APPLICATION NOTE

ST-0124 November 17, 2005

Product: ShoreTel system

System version: ShoreTel 5 Release 2

ShoreTel IP Phone System – PBX Interoperability: Nortel Meridian 1 Option 11C

This document describes the interoperability and configuration of a Nortel Meridian 1 Option 11C with the ShoreTel IP Phone System. It includes the following sections:

Tie line integration using PRI (Primary Rate Interface)

SMDI integration – ShoreTel as voicemail

Overview

The purpose of this document is to provide a step by step guide on configuring a ShoreTel system to integrate with a legacy PBX system. This document also aims to provide an example of how to configure the legacy equipment to function in this environment; however this information is targeted to individuals who already have knowledge on configuring the legacy PBX systems. Please be aware that the scope of this document is not to give step by step instructions on configuring 3rd party PBX systems, and the environment can very depending on the customer's PBX hardware, software and operating environment. The examples provided are from tested, functioning systems but may vary from your environment.

Record of Change

This application note is subject to change as third party hardware and software changes. Updates and corrections are always welcome. Please submit any updates or corrections to ProServices@ShoreTel.com.

Issue	Author	Reason For Change	Date
1.0	S. Graham	Initial release	Nov. 11, 2005

1.0 Tie Line Integration Using PRI:

1.1 System Components:

PBX Model	Meridian 1 Option 11C
PBX Software Release	Rel. 25; Succession 3.0
PBX Interface card	NTAK09xx, 1.5 Mb
Telephone Signaling	PRI
ShoreTel Software Release	ShoreTel5 Release 2
ShoreTel Hardware	ShoreGear-T1
Interconnect	RJ-48c crossover cable

1.2 System Requirements:

The following are required on the ShoreTel 6 system, and the legacy PBX to enable the integration of the two systems:

• ShoreTel 6 system

— ShoreGear-T1 Voice Switch - The ShoreGear-T1 voice switch supports both T1 and PRI connections and includes an integrated CSU.

• Legacy PBX

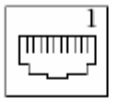
— T1 or PRI card for the PBX

— Available card slot and capacity for the added trunks

— Required software or licenses to support the desired trunk interface

1.3 Connectivity Diagrams:

RJ-48C T1/E1 and T1/E1 Monitor Connectors



Pin	Designation
1	RX Ring
2	RX Tip
3	—
4	TX Ring
5	TX Tip
6	—
7	—
8	—

NOTE When connecting the ShoreGear-T1 or ShoreGear-E1 to a legacy PBX, you must use a crossover cable between the two systems.

1.4 Setup Notes:

For extension-to-extension integration of two different systems you will need to determine which extension ranges are to exist on each PBX. You can not have overlapping extensions that exist on both systems, for example if extension 1234 is a valid extension on the legacy PBX, you should not create a ShoreTel user with extension 1234. There is an "off system" extension range that can be associated with the tie-line to allow these numbers to be dialed, which is covered in further detail below.

1.5 Nortel PBX Configuration:

Example configuration of Nortel PBX tie-line for extension-to-extension with tandem trunking:

NACT
REQ:
REQ PRT
TYPE:
TYPE TNB
TN 8 1
DATE
PAGE

```
DES

DES  VOIP
TN   008 01
TYPE DID
CDEN SD
CUST 0
TRK  PRI
PDCA 1
PCML MU
NCOS 0
RTMB 12 1
B-CHANNEL SIGNALING
NITE
STRI/STRO OWK OWK
AST  NO
IAPG 0
CLS  UNR DTN WTA LPR APN THFD HKD
     P10 VNL
TKID
DATE  3 AUG 2005


NACT ****
OVL000
>ld 22
PT2000

REQ  prt
TYPE cfn

ADAN   HIST
  SIZE   10000
  USER MTC SCH
ADAN     TTY 0
  TTY_TYPE SDI
  CAB 00
  CARD 00
  PORT 0
  DES  sebmodem
  FLOW NO
  USER MTC SCH BUG
  TTYLOG       0
  BANR NO
ADAN     TTY 1
  TTY_TYPE SDI
  CAB 00
  CARD 00
  PORT 1
  DES  maint
  BPS  9600
  BITL 8
```

```
  STOP 1
  PARY NONE
  FLOW NO
  USER MTC SCH BUG
  TTYLOG       0
  BANR NO
ADAN     TTY 2
  TTY_TYPE SDI
  CAB 00
  CARD 00
  PORT 2
  DES  CDR
  BPS  9600
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER CTY
ADAN     ELAN 16
  CTYP ELAN
  DES  ELAN16
  N1   512
ADAN     DCH 3
  CTYP MSDL
  CARD 08
  PORT 1
  DES  VOIP
  USR  PRI
  DCHL 8
  OTBF 32
  PARM RS422  DTE
  DRAT 64KC
  CLOK EXT
  IFC  NI2
    ISDN_MCNT 300
  CLID OPT0
  CO_TYPE  STD
  SIDE NET
  CNEG 1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  RLS  ID  **
  RCAP NCT COLP
  MBGA NO
  OVLR NO
  OVLS NO
  T310 120
  T200 3
  T203 10
```

```
  N200 3
  N201 260
  K    7
  BSRV  NO
ADAN     DCH 4
  CTYP MSDL
  CARD 09
  PORT 1
  DES  LAKELINE
  USR  PRI
  DCHL 9
  OTBF 32
  PARM RS422  DTE
  DRAT 64KC
  CLOK EXT
  NASA NO
  IFC  SL1
  SIDE NET
  SEMT 1
  CNEG 1
  RLS  ID  24
  RCAP ND2
  MBGA NO
  OVLR NO
  OVLS NO
  T200 3
  T203 10
  N200 3
  N201 260
  K    7
ADAN     DCH 5
  CTYP DCHI
  CARD 05
  PORT 1
  DES  BREAKER
  USR  PRI
  DCHL 5
  OTBF 32
  DRAT 64KC
  CLOK EXT
  NASA NO
  IFC  SL1
  SIDE NET
  SEMT 1
  CNEG 1
  RLS  ID  23
  RCAP ND2
  MBGA NO
  OVLR NO
  OVLS NO
  T23  20
  T200 3
```

T203 10

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N200 3
N201 260
K 7
ADAN DCH 6
CTYP DCHI
CARD 06
PORT 1
DES LUBOCK
USR PRI
DCHL 6
OTBF 32
DRAT 64KC
CLOK EXT
NASA NO
IFC SL1
SIDE USR
CNEG 1
RLS ID 23
RCAP ND2
MBGA NO
OVLR NO
OVLS NO
T23 20
T200 3
T203 10
N200 3
N201 260
K 7
ADAN DCH 7
CTYP DCHI
CARD 02
PORT 1
DES SMARTTRUNKS
USR PRI
DCHL 2
OTBF 32
DRAT 64KC
CLOK EXT
IFC D100
SIDE USR
CNEG 1
RLS ID **
RCAP
MBGA NO
OVLR NO
OVLS NO

T23 20
T200 3
T203 10
N200 3
N201 260
K 7
PARM
LPIB 96
HPIB 16
500B 16
NCR 88
MGCR 25
CSQI 20
CSQO 20
TUBO NO

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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
MARP YES
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
IDLE_SET_DISPLAY NORTEL
CLNP YES
ICON YES
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

  DLOP  NUM DCH FRM TMDI LCMT YALM T1TE TRSH
   PRI  02   23  ESF NO   B8S  FDL  -    00
        05   24  ESF NO   B8S  FDL  -    00
        06   24  ESF NO   B8S  FDL  -    00
        08   23  ESF NO   B8S  FDL  -    00
        09   24  ESF NO   B8S  FDL  -    00
  MISP
OVLY
  SID  0
  BKGD 044
  PBXH 01
  TODR 05
  DROL 030 034 038 043 044 060 135
  MULTI_USER ON
VAS
  VSID   16
    DLOP
    ELAN 16
      SECU YES
      INTL 0001
      MCNT 9999



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ATRN
  CODE 0
  SOLR 12
  ROLR +45.00
  AOLR +45.00
  TOLR -45.00
  AGCD NO
  VOLR NO
  HRLR +42.00
  HTLR -44.00

