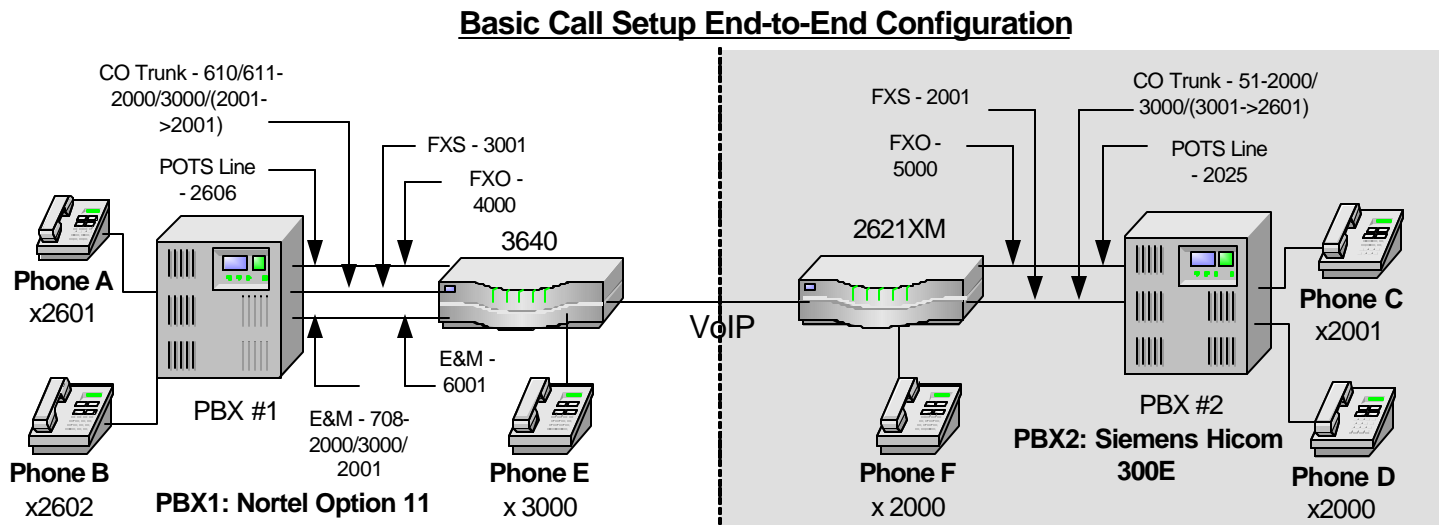


Cisco 3640 Gateway - PBX Interoperability: Nortel Option 11 PBX using Analog FXS/FXO/E&M Interfaces to an MGCP Gateway

Introduction

- This application note describes the interoperability of the Nortel Option 11 PBX with the Cisco 3640 gateway using analog FXS/FXO/E&M interface ports.
- The network topology diagram shows the end-to-end interoperability.

Network Topology





Limitations

- Ground-start signaling type is not supported on a Nortel Option 11 PBX POTS line.
- The FXO voice port goes off-hook on the first ring of an incoming seizure before the targeted phone has answered. The PBX analog extension does not support disconnect supervision, which causes trunk hang issues and long ring-no answer times.

For more information about disconnect supervision, refer to *FXO Answer and Disconnect Supervision* at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t2/ft_ansds.htm

System Components

Hardware Requirements

- Cisco 3640 gateway with analog VIC 2FXO, VIC 2FXS and VIC-2E/M interface cards
- Nortel Option 11 PBX

Software Requirements

- Cisco IOS Software Release c3640-is-mz.122-10.7.T6
- Nortel PBX software version:

```
*****
Nortel Software Release and Version number
*****
ld 22PT2000
MARP NOT ACTIVATED
REQ iss
VERSION 2111
RELEASE 24
ISSUE 24
```

Configuration

Configuring the Nortel Option 11 PBX

Nortel Switch Configuration

```
REQ prtTYPE parmPARM
LPIB 192
HPIB 32
500B 16
NCR 200
MGCR NULL
CFWS YES
PCML MU
ALRM YES
ERRM ERR BUG AUD
DTRB 50
TMRK 128
FCDR OLD
PCDR NO
TPO NO
TSO NO
```



