



# Cisco AS5300 Gateway-PBX Interoperability: Nortel Option 11C with E1 PRI QSIG Signaling

This document describes the interoperability and configuration of a Cisco AS5300 voice gateway with a Nortel Option 11C PBX using E1 QSIG signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

## System Components

<b>PBX Model</b>	Nortel Option 11C
<b>PBX Release</b>	Version 2111 Release 24 Issue 24
<b>Telephony Signaling</b>	E1 QSIG
<b>Voice Gateway</b>	Cisco AS5300
<b>Gateway Release</b>	Cisco IOS™ Version 12.2.1
<b>VoX Protocol</b>	H.323

## Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Nortel Option 11C PBX Configuration
- Cisco AS5300 Gateway Configuration

# Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

## Connectivity Diagrams

**Figure 1: Test Configuration**

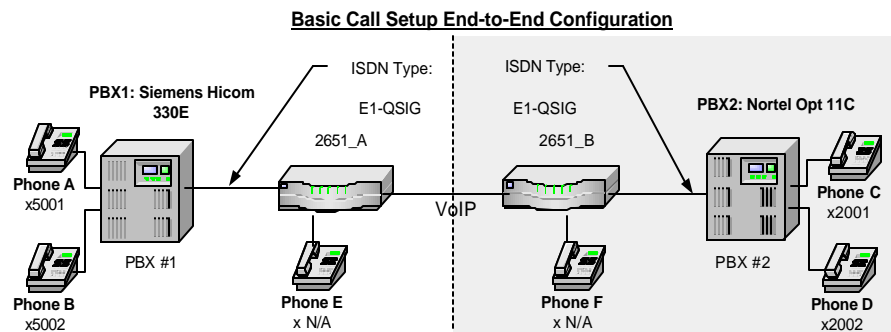


Figure 1 represents the configuration used for testing: a Nortel Option 11C PBX connected to a Cisco AS5300 voice gateway via an E1 QSIG connection.

## Set Up Notes

- The Cisco AS5300 gateway with ISDN switch type setting of **primary-qsig** supports both protocol sides by using the “isdn protocol-emulate network/user” command.
- The Nortel allows QSIG channel coding for QSIG types ESGF and ISGF. This allows the capability to configure the mapping between the channel number field in the Channel Identification Information Element (IE) and the timeslot number for timeslots 17 to 31 on the Nortel. This is set at the QCHID prompt under LD 17.
- The Nortel Meridian Option 11C, when set to ESIG, ISIG, ESGF or ISGF, supports both “USER” and “NETWORK” protocol sides. This USER/NETWORK choice is set on the Nortel by using LD 17.

# Nortel Option 11C PBX Configuration

## Nortel Option 11C PBX Sample Configuration

See the following sections for sample configuration information:

- System Configuration
- Route Data Block Configuration
- Trunk Configuration
- Digital Station Configuration
- Software Packages Installed (Release 24)

### System Configuration

```
ld 22PT2000
MARP NOT ACTIVATED
```

```
REQ prt
TYPE cfn
ADAN HIST
  SIZE 5000
  USER MTC SCH BUG
ADAN TTY 0
  TTY_TYPE SDI
  CAB 00
  CARD 00
  PORT 0
  DES
  FLOW NO
  USER MTC SCH BUG
  TTYLOG 0
  BANR YES
ADAN TTY 1
  TTY_TYPE SDI
  CAB 00
  CARD 00
  PORT 1
  DES
  BPS 9600
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER MTC SCH BUG
  TTYLOG 0
  BANR YES
ADAN TTY 2
  TTY_TYPE SDI
  CAB 00
  CARD 00
  PORT 2
  DES
  BPS 9600
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER MTC SCH BUG
  TTYLOG 0
  BANR YES
ADAN DCH 3
  CTYP MSDL
  CARD 03
  PORT 1
```

```
DES  ESIG2_USR_TIE
USR  PRI
DCHL 3
OTBF 32
PARM RS422  DTE
DRAT 64KC
CLOK EXT
IFC  ESIG
    ISDN_MCNT 300
CLID OPT0
CO_TYPE STD
SIDE USR
CNEG 1
RLS  ID  22
RCAP COLP
```

PAGE 001

```
MBGA NO
OVLN NO
OVLN NO
T310 120
T200 3
T203 10
N200 3
N201 260
K    7
ADAN    DCH 4
CTYP MSDL
CARD 04
PORT 1
DES  ESIG2_NET_TIE
USR  PRI
DCHL 4
OTBF 32
PARM RS422  DTE
DRAT 64KC
CLOK EXT
IFC  ESIG
    ISDN_MCNT 300
CLID OPT0
CO_TYPE STD
SIDE NET
CNEG 1
RLS  ID  22
RCAP COLP
MBGA NO
OVLN NO
OVLN NO
T310 120
T200 3
T203 10
N200 3
N201 260
K    7
ADAN    DCH 5
CTYP MSDL
CARD 05
PORT 1
DES  esgf(user)
USR  PRI
DCHL 5
OTBF 32
PARM RS422  DTE
DRAT 64KC
CLOK EXT
IFC  ESGF
    PINK_CUST 0
    ISDN_MCNT 300
CLID OPT0
```

CO\_TYPE STD  
SIDE USR  
CNEG 1  
RLS ID \*\*  
QCHID YES  
RCAP COLP NDO  
MBGA NO  
OVLN NO  
OVLS NO

PAGE 002

T310 120  
T200 3  
T203 10  
N200 3  
N201 260  
K 7  
ADAN DCH 6  
CTYP MSDL  
CARD 06  
PORT 1  
DES ESGF2\_NET\_TIE  
USR PRI  
DCHL 6  
OTBF 32  
PARM RS422 DTE  
DRAT 64KC  
CLOK EXT  
IFC ESGF  
PINK\_CUST 0  
ISDN\_MCNT 300  
CLID OPT0  
CO\_TYPE STD  
SIDE NET  
CNEG 1  
RLS ID 22  
QCHID YES  
RCAP COLP  
MBGA NO  
OVLN NO  
OVLS NO  
T310 120  
T200 3  
T203 10  
N200 3  
N201 260  
K 7  
PARM  
LPIB 192  
HPIB 32  
500B 16  
NCR 200  
MGCR NULL  
CFWS NO  
PCML MU  
ALRM YES  
ERRM ERR BUG AUD  
DTRB 100  
TMRK 128  
FCDR OLD  
PCDR NO  
TPO NO  
TSO NO  
CLID NO  
DUR5 NO  
MLDN YES  
MARF NO  
FRPT NEFR  
DCUS NULL

MSCL 255  
PMSI  
MANU PMS1

PAGE 003

PMCR 20  
PORT NONE  
NDIS 20  
OCAC NO  
MTRO MR  
SBA\_ADM\_INS 001  
SBA\_USER 010  
BCAP SPEECH  
NORTEL\_BRAND NO  
CEQU  
MPED 8D  
SUPL 000 004 008 012  
016 032 036 040  
044 048 064 068  
072  
XCT 000  
CONF 029 030 031 062  
094 095  
PRI2 03 04 05 06  
07 08  
DTI2  
MISP  
OVLY  
SID 0  
BKGD 044  
PBXH 01  
TODR 01  
DROL 030 034 038 044 135  
MULTI\_USER OFF  
ATRNR  
CODE 0  
SOLR 12  
ROLR +45.00  
AOLR +45.00  
TOLR -45.00  
AGCD NO  
VOLR NO  
HRLR +42.00  
HTLR -44.00  
REQ \*\*\*\*  
>  
OVL000

### Route Data Block Configuration

>ld 21PT1000  
REQ: prt  
TYPE: rdb  
CUST 0  
ROUT 105  
TYPE RDB  
CUST 00  
DMOD  
ROUT 105  
DES ESGF(USER)  
TKTP TIE  
ESN NO  
CNVT NO  
SAT NO  
RCLS EXT  
DTRK YES  
BRIP NO

```
DGTP PRI2
ISDN YES
  MODE PRA
  IFC ESGF
  SBN NO
  PNI 00001
  NCNA NO
  NCRD NO
  CTYP UKWN
  INAC NO
  ISAR NO
  CPFXS YES
  DAPC NO
  INTC NO
DSEL VOD
PTYP DTT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH RRB
TRMB YES
STEP
ACOD 705
TCPP NO
TARG 01
CLEN 1
BILN NO
OABS
INST
ANTK
SIGO STD
ICIS YES
TIMR ICF 512
      OGF 512
      EOD 13952
      NRD 10112
      DDL 70
      ODT 4096
      RGV 640
      GRD 896
      SFB 3
      NBS 2048
      NBL 4096
      TFD 0
DRNG NO
CDR NO
MUS NO
OHQ NO
OHQT 00
CBQ NO
```