REQ  end
>ld 21
PT1000

REQ: prt
TYPE: cdb
```

```
CUST 0

TYPE CDB
CUST 00
AML_DATA
  OPT DNX
  VSID
  GP02
  GP03
  GP04
  GP05
  GP06
  GP07
  GP08
  GP09
  GP10
  GP11
  GP12
  GP13
  GP14
  GP15
ANI_DATA
  ANAT 391
  ANLD 5500
  M911_PANI NO
ATT_DATA
  OPT AHA BBIN BIXA BLA
     DNX IC1 XTG IDP XLF XBL
     FKA MWUD LOD
     REA SYA ATDA
  ATDN 0
  NCOS 5
  CWUP YES
  CWCL 1 1
  CWTM 0 0
  CWBZ YES YES
  EFLL 0
  MATT NO
  RTIM 0 0 0
  ATIM 32
  AQTT 16
  AODN 5555
  SPVC 00
    SBLF NO
  RTSA RSAD
  SACP NO
  ABDN NO
  IRFR NO
  XRFR NO
  IDBZ NO
  PBUZ 02  02
  ICI 00 R000
```

ICI 01 LD0
ICI 02 R006
ICI 03 INT
ICI 04 RLL
ICI 05 DL0
ICI 06 CFN
ICI 07
ICI 08
ICI 09
RICI
AWU_DATA
AWU YES
ATRC NO

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RANF
RAN1 000
RAN2 000
LA11 000
LA12 000
LA21 000
LA22 000
LA31 000
LA32 000
LA41 000
LA42 000
LA51 000
LA52 000
R2BN 00 00
R2ED 00 00
NRWU 5
TAWU 3
WUD NO
STE NO
CAS_DATA
CAS NO
CCS_DATA
CCRS UNR
ECC1 UNR
ECC2 UNR
CNCS
PELK NO
CDR_DATA
CDR YES
IMPH NO
OMPH NO
AXID YES
TRCR YES
CDPR NO
ECDR 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: 00 **
     UNKN**INTL**NATL**ESPN**LOCL**ELOC**ECDP**
UNKN*
E164*      00    0
PRIV*
E163*      00    0
TELX*
X121*
NATL*

  OPT AHA BBIN 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 RTA ROX SBD SYA
     TTAD VOBA CWRD HLPD HRLD


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     CXOD
  DGRP 20
  IRNG YES
  PKND 2
  DNDL NO
  SPRE 1
  PREO 0
  BPSS NO
  SRCD 1234
  EEST NO
  EESD NO
```

```
  TTBL 0
  MUS YES
    MUSR 40
  ALDN
  RECD NO
  PORT 0
  STCB NO
  NSCP NO
  MCDC NO
  NAUT YES
  IDEF YES
  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
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
LDN_DATA
  OPT NLDN
  DLDN YES
  LDN0 5500
  LDA0
  LDN1
  LDA1
  LDN2
  LDA2
  LDN3
  LDA3
  LDN4
  LDA4
  LDN5
  LDA5
  LDBZ
  ICI 00 R000
  ICI 01 LD0
  ICI 02 R006
  ICI 03 INT
  ICI 04 RLL
  ICI 05 DL0
  ICI 06 CFN
  ICI 07
  ICI 08
  ICI 09
MON_DATA
  USBM NO
MPO_DATA
FMOP
  RGNA STD STD
  AOCS DIS DIS
  RCY1 04
  RCY2 04
  RALL NO
  CDTO 14
IFLS NO
MHLD NO
```

PCDS
  CNFD 1
  TGLD 2
  DISD 3
CCDO NO
AFCO NO
ACNS NO
NET_DATA
OPT RTA
AC1 INTL NPA SPN NXX LOC
AC2
FNP YES
ISDN YES

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  VPNI 0
  PNI 1
  PINX_DN
  MBG 0
  BSGC 65535
  PFX1
  PFX2
  HLOC
  LSC
  RCNT 5
  PSTN NO
  TNDM 15
  PCMC 15
  SATD 1
  OCLI NO
DITI NO
TRNX YES
EXTT YES
FTOP FRES
VNR NO
NIT 8
NAS_ATCL YES
NAS_ACTV NO
FOPT 14
CNTC
NATC
INTC
NIT_DATA
NIT1 6500
TIM1 00 00
NIT2
TIM2
NIT3
TIM3
NIT4

TIM4
ENS NO
OAS_DATA
ODN0
ODN1
ODN2
ODN3
ODN4
ODN5
ODN6
ODN7
ODN8
ODN9
ASTM 30
HDOPT 0
HDTM 30
RDR_DATA
OPT CFO CFRA PVCD CWRD
FNAD FDN
FNAT FDN
FNAL FDN
CFTA NO
CCFWDN
CFN0 3
CFN1 3
CFN2 3
DFN0 3

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DFN1 3
DFN2 3
DNDH NO
MDID YES
NDID YES
MWFB YES
TRCL 0
CRT0 00 00 00 00
CRT1 00 00 00 00
CRT2 00 00 00 00
CRT3 00 00 00 00
DAY0
DAY1
DAY2
DAY3
HOLIDAY0
HOLIDAY1
HOLIDAY2
HOLIDAY3
ROA_DATA
OPT ROX

RICI
TIM_DATA
FLSH 45
PHDT 30
DIND 30
DIDT 14
LDTT 6
BOTO 14
DBRC 60
RTIM 0 0 0
ATIM 32
AQTT 16
ADLD 0
NFNA 0
HWTT 300
NIT 8
FOPT 14
TST_DATA

REQ: prt
TYPE: rdb
CUST 0
ROUT 12

TYPE RDB
CUST 00
DMOD
ROUT 12
DES VOIP
TKTP DID
M911_ANI NO
M911_TONE NO
NPID_TBL_NUM 0
SAT NO
IDEF NET
RCLS EXT
VTRK NO
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
   MODE PRA
   IFC NI2
   CBCR NO
   NCOS 0
   SBN NO
   PNI 00001
   NCNA YES
   NCRD NO
   CHTY BCH
   CPFXS YES
   CPUB OFF

DAPC NO
BCOT 0
INTC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
RANX NO
SRCH LIN
TRMB YES
STEP
ACOD 7012
TCPP NO
PII NO
TARG 01
CLEN 1
BILN NO
OABS
INST
ICIS YES
TIMR ICF 512
OGF 512
EOD 13952
NRD 10112
DDL 70
ODT 4096
RGV 640
FLH 510
GRD 896
SFB 3
NBS 2048
NBL 4096

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IENB 5
VSS 0
VGD 6
DRNG NO
CDR NO
VRAT NO
MUS 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
TTBL 0
ATAN NO
PLEV 2
MCTS NO
ALRM NO
ART 0
SGRP 0
AACR NO

REQ:

REQ: prt
TYPE: rdb
CUST 0
ROUT 6

TYPE RDB
CUST 00
DMOD
ROUT 6
DES LUBUCK
TKTP TIE
NPID_TBL_NUM   0
ESN NO
CNVT NO
SAT NO
IDEF NET
RCLS EXT
VTRK NO
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
   MODE PRA
   IFC SL1
   PNI 00001
   NCNA YES
   NCRD NO
   CHTY BCH
   CTYP UKWN
   INAC YES
   ISAR NO
   DAPC NO
DSEL VOD
PTYP PRI
AUTO NO

DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 7006
TCPP NO
TARG
CLEN 1
BILN NO
OABS
INST
ANTK
SIGO ESN5
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

    IENB 5
    TFD 0
    VSS 0
    VGD 6
DRNG NO

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CDR YES
INC YES
LAST NO
QREC NO
OAL YES
AIA YES
OAN NO
OPD YES
CDRX NO
NATL YES
VRAT NO
MUS YES
MRT 40
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
TTBL 0
ATAN NO
PLEV 2
ALRM NO
ART  0
SGRP 0
AACR NO

REQ: end
>ld 21
PT1000

REQ: prt
TYPE: t*
TYPE: rdb
CUST 0
ROUT 5

TYPE RDB
CUST 00
DMOD
ROUT 5
DES  BREAKER
TKTP TIE
NPID_TBL_NUM   0
ESN  NO
CNVT NO
SAT  NO
IDEF NET
RCLS EXT
VTRK NO
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
   MODE PRA
   IFC  SL1
   PNI  00001
   NCNA YES
   NCRD NO
   CHTY BCH
   CTYP UKWN
```

INAC NO
ISAR NO
DAPC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB NO
STEP
ACOD 7005
TCPP NO
TARG
CLEN 1
BILN NO
OABS
INST
ANTK
SIGO ESN5
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

IENB 5
TFD 0
VSS 0
VGD 6
DRNG NO

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CDR YES
INC YES
LAST NO
QREC NO
OAL YES
AIA YES
OAN NO
OPD YES
CDRX NO

NATL YES
VRAT NO
MUS YES
MRT 40
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
TTBL 0
ATAN NO
PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO

REQ: ****
OVL000
>*ld 90
ESN000

MEM AVAIL: (U/P): 2909576   USED U P: 139917 79850   TOT: 3129343
DISK RECS AVAIL: 392
REQ prt
CUST 0
FEAT net
TRAN ac1
TYPE npa

NPA 1214

NPA 1214
RLI 1
DENY 976

SDRR DENY CODES = 1
ITEI NONE

MEM AVAIL: (U/P): 2909576   USED U P: 139917 79850   TOT: 3129343
DISK RECS AVAIL: 392
REQ ****
OVL000