CLID YES
DUR5 NO
MLDN YES
MARF NO
FRPT NEFR
DCUS NULL
MSCL 255
PMSI
 MANU PMS1
 PMCR 20
 PORT NONE
NDIS 20
OCAC NO
MTRO MR
SBA_ADM_INS 001
SBA_USER 010
BCAP SPEECH
NORTEL_BRAND NO

Nortel Common Equipment Configuration

REQ PRT
TYPE CEQU

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

DL0P NUM DCH FRM LCMT YALM T1TE TRSH
PRI 003 24 ESF B8S FDL - 00
 004 24 ESF B8S FDL - 00
 005 24 ESF B8S FDL - 00
PRI2 06 07
DTI2
MISP

Nortel Route Data Block for Loop Start CO Trunk

>ld 21

REQ: prtTYPE: rdbCUST 0ROUT 10
TYPE RDB
CUST 00
DMOD
ROUT 10
DES ANALOG_LOOP_COT
TKTP COT
PRIV NO
SAT NO
RCLS EXT
DTRK NO
ISDN NO
PTYP ACO



AUTO YES
ICOG IAO
RANX NO
SRCH RRB
TRMB YES
STEP
ACOD 610
CPP NO
TARG 01
CLEN 1
BILN NO
OABS
TIMR ICF 512
OGF 512
EOD 13952
DSI 34944
NRD 10112
DDL 70
ODT 4096
RGV 640
FLH 510
GRD 896
SFB 3
CRD 512
TFD 0
LEXT 100
SST 3 0
NEDC ETH
FEDC ORG
CPDC NO
SPCT IMM
HOLD 02 02 40
SEIZ 02 02
RGFL 02 02
RVSD 08 31
ILLR 02 02
DRNG NO
CDR NO
MUS NO
MR NO
MANO NO
EQAR NO
OHQ NO
OHQT 00
TTBL 0
OHTD NO
PLEV 2
MCTS NO
ALRM NO
ART 0
SGRP 0
AACR NO

Nortel Trunk Data Block for Loop Start CO Trunk

>OVL000
>ld 20
PT0000
MARF NOT ACTIVATED

REQ: prtTYPE: tnbTN 9 0 0 0DATE PAGE DES



TN 009 0 00 00
TYPE COT
CDEN 8D
CUST 0
XTRK XUT
TIMP 600
BIMP 600
TRK ANLG
NCOS 0
RTMB 10 1
ATDN 2601
SIGL LOP
SUPN NO
AST NO
IAPG 0
CLS UNR DTN CND WTA LPR APN THFD
P10 NTC LOL
TKID

DATE 31 OCT 2002

Nortel Analog Phone Configuration

>ld 10PBX000
MARP NOT ACTIVATED

MEM AVAIL: (U/P):	1272407	USED U P:	106347 95805	TOT:	1474559
DISK RECS AVAIL:	476				
TNS AVAIL:	47	USED:	153	TOT:	200
ACD AGENTS AVAIL:	300	USED:	0	TOT:	300
ANALOGUE TELEPHONES AVAIL:	2498	USED:	2	TOT:	2500
AST AVAIL:	100	USED:	0	TOT:	100
WIRELESS TELEPHONES AVAIL:	2500	USED:	0	TOT:	2500

REQ: prtTYPE: 500

MARP NOT ACTIVATED

TN 002 0 0 0DATE PAGE DES
DES TEST1
TN 002 0 00 00
TYPE 500
CDEN 4D
CUST 0
WRLS NO
DN 2606 0 MARP
AST NO
IAPG 0
HUNT
TGAR 0 LDN NO
NCOS 0
SGRP 0
RNPG 0
XLST
SCI 0
CLS CTD DTN FBD XFD WTA THFD FND HTD ONS
LPR XRD CWD SWD MWD RMMD SMWD LPD XHD CCSD LND TVD
CFTD SFD MRD C6D CNID CLBD AUTU
ICDD CDMD LLCN EHTD MCTD
GPUD DPUD CFXD ARHD OVDD AGTD CLTD LDTA ASCD
MBXD CPFA CPTA DDGA NAMA



```
MCRD
EXR0 SHL ABDD CFHD DNDY DNO3
CWND USMD USRD BNRD RTDD RBDD RBHD FAXA CNUD CNAD PGND FTTC
PLEV 02
AACS NO
MLWU_LANG 0
DATE 21 OCT 2002
```

