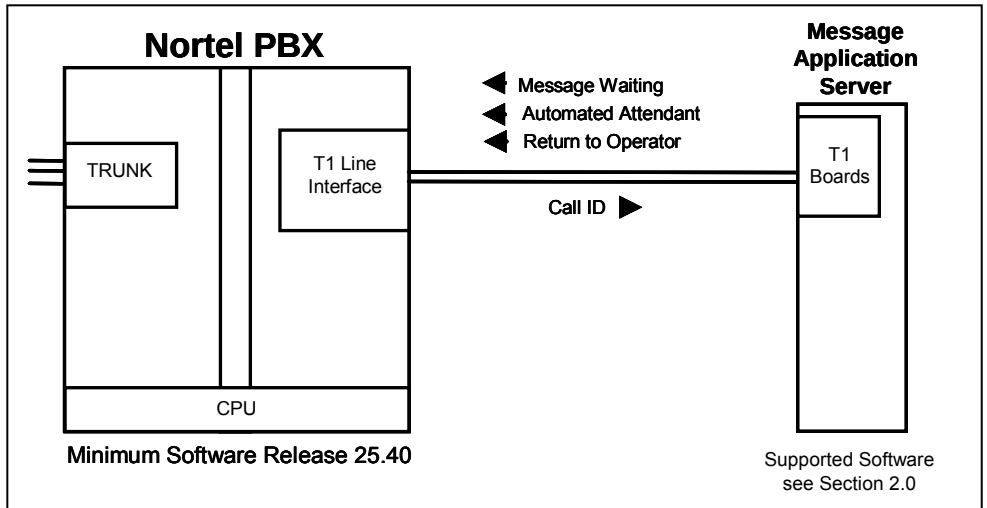


Configuration Note 88024 – Version O (1/10)

Nortel M1 T1/QSIG

The PBX and MM are assumed to be collocated. For other configurations please consult with the Switch Integrations group.



Overview

This Configuration Note is intended for Avaya certified Modular Messaging technicians/engineers who are familiar with Modular Messaging procedures and terminology. It also assumes that you are Nortel certified or very familiar with the features and functionality of the Nortel PBXs supported in this Configuration Note and the QSIG protocol.

Use this document in conjunction with *Modular Messaging Installation Guide* and the *Nortel PBX Administration Guide*.

Please read the entire document before attempting any configuration.

1.0 METHOD OF INTEGRATION

With T1 QSIG, one digital pathway between the PBX and the MAS transmits both call information and voice communications

With T1 QSIG integration, one digital pathway between the PBX and the Avaya Message Application Server (MAS) transmits both call information and voice communications. The pathway is provided by an ISDN digital link (QSIG), which provides channels that connect to the Dialogic T1 card. Within the D-Channel, routing information is sent to the MAS containing information regarding the source of the call and with reason codes. The MAS processes call information from the supplementary code in the D-Channel, which routes call reasons directly to mailboxes. Message Waiting Indication is set and canceled using the supplementary code service. Voice is carried through the system in digital format.

MAS Requirements

¹**Release Note:**

Should features of the integration not function optimally when integrated to a PBX or MM that may be operating on an unsupported software release as defined Section 2.0 and 3.1, customers will need to upgrade their PBX and/or MM to a supported software release.

PBX hardware requirements

PBX software requirements

2.0 AVAYA MESSAGE APPLICATION SERVER REQUIREMENTS

- Dialogic D/480JCT-1T1 or D/240JCT-T1
- CT Bus cable (only required for multiple card installation)
- Software Releases ¹: MM 2.0 (w/SP3 or later), MM 3.x, 4.x, 5.x

3.0 PBX HARDWARE REQUIREMENTS

- NT5D12 Dual PRI or equivalent (Option 51, 61, 81)
NT5D16BA Cable
- NTAK09BA (Option 11, Succession 3.0)
- **Cables:**
The Dialogic T1 board requires male ended RJ-45C cable. The Nortel uses a DB15 female ended cable, so an adapter from DB15 female ended to RJ-45C female ended is required. Note to cross over the cable.

Pins 1 & 9 are Trx1, and pins 9 & 11 are Trx2. These need to be crossed over within the DB15. Then straight through male to male RS-45 cables can be used to connect from the PBX to the Dialogic T1 boards.

3.1 PBX SOFTWARE REQUIREMENTS

- Minimum Software ¹:

Release 25.40 (Option 11, 51, 61, 81)

Succession 3.0, 4.x, 5.x*

***Note:** Multi Customer for Succession is not supported.

Important: Ensure all latest patches are installed on the PBX.