```
>ld 86
ESN000

MEM AVAIL: (U/P): 2909576    USED U P: 139917 79850    TOT: 3129343
DISK RECS AVAIL: 392
REQ  prt
CUST 0
FEAT rlb
RLI  1

RLI  1
ENTR 0
LTER NO
ROUT 2
TOD  0 ON  1 ON  2 ON  3 ON
    4 ON  5 ON  6 ON  7 ON
VNS  NO
CNV  NO
EXP  NO
FRL  0
DMI  0
FCI  0
FSNI 0
SBOC NRR
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 1
LTER NO
ROUT 0
TOD  0 ON  1 ON  2 ON  3 ON
    4 ON  5 ON  6 ON  7 ON
VNS  NO
CNV  NO
EXP  NO
FRL  0
DMI  0
FCI  0
FSNI 0
SBOC NRR
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ISET 0
NALT 5
MFRL 0
OVLL 0
```

MEM AVAIL: (U/P): 2909576 USED U P: 139917 79850 TOT: 3129343
DISK RECS AVAIL: 392
REQ
DCH 6 I 22393E97
1C 01 00 01 05 00 00 00 00 00 00 FF 00 00 00 00
00 00

DCH 6 I 2239501A
1C 01 00 00 00 00 00 00 00 00 00 FF 00 00 00 00
00 00

DCH: 6 RLS NO RESPONSE TIME: 14:54:00 5/08/2005

DTA021 6
****
OVL000
>ld 20

PT0000
REQ: prt
TYPE: tnb
TN 5 1
DATE
PAGE
DES

DES TIE
TN 005 01
TYPE TIE
CDEN SD
CUST 0
TRK PRI
PDCA 1
PCML MU
NCOS 0
RTMB 5 1
B-CHANNEL SIGNALING
TGAR 0
AST NO
IAPG 0
CLS CTD DTN WTA LPR APN THFD HKD
    P10 VNL
TKID
DATE NO DATE

NACT
REQ: prt
TYPE: rdnb*
TYPE: rdb
SCH0099 RDB?

```
TYPE: ****
OVL000
>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 5

TYPE RDB
CUST 00
DMOD
ROUT 5
DES  BREAKER
TKTP TIE
NPID_TBL_NUM   0
ESN  NO
CNVT NO
SAT  NO
IDEF NET
RCLS EXT
VTRK NO
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
   MODE PRA
   IFC  SL1
   PNI  00001
   NCNA YES
   NCRD NO
   CHTY BCH
   CTYP UKWN
   INAC NO
   ISAR NO
   DAPC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB NO
STEP
ACOD 7005
TCPP NO
TARG
CLEN 1
BILN NO
OABS
```

INST
ANTK
SIGO ESN5
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

    IENB 5
    TFD 0
    VSS 0
    VGD 6
DRNG NO

PAGE 002

CDR YES
INC YES
LAST NO
QREC NO
OAL YES
AIA YES
OAN NO
OPD YES
CDRX NO
NATL YES
VRAT NO
MUS YES
MRT 40
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
TTBL 0
ATAN NO

PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO

REQ: end
>ld 16
RDB000
MEM AVAIL: (U/P): 2909576   USED U P: 139917 79850   TOT: 3129343
DISK RECS AVAIL: 392
RAN RTE AVAIL: 500   USED: 0   TOT: 500
REQ chg
TYPE re*
TYPE rdbv
SCH0111
TYPE rdb
CUST 0
DMOD
ROUT 12
DES
TKTP
M911_ANI
SAT
IDEF
RCLS
DTRK YES
DGTP PRI
ISDN YES
MODE PRA
IFC NI2
CBCR NO
PNI
NCNA
NCRD
CHTY BCH
NCOS
CPFXS
CPUB
DAPC
BCOT
INTC
DSEL
PTYP
AUTO
DNIS
DCDR
IANI
ICOG
RANX
SRCH
TRMB

STEP
ACOD
CLEN
TCPP
PII
TARG x
SCH0389
TARG 0
BILN
SGRP
OABS
INST
CNTL
DRNG
CDR
VRAT
MUS
EQAR
FRL
OHQ
OHQT
TTBL
ATAN
PLEV
MCTS
ALRM

MEM AVAIL: (U/P): 2909576 USED U P: 139917 79850 TOT: 3129343
DISK RECS AVAIL: 392
RAN RTE AVAIL: 500 USED: 0 TOT: 500
REQ
SCH0101
REQ
SCH0101
REQ
SCH0101
REQ end

>ld 20

PT0000
REQ: ****
OVL000
>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 12

```
TYPE RDB
CUST 00
DMOD
ROUT 12
DES  VOIP
TKTP DID
M911_ANI  NO
M911_TONE  NO
NPID_TBL_NUM   0
SAT  NO
IDEF NET
RCLS EXT
VTRK NO
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
   MODE PRA
   IFC  NI2
   CBCR NO
   NCOS 0
   SBN  NO
   PNI  00001
   NCNA YES
   NCRD NO
   CHTY BCH
   CPFXS YES
   CPUB OFF
   DAPC NO
   BCOT 0
   INTC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
RANX NO
SRCH LIN
TRMB YES
STEP
ACOD 7012
TCPP NO
PII NO
TARG 01
CLEN 1
BILN NO
OABS
INST
ICIS YES
TIMR ICF  512
    OGF  512
```

EOD 13952
NRD 10112
DDL 70
ODT 4096
RGV 640
FLH 510
GRD 896
SFB 3
NBS 2048
NBL 4096

PAGE 002

IENB 5
VSS 0
VGD 6
DRNG NO
CDR NO
VRAT NO
MUS 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
TTBL 0
ATAN NO
PLEV 2
MCTS NO
ALRM NO
ART 0
TIM000 15:00 5/8/2005 CPU 0

SGRP 0
AACR NO

REQ:
AUD000
end
>ld 16
RDB000
MEM AVAIL: (U/P): 2909576 USED U P: 139917 79850 TOT: 3129343
DISK RECS AVAIL: 392
RAN RTE AVAIL: 500 USED: 0 TOT: 500

REQ chg
TYPE rdb
CUST 0
DMOD 12
ROUT 12
DES
TKTP
M911_ANI
SAT
IDEF
RCLS
DTRK YES
DGTP PRI
ISDN YES
MODE PRA
IFC NI2
CBCR NO
PNI
NCNA
NCRD
CHTY BCH
NCOS
CPFXS
CPUB
DAPC
BCOT
INTC
DSEL
PTYP
AUTO
DNIS
DCDR
IANI
ICOG
RANX
SRCH
TRMB
STEP
ACOD
CLEN
TCPP
PII
TARG x01
BILN
SGRP
OABS
INST
CNTL
DRNG
CDR
VRAT
MUS

```
EQAR
FRL
OHQ
OHQT
TTBL
ATAN
PLEV
MCTS
ALRM

MEM AVAIL: (U/P): 2909576    USED U P: 139917 79850    TOT: 3129343
DISK RECS AVAIL: 392
RAN RTE AVAIL:   500    USED:     0    TOT:   500
REQ
SCH0101
REQ
SCH0101
REQ  end


>log*
>
OVL000
>ld 96
DCH000
.stat
DCH010


.stat dch
DCH 003 : OPER  EST   ACTV  AUTO        DES : VOIP
DCH 004 : OPER  EST   ACTV  AUTO        DES : LAKELINE
DCH 005 : OPER  EST   ACTV  AUTO        DES : BREAKER
DCH 006 : OPER  RLS       AUTO        DES : LUBOCK
DCH 007 : OPER  EST   ACTV  AUTO        DES : SMARTTRUNKS
.****
OVL000
>ld 60
DTI000
.stat

