



# Cisco 3640 Series Gateway-PBX Interoperability: Nortel Meridian 1 Option 11C PBX with Analog E&M Signaling

This document describes the interoperability and configuration of a Cisco 3640 voice gateway with a Nortel Meridian 1 PBX using Analog E&M signaling. It includes the following sections:

- System Components
- Configuration Tasks

## System Components

<b>PBX Model</b>	Nortel Meridian 1 Option 11C
<b>PBX Release</b>	Release 21 Issue 23
<b>Telephony Signaling</b>	Analog E&M
<b>Voice Gateway</b>	Cisco 3640
<b>Gateway Release</b>	IOS™ 12.0(4)T
<b>VoX Protocol</b>	H.323

## Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Nortel PBX Configuration
- Cisco 3640 Gateway Configuration

### Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes
- Cabling Requirements

## Connectivity Diagrams

Figure 1: *Test Configuration*

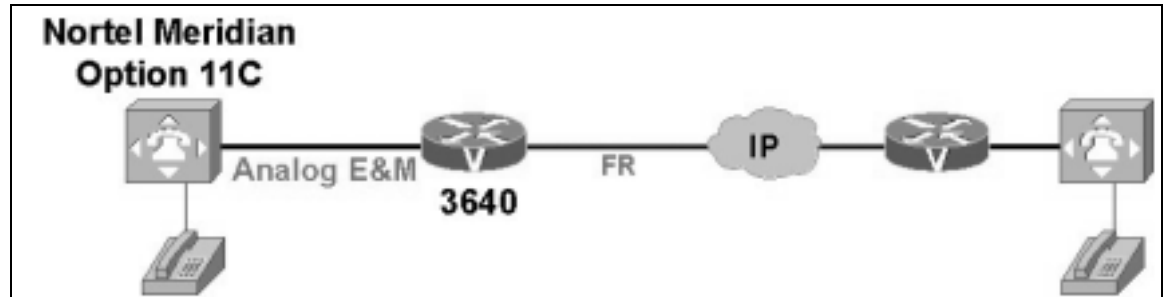


Figure 1 represents the configuration used for testing. A Nortel Meridian Option 11C PBX connected to a Cisco 3640 voice gateway via an Analog E&M connection.

## Set Up Notes

- The Nortel Option 11C PBX E&M Type I signaling matches the Cisco 3640 (or any other Cisco IOS GW) Type V signaling.
- Answer and disconnect supervision must be configured in the Nortel Option 11C PBX trunk data block for the E&M ports or calls will disconnect after about 10 minutes.

## Cabling Requirements

The Cisco 3640 E&M analog interface does not use the same pinouts as the Nortel Meridian Option 11C for Type 1 E&M. Use the table below as a guide when constructing an E&M analog cable to connect the Cisco 3640 E&M VIC to a Northern Meridian Universal Trunk Card.

Cisco 3640 E&M Pinouts		Nortel Option 11C E&M Pinouts		Comments
Cisco Pin #	Signal	Meridian Wire Color	Signal	
1	SB (signal Battery)			Not Used
2	M-lead	G/W	M-lead	
3	Ring (in / Rcv)	B/W	TB (Tx)	
4	Ring1 (out / Tx)	O/W	RB (Rcv)	
5	Tip1 (out / Tx))	W/O	RA (Rcv)	
6	Tip (in / Rcv)	W/B	TA (Tx)	
7	E-lead	W/G	E-lead	
8	SG (signal ground)			Not Used

## Nortel PBX Configuration

### E&M ROUTE DATA BLOCK

---

```
TYPE RDB
CUST 00
DMOD
ROUT 98
TKTP TIE
ESN NO
CNVT NO
SAT NO
RCLS EXT
DTRK NO
PTYP AOT
AUTO NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 602
TARG
OABS
INST
SIGO STD
STYP SDAT
MFC NO
TIMR ICF 512
      OGF 512
      EOD 13952
      DSI 34944
      NRD 10112
      DDL 0
      ODT 4096
      RGV 640
      GTO 896
      GTI 896
      SFB 3
      TFD 0
SST 5 7
DTD YES
```

XTDT 00  
MTD 05  
DTDF 00 00

SCDT NO  
2 DT YES  
NEDC ETH  
FEDC ETH  
CPDC NO  
DLTN YES  
HOLD 02 02 40  
SEIZ 02 02  
SVFL 02 02  
DRNG NO  
CDR NO  
NATL YES  
SSL  
CFWR NO  
IDOP NO  
MUS NO  
PANS YES  
MANO NO  
EQAR NO  
FRL 0 0  
FRL 1 0

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FRL 2 0  
FRL 3 0  
FRL 4 0  
FRL 5 0  
FRL 6 0  
FRL 7 0  
TTBL 0  
OHTD NO  
PLEV 2  
OPR NO  
ALRM NO  
ART 0  
PECL NO  
DCTI 0