PAGE 002

```
AUTH NO
TTBL 0
PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO
```

```
REQ: ****
>
OVL000
```

### Trunk Configuration

```
>ld 20
PT0000
MARF NOT ACTIVATED
```

REQ: prt  
TYPE: tnb  
TN 5 1

DATE PAGE DES  
TN 005 01  
TYPE TIE  
CDEN SD  
CUST 0  
TRK PRI2  
PDCA 1  
PCML A  
NCOS 0  
RTMB 105 1  
B-CHANNEL SIGNALING  
TGAR 1  
AST NO  
IAPG 0  
CLS UNR DTN CND WTA LPR APN THFD  
P10 VNL  
TKID  
DATE 22 APR 2001

NACT \*\*\*\*  
>  
OVL000

**Digital Station Configuration**

>ld 11SL1000  
MARP NOT ACTIVATED

MEM AVAIL: (U/P): 1337098      USED U P: 105713 31748      TOT: 1474559  
DISK RECS AVAIL: 477  
TNS      AVAIL:    55      USED:    145      TOT:    200  
ACD AGENTS AVAIL:    300      USED:    0      TOT:    300  
AST      AVAIL:    100      USED:    0      TOT:    100  
DIGITAL TELEPHONES AVAIL: 2498      USED:    2      TOT:    2500

REQ: prt  
TYPE: 2616

MARP NOT ACTIVATED

TN 001 0 00 00  
DATE PAGE DES  
DES TEST1  
TN 001 0 00 00  
TYPE 2616  
CDEN 8D  
CUST 0  
AOM 0  
FDN  
TGAR 0  
LDN NO  
NCOS 0  
SGRP 0  
RNPG 0  
SCI 0  
SSU  
LNRS 16  
XLST  
CLS CTD FBD WTA LPR MTD FND HTD ADD HFA  
MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1  
POD DSX VMD CMSD CCSD SWD LNA CNDA  
CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBF  
ICDD CDMD LLCN MCTD CLBD AUTU  
GPUD DPUD DNDA CFXA ARHD CLTD ASCD  
CPFA CPTA ABDD CFHD FICD NAID BUZZ AHD  
DDGA NAMA  
DRDD EXR0



```
      USMD USRD ULAD RTDD RBDD RBHD PGND FLXD FTTC DNDY DNO3
CPND_LANG ENG
HUNT
PLEV 02
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 2001 0      MARP
      CPND
        NAME Nortel Testphone 1
        XPLN 27
        DISPLAY_FMT FIRST, LAST
01 SCR 2010 0      MARP
      CPND
        NAME Nortel Testphone 1B
        XPLN 27
        DISPLAY_FMT FIRST, LAST
02
03 CFW 12 5002
04 AO6
05 TRN
06 DSP
07
08 ADL 16
09 ADL 16
10 ADL 16
11 ADL 16
12 ADL 16
13 ADL 16
14 ADL 16
15
DATE 20 APR 2001
```

```
NACT ****
>
```

```
OVL000
```

**Software Packages Installed (Release 24)**

```
>ld 22PT2000
MARP NOT ACTIVATED
```

```
REQ prt
TYPE pkg
OPTF 1
CUST 2
CDR 4
CTY 5
RAN 7
TAD 8
DNDI 9
EES 10
INTR 11
ANI 12
ANIR 13
BRTE 14
DNDG 16
MSB 17
SS25 18
DDSP 19
ODAS 20
DI 21
CHG 23
CAB 24
BAUT 25
CASM 26
CASR 27
```

BQUE	28
NTRF	29
NCOS	32
CPRK	33
SSC	34
IMS	35
UST	35
UMG	35
ROA	36
NSIG	37
MCBQ	38
NSC	39
BACD	40
ACDB	41
ACDC	42
LMAN	43
MUS	44
ACDA	45
MWC	46
AAB	47
GRP	48
NFCR	49
ACDD	50
LNK	51
FCA	52
SR	53
AA	54
HIST	55
AOP	56
BARS	57
NARS	58
CDP	59
PQUE	60
FCBQ	61
OHQ	62
NAUT	63
SNR	64

PAGE 001

NXFR	67
HOT	70
DHLD	71
LSEL	72
SS5	73
DRNG	74
PBXI	75
DLDN	76
CSL	77
OOD	79
SCI	80
CCOS	81
CDRQ	83
TENS	86
FTDS	87
DSET	88
TSET	89
LNR	90
DLT2	91
PXLT	92
SUPV	93
CPND	95
DNIS	98
BGD	99
RMS	100
MR	101
AWU	102
PMSI	103
LLC	105
MCT	107

ICDR	108
APL	109
TVS	110
TOF	111
IDC	113
AUXS	114
DCP	115
PAGT	116
CBC	117
CCDR	118
EMUS	119
SCMP	121
FTC	125
BKI	127
DTI2	129
TBAR	132
ENS	133
FFC	139
DCON	140
MPO	141
ISDN	145
PRA	146
ISL	147
NTWK	148
IEC	149
DNXP	150
CDRE	151
IAP3P	153
PRI2	154
ACNT	155
THF	157

PAGE 002

FGD	158
FNP	160
ISDN INTL SUP	161
SAR	162
LAPW	164
GPRI	167
ARIE	170
CPGS	172
ECCS	173
AAA	174
NMS	175
EOVF	178
HVS	179
DKS	180
SACP	181
OVLP	184
EDRG	185
POVR	186
SECL	191
ORC-RVQ	192
AINS	200
IPRA	202
XPE	203
XCT0	204
XCT1	205
MLWU	206
NACD	207
HSE	208
MLM	209
MAID	210
VAWU	212
EAR	214
ECT	215
BRI	216
IVR	218
MWI	219

MSDL 222  
FC68 223  
M911 224  
CWNT 225  
SSAU 229  
BRIT 233  
FCDR 234  
BRIL 235  
MCMO 240  
MULTI\_USER 242  
ALRM\_FILTER 243  
VMBA 246  
CALL ID 247  
DPNA 250  
SCDR 251  
ARFW 253  
PHTN 254  
ADMINSET 256  
ATX 258  
QSIG 263  
NI-2 291  
MAT 296  
MQA 297  
CPP 301  
QSIGGF 305

PAGE 003

CPRKNET 306  
PAGENET 307  
CPCI 310  
NGCC 311  
TATO 312  
OPEN ALARM 315  
QSIG-SS 316  
QTN 321  
NGEN 324  
RANBRD 327  
MUSBRD 328  
ESA 329  
ESA\_SUPP 330  
ESA\_CLMP 331  
CNUMB 332  
CNAME 333  
NI-2 CBC 334  
MEET 348  
MC32 350  
DBA 351  
FDID 362  
NMCE 364

REQ \*\*\*\*  
>  
OVL000  
>

## Cisco AS5300 Gateway Configuration

The following is the configuration of the Cisco AS5300 voice gateway connected to the Nortel Option 11C PBX E1 QSIG interface.

### Cisco AS5300 Voice Gateway Version Information

---

```
AS5300_B#sh ver
Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-JS-M), Version 12.2(1), RELEASE SOFTWARE (fc2)
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 27-Apr-01 00:59 by cmong
Image text-base: 0x60008958, data-base: 0x611DA000

ROM: System Bootstrap, Version 12.0(2)XD1, EARLY DEPLOYMENT RELEASE SOFTWARE (fc
1)

AS5300_B uptime is 3 hours, 12 minutes
System returned to ROM by reload
System image file is "flash:c5300-js-mz.122-1"

cisco AS5300 (R4K) processor (revision A.32) with 131072K/16384K bytes of memory
.
Processor board ID 13241546
R4700 CPU at 150Mhz, Implementation 33, Rev 1.0, 512KB L2 Cache
Channelized E1, Version 1.0.
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
Primary Rate ISDN software, Version 1.1.
Backplane revision 2
Manufacture Cookie Info:
  EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x30,
  Board Hardware Version 3.1, Item Number 800-2544-03,
  Board Revision D0, Serial Number 13241546,
  PLD/ISP Version 0.0, Manufacture Date 17-May-2000.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
35 Serial network interface(s)
4 Channelized E1/PRI port(s)
60 Voice resource(s)
128K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)
8192K bytes of processor board Boot flash (Read/Write)

Configuration register is 0x2102

AS5300_B#
```