Nortel Digital Station Phone 2601 Configuration

```
>ld 11SL1000
MARP NOT ACTIVATED
```

```
MEM AVAIL: (U/P): 1272407      USED U P: 106347 95805      TOT: 1474559
DISK RECS AVAIL: 476
TNS      AVAIL: 47      USED: 153      TOT: 200
ACD AGENTS AVAIL: 300      USED: 0      TOT: 300
AST      AVAIL: 100      USED: 0      TOT: 100
DIGITAL TELEPHONES AVAIL: 2494      USED: 6      TOT: 2500
```

```
REQ: prtTYPE: 2616
```

```
MARP NOT ACTIVATED
```

```
TN 001 0 0 0DATE 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 XLST
CLS CTD FBD WTA LPR MTD FND HTD ADD HFD
MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD DSX VMD CMSD CCSD SWD LND 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 RTDA 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
ARTO 0
AFD
```



```
AHNT
KEY 00 SCR 2601 0      MARP
      CPND
      NAME BERT
      XPLN 27
      DISPLAY_FMT FIRST, LAST
01 SCR 3510 0      MARP
02
03 CFW 12  2002
04 AO6
05 TRN
06 DSP
07
08 ADL 16  7055573500
09 ADL 16
10 ADL 16
11 ADL 16
12 ADL 16
13 ADL 16
14 ADL 16
15
DATE 3 OCT 2002
```

Configuring the Cisco 3640 Router

Loop-Start Configuration

```
Router# show running-config
Building configuration...

Current configuration : 2258 bytes
!
version 12.2
no parser cache
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
no service dhcp
!
hostname 3640_Analog
!
no logging buffered
enable password cisco
!
voice-card 1
!
ip subnet-zero
!
no ip domain lookup
!
isdn switch-type primary-net5
isdn voice-call-failure 0
!
voice call carrier capacity active
!
mta receive maximum-recipients 0
!
controller E1 1/0
framing NO-CRC4
ds0-group 1 timeslots 1 type e&m-immediate-start
!
```



```
controller E1 1/1
  clock source internal
  pri-group timeslots 1-31
!
interface Ethernet0/0
  ip address 10.10.10.102 255.255.255.0
  no ip mroute-cache
  shutdown
  full-duplex
  no cdp enable
!
interface Ethernet0/1
  ip address 1.1.1.1 255.255.255.0
  no ip mroute-cache
  full-duplex
  no cdp enable
!
interface Serial1/1:15
  no ip address
  no logging event link-status
  isdn switch-type primary-net5
  isdn overlap-receiving
  isdn protocol-emulate network
  isdn incoming-voice voice
  no cdp enable
!
ip classless
no ip http server
!
!
no cdp run
!
snmp-server manager
call rsvp-sync
!
voice-port 1/0:1
  shutdown
!
voice-port 1/1:15
!
voice-port 2/0/0
!
voice-port 2/0/1
!
voice-port 2/1/0
!
voice-port 2/1/1
!
voice-port 3/0/0
!
voice-port 3/0/1
!
voice-port 3/1/0
!
voice-port 3/1/1
!
no mgcp timer receive-rtcp
!
mgcp profile default
!
dial-peer cor custom
!
```




```
dial-peer voice 1 pots
  shutdown
  destination-pattern 5...
  direct-inward-dial
  forward-digits all
!
dial-peer voice 2 voip
  destination-pattern 2...
  session target ipv4:1.1.1.2
!
dial-peer voice 3 pots
  destination-pattern 3000
  port 3/0/0
!
dial-peer voice 4 pots
  destination-pattern 3001
  port 3/0/1
!
dial-peer voice 5 pots
  shutdown
  destination-pattern 3...
  progress_ind setup enable 1
  direct-inward-dial
  forward-digits all
!
dial-peer voice 6 pots
  destination-pattern 4...
  port 1/1:15
  prefix 4
!
dial-peer voice 7 voip
  destination-pattern 5...
  session target ipv4:1.1.1.2
  dtmf-relay h245-alphanumeric
!
dial-peer voice 8 pots
  shutdown
  destination-pattern 5...
  direct-inward-dial
  prefix 5
!
dial-peer voice 9 pots
  destination-pattern 4000
  port 3/1/0
!
dial-peer voice 10 pots
  destination-pattern 6000
  port 2/1/0
!
line con 0
line aux 0
line vty 0 4
  login
!
end
```

Ground-Start Configuration

```
Router# show running-config
Building configuration...
```

```
Current configuration : 2456 bytes
```



```
!  
version 12.2  
no parser cache  
service timestamps debug uptime  
service timestamps log uptime  
no service password-encryption  
no service dhcp  
!  
hostname 3640_Analog  
!  
no logging buffered  
enable password cisco  
!  
voice-card 1  
!  
ip subnet-zero  
!  
no ip domain lookup  
!  
isdn switch-type primary-net5  
isdn voice-call-failure 0  
!  
voice call carrier capacity active  
!  
mta receive maximum-recipients 0  
!  
controller E1 1/0  
  framing NO-CRC4  
  ds0-group 1 timeslots 1 type e&m-immediate-start  
!  
controller E1 1/1  
  clock source internal  
  pri-group timeslots 1-31  
!  
interface Ethernet0/0  
  ip address 10.10.10.102 255.255.255.0  
  no ip mroute-cache  
  shutdown  
  full-duplex  
  no cdp enable  
!  
interface Ethernet0/1  
  ip address 1.1.1.1 255.255.255.0  
  no ip mroute-cache  
  full-duplex  
  no cdp enable  
!  
interface Serial1/1:15  
  no ip address  
  no logging event link-status  
  isdn switch-type primary-net5  
  isdn overlap-receiving  
  isdn protocol-emulate network  
  isdn incoming-voice voice  
  no cdp enable  
!  
ip classless  
no ip http server  
!  
no cdp run  
!  
snmp-server manager
```



```
call rsvp-sync
!
voice-port 1/0:1
 shutdown
!
voice-port 1/1:15
!
voice-port 2/0/0
 operation 4-wire
 signal immediate
!
voice-port 2/0/1
 operation 4-wire
!
voice-port 2/1/0
 signal groundStart
!
voice-port 2/1/1
 signal groundStart
!
voice-port 3/0/0
!
voice-port 3/0/1
!
voice-port 3/1/0
 signal groundStart
!
voice-port 3/1/1
 signal groundStart
!
no mgcp timer receive-rtcp
!
mgcp profile default
!
dial-peer cor custom
!
dial-peer voice 1 pots
 shutdown
 destination-pattern 5...
 direct-inward-dial
 forward-digits all
!
dial-peer voice 2 voip
 destination-pattern 2...
 session target ipv4:1.1.1.2
!
dial-peer voice 3 pots
 destination-pattern 3000
 port 3/0/0
!
dial-peer voice 4 pots
 destination-pattern 3001
 port 3/0/1
!
dial-peer voice 5 pots
 shutdown
 destination-pattern 3...
 progress_ind setup enable 1
 direct-inward-dial
 forward-digits all
!
dial-peer voice 6 pots
```



```
destination-pattern 4...
port 1/1:15
prefix 4
!
dial-peer voice 7 voip
destination-pattern 5...
session target ipv4:1.1.1.2
dtmf-relay h245-alphanumeric
!
dial-peer voice 8 pots
shutdown
destination-pattern 5...
direct-inward-dial
prefix 5
!
dial-peer voice 9 pots
destination-pattern 4000
port 3/1/0
!
dial-peer voice 10 pots
destination-pattern 6000
port 2/1/0
!
dial-peer voice 11 pots
destination-pattern 6001
port 2/0/0
!
!
line con 0
line aux 0
line vty 0 4
login
!
end
```

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