- Network Alternate Route Selection (NARS) package 58
- Coordinated Dialing Plan (CDP) package 59
- Flexible Numbering Plan (FNP) package 160
- QSIG Interface (QSIG) package 263
- QSIG-GF Transport (QSIGGF) package 305
- QSIG Supplementary Services (QSIG-SS) package 316
- Primary Rate Access (PRI) package 146
- Multipurpose Serial Data Link (MSDL) package 222

4.0 SUPPORTED INTEGRATION FEATURES

[✓] Items are supported

System Forward to Personal Greeting

All Calls	[✓]
Ring/no answer	[✓]
Busy	[✓]
Busy/No Answer	[✓]

Station Forward to Personal Greeting

All Calls	[✓]
Ring/no answer	[✓]
Busy	[✓]

Auto Attendant	[✓]
Call Me	[✓]
Direct Call	[✓]
External Call ID (ANI)	[✓]
Fax	[✓]
Find Me	[✓]
Internal Call ID	[✓]
Message Waiting Indication (MWI)	[✓]
Multiple Call Forward	[✓]
Multiple Greetings	[✓]
N+1	[✓]
Outcalling	[✓]
Queuing	[]
Return to Operator	[✓]

5.0 CONFIGURING THE PBX TO INTEGRATE

The following tasks must be completed when programming the PBX to integrate. The following programming is intended for certified PBX technicians/engineers. They are as follows:

- Verify optional, Q.SIG and Call Routing Packages are installed. (LD 22)
- Create Trunk Line Coding Format.
(LD 17- CEQU: Change to Common Equipment)
- Create the D-Channel Protocol and Configuration.
(LD 17- ADAN: Action Device And Number)
- Create the Trunk Route Data Block
(LD 16- RDB: Route Data Block)
- Create Trunk Members
(LD 14: Trunk Data Block)
- Create Digit Manipulation Index entries.
(LD 86- DGT: Digit Manipulation)
- Create Route List Block
(LD 86- RLB: Route List)
- Create Coordinated Dialing Plan (CDP) number for MAS
(LD 87- CDP Coordinated Dialing Plan)
- Change subscribes' Hunt and Forwarding to new CDP number. (LD 10,11, and 20)
- Bring link into service.
(LD 96 and 60)

NOTICE:

The screens in this Config Note are only for illustration purposes.

It is recommended that a qualified technician review the customer's CM QSig programming for accuracy.

Verify Optional Features
required on the switch are
loaded

Note: Screens and parameters may appear different depending on switch software version. Critical entries are in **BOLD**, entries that are installation specific are in *italics*, and entries not shown use the default value.

```
> Id 22

REQ  prt
TYPE pkg
OPTF  1
CUST  2
CDR   4
:
NARS  58
CDP   59
PRA   146
FNP   160
MSDL  222
QSIG  263
QSIGGF 305
QSIG-SS 316
```

Note: The following screen parameter samples use 14 as the Digital Loop (DLOP), and 11 as the D-Channel.

Create Trunk Line Coding
Format

```
>Id 17

REQ  new
TYPE cequ (common equipment)
MPED
TERM
REMO
TERD
REMD
TERQ
REMQ
XCT
TDS
CONF
MFSD
DLOP  14 24 esf
MODE  pri
LCMT
YALM
TRSH  0
DTIC
DLOP
```

Create the D-Channel Protocol and Configuration

CTYP = Card Type

NOTE: 1 D-Channel per each Dialogic board is required

RCAP = Remote D-Channel Capability

```
>Id 17
REQ new
TYPE adan
ADAN new dch 11
CTYP msdl (Option 51, 61, 81) DCHI (Option 11, Succession 3.0)
DNUM 10
PORT 3
DES SAQSIG
USR pri
IFC isgf
  PINX_CUST 0
  ISDN_MCNT
CLID
DCHL 14
PRI
OTBF
DRAT
SIDE net
CNEG
RLS
RCAP COLP NDI PRI DV3I QMWI
PR_TRIGS DIV 2 3 (see note below)
PR_TRIGS CNG 2 3
PR_TRIGS CTR2 1 1
PR_TRIGS
PR_RTN
OVLN
OVLS
NASA
TIMR
LAPD
```

Note: At one site Path Replacement was not working and the addition of PR_TRIGS settings that included DIV 2 3 and CNG 2 3 were use to correct the issue.