PRI*  TRK  LOOP 2 - ENBL
FFMT/LCMT/YALMT:  ESF/B8Z/FDL
TRACKING
SERVICE RESTORE: YES
YEL ALM PROCESS: YES
ALARM STATUS : NO ALARM
CH 01 - BUSY DID   VOD  *         CH 02 - IDLE DID   VOD  *
CH 03 - IDLE DID   VOD  *         CH 04 - IDLE DID   VOD  *
CH 05 - IDLE DID   VOD  *         CH 06 - IDLE DID   VOD  *
CH 07 - IDLE DID   VOD  *         CH 08 - IDLE DID   VOD  *
CH 09 - IDLE DID   VOD  *         CH 10 - IDLE DID   VOD  *
```

CH 11 - IDLE DID VOD * CH 12 - IDLE DID VOD *
CH 13 - IDLE DID VOD * CH 14 - IDLE DID VOD *
CH 15 - IDLE DID VOD * CH 16 - IDLE DID VOD *
CH 17 - IDLE DID VOD * CH 18 - IDLE DID VOD *
CH 19 - IDLE DID VOD * CH 20 - IDLE DID VOD *
CH 21 - IDLE DID VOD * CH 22 - IDLE DID VOD *
CH 23 - IDLE DID VOD * CH 24 - DCH 7

PRI* TRK LOOP 5 - ENBL
FFMT/LCMT/YALMT: ESF/B8Z/FDL
SERVICE RESTORE: YES
YEL ALM PROCESS: NO
ALARM STATUS : NO ALARM
CH 01 - IDLE TIE VOD * CH 02 - IDLE TIE VOD *
CH 03 - IDLE TIE VOD * CH 04 - IDLE TIE VOD *
CH 05 - IDLE TIE VOD * CH 06 - IDLE TIE VOD *
CH 07 - IDLE TIE VOD * CH 08 - IDLE TIE VOD *
CH 09 - IDLE TIE VOD * CH 10 - IDLE TIE VOD *
CH 11 - IDLE TIE VOD * CH 12 - IDLE TIE VOD *
CH 13 - IDLE TIE VOD * CH 14 - IDLE TIE VOD *
CH 15 - IDLE TIE VOD * CH 16 - IDLE TIE VOD *
CH 17 - IDLE TIE VOD * CH 18 - IDLE TIE VOD *
CH 19 - IDLE TIE VOD * CH 20 - IDLE TIE VOD *
CH 21 - IDLE TIE VOD * CH 22 - IDLE TIE VOD *
CH 23 - IDLE TIE VOD * CH 24 - DCH 5

PRI* TRK LOOP 6 - ENBL
FFMT/LCMT/YALMT: ESF/B8Z/FDL
SERVICE RESTORE: YES
YEL ALM PROCESS: NO
ALARM STATUS : RED
CH 01 - DSBL TIE VOD * CH 02 - DSBL TIE VOD *
CH 03 - DSBL TIE VOD * CH 04 - DSBL TIE VOD *
CH 05 - DSBL TIE VOD * CH 06 - DSBL TIE VOD *
CH 07 - DSBL TIE VOD * CH 08 - DSBL TIE VOD *
CH 09 - DSBL TIE VOD * CH 10 - DSBL TIE VOD *
CH 11 - DSBL TIE VOD * CH 12 - DSBL TIE VOD *
CH 13 - DSBL TIE VOD * CH 14 - DSBL TIE VOD *
CH 15 - DSBL TIE VOD * CH 16 - DSBL TIE VOD *
CH 17 - DSBL TIE VOD * CH 18 - DSBL TIE VOD *
CH 19 - DSBL TIE VOD * CH 20 - DSBL TIE VOD *
CH 21 - DSBL TIE VOD * CH 22 - DSBL TIE VOD *
CH 23 - DSBL TIE VOD * CH 24 - DCH 6

PRI* TRK LOOP 8 - ENBL
FFMT/LCMT/YALMT: ESF/B8Z/FDL
SERVICE RESTORE: YES
YEL ALM PROCESS: YES
ALARM STATUS : NO ALARM
CH 01 - IDLE DID VOD * CH 02 - IDLE DID VOD *
CH 03 - IDLE DID VOD * CH 04 - IDLE DID VOD *
CH 05 - IDLE DID VOD * CH 06 - IDLE DID VOD *

CH 07 - IDLE DID VOD * CH 08 - IDLE DID VOD *
CH 09 - IDLE DID VOD * CH 10 - IDLE DID VOD *
CH 11 - IDLE DID VOD * CH 12 - IDLE DID VOD *
CH 13 - IDLE DID VOD * CH 14 - IDLE DID VOD *
CH 15 - LCKO DID VOD * CH 16 - LCKO DID VOD *
CH 17 - IDLE DID VOD * CH 18 - LCKO DID VOD *
CH 19 - LCKO DID VOD * CH 20 - IDLE DID VOD *
CH 21 - BUSY DID VOD * CH 22 - BUSY DID VOD *
CH 23 - IDLE DID VOD * CH 24 - DCH 3

PRI* TRK LOOP 9 - ENBL
FFMT/LCMT/YALMT: ESF/B8Z/FDL
SERVICE RESTORE: YES
YEL ALM PROCESS: YES
ALARM STATUS : NO ALARM
CH 01 - IDLE TIE VOD * CH 02 - IDLE TIE VOD *
CH 03 - IDLE TIE VOD * CH 04 - IDLE TIE VOD *
CH 05 - IDLE TIE VOD * CH 06 - IDLE TIE VOD *
CH 07 - IDLE TIE VOD * CH 08 - IDLE TIE VOD *
CH 09 - IDLE TIE VOD * CH 10 - IDLE TIE VOD *
CH 11 - IDLE TIE VOD * CH 12 - IDLE TIE VOD *
CH 13 - IDLE TIE VOD * CH 14 - IDLE TIE VOD *
CH 15 - IDLE TIE VOD * CH 16 - IDLE TIE VOD *
CH 17 - IDLE TIE VOD * CH 18 - IDLE TIE VOD *
CH 19 - IDLE TIE VOD * CH 20 - IDLE TIE VOD *
CH 21 - IDLE TIE VOD * CH 22 - IDLE TIE VOD *
CH 23 - IDLE TIE VOD * CH 24 - DCH 4

.****
OVL000
>logo
TTY #00 LOGGED OUT 15:03 5/8/2005
SESSION DURATION: 00:26

>

DCH 3 UIPE_IMSG CC_RELEASE_IND REF 00001300 CH 8 19 TOD 16:04:34 CK 22BAD606

DCH 3 UIPE_IMSG CC_RELEASE_IND REF 00000339 CH 8 21 TOD 16:04:42 CK 22BB14D6

DCH 3 UIPE_IMSG CC_SETUP_IND REF 00001380 CH 8 21 TOD 16:05:08 CK 22BBDA41
CALLED #:2805699 NUM PLAN: UNKNOWN TON: UNKNOWN
CALLING #:NO DIGIT NUM PLAN: UNKNOWN TON: UNKNOWN

DCH 3 UIPE_IMSG CC_SETUPCOMP_IND REF 00001380 CH 8 21 TOD 16:05:10 CK 22BBF3D0

DCH 3 UIPE_IMSG CC_DISC_IND REF 00001380 CH 8 21 TOD 16:05:18 CK 22BC3119
CAUSE: #16 - NORMAL CALL CLEARING

DCH 3 UIPE_IMSG CC_RELEASE_CONF REF 00001380 CH 8 21 TOD 16:05:18 CK 22BC3161

DCH 3 UIPE_IMSG CC_PROCEED_IND REF 0000033B CH 8 23 TOD 16:05:38 CK 22BCC1D3

DCH 3 UIPE_IMSG CC_DISC_IND REF 0000033B CH 8 23 TOD 16:05:38 CK 22BCC36A
CAUSE: #17 - USER BUSY

DCH 3 UIPE_IMSG CC_RELEASE_CONF REF 0000033B CH 8 23 TOD 16:05:38 CK 22BCC3E3

DCH 3 UIPE_IMSG CC_DISC_IND REF 0000033A CH 8 20 TOD 16:06:14 CK 22BDE10C
CAUSE: #16 - NORMAL CALL CLEARING

DCH 3 UIPE_IMSG CC_RELEASE_CONF REF 0000033A CH 8 20 TOD 16:06:14 CK 22BDE193

DCH 3 UIPE_IMSG CC_PROCEED_IND REF 0000033C CH 8 23 TOD 16:06:22 CK 22BE20EF

DCH 3 UIPE_IMSG CC_DISC_IND REF 0000033C CH 8 23 TOD 16:06:22 CK 22BE2284
CAUSE: #17 - USER BUSY

DCH 3 UIPE_IMSG CC_RELEASE_CONF REF 0000033C CH 8 23 TOD 16:06:22 CK 22BE231D

DCH 3 UIPE_IMSG CC_SETUP_IND REF 00001400 CH 8 21 TOD 16:07:14 CK 22BFB4C1
CALLED #:99170096 NUM PLAN: UNKNOWN TON: UNKNOWN
CALLING #:NO DIGIT NUM PLAN: UNKNOWN TON: UNKNOWN

DCH 3 UIPE_IMSG CC_SETUPCOMP_IND REF 00001400 CH 8 21 TOD 16:07:22 CK 22BFF66B

DCH 3 UIPE_IMSG CC_RELEASE_IND REF 00001400 CH 8 21 TOD 16:07:28 CK 22C02753

DCH 3 UIPE_IMSG CC_PROCEED_IND REF 0000033D CH 8 23 TOD 16:09:38 CK 22C414E3

DCH 3 UIPE_IMSG CC_SETUP_CONF REF 0000033D CH 8 23 TOD 16:09:38 CK 22C41625

DCH 3 UIPE_IMSG CC_DISC_IND REF 0000033D CH 8 23 TOD 16:10:14 CK 22C53717
CAUSE: #16 - NORMAL CALL CLEARING

DCH 3 UIPE_IMSG CC_RELEASE_CONF REF 0000033D CH 8 23 TOD 16:10:14 CK 22C5379A

ERR5142 00000000 00000005
dis
DCH018

.
DCH000
.dis msgi 3

.****
OVL000
>*

1.5 ShoreWare Director Configuration

1.5.1 Configure Trunk Group

1. Log into ShoreWare Director.
2. Navigate to **Trunks** and select **Trunk Groups.**
3. Select the site you wish to add the Trunk Group to (Note: Must be the same site selected when adding the SG-T1 switch).
4. Select trunk group type **PRI** and click **Go**.
5. Assign a name for the trunk group (example: **Nortel Tie**).
6. Set **Number of Digits from CO** to **4**.
7. Select the **extension** check box.
8. Select **Tandem Trunking** if applicable.
9. Select the **Outbound Services** you wish to allow between systems (if any).
10. Add the range of **off system extensions** that will be accessible on the Nortel PBX.
11. Click **Save** at the top of the page.

1.5.2 Configure ShoreGear-T1

1. Navigate to the **Switches** page.
2. Select the site you wish to add the ShoreGear-T1 to.
3. Select switch type **ShoreGear-T1** and click **Go**.
4. Enter the appropriate parameters for the switch **Name, Description, IP Address** and **Ethernet Address**.
5. Select **T1 PRI User** for switch type.
6. Select **ESF** framing format.
7. Select **B8ZS** line coding.
8. Select **NI-2** for CO type (or select a setting compatible with the PBX).
9. Select **Master** clock source.
10. In Channel 1, select the trunk group created in section 1.5.1, and click the **Fill Down** button.
11. Click **Save** at the top of the page.

2.0 SMDI Integration – ShoreTel as Voice Mail

Figure 14-2 below shows the legacy system providing PBX services and the ShoreTel equipment providing voice mail services.

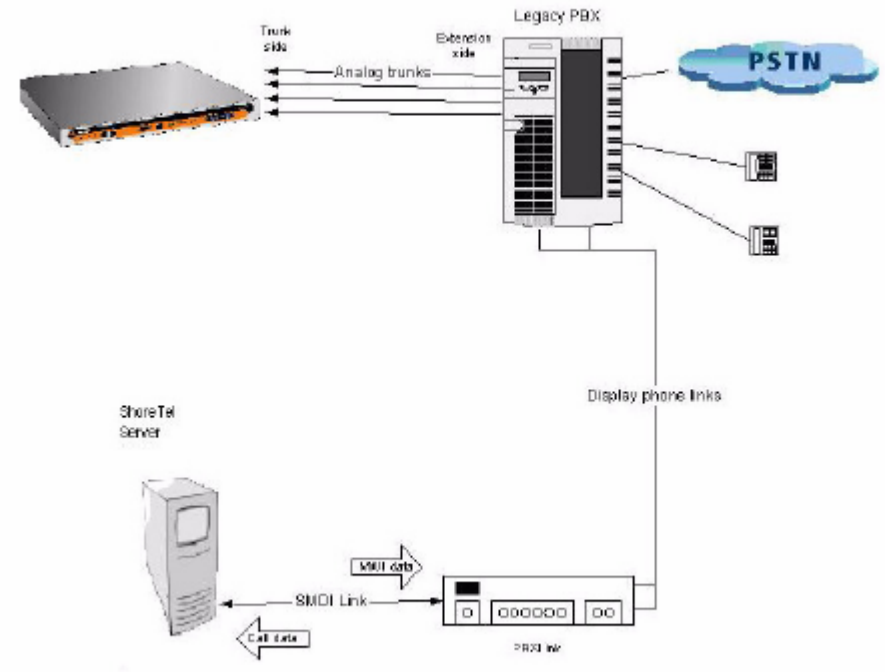

Figure 14-2 ShoreTel Voice Mail with legacy PBX

2.1 Overview

SMDI Protocol Support

The ShoreTel 6 product supports the SMDI protocol, enabling seamless integration of ShoreTel equipment with legacy phone systems and enabling a smooth migration toward an all-IP telephony solution.

How it works

SMDI enables the separate devices that provide PBX and voice mail services to share information over an out-of-band serial cable connection. The PBX shares information with the voice mail system about incoming calls. The following information is passed to the voice mail system:

- who the call is from
- where the call is going (i.e. user extension)
- the reason the call is going to voice mail instead of being answered

In response, the voice mail system returns a notification to the PBX that a message was left on the voice mail server. The PBX system then uses this information to alert the user by turning on the "message waiting" light on his or her phone.

Configurations of integrated equipment

With SMDI support, there are essentially two possible ways the ShoreTel and legacy equipment can be configured:

External Voice Mail Configuration – The legacy system provides voice mail services while the ShoreTel 6 system acts as the PBX.

ShoreTel VoiceMail Configuration – The ShoreTel system provides voice mail services while the legacy system acts as the PBX.

Additional details

A group of analog trunks from the ShoreTel system is used to access the legacy voice mail system (the ShoreTel system is on the extension side of the trunks). The ShoreTel voice mail application manages the group of outgoing extensions. The ShoreTel server provides digit translations if the legacy voice mail and ShoreTel system have different extension lengths.

Details:

- Figure 14-2 shows a ShoreTel switch connected to a legacy PBX through several analog trunks. These phone lines carry voice information from the PBX to the voice mail server. Signaling information is carried out-of-band on the separate serial line (near the bottom of the illustration).
- A ShoreTel voice mail server (near the bottom) is connected through a serial cable to a PBX link device. (The PBX link device provides the basic SMDI services that were not included in some of the older legacy PBX devices. This device must be purchased separately and configured per the manufacturer's instructions.)
- The ShoreTel server and PBX link exchange information. The PBX link sends call data to the ShoreTel voice mail server, and the call data contains information related to the source and destination of the phone call, and provides information about why the call is going to voice mail (e.g. user did not answer, line was busy, etc.).
- The ShoreTel server, in return, sends MWI (Message Waiting Indicator) information that is used by the legacy PBX to turn on the message-waiting mechanism on a user's phone to let her know she has received a message.

Information Transferred via SMDI

The COM port is used to send call information between the ShoreTel system and the legacy voice mail system.

2.2 Feature Support

The SMDI protocol transmits the following call information from the ShoreTel system to the legacy system:

- Message desk number: 1-999
- Logical Terminal number (terminal identifier): 1-9999
- Call type (All, Busy, Direct, No Answer, Unknown)
- Called party
- Calling party

The SMDI MWI protocol transmits the following information from the legacy voice mail system to the ShoreTel system:

- Message waiting indication control
- Extension
- On/Off indication

When using SMDI, ShoreTel voice mail configuration, the following features will not be supported:

- Office Anywhere
- Setting call handling mode
- Setting agent state

The following features will be supported:

- Recording greeting and name
- Setting TUI password
- Enable/disable envelope information
- Email voice message options
- FindMe
- Message functions including call back
- Message sending functions
- Workgroup
- "ShoreTel voice mail"
- Agents can't be extensions in the legacy PBX.
- System configuration
- Configuration parameters

2.3 Configuring ShoreTel for SMDI - Overview

Configuring Legacy Voice Mail Integration Using SMDI

As mentioned before, there are two modes of operation with respect to integrating a ShoreTel system and a legacy system:

- *External Voice Mail Configuration* - In this configuration, the legacy system provides voice mail services while the ShoreTel system acts as PBX for users.

• *ShoreTel Voice Mail Configuration* - In this configuration, the ShoreTel system provides voice mail services while the legacy system acts as a PBX for users.

The former of these two operational modes (External voice mail) is discussed below, while the procedure for the latter configuration (ShoreTel voice mail) follows in "Configuring ShoreTel Voice Mail Integration Using SMDI" on page 14-19 of the ShoreTel planning and installation guide.

To integrate a legacy voice mail system with ShoreTel 6, you need to perform the following basic tasks:

• Configure the server COM port for SMDI connections to the legacy system.
• Configure interface options from ShoreWare Director
• Create a user group for users with access to the integration extensions

Configuring the COM Port on the ShoreWare Server

COM Port Setup

To establish the SMDI link between the ShoreTel server and the legacy voice mail system, connect one end of a DB-9 serial cable to the COM port on the ShoreTel server and the other end of the cable to a COM port on the legacy voice mail server. The COM port settings on the ShoreTel server must match the settings of the COM port on the legacy voice mail server. Obtain the legacy voice mail COM port settings from the legacy voice mail server's administration guide or from your system integration manager. You need the following information:
• Baud rate
• Data bits
• Parity
• Stop bits
• Flow control

To configure COM port communication:
Step 1 From the **Start** menu on the Windows server connected to the legacy voice mail server, select **Settings**, and then **Control Panel**.
Step 2 In the **Control Panel**, open the **Computer Management** folder.
Step 3 Open the **Device Manager**.
Step 4 From the right pane in the window, expand the item **Ports (COM & LTP)**.
Step 5 Right-click the COM port used to connect the ShoreTel server and legacy voice mail system, and select **Properties** from the menu.

Ask your server administrator if you need help in determining the correct COM port.

Step 6 In the **Properties** window, enter the settings for the legacy voice mail server COM port.
Step 7 Click **OK** to save the settings.
Step 8 In ShoreWare Director, open the **Server** edit page.
Step 9 Enter the COM port the server will use for SMDI communications in the **COM Port (1-10)** text box.
Step 10 Click **Save**.
NOTE The ShoreTel 6 system will not read the COM port settings until you have saved changes to the Server edit page or voice mail service or restarted.

2.5 Configuring Analog Trunk Ports

The ShoreTel system sends calls to the legacy voice mail server over analog trunks connecting the two systems. The extensions are on the ShoreTel side, and the legacy voice mail system is the trunk side. The ShoreTel system sends calls made to these extensions to the legacy voice mail system when voice mail is needed. Before the call is sent, the SMDI protocol sends information about the call to the legacy voice mail system via the SMDI serial link. This allows the legacy voice mail system to handle the call correctly.

To configure the extensions, you need to do the following:
• Create a list of the extensions and include the Logical Terminal Number for each extension.
• Configure the extensions with a new dial number (DN) type and marked as private users with no mail box.
• Assign a physical port to each extension in Director. Configure the extensions to forward to the Backup Auto Attendant on "no answer" or "busy."

Configuring the ShoreWare Server

Follow these steps to set up communication between ShoreWare Director and the legacy voice mail server.

2.6 Configuring Shoreware Director for SMDI

To set up ShoreWare Director to communicate with the legacy voice mail server:
Step 1 From **ShoreWare Director**, click **Servers** in the navigation frame.
Step 2 Select the server connected to the legacy voice mail system.
Step 3 In the Edit Server page under **Simplified Message Desk Interface**, change the settings as follows:
A) Make sure that the **ShoreTel as PBX** box is selected.
B) In the **COM Port** field, enter the port on the server that will be used for SMDI communication.
C) In the **Message Desk Number** field, enter the Message Desk number (range is 1-999, with a default of 1). This number identifies a specific voice mail system and must be set to the value the voice mail system expects. In configurations where a number of SMDI links are daisy chained together, this value is used to allow each system to known what data belongs to it. Since most systems use only one SMDI link, this parameter is normally set to 1.