### Cisco AS5300 Voice Gateway Controller Information

---

```
AS5300_B#sh controllers e1 0
E1 0 is up.
  Applique type is Channelized E1 - balanced
  No alarms detected.
  alarm-trigger is not set
  Version info of slot 0: HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
  EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x4B,
  Board Hardware Version 3.1, Item Number 800-3881-02,
  Board Revision B0, Serial Number 20744904,
  PLD/ISP Version 0.1, Manufacture Date 23-Jun-2000.
```

```
Framing is CRC4, Line Code is HDB3, Clock Source is Line Primary.
Data in current interval (107 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
AS5300_B#
```

---

### Cisco AS5300 Voice Gateway VCWare Information

---

```
AS5300_B#sh vfc 2 version veware
Voice Feature Card in Slot 2:
  VCware Version      : 7.16
  ROM Monitor Version: 1.3
  DSPware Version     : 3.4.271
  Technology          : C549
AS5300_B#
```

---

### Cisco AS5300 Voice Gateway DSPWare Information

---

```
AS5300_B#sh vfc 2 version dspware
Version of Dspware in VFC slot 2 is 3.4.271
AS5300_B#
```

---

### Cisco AS5300 Voice Gateway Sample Configuration

---

```
AS5300_B#sh conf
Using 2077 out of 124920 bytes
!
version 12.2
service config
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname AS5300_B
!
logging rate-limit console 10 except errors
enable secret 5 $1$/.SG$h05ycqcEN3shrrgYfUUo91
enable password lab
!
!
!
resource-pool disable
!
call rsvp-sync
ip subnet-zero
no ip finger
no ip domain-lookup
!
no ip dhcp-client network-discovery
isdn switch-type primary-qsig
!
!
!
!
!
fax interface-type vfc
mta receive maximum-recipients 0
!
!
controller E1 0
```

```
clock source line primary
pri-group timeslots 1-31
!
controller E1 1
clock source line secondary 1
!
controller E1 2
clock source line secondary 2
!
controller E1 3
clock source line secondary 3
!
!
interface Ethernet0
ip address 10.1.1.203 255.255.255.0
no cdp enable
!
interface Serial0
no ip address
shutdown
no fair-queue
clockrate 2015232
!
interface Serial1
no ip address
shutdown
no fair-queue
clockrate 2015232
no cdp enable
!
interface Serial2
no ip address
shutdown
no fair-queue
clockrate 2015232
no cdp enable
!
interface Serial3
no ip address
shutdown
no fair-queue
clockrate 2015232
no cdp enable
!
interface Serial0:15
no ip address
no logging event link-status
isdn switch-type primary-qsig
isdn protocol-emulate network
isdn incoming-voice modem
no isdn T309-enable
isdn T203 30000
isdn T310 60000
isdn bchan-number-order ascending
no cdp enable
!
interface FastEthernet0
ip address 1.1.1.2 255.255.255.0
duplex auto
speed auto
no cdp enable
!
router rip
network 1.0.0.0
!
ip kerberos source-interface any
ip classless
no ip http server
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
```

```
!  
!  
voice-port 0:D  
!  
dial-peer voice 2 voip  
  destination-pattern 5...  
  progress_ind setup enable 1  
  session target ipv4:1.1.1.1  
!  
dial-peer voice 1 pots  
  destination-pattern 2...  
  direct-inward-dial  
  port 0:D  
  prefix 2  
!  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
  transport input none  
line aux 0  
line vty 0 4  
  password lab  
  login  
!  
scheduler interval 1000  
end  
  
AS5300_B#
```

## Caveats

- Overlap Sending or Receiving is not supported on the Nortel Option 11C.