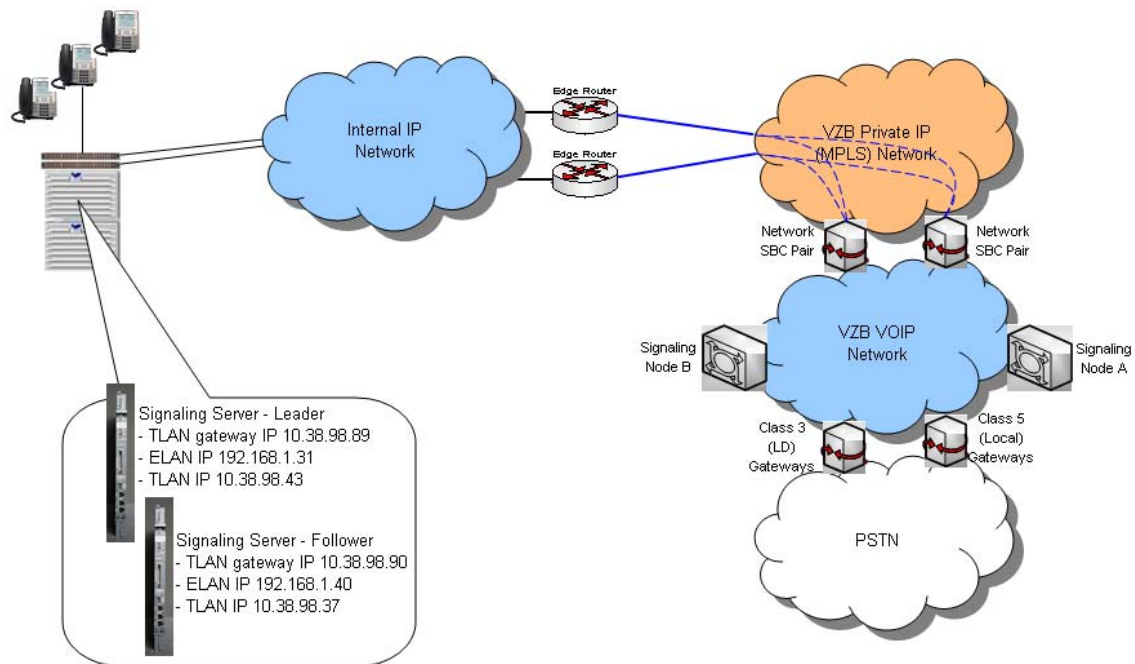
Application level configuration

To perform the desired tests, the Nortel CS1000E lab system was configured with an additional Signaling Server (SS). The additional SS consisted of a CPPM (Call Processor Pentium Mobile) equipped with a hard drive. This unit was installed within the existing Media Gateway and involved additional programming and connectivity to the system ELAN and TLAN. The Nortel practice defining the process to add the additional SS is NN43001-312.

The new equipment part is:

- | | | |
|---|----------|---|
| 1 | NTHU62AA | CPPM Signaling Server with Hard Drive Kit |
|---|----------|---|

The following figure depicts an outline of the lab test configuration:



Programming of the additional SS was accomplished via the system Element Manager. Screen shots of the key program elements for the “Leader and “Follower” SS are displayed in the following figures:

Release 5.x

Element Manager - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://192.168.1.31/cgi/pwd.cgi>

Nortel CS 1000 ELEMENT MANAGER Help Logout

- Signaling Server 192.168.1.31 Properties Remove

Role **Leader**

Type **ISP1100**

Embedded LAN (ELAN) IP address 192.168.1.31

Embedded LAN (ELAN) MAC address 00:0e:0c:b2:95:ea

Telephony LAN (TLAN) IP address 10.38.98.43

Telephony LAN (TLAN) gateway IP address 10.38.98.89

Hostname 1201Lab

H323 ID aeiebas1.gsisv.com

Enable Line TPS ☒

Enable IP Peer Gateway (Virtual Trunk TPS) SIP only

If Telephony LAN(TLAN) IP address and Telephony LAN(TLAN) gateway IP address are not in the same subnet as Telephony LAN(TLAN) Node IP address when Line TPS or IP Peer Gateway is enabled, then the TPS and/or VTRK applications will not run.

Enable SIP Proxy / Redirect Server ☒

Local SIP TCP/UDP Port to Listen to 5060

SIP Domain name cs1k.iptrunksit1.gsisv.com

SIP Gateway Endpoint Name cs1k.gsisv.com

SIP Gateway Authentication Password

Done Internet

start Element Manager - Mi...

4:05 PM

Element Manager - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://192.168.1.31/cgi/pwd.cgi>

Nortel CS 1000 ELEMENT MANAGER Help Logout

- Home
- Links
 - Virtual Terminals
 - Bookmarks
- 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
 - QoS Thresholds
 - Personal Directories
 - + Interfaces
 - + Engineered Values
 - + Emergency Services
 - + Software
- Customers
 - Routes and Trunks
 - Routes and Trunks
 - D-Channels
 - Digital Trunk Interface
- Dialing and Numbering Plans
 - Electronic Switched Network
 - Network Routing Service
 - Flexible Code Restriction
 - Incoming Digit Translation

- Signaling Server 192.168.1.40 Properties Remove

Role: Follower
Type: CPPM

Embedded LAN (ELAN) IP address: 192.168.1.40

Embedded LAN (ELAN) MAC address: 00:1b:ba:fd:30:fa

Telephony LAN (TLAN) IP address: 10.38.98.37

Telephony LAN (TLAN) gateway IP address: 10.38.98.89

Hostname: SIPCPE2

H323 ID:

Enable Line TPS: ☒

Enable IP Peer Gateway (Virtual Trunk TPS): SIP only

If Telephony LAN(TLAN) IP address and Telephony LAN(TLAN) gateway IP address are not in the same subnet as Telephony LAN(TLAN) Node IP address when Line TPS or IP Peer Gateway is enabled, then the TPS and/or VTRK applications will not run.

Local SIP TCP/UDP Port to Listen to: 5060

SIP Domain name: cs1k.iptrunksit1.gsiv.com

SIP Gateway Endpoint Name: cs1k.gsiv.com

SIP Gateway Authentication Password: •••••

Save and Transfer Cancel

Done Internet

start Element Manager - Mi... 2CPE_VzB.doc - Micro... 4:05 PM

Release 6.0

Element Manager - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address https://172.16.3.37/emWeb_6_0/SECURE_OBJECT_ID/com.nortel.ems.CS1000/937991d3-ac5c-11de-8e6a-5792863737a7/ElementManagerLaunchServlet.secure

Google Search

NORTEL CS 1000 ELEMENT MANAGER Help | Logout

Managing: 192.168.1.39 Username: donz
System > IP Network > IP Telephony Nodes

Node Details (ID: 1001 - LTPS, PD, Gateway (SIPGw))

Node ID: 1001 * (0-9999)

Call Server IP Address: 192.168.1.39 *

Telephony LAN (TLAN)

Node IP Address: 172.16.3.37 *

Subnet Mask: 255.255.255.0 *

Embedded LAN (ELAN)

Gateway IP address: 192.168.1.39 *

Subnet Mask: 255.255.255.0 *

IP Telephony Node Properties

- Voice Gateway (VGW) and Codecs
- Quality of Service (QoS)
- LAN

Applications (click to edit configuration)

- SIP Line
- Terminal Proxy Server (TPS)
- Gateway (SIPGw)

* Required Value. [Save] [Cancel]

Associated Signaling Servers & Cards

Select to add [Add] [Remove] [Make Leader] [Print] [Refresh]

Hostname	Type	Deployed Applications	ELAN IP	TLAN IP	Role
<input type="checkbox"/> nasipcots	Signaling Server	LTPS, Gateway, PD	192.168.1.31	172.16.3.37	Leader
<input type="checkbox"/> nasipcprm	Signaling Server	LTPS, Gateway, PD	192.168.1.40	172.16.3.39	Follower

Note: Only server(s) that are not part of any other IP telephony node and deployed application(s) that match the service(s) selected for this node are

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Done

start

Inbox - Microsoft Out... Element Manager - M... Document3 - Microsof...