D) In the **Number of Digits** field, enter the extension length. (range 2-32 digits). This value is used to determine how many digits the ShoreTel 6 system sends in SMDI extension fields. This value needs to be set to the value the voice mail system expects. The most common values are either 7 or 10. If the system extension length is less than the number of SMDI digits then the extension number will be padded. For example, if the ShoreTel 6 system needs to send extension 456 and the number of SMDI digits is set to 7, extension 0000456 is sent. If no padding is desired, the number of digits should be set to 2. In the above example with the number of SMDI digits set to 2 only 456 will be sent.
E) In the Translation Table field, select a translation table. Translation tables are created in ShoreWare Director. If you are using a translation table, make sure the **Use for Call Data** and **Use for MWI Data** check boxes are selected. For more information on building translation tables, see the *ShoreTel 6 Administration Guide*.
f Click **Save**.

Digit Translation

If ShoreTel system extensions and legacy voice mail system extensions differ in length, you need to create digit translation tables that map the ShoreTel extensions to legacy system extensions. The digit translation tables must be added as a group of named tables from the Voice Mail section of ShoreWare Director. For more information see the *ShoreTel 6 Administration Guide*.

To create a digit translation table, follow the procedure below:
Step 1 Launch ShoreWare Director and enter the user ID and password.
Step 2 Click on the **Administration** link to expand the list (if it has not already been expanded).
Step 3 Click on the **System Parameters** link to expand the list.
Step 4 Click on the **Digit Translation Tables** link.
Step 5 Click the **New** button.
Step 6 Enter a name in the **Name** field and click the **Save** button to store your digit translation table.
Step 7 Click the **New** button again to display the **Digit Translation** window (below).
Next, you must select the digit translation mapping that you just created at the server.
Step 8 Click on the **Application Servers** link and click on the name of the ShoreTel server that will be handling the digit translation.
Step 9 In the Simplified Message Desk Interface section of the Application Servers window, select **ShoreTel Voice Mail** from the **Mode** drop-down menu.
Step 10 The **Translation Table** drop-down menu appears. Click on the arrow button and select the name of the digit translation table that you just created.
Step 11 Select the **Use for Call Data** check box and **Use for MWI Data** check box by placing a check mark in each one (as shown below). Doing so allows for the digit translation to occur when:
• Data about a call is transferred between the legacy and ShoreTel systems.
• Message Waiting Indicator information is transferred between the two systems to notify the legacy PBX that a message was left on the ShoreTel voice mail.

Step 12 By default, the "Use Flash to Route Calls" check box is enabled. Leave this as is. Note that this check box only appears when "ShoreTel Voice Mail" is selected in the *Mode* drop-down menu in the *Simplified Message Desk Interface* section of the window. If selected, calls sent to the ShoreTel Auto Attendant from the SMDI trunk group are automatically transferred to the dialed extension using flash. If not selected, calls will be routed using other lines.

NOTE The flash call routing function is only supported on the following switches: ShoreGear-40/8, ShoreGear-60/12, ShoreGear-120/24.

NOTE The extension length must be the same on each of the systems for the "Transfer Using Flash" feature to work as no translation is applied.

Setting Up the User Group in ShoreWare Director

Follow these steps to set up a user group for those users who will have their voice mail re-directed to the legacy voice mail system.

To set up the user group:
Step 1 Open **ShoreWare Director**.
Step 2 From the navigation frame, click **Users** and then **User Groups**.
Step 3 Select an existing user group or create a new user group.
Step 4 Change the **Simplified Message Desk Interface Mode** option to **ShoreTel as PBX** by selecting this setting from the drop-down menu.

Step 5 Click **Save**.

Configuring ShoreTel Voice Mail Integration Using SMDI

As mentioned before, there are two modes of operation with respect to integrating a ShoreTel system and a legacy system:

- *External Voice Mail Configuration* - In this configuration, the legacy system provides voice mail services while the ShoreTel system acts as PBX for users.
- *ShoreTel Voice Mail Configuration* - In this configuration, the ShoreTel system provides voice mail services while the legacy system acts as a PBX for users.

The former of these two operational modes (External voice mail) is discussed in "Configuring Legacy Voice Mail Integration Using SMDI" on page 14-11. The procedure for the latter configuration (ShoreTel voice mail) follows. Configuring the "ShoreTel Voice Mail Configuration" consists of the following major tasks:

- Creating a Trunk Group
- Creating Trunks
- Configuring the ShoreTel Server for SMDI
- Creating a User Group
- Adding an Individual User
- Configuring the Serial Connection
- Configuring Digit Translation Tables
- PBX link

Creating a Trunk Group

One of the first tasks involved in configuring SMDI is to create a trunk group. The trunk group is used to manage the individual trunk lines between the ShoreTel switch and the legacy PBX. Instructions for creating the trunk group are provided below. For additional details on setting up trunk groups, refer to the *ShoreTel 6 Administration Guide*.

To create a trunk group for SMDI trunks, follow the procedure below:

Step 1 Launch ShoreWare Director and enter the user ID and password.
Step 2 Click on the **Administration** link to expand the list (if it has not already been expanded).
Step 3 Click on the **Trunks** link to expand the list.
Step 4 Click on the **Trunk Groups** link to display the Trunk Groups window.
Step 5 Select the trunk group site, and select **Analog Loop Start** for the type. Then click the **Go** link.
Step 6 Enter a name for the trunk group in the **Name** field.
Step 7 Enter a voice mail extension in the **Inbound Destination** field to direct inbound calls to the ShoreTel Auto Attendant system.
Step 8 Click the **Save** button to store your changes.

Creating Trunks

After creating the trunk group, the next step is to create one or more trunk lines representing each data connection between the ShoreTel switch and the legacy PBX. The lines between the PBX and ShoreTel voice mail must be trunk lines with ShoreTel being the trunk side and the PBX being the extension side, (i.e. calls leaving the PBX for the voice mail system will leave on extensions). The PBX-to-voice mail connection might also be a T1 trunk that uses a channel bank to provide extensions to the legacy PBX.

To create a trunk line, follow the procedure below:
Step 1 With ShoreWare Director still open, click on the **Trunks** link to expand the list.
Step 2 Click on the **Individual Trunks** link.
Step 3 Select the trunk line site (i.e. Headquarters or Remote) from the dropdown menu, and use the drop-down menu to find and select the name of the trunk group you just created.
Step 4 Click the **Go** link to display the Edit Trunk window.
Step 5 In the **Number** field, enter the Logical Terminal Number. This value can range from 1 to 9999. For many systems the extension number of the port is used.
NOTE The Logical Terminal Number identifies the port the PBX will use to send the call to the ShoreTel voice mail system. It is very important that the LTN match what the PBX will send. You must check with your PBX vendor to determine what will be sent.
Step 6 Click the **Save** button to store your changes.

Configuring the ShoreTel Server for SMDI

After creating the trunk lines, you will configure the ShoreTel voice mail server. Configuration involves setting up the various SMDI parameters. To configure the ShoreTel voice mail server for SMDI operations, follow the procedure below:
Step 1 With ShoreWare Director still open, click on the **Application Servers** link.
Step 2 Click on the name of the server (Headquarters or Remote) that will be acting as the voice mail server for the legacy PBX.
Step 3 In the Simplified Message Desk Interface section of the Application Servers window, click on the drop-down menu and select **ShoreTel Voice Mail**. A new set of fields and menus related to SMDI appear.
Step 4 In the **Trunk Group** drop-down menu, select the name of the SMDI trunk group that you created earlier. This tells the server the name of the trunk group from which it should expect to receive voice mail calls.
Step 5 In the **COM Port** field, enter the numerical value (from 1-10) that corresponds to the serial port of the ShoreTel server where you will be connecting the serial port. (This serial port will be used to route out-ofband SMDI signaling information between the PBX link device and the ShoreTel server.)
Step 6 The Message Desk Number, which has a range of 1-999, is optional and can be set to the default value of 1. Check with the vendor for this value.

NOTE The Message Desk Number is used to indicate a specific system in situations where a number of SMDI links have been daisy-chained together. This value allows each system to known which data belongs to it. In most case this parameter is set to 1, since only one system will
be using the SMDI link.
Step 7 The Number of Digits field, which has a range of 2-32, is optional.

NOTE This value determines how many digits the ShoreTel system will send in SMDI extension fields. This value needs to be set to the value the voice mail system expects. The most common values are either 7 or 10. If the system extension length is less than the number of SMDI digits, then the extension number will be padded. For example, if the ShoreTel system needs to send extension 456 and the number of SMDI digits is set to 7, extension 0000456 will be sent. If no padding is desired the number of digits should be set to 2. In the above example with the number of SMDI digits set to 2 only 456 will be sent.
Step 8 The translation table is optional and can be left as is for now. We will be returning to the related topic of digit translation tables later.
Step 9 Click the **Save** button to store your changes.

Creating a User Group

After setting up the ShoreTel voice mail server for SMDI, the next step is to add users to the system. You will create a user group, and in this user group you will specify that all members will use ShoreTel Voice Mail. Once this is done, then you will modify user profiles at the individual level. For now, we will talk about creating the user group.

To create a user group for users on the legacy PBX system, follow the procedure below:
Step 1 With ShoreWare Director still open, click on the **Users** link to expand the list.
a Click on the **User Groups** link.
b Click on the **Add New** link to display the **User Groups** window.
Step 2 Enter a Name for the user group in the **Name** field.
Step 3 In the Simplified Message Desk Interface Mode drop-down window, select **ShoreTel Voice Mail** from the list.
Step 4 Click the **Save** button to store your changes.

Adding an Individual User

After creating the user group, you can create user profiles for the legacy PBX users. To do so, follow the procedure below:
Step 1 With ShoreWare Director still open, click on the **Users** link to expand the list.
Step 2 Click on the **Individual Users** link.
Step 3 In the **Add new user at site** field, select the server where you configured the ShoreTel voice mail for the PBX link device.
Step 4 Click the **Go** link to display the **Edit User** window, shown below.
Step 5 Enter a name for the user in the **First Name** and **Last Name** fields.
Step 6 In the License Type drop-down menu, click on the arrow-button and select **Mailbox-Only.** The user is located on the legacy system and thus, he or she does not require a ShoreTel extension.
Step 7 In the User Group drop-down menu, click on the arrow-button and find and select the name of the user group you just created.
Step 8 Click the **Save** button to store your changes.

2.7 SMDI Integration – Programming the Nortel PBX and the PBXLink interface:

Programming the Nortel PBX

This chapter describes how to configure a Northern Telecom Meridian 1 PBX for the PBXLink. To integrate a voice mail system with the Meridian 1. It is necessary to ensure that your PBX has the correct level of software to operate with the PBXLink. These are outlined below. All Meridian 1 systems with these options can support Bridged mode operation so there is no need for transfer mode on Meridian 1.
Throughout this chapter the convention will be used that **bold** type are things that need to be entered. For example:
CUST **0** [Example only]
CUST - this is printed by the PBX
0 - this is entered by you
[Example only] - this is just a comment
In our examples the analog lines for the voice mail system will be **2000, 2001, 2002** etc. The main voice mail number (or "pilot number") will be **2000**.

The work involved can be broken down into a number of separate tasks:

__ Task 1: Preparing the PBX
__ Task 2: Setting up the Voice Mail analog lines
__ Task 3: Setting up the PBXLink's digital line
__ Task 4: Setting up the Voice Mail users' telephones

These tasks are covered in the sections below:
After configuring the PBX, you will need to configure the PBXLink. See *Chapter 8 of the PBXlink documentation -- Configuring the PBXLink* for details.
Note: Your PBX configuration options may not be exactly the same as those shown in this chapter, as they depend on installed options and the PBX software version

Task 1: Preparing the PBX
Before starting any programming of the PBX, it is strongly recommended that you obtain a hard copy of the current PBX configuration.

This task consists of three parts:

- PBX Software Confirmation

Checking that the PBX is running the right software

- Customer Data Block setup

Ensuring that the Customer Data Block has the correct privileges

- Programming Calling Party Name Display

Ensuring that the reason for a call being forwarded is sent to the PBXLink

PBX Software Confirmation
It is necessary to ensure that the correct software packages have been installed, for the PBXLink to operate correctly. To ensure this use overlay 22 as follows

>**LD 22**
REQ **PRT**
TYPE **PKG**
OPTF 1
CUST 2
CTY 5
DNDI 9
EES 10
MSB 17
DDSP 19
MWC 46
DSET 88
CPND 95
ARIE 170
If the options underlined above are not present in the list of optional packages then you will need to upgrade the PBX software.

Customer Data Block Setup
It is necessary to enable certain options in the Customer Data Block to ensure correct operation of the digital line used by the PBXLink.

>**LD 15**
REQ **CHG**
TYPE **CDB**
CUST **0** [Example only]

LDN0
DGRP
NITE **2000** [The pilot number if night calls go to Voice Mail]
TSTL
SPRE
ATDN
NCOS
OPT **CFO** [Call forwarding Originating Party COS]
MCI [Message Centre Included]
IDP [Include Digit Display]
INTR
RTIM
CDR
ICI
FLSH
CHLN
FCAF
SPWD
FNAD **FDN** [Call Forward No Answer DID]
FNAN **FDN** [Call Forward No Answer NONDID]
FNAT **FDN** [Call Forward No Answer Trunk]
FNAL **FDN** [Call Forward No Answer Local]
CFNA **6** [Rings for Call Forward No Answer NONDID]
DFNA **6** [Rings for Call Forward No Answer DID]
PHDT
AQTT
AODN **2000** [Attendant overflow sent to Voice Mail]
SRCD
ATAC
CWCL
CWTM
CWBZ
DNDT
CCRS
MDID **YES** [No Answer DID to Voice Mail]
NDID **YES** [No Answer NONDID to Voice Mail]
MWFB **YES** [Busy DID to Voice Mail]
MATT
CONG
LLT
DLT
DIND
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DIDT
LDTT **6** [Line Disconnect Tone Timer for 500/255 phones]
BOTO
NFCR
EEST **NO** [Enable End-to-End signaling for digital phones]

Programming Call Party Name Display

When the PBX forwards a call, it displays a 4 letter string on the display which explains why the call was forwarded. These 4 letter strings can be changed by the PBX administrator -- this is done in LD 95.
The relevant strings and their reasons for being displayed are:
__ CFWD -- call forwarded because all calls have been forwarded to voice mail
__ CFNA -- call forwarded because there was no answer
__ HUNT -- call forwarded because the extension was busy

This LD95 session sets up the default strings:
>**LD 95**
REQ **CHG**
TYPE **CPND**
CUST **0** [Example only]
CNFG
MXLN
STAL
DFLN
DES
RESN **YES**
CFWD **CFWD**
CFNA **CFNA**
HUNT **HUNT**
PKUP
XFER **T**
AAA **A**

If your system does not use the default strings, then you must configure your PBXLink with the strings that you use. This is done in:
Configuration...
PBX Options...
Call Forward Display...

Task 2: Setting up the Voice Mail analog lines
Analog lines need to be used to connect the voice mail system to the PBX. At this stage it is important to know how many there are going to be and have extensions assigned for them. In bridged mode the PBX is configured to send calls directly to the analog port. For this reason the first analog port has an extension of **2000**.

This is how to set up an analog line.
>**LD 10**
REQ **NEW**
TYPE **500**
TN **0 0 3 1** [Example only]
CDEN **SD** [**SD** if QPC60, **DD** if QPC452, **4D** if QPC594]
DES
CUST **0** [Example only]
DIG
DN **2000**
HUNT **2001**
TGAR
NCOS
RNPG
CLS **HTA FBD DTN XFA FND MWD LDTA**
[HTA: Hunting allowed (REQUIRED)]

[FBD: Forward-on-busy disallowed (REQUIRED)]
[DTN: DTMF Dialing Allowed (RECOMMENDED)]
[XFA: Transfer allowed (RECOMMENDED)]
[FND: Forward-no-answer disallowed (RECOMMENDED)]
[MWD: Message Waiting disallowed (RECOMMENDED)]
[LDTA: Line disconnect tone allowed (RECOMMENDED)]
FTR

Note that LDTA is only provided on Release 17 and later.
Repeat this process for each of the analog ports, using the appropriate DN and TN. In each case the HUNT extension should be the DN of the next analog line connected to the voice mail system. This way a call will arrive at the first port and the PBX will hunt for a free analog line and deliver the call ringing to it.

Task 3: Setting up the PBXLink's digital line
Configure the digital line being used for the PBXLink as a 2616 with 1 add on module. Key 0 is the primary DN for the digital line and can be set to any value. Keys 16 onwards are bridged appearances of the analog ports going to the voice mail system.
This example has 6 voice mail ports, starting with extension 2000.

>**LD 11**
REQ **NEW**
TYPE **2616**
TN **0 0 1 4** [Example only]
DES
CUST **0** [Example only]
AOM **1**
FDN
TGAR
NCOS
RNPG
SSU
CLS **ADD HFD CNDA DNDA**
HUNT **000**
LHK
KEY **00 SCR 2999** [This can be any DN]
KEY **12 DSP**
KEY **13 MIK**
KEY **14 MCK**
KEY **16 SCN 2000** [Pilot number for the voice mail system]
MIX
KEY **17 SCN 2001**
MIX
KEY **18 SCN 2002**
MIX
KEY **19 SCN 2003**
MIX
KEY **20 SCN 2004**
MIX
KEY **21 SCN 2005**
MIX
KEY [Add more extensions here as needed…]

Using Both Digital Ports
This section does not apply to the PBXLink ISA.
To use the second digital ports program up a second digital line exactly the same way as the first, on a different TN and with each analog line appearing bridged to only one of the digital lines. It is recommended that the analog lines alternate between each of the digital lines as they proceed along the hunt group. This ensures that there is an even work load on each of the digital PBX lines.

Task 4: Setting up the Voice Mail users' telephones
Users need to have their phones set up so that their calls are forwarded to the voice mail system if they do not answer or if they are on the phone. It is also important to ensure that the PBXLink is able to illuminate the message waiting indicator on the users phone, or if they don't have a light then allow stuttered dial tone.
The exact way that this is done depends upon the sort of set that the user has: analog, digital or SL-1.

Setting up a user's analog set
If the user has an analog set then the setup will look like this.
>**LD 10**
REQ **CHG**
TYPE **500**
TN **0 0 2 4**
CDEN
DES
CUST
DIG
DN
HUNT **2000**
TGAR
NCOS
RNPG
CLS **HTA FNA MWA LPA *CFTA SFA***
FTR **FDN 2000**
EFD 2000
EHT 2000

Setting up a user's digital set
A digital set, say a 2008, would be set up like this:
>**LD 11**
REQ **CHG**
TYPE **2008**
TN **0 0 4 3**
ECHG
DES
FDN **2000**
TGAR
NCOS
RNPG
SSU
CLS **HTA FNA MWA *CFTA***
EFD **2000**
HUNT **2000**
EHT **2000**
LHK

Setting up a user's SL-1 set
If the user has an SL-1 set then it could be set up like this.
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>**LD 11**
REQ **CHG**
TYPE **SL1**
TN **0 0 6 2**
CDEN
DES
CUST
KLS
FDN **2000**
TGAR
NCOS
RNPG
SSU
CLS **HTA FNA MWA *CFTA***
*EFD **2000***
HUNT **2000**
*EHT **2000***
LHK
KEY **04 MWK 2000**

The Next Step
Having configured the PBX, you now need to configure the PBXLink.

Configuring the PBXLink
You need to configure the PBXLink to tell it how your PBX and voice mail system are configured. There are many settings which can be changed, and these are all described in *Chapter 11 -- Configuration Parameters*. However most of these can be left at the default setting on most systems, and only a few important ones need changing.

These are described below.
Configuration Menus
The PBXLink is configured through menus. If you have a PBXLink ISA, these are accessed through either the built-in SMDI serial port, or through the external management serial port, as described below. If you have a PBXLink box, you can also access the menus through the front panel keypad and LCD. Operation of the keypad and LCD is described in *Chapter 12 -- Using the LCD and Key Pad - PBXLink*.
To access the configuration menus through the SMDI port, you will need to have got the SMDI port working with suitable terminal emulation software, as described in *Chapter 2 -- Installing Your PBXLink* or *Chapter 3 - - Installing Your PBXLink ISA*. You can also access the menus through the management serial port if you have this set up.

When you type
M <enter>
on the terminal, you will see the main menu displayed. This looks similar to
PBXLink ISA v 2.70
1. Configuration…
2. Monitor PBXLink…
3. Reboot/Download…
Then type
1 <enter>

to enter the main configuration menu. This offers several sub-menus, and looks similar to:

Configuration
1 - Integration [Started]
2 - PBX Type...
3 - PBX Options...
4 - SMDI Options...
5 - Serial Port Options...
6 - Remote Access...
7 - Reset to Factory Default...

Check the following menu options:

Configuration…/PBX Type
This must be set to the type of PBX you have. When this setting is set correctly, the port LED will stop flashing (this is the LED on the bracket of the PBXLink ISA, and the LED labeled PBX A on the PBXLink box).
If you have a Nortel Meridian 1 or SL-100 PBX, choose the **Nortel M1** option.
Note that when you change the PBX type, the PBXLink will restart. This means that you will be back outside the menu systems so, after allowing it a few seconds, you will have to type **M <enter>** again to get back into the configuration menus.

Configuration…/Integration
This should be set to **Started**.

Configuration…/PBX Options…/Analog Ports on A
This should be set according to the number of analog lines connected to your voice mail system.

Configuration…/PBX Options…/Configure Port A
This should be set to **Calls + MWI**, the default.

Configuration…/PBX Options…/Prime number (Nortel and Lucent bridged mode only)
This should be set to the extension number that voice mail users call to pick up their voice mail..

Configuration…/PBX Options…/Message Waiting Ind…(Lucent only)
These settings must match those in the Feature Access Codes pages of the PBX programming, and are the prefixes that are dialed before an extension number to turn on or off a Message Waiting Indicator.
The defaults are *4 and #4, which are the defaults for most PBXs.

Configuration…/PBX Options…/Call Forward display…(Nortel only)
These settings must match those in LD 95 of PBX programming (see *Chapter 7 -- Programming Your Nortel PBX*), and indicate what the PBX should expect on the display of the digital phone it is emulating. There are three settings: one for all calls forwarded, one for forward on no answer, and one for forward on busy.

The Next Step
Having configured both the PBX and the PBXLink, you can now test the installation.