**E&M TIE TRUNK DATA BLOCK**

---

TN 004 0 00 01  
TYPE TIE  
CUST 0  
XTRK XEM  
EMTY TY1  
CPAD COUT  
TRK ANLG  
NCOS 0

```
RTMB 98 1
TGAR 0
SIGL EM4
STRI/STRO IMM IMM
SUPN YES
CLS UNR DTN ECD WTA LPR APN THFD BARD
      P10 VNL MID
TKID
```

## Cisco 3640 Gateway Configuration

The following is the configuration of the Cisco 3640 gateway connected to the Nortel Option 11C PBX Analog E&M interface.

### Cisco 3640 Voice Gateway Version Information

---

```
3640-PBX-A#sh ver
Cisco Internetwork Operating System Software
IOS (tm) 3600 Software (C3640-JS-M), Version 12.0(3.0.3)T, DEVELOPMENT TEST SOF
TWARE
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Tue 09-Feb-99 14:14 by kpma
Image text-base: 0x600088E0, data-base: 0x60D30000

ROM: System Bootstrap, Version 11.1(7)AX [kuong (7)AX], EARLY DEPLOYMENT RELEASE
SOFTWARE (fc2)

3640-PBX-A uptime is 4 hours, 39 minutes
System restarted by power-on
System image file is "flash:c3640-js-mz.120-3.0.3.T"

cisco 3640 (R4700) processor (revision 0x00) with 36864K/4096K bytes of memory.
Processor board ID 05634407
R4700 CPU at 100Mhz, Implementation 33, Rev 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.
Basic Rate ISDN software, Version 1.1.
4 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
1 ISDN Basic Rate interface(s)
1 Channelized T1/PRI port(s)
2 Voice FXO interface(s)
2 Voice FXS interface(s)
2 Voice E & M interface(s)
2 Voice TE BRI interface(s)
DRAM configuration is 64 bits wide with parity disabled.
125K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read/Write)
```

### Cisco 3640 Voice Gateway Sample Configuration

---

```
3640-PBX-A#sh conf
Using 2304 out of 129016 bytes
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3640-PBX-A
!
```

```
enable secret 5 $1$q8p8$9WpmKtpFAEi82g10zvQJf0
!
ip subnet-zero
!
!
!
controller T1 3/0
 framing esf
 linecode b8zs
 channel-group 0 timeslots 1-24 speed 64
!
!
voice-port 0/0/0
 description E&M to PBX
 operation 4-wire
 signal immediate
 type 5
!
voice-port 0/0/1
 operation 4-wire
!
voice-port 0/1/0
 description FXO PORT TO PBX
!
voice-port 0/1/1
!
voice-port 1/0/0
 description FXS
!
voice-port 1/0/1
 description FXS
!
voice-port 1/1/0
!
dial-peer voice 1 pots
 destination-pattern 5000
 port 1/0/0
!
dial-peer voice 2 voip
 destination-pattern 2553
 req-qos controlled-load
 codec g711ulaw
 session target ipv4:10.0.0.2
!
dial-peer voice 3 pots
 destination-pattern 2552
 port 0/0/0
!
interface BRI1/0
 no ip address
 no ip directed-broadcast
!
interface Ethernet2/0
 ip address 20.0.0.1 255.0.0.0
 no ip directed-broadcast
 no cdp enable
!
interface Ethernet2/1
 no ip address
 no ip directed-broadcast
 shutdown
 no cdp enable
!
interface Ethernet2/2
 no ip address
 no ip directed-broadcast
 shutdown
 no cdp enable
!
interface Ethernet2/3
 no ip address
 no ip directed-broadcast
```

```
shutdown
no cdp enable
!
interface Serial3/0:0
mtu 300
no ip address
no ip directed-broadcast
ip rsvp bandwidth 1000 400
encapsulation frame-relay IETF
no ip route-cache
no fair-queue
frame-relay lmi-type ansi
!
interface Serial3/0:0.1 point-to-point
mtu 300
ip address 10.0.0.1 255.0.0.0
no ip directed-broadcast
no ip route-cache
no cdp enable
frame-relay interface-dlci 100
!
interface Serial3/0:0.2 point-to-point
mtu 300
ip address 30.0.0.1 255.0.0.0
no ip directed-broadcast
no ip route-cache
no cdp enable
frame-relay interface-dlci 200
!
router rip
network 10.0.0.0
network 20.0.0.0
network 135.16.0.0
!
ip classless
ip route 135.16.0.0 255.255.0.0 30.0.0.2
no ip http server
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
no cdp run
!
!
line con 0
transport input none
line aux 0
line vty 0 4
password worldwide
login
!
end
```