

Application Note

Product: Gateway

Purpose: Information that maybe used as a guide to configure the Ascom VoIP Gateway to the Nortel Meridian PBX Option 11C and Option 81C.

Date: 06/04/2007

Minimum Requirements:

Ascom VoIP Gateway running SW version 1.2.1

Ascom i75 Handsets running SW version 1.2.21 (QSIG only)

1.0 Overview

Intended Audience: Nortel PBX System Administrators or persons having extensive knowledge of the Nortel Meridian PBX.

This document contains configuration information that may be used as a guide to configure the Ascom VoIP Gateway system to the Nortel Meridian PBX. Figure 1 below provides an overview of a generic connection between the Mobility Server system and a Nortel Meridian PBX.

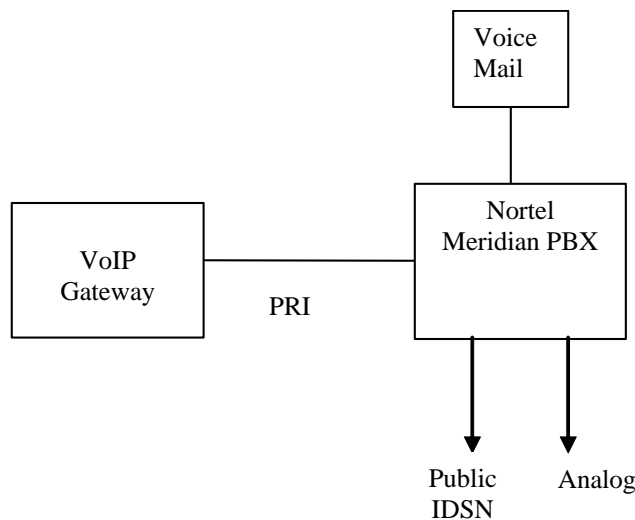


Figure 1

The following configuration sections are provided in this document:

Notes See Section 1.1

Connections to T1 5ESS (**Options 11C, 81C**) See Section 2.1

Connections to T1 Q-SIG (**Options 11C, 81C**) See Section 2.2

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Connections to E-1 Q-SIG (Option 81C)	See section 2.3
Coordinated Dialing Plan	See section 2.4
References	See section 3

1.1 Notes

- a.) Coordinated Dialing Plan (CDP) is an optional package in the Nortel Meridian that allows calls to be routed to the VoIP Gateway system as DIDs. The customer **needs** to purchase this SW in order to properly integrate VoIP Gateway.
- b.) If 5ESS is the protocol used, the PBX delivers the calls as Public and National instead of Private and Local. The PBX will also not route extension numbers beginning with 0 and 1 across the link to the MS. QSIG is preferred for this reason..
- c.) Shared D-Channels are not allowed. Each PRI needs it's own D-Channel.
- d.) If you have setup the PBX call routing to the VoIP Gateway using CDP then by default CDP uses CLID table 0. CDP can only use CLID table 0. If you have the HNTN (Area Code) and HLCL (NSX) values set in CLID Table 0 then you will see a 10 digit number show up on the Ascom phone from calls made from PBX desk phones. This is because calls routed to the MS from the PBX are being routed through CDP. CDP can only use CLID table 0 and thus the HNTN and HLCL values are being appended to the extension number.

One possible work around would be to build another CLID table and assign PBX users to this new CLID table. Then go back and modify CLID table 0, which CDP uses, and remove the values for the HNTN and HLCL. Note: This change will affect all users that are using CDP.

Another work around could be to remove the HNTN and HLCL values and let your CO hardcode the main number to your facility as the caller ID.