Internet

9:10 AM
Monday
11/30/2009

Appendix C – T.38 Fax Support

The CS1000 supports T.38 as well as Modem Pass-through (G.711) fax transmission. Previous certification activities with the Verizon SIP network (which did not support T.38 protocol) resulted in the CS1000 configuration being set to have T.38 disabled.

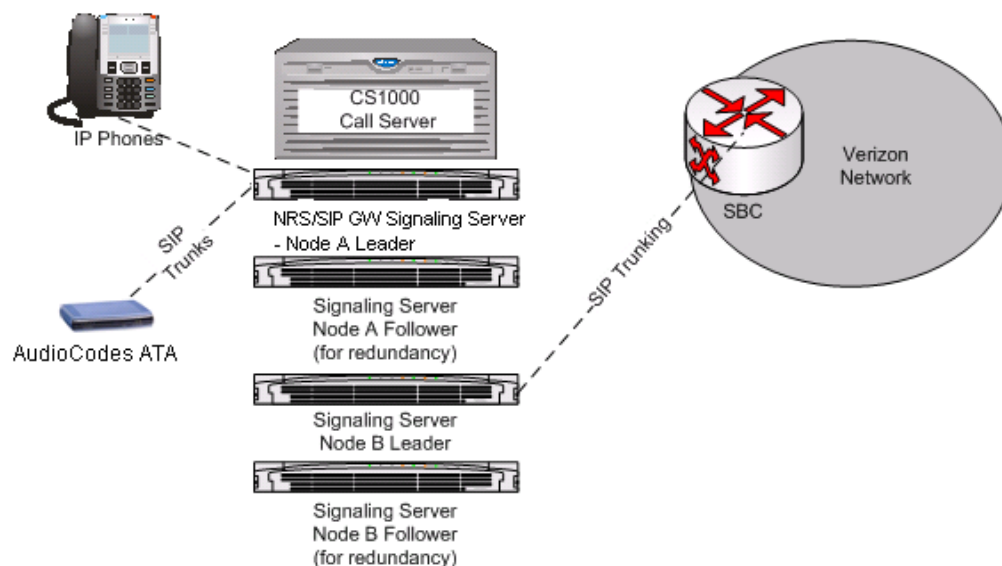
During Q2 2011 Verizon will be introducing T.38 support in the network. During this transition there will be times where one fax call can use T.38 while a call to a different destination will not.

CS1000 R5.5

CS1000 R5.5 systems that utilize fax over Verizon SIP Trunks will not be able to support T.38 operation natively, but T.38 can be supported by moving the fax lines from the CS1000 to an Analog Terminal Adaptor (ATA) device that supports mixed G.711/T.38 operation.

The AudioCodes MP-11X SIP ATA devices are Developer Connect tested against the CS1000 R5.5 release. Further testing in the Verizon lab has confirmed that the mixed G.711/T.38 call flows required are achievable. Please contact AudioCodes for MP-11X configuration details.

The testing performed in the Verizon lab occurred using the following IP Peering networking configuration:



In the diagram above, Node A has both NRS as well as SIP GW applications installed. The AudioCodes ATA registers to the NRS. The NRS routing configuration passes all inbound and outbound fax calls through the CS1000 in a tandem fashion. The NRS configuration is standard IP Peer configuration. For example, an established fax call would have the following signalling path:

AudioCodes----Node A(NRS/SIPGW)----CallServer---- Node B(SIPGW)----SBC(VerizonNetwork)

The audio path, either T.38 or G.711 would be directly from the AudioCodes to the SBC.

Node A is a standard IP Peer configuration with standard DEPLIST software. Node B is a dedicated GW for Verizon SIP trunking only and is patched as outlined earlier in this document.



CS1000 R6.0

The following information is provided to explain the recommended CS1000 R6.0 configuration and technical details.

NOTE: The CS1000 SIP GW dedicated for Verizon SIP Trunking must be at the correct software and patch levels to support T.38 – please see the System Software details earlier in this document.

Configuration Options that affect faxing on the CS1000

When a call is originated or terminated on an analog TN on the CS1000 the initial codec selected is determined by the **Modem Pass Through Allow (MPTA)** or **Disallow (MPTD)** configuration.

The use of MPTA will force the initial connection to be G711.

A setting of MPTD will result in the Zone/Band Width Management settings being consulted to determine the codec used.

The V.21 Tone Detection setting is used to detect the presence of Fax Tones in the audio stream. If the CS1000 is the terminating device and V.21 Tone Detection is Enabled, a reinvite will be sent to switch to T.38 when tones are detected.

If the V.21 Tone Detection is Disabled, the CS1000 will not request a change to T.38

Recommended CS1000 R6.0 Fax Support Configuration

- At the Media Gateway Card (MGC) level, Mode Pass Through (MPT) and V.21 Tone Detection are both **Enabled**
- At the Node level, Mode Pass Through (MPT) and V.21 Tone Detection are both **Enabled**.
- At the CS1000 analog fax TN a Class of Service **MPTD** and **FAXA** is used.

When faxing to the public network, you may be calling a V.34 capable fax machine (modern) or a non capable machine (older). To ensure the most flexible options in signalling, use the MPTD class of service on the Fax TN so that T.38 can be used when Modem Pass through cannot be supported by the far end fax machine.

The information on the following page describes the various fax scenarios that could be experienced on the Verizon Network as T.38 support is rolled out.

The examples contain situations where the CS1000 T.38 support is **disabled as a reference only**. For flexibility and reliability use the configuration noted above.



CS1000 Calls Verizon Network

CS1000 T.38 Disabled / Network T.38 Not Available

If initial codec negotiated was G.729 the Network will re-invite to G.711 upon detection of Fax Tones. CS1000 will accept re-invite to G.711. Fax should complete successfully using G.711.

CS1000 T.38 Disabled / Network T.38 Available

The Network will re-invite to T.38 upon detection of V.21 tones. The CS1000 will respond with a 488 message. If initial codec negotiated was G.729 Network will re-invite to G.711 upon receipt of a 488 message. CS1000 will accept a re-invite to G.711. Fax should complete successfully using G.711.

CS1000 T.38 Enabled / Network T.38 Not Available

Fax should complete successfully using G.711.

CS1000 T.38 Enabled / Network T.38 Available

The Network will re-invite to T.38 upon detection of V.21 Tones. Fax should complete successfully using T.38.

Verizon Network Calls CS1000

CS1000 T.38 Disabled / Network T.38 Not Available

Fax should complete successfully using G.711.

CS1000 T.38 Disabled / Network T.38 Available

The Network will re-invite to T.38 upon detection of V.21 Tones. CS1000 will respond with a 488 message. If initial codec negotiated was G.729 Network will re-invite to G.711 upon receipt of a 488 message. CS1000 will accept re-invite to G.711. Fax should complete successfully using G.711.

CS1000 T.38 Enabled / Network T.38 Not Available

CS1000 will re-invite to T.38 upon detection of V.21 Tones. Network will respond with a 488 message. If initial codec negotiated was G.729 CS1000 will re-invite to G.711 upon receipt of a 488 message. Fax should complete successfully using G.711.

CS1000 T.38 Enabled / Network T.38 Available

CS1000 will re-invite to T.38 upon detection of V.21 Tones. Fax should complete successfully using T.38.



*******END*******

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