Create the Trunk Route Data Block

```
> Id 16
REQ new
TYPE rdb
CUST 0
ROUT 14
DES MASQSIG
TKTP tie
ESN
CNVT
SAT
RCLS
DTRK yes
```

BRIP
ISDN **yes**
MODE **pra**
IFC **isgf**
PNI
CHTY
CTYP
INAC
CPFXS
DAPC
INTC
DSEL **3VCE**
PTYP **pri**
AUTO
DNIS
IANI
ICOG **iao**
SRCH **rrb**
TRMB **yes**
STEP
ACOD **8214**
CLEN **0**
TCPP
TARG
BILN
SGRP
OABS
INST
IDC
ANTK
SIGO
CNTL
DRNG
CDR
MUS
EQAR
FRL
OHQ
OHQT
CBQ
AUTH
TTBL
ATAN
PLEV
ALRM

Create Trunk Members

>ld 14

REQ new 23
 TYPE tie
 TN 14 1
 DES MASQSIG
 PDCA
 PCML
 CUST 0
 NCOS 7
 RTMB 14 1
 B-CHANNEL SIGNALING
 INC
 MNDN
 TGAR
 AST
 CLS dtn
 TKID

NEW TRK TN 014 01 RT 14 MB 1

MEM AVAIL: (U/P): 5114376 USED U P: 114508 63147 TOT: 5292031
 DISK SPACE NEEDED: 98 KBYTES
 2MB BACKUP DISKETTE(S) NEEDED: 1 (PROJECTED LD43 - BKO)
 TNS AVAIL: 43 USED: 357 TOT: 400
 AST AVAIL: 40 USED: 0 TOT: 40
 NEW TRK TN 014 02 RT 14 MB 2

MEM AVAIL: (U/P): 5114172 USED U P: 114647 63212 TOT: 5292031
 DISK SPACE NEEDED: 98 KBYTES
 2MB BACKUP DISKETTE(S) NEEDED: 1 (PROJECTED LD43 - BKO)
 TNS AVAIL: 42 USED: 358 TOT: 400
 AST AVAIL: 40 USED: 0 TOT: 40

:
 :
 :

NEW TRK TN 014 23 RT 14 MB 23

MEM AVAIL: (U/P): 5109888 USED U P: 117566 64577 TOT: 5292031
 DISK SPACE NEEDED: 101 KBYTES
 2MB BACKUP DISKETTE(S) NEEDED: 1 (PROJECTED LD43)
 TNS AVAIL: 21 USED: 379 TOT: 400
 AST AVAIL: 40 USED: 0 TOT: 40

**Create Digit Manipulation
Index entries**

```
> Id 86
REQ  new
CUST 0
FEAT dgt
DMI  7
DEL   0
INST 0
CTYP  CDP
```

Create Route List Block

```
>Id 86

REQ  new
CUST 0
FEAT rlb
RLI  32
ENTR 0
LTER no
ROUT 14
TOD
CNV
EXP
FRL  0
DMI  7 (Note: Enter the first DMI entry created above)
FCI
SBOC rra
COPT 1
OHQ
CBQ
```

**Create Coordinated Dialing
Plan (CDP) number for MAS**

```
>Id 87

REQ  new
CUST 0
FEAT cdp
TYPE dsc
DSC  2945 (Note: Enter MAS pilot number)
RLI  32 (Note: This is the RLI number created above)
NPA
NXX
DSC
```

5.2 CONFIGURING THE SUBSCRIBERS TELEPHONE

ld 11

REQ CHG

TYPE 2616 Digital set data blockTN III S CC U Terminal number: loop (0-159)
shelf (0-1) card (1-10) unit (0-7)CDEN SD, (DD), 4D Density of this card is
D8 single, (double), quad

CUST 0-31 Customer number

DES XXXXX Designation for telephone

FDN 2945 Forward Directory Number (MAS Pilot number)

CLS FBA Forward Busy Allowed
FNA Forward Ring-No-Answer Allowed
HTA Hunting Allowed
MWA Message Waiting Allowed
CNDA Calling Name Display Allowed
DNDA Dialed Number Display AllowedHUNT 2945 Extension to forward on a busy
(Enter the Pilot number of the MAS)KEY 00 SCR XXXX PDN (Primary Number)
xx MWK 2945 Message Waiting Key can be programmed
on any other available key.**Configure Link Services**

>ld 96

.dis dch <D-Channel #>

DCH: 11 RLS CONFIRM TIME: 10:12:00 11/01/2004

.enl dch 11

.

DCH: 11 EST CONFIRM TIME: 20:23:20 25/09/2002

stat dch 11

DCH 011 : OPER EST ACTV

DES : SAQSIG

Save these PBX changes.

5.3 Procedure to forward multiple stations to Pilot Number

(Note: This is an optional procedure that is not applicable to every installation)

Nortel PBX Procedure/Workaround:

Please note this procedure is optional. It is provided here only as a potentially time saving way to forward multiple stations to a Pilot Number instead of programming then one at a time.