2.0 Technical Discussion

2.1 Connections to T1 5ESS

VoIP Gateway connection to the Nortel Meridian PBX (5ESS T1)

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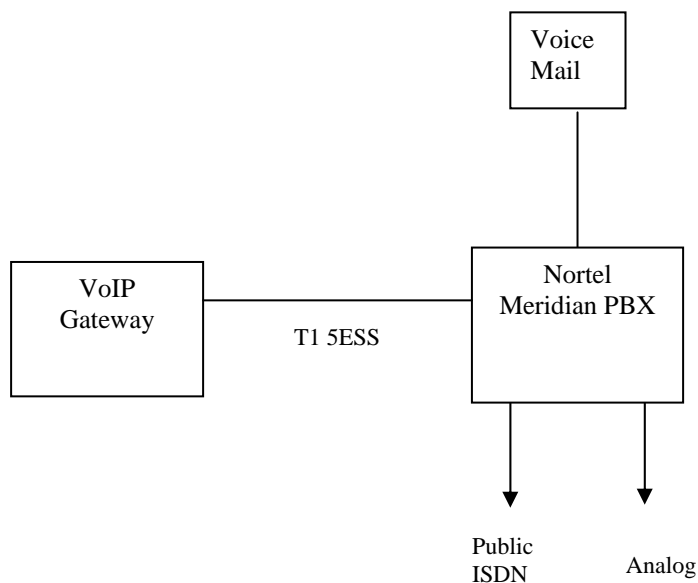


Figure 2

NORTEL MERIDIAN HARDWARE REQUIREMENTS

Combinations of the following board types may be found in the Meridian PBX.

Option 11C

- **NTRB21** - 1.5Mb DTI/PRI Card with downloadable D-channel
- **NTAK09** - 1.5Mb DTI/PRI Card
- **NTAK20** - Clock Controller daughter board
- **NTAK93** - D-channel Handler Interface daughter board
- **NTBK51** - Downloadable D-Channel daughter board

Option 81C

- **NT5D12** - Dual port 1.5Mb DTI/PRI card
- **NTBK51AA** - Downloadable D-Channel daughter board
- **NT6D80 MSDL** - Multipurpose Serial Data Link

CONFIGURATION OF T1 5ESS TO VoIP Gateway

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T1 5ESS VoIP Gateway to Nortel PBX

Link ID	<i>Name</i>
PRI Number	1
NT Mode	Yes
Clock Mode	Slave
Capacity	T1
u-law	yes
Protocol layer 3	ISDN 5ESS
PRI Interop	CR Length = 1

T1 5ESS Nortel to Mobility Server

See Description 1, below

Description 1

The following are the parameter settings in the Nortel to set up the routes. In order to set up the routes in the Nortel you must build both D-channel settings and route database. Numbering plans will need to be provisioned to match current dialing plan.

// T-1 5ess /////

```
ADAN DCH 10
CTYP MSDL (DCHI) Note: can be either type of D-channel card for 5ESS PRI
CARD 03
PORT 1
DES PWT MOB SERVER
USR PRI
DCHL 3
OTBF 32
PARAM RS422 DTE Note: this option is only needed if using MSDL (CTYP)
DRAT 64KC
CLOCK EXT
NASA NO
IFC ESS5
SIDE USR
CNEG 1
RLS ID **

RCAP ND2
MBGA NO
```

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OVLR NO --- (May not appear depending on the software release and packages)
OVLS NO
T200 3
T203 10
N200 3
N201 260
K 7

// RDB 5ess /// --- (Route)
TYPE RDB
CUST 00
DMOD 23 --- (Opt. 11C only)
ROUT 26
DES PWT MOB SERVER-1
TKTP **TIE**
ESN NO
CNVT NO
SAT NO
RCLS INT
DTRK YES
DGTP PRI
ISDN YES
MODE PRA
IFC ESS5
SBN NO
PNI 00000
SRVC NNSF
NCNA YES
NCRD NO
CHTY BCH
CTYP CDP
INAC NO
ISAR NO
TGAR 0 --- (Site Dependent)
BCOT 0
DSEL 3VCE --- See the note on page 11.
PTYP PRI
AUTO NO
DNIS NO
DCDR NO --- (Site Dependent)
ICOG IAO
SRCH LIN
TRMB NO **Turn Tromboning OFF**

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STEP

ACOD 206

TCPD NO

PII NO

TARG 01 --- (Site Dependent)

CLEN 10 --- (Site Dependent)

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 --- (Site Dependent) CDR is OFF

MUS NO

EQAR NO

FRL 0 0

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FRL 1 0

FRL 2 0

FRL 3 0

FRL 4 0

FRL 5 0

FRL 6 0

FRL 7 0

OHQ NO

OHQT 00

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

Trunk Channel Setting For 5ESS (Load 14)

TN 114 1
TYPE TIE
CDEN SD
CUST 0
TRK PRI
PDCA 1
PCML MU Set to MU-law for T1 circuits
NCOS 6 Should be set to equal the highest extension NCOS!
RTMB 26 1 --- (Site Dependent)
B-CHANNEL SIGNALING
TGAR 1 --- (Site Dependent)
AST NO
IAPG 0
CLS **CTD DTN** CND WTA LPR APN THFD HKD
P10 VNL
TKID
DATE 7 MAY 2004

Route stat

PRI* TRK LOOP 3 - ENBL
FFMT/LCMT/YALMT: ESF/B8Z/FDL
SERVICE RESTORE: YES
YEL ALM PROCESS: YES
ALARM STATUS : NO ALARM
CH 01 - IDLE TIE 3VCE * CH 02 - IDLE TIE 3VCE *
CH 03 - IDLE TIE 3VCE * CH 04 - IDLE TIE 3VCE *
CH 05 - IDLE TIE 3VCE * CH 06 - IDLE TIE 3VCE *
CH 07 - IDLE TIE 3VCE * CH 08 - IDLE TIE 3VCE *

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CH 09 - IDLE TIE 3VCE *	CH 10 - IDLE TIE 3VCE *
CH 11 - IDLE TIE 3VCE *	CH 12 - IDLE TIE 3VCE *
CH 13 - IDLE TIE 3VCE *	CH 14 - IDLE TIE 3VCE *
CH 15 - IDLE TIE 3VCE *	CH 16 - IDLE TIE 3VCE *
CH 17 - IDLE TIE 3VCE *	CH 18 - IDLE TIE 3VCE *
CH 19 - IDLE TIE 3VCE *	CH 20 - IDLE TIE 3VCE *
CH 21 - IDLE TIE 3VCE *	CH 22 - IDLE TIE 3VCE *
CH 23 - IDLE TIE 3VCE *	CH 24 - DCH 10

2.2. Connections to T1 Q-SIG

PWT Mobility Server connection to the Nortel Meridian PBX (QSIG T1).

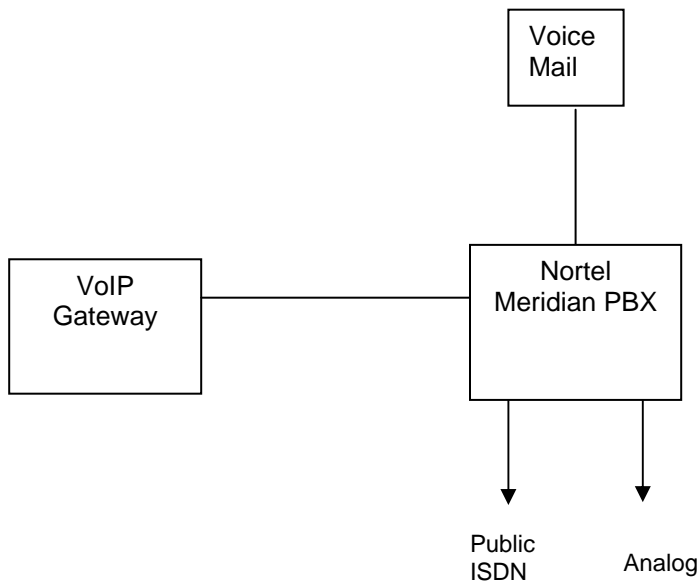


Figure 3

Application Note

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Option 81C

- **NT5D12** - Dual port 1.5Mb DTI/PRI card
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T1 QSIG Mobility server to Nortel PBX

Link ID	<i>Name</i>
Pri Number	1
NT Mode	<i>Choice</i>
Clock Mode	Slave
u-Law	yes
Capacity	T1
Protocol Version	QSIG-ECMA2 2

T1 QSIG Nortel to Mobility Server

See Description 2, below

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Description 2

Nortel Configuration for QSIG T-1

D-CHANNEL SETTINGS

ADAN DCH 14

CTYP MSDL Note: This card must be a MSDL in order to support Q_SIG (downloadable D-channel)

CARD 02

PORT 1

DES QSIG_PWT MOB SERVER

USR PRI

DCHL 2

OTBF 32

PARM RS422 DTE

DRAT 64KC

CLOK EXT

NASA NO

IFC ESGF

PINX_CUST 0

ISDN_MCNT 300

CLID OPT0

CO_TYPE STD

SIDE USR

CNEG 1

RLS ID **

RCAP COLP NDS CCBS CCNR (using xxxO options turns on name display, etc. NDO, **CCNO, etc**)

MBGA NO

OVLN YES

DIDD 0

OVLS YES

OVLT 0

T310 120

T200 3

T203 10

N200 3

N201 260

K 7

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ROUTE DATA BASE

TYPE RDB
CUST 00
DMOD
ROUT 21
DES PWT MOB SERVER_Q
TKTP TIE
ESN NO
CNVT NO
SAT NO
RCLS EXT
DTRK YES
DGTP PRI
ISDN YES
 MODE PRA
 IFC ESGF
 SBN NO
 PNI 00000
 NCNA NO
 NCRD NO
 CHTY BCH
 CTYP UKWN
 INAC NO
 ISAR NO
 TGAR 0
 CPFXS YES
 ADDP NO
 INTC NO
DSEL 3VCE
PTYP DTT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB NO
STEP
ACOD 202
TCPP NO
TARG 01
CLEN 1
BILN NO
OABS

Set Tromboning OFF

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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
EQAR NO
FRL 0 0

PAGE 002

FRL 1 0
FRL 2 0
FRL 3 0
FRL 4 0
FRL 5 0
FRL 6 0
FRL 7 0
OHQ NO
OHQT 00
CBQ NO
AUTH NO
TTBL 0
PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO

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2.3 E-1 QSIG (Option 81C)

MERIDIAN 1 NORTEL PABX SYSTEM

SYSTEM TYPE : OPT81C
RELEASE : 23.37
VERSION : 1911

PWT Mobility Server connection to the Nortel Meridian PBX (E1 QSIG)

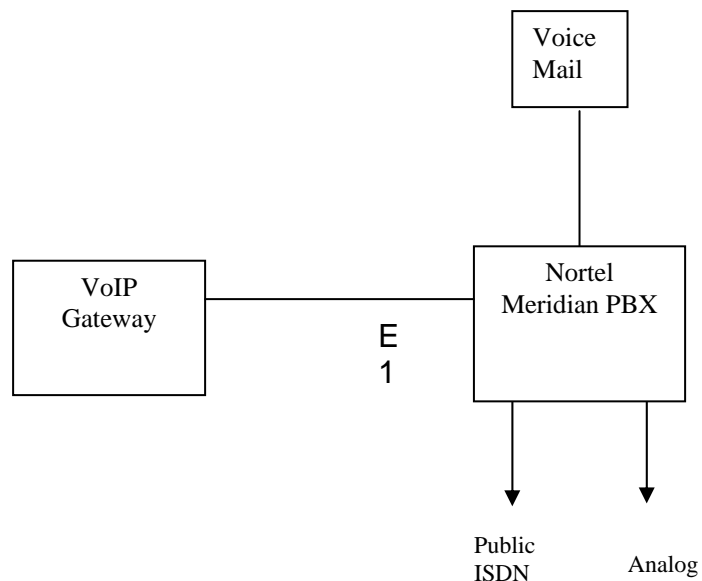


Figure 4

HARDWARE REQUIREMENT

- **NTCK43** - 2.048 MBIT DUAL PRIMARY RATE ACCESS CARD
- **NTBK51** - DOWNLOADABLE D-CHANNEL DAUGHTERBOARD

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CONFIGURATION OF QSIG TO MOBILITY SERVER

2 E1 Physical Link MS2.x to Meridian

T-1	No
u-LAW	Yes
PRI Number	1
Protocol Version	ECMA Edition 2
Clock Mode	Slave
NT Mode	Choice

1 E1 Physical Link Meridian to MS2.x

See Description 3, below

Description 3

D-CHANNEL SETTING

ADAN DCH 34
CTYP MSDL
GRP 1
DNUM 8
PORT 0
DES ASCOM
USR PRI
DCHL 34
OTBF 32
PARM RS422 DTE
DRAT 64KC
CLOK EXT
NASA NO
IFC ESGF
PINX_CUST 0
ISDN_MCNT 300
CLID OPT0
CO_TYPE STD
SIDE USR
CNEG 1
RLS ID **

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RCAP COLP NDS CCBS CCNR

OVLR YES

DIDD 0

OVLS YES

OVLT 0

T310 120

T200 3

T203 10

N200 3

N201 260

K 7

QSIG ROUTE DATA SETTING FOR D-CHANNEL 34

TYPE RDB

CUST 00

ROUT 34

DES ASCOM

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 00000

NCNA NO

NCRD NO

CTYP UKWN

INAC NO

ISAR NO

TGAR 0

CPFXS YES

ADDP NO

INTC NO

DSEL 3VCE

PTYP DTT

AUTO NO

DNIS NO

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DCDR NO
ICOG IAO
SRCH LIN
TRMB NO
STEP
ACOD **7134**
TCPP NO
TARG
BILN NO
OABS
INST
IDC NO
DCNO 0 *
NDNO 0
DEXT NO
ANTK
SIGO STD
MFC NO
ICIS YES
OGIS YES
TIMR ICF 512
 OGF 512
 EOD 13952
 NRD 10112
 DDL 70
 ODT 4096
 RGV 640
 GTO 896
 GTI 896
 SFB 3
 NBS 2048
 NBL 4096
 TFD 0
DTD NO
SCDT NO
2 DT NO
DRNG NO
CDR YES
INC NO
LAST NO
QREC NO
OAL YES
AIA YES
OAN YES

Set Tromboning OFF

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OPD YES
NDP EXC 0
CDRX NO
NATL YES
SSL
CFWR NO
IDOP NO
MUS NO
PANS YES
RACD NO
EQAR NO
FRL 0 0
FRL 1 0
FRL 2 0
FRL 3 0
FRL 4 0
FRL 5 0
FRL 6 0
FRL 7 0
OHQ NO
OHQT 00
CBQ NO
AUTH NO
TDET NO
TTBL 1
PLEV 2
OPR NO
ALRM NO
ART 0
PECL NO
DCTI 0
SGRP 0
AACR NO

TRUNK CHANNEL SETTING FOR QSIG

TN 034 01
TYPE TIE
CDEN SD
CUST 0
TRK PRI2
PDCA 1
PCML A
NCOS 0

Set to A-law for E1 Qsig
Set this to equal the highest extension NCOS!

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RTMB 34 1

B-CHANNEL SIGNALING

TGAR 0

AST NO

IAPG 0

CLS **CTD DTN** WTA LPR APN THFD BARD

P10 VNL

TKID

DATE 20 AUG 1999

TN 034 02

TYPE TIE

CDEN SD

CUST 0

TRK PRI2

PDCA 1

PCML A

NCOS 0

RTMB 34 2

B-CHANNEL SIGNALING

TGAR 0

AST NO

IAPG 0

CLS **CTD DTN** WTA LPR APN THFD BARD

P10 VNL

TKID

DATE 20 AUG 1999

LOOP TIMER SETTING FOR LOOP 34

TYPE PRI2

FEAT LPTI

LOOP 34

MFF **CRC**

ACRC NO

ALRM REG

RAIE NO

G1OS YES

SLP 5 24 H 30 1 H

BPV 128 122

CRC 201 97

FAP 28 1

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RATS 10
GP2 20 100 S 12 S 12 S 4 S
MNG1 15 M
NCG1 15 M
OSG1 15 M
MNG2 15 S
NCG2 15 S
OSG2 15 S
PERS 50
CLRS 50
OOSC 5

2.4. Coordinated Dialing Plan

Note: CDP is an optional package that allows calls to be routed to the PWT MOB SERVER system as DIDs. The customer **needs** to purchase this SW in order to properly integrate to the PWT MOB SERVER.

CDP entry 73

>ld 87
ESN000

MEM AVAIL: (U/P): 470428 USED: 103011 TOT: 573439

DISK RECS AVAIL: 449

REQ prt

CUST 0

FEAT cdp

TYPE dsc

DSC 73

DSC 73

FLEN 0

DSP LSC **changing DSP = DN will help with the CLID display at the other end. It sets the e.164**

RLI 9 **as Private/Local and allows the call to ring as Internal**

Note: this table points the numbers starting with 73 toward the RLI 9 (route list 9)

RLB RLI 9

RLI 9

RLI 9
ENTR 0

Rev. B

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LTER NO
ROUT 26
TOD 0 ON 1 ON 2 ON 3 ON
4 ON 5 ON 6 ON 7 ON
CNV NO
EXP NO
FRL 0
DMI 2
FCI 0
FSNI 0
OHQ NO
CBQ NO

ENTR 1
LTER YES
TOD 0 ON 1 ON 2 ON 3 ON
4 ON 5 ON 6 ON 7 ON
FRL 0
DMI 3
FCI 0
FSNI 0

ISET 0
MFRL 0
OVLL 0

Note: this RLI9 table points the calls toward route 26 (PWT MOB SERVER) as the 1st option using DMI table 2, and as a second option if PWT MOB SERVER is unavailable to a local termination (extension) using DMI table 3.

DMI table 2 and 3

DMI 2 is to route the PRI to PWT MOB SERVER
DMI 3 is to reroute if PRI is down

FEAT dgt
DMI 2

DMI 2
DEL 0
INST 0
CTYP NXX

Note: This is DMI if using 5ESS

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CUST 0
FEAT DGT
DMI 2

DMI 2
DEL 1
INST 7
CTYP LOC
Note: This is the DMI if using QSIG

CUST 0
FEAT dgt
DMI 3

DMI 3
DEL 5
INST 4001
CTYP UKWN

Note: as displayed this deletes all 5 digits dialed and sends 4001 (an extension). It can be configured to delete only the 1st part of the number thus allowing a desk phone to be called that has a consistent number with the Personal Number. I.e.: 73001 (personal number) delete (2), insert (4), which modifies 73001 to be 4001 if the span is down and that allows calls to the intended desk phone. All personal numbers and desk extensions would need to conform to this numbering scheme.

3.0 Setting up the VoIP Gateway Routing

The VoIP Gateway routes must have QSIG-Interworking turned ON when using QSIG in order for Caller Name Display to work on all incoming routes/maps and all outgoing routes/maps to and from the Meridian.

Refer to the Ascom VoIP Gateway manual for detailed information on how to set up the routes for the Gateway, as this is dependent upon how the Gateway is licensed.

4.0 Known issues

Account/Authorization Codes:

If the Meridian is using Auth Codes for LD calls, the Gateway may experience problems allowing the DTMF to be sent for the AUTH code.

For 5ESS:

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If the "CONNECT" message is not received and the Gateway is not running 1.2.1, then no DTMF will be sent from the handsets, and AUTH codes will not work.

For QSIG:

If the "CONNECT" message is not received and the Gateway is not running 1.2.1, then no DTMF will be sent from the handsets, and AUTH codes will not work. Further, the i75 handsets must be at release 1.2.21, else the DTMF will not be sent during the setup phase.

The incoming trunk on the Meridian must have an NCOS value set high enough to allow the particular type of dialing received from the VoIP Gateway. For example, using NCOS 5 allows local, Toll Free, and LD dialing. If any VoIP user needs to dial IDDD (011), then the trunk group must have the proper NCOS to allow the call to proceed. The VoIP Gateway can restrict calls based on dialed digits in a similar manner.

Application Note

ascom
Ascom® Wireless Solutions Inc.

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5.0 Reference

Installation and Operation manual for Ascom VoIP Gateway

Nortel Meridian X11 Administration Input/Output Guide 553-3001-311

Nortel Meridian ISDN Primary Rate Interface Installation Guide 553-2901-201

Nortel Meridian Option 11C 1.5Mb DTI/PRI 553-3011-310

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