In LD15, the default configuration for Customer Data Block of the Meridian 1 is CXOD (No Override of Call Forward External). This means that each station's COS requires a programming change to allow users the ability to call forward their telephone sets to the CDP steering code (Pilot Number) of the voicemail system as CFXA (External Forwarding allowed). If you had several thousand users, it would be a very time consuming process to change each station's COS to allow for this.

The work-around or procedure found to do this globally was a change in the Customer Data Block (CDB). In the CDB change the CXOD prompt to CXOA (Overrides Call Forward External Denied (CFXD). This will now allow users to call forward their station to the CDP Distant Steering Code (DSC), or Pilot Number for MM.

Ld 15

TYPE CDB

FTR_DATA

DAPCPREFIX TABLE NO: 00 **

UNKN**INTL**NATL**ESPN**LOCL**ELOC**ECDP**

UNKN*

E164* 00 0

PRIV*

E163* 00 0

TELX*

X121*

NATL*

OPT AHA BIND BIXA BLA CFF CFRA

COX CPA CTA DBA DNX DSX

HTU HVD XBL IC1 IDP XLF

IHD XTG FKA LOA LRA MCI

MWUD PVCD REA RND

RTR RTD ROX SBD SYA

TTAD VOBA CWRD HLPD HRLD

CXOD *(change this prompt to: **CXOA**)*

Configuring the MAS

6.0 CONFIGURING THE MESSAGE APPLICATION SERVER

Configuring the MAS platform for proper PBX integration requires configuring several menus accessed within the Voice Mail System Configuration application.

- Access the **Voice Mail System Configuration** application from the MAS program group. Expand all fields so all-applicable options are visible.

The following programming is a continuation from the Modular Messaging (MAS section) Installation Guide:

1. Select the **Voice Mail Domain**
 2. Expand **PBXs**
 3. Select the newly created **NT M-1 (QSIG)**
 4. Access the **General (QSIG) PBX Configuration** tab
 5. **DTMF Inter-Digit Delay during Dialing (ms)** = 80
 6. **DTMF Length during Dialing (ms)** = 80
 7. **DTMF Length during Detection (ms)** = 50
- Next access the **Transfer/Outcall** tab
Transfer Mode = Blind
 - Next access the **Tone Detection** tab
Maximum Silence before Hanging Up (ms) = 6000
 - Next access the **Outgoing Call** tab
 1. **Layer Protocol** = G.711 u-Law
 2. **BC Transfer Cap** = Speech
 3. **Number Type** = Unknown
 4. **Number Plan** = Unknown
 5. **Origin Number** = * (see below)
 6. Select **OK** to save changes

Note: Confirm these ISDN values with your PBX vendor. If these values do not match the ISDN protocol, then transfer and out calling will not work.

- * Enter the MAS server pilot number in the Origin Number field

- continued on next page -

- Next access the **Message Waiting Indicator (MWI)** tab

Support NOTE
for MM 1.1 & 2.0 only:

- Limit Requests should be checked.
- Maximum Requests per Minute should be set for 200.

1. **Enable Message Waiting Indicator (MWI)** = Enable by checking the box
2. **MAS MWI Server** = Enter the name of the MWI server created during the installation procedure.
3. **Limit requests** = Enable by checking the box
4. **Scheduled MWI updates: Active or Inactive** = **Configure as per customer requirements.***
5. **Limit Requests** = Leave Unchecked
6. **Maximum Requests per Minute** = <grayed out>
7. **Message Application Servers that Support MWI** = This box should contain a list of MAS servers capable of placing MWI requests.

***Note:** The Scheduled MWI updates parameter is only available on MM 3.x

- continued on next page -

NOTE: The MWI port within the MWI Port Group it's used by the MWI sub-system to control concurrent MWI requests. This does not affect incoming/outgoing traffic to the port in anyway. All MWI function is handled by the D-Channel.

Tip: To make the QSIG or set emulation telephony interface active, click the down arrow and click **Make Active**. If the QSIG or set emulation telephony interface is already active, this field does not appear.

- Next access the **Port Groups** General tab
 1. Click **Add Group** Button
 2. Name Group **MWI**
 3. Within the new **MWI** Port Group General tab uncheck all **Ports** except the **MWI** port. This will be the upper most port of the Trunk Group. Port 23 on a single board, Port 46 if 2 boards, or Port 69 if 3 boards are used. (see side NOTE).
 4. Select the **Default Group** under **Port Groups** and ensure it is configured to meet the customer's need for **Incoming** and **Outgoing** under **Port Group Usage**.
 5. Next check all **Ports** (including the MWI port).
 6. Select **OK** to save changes

- Next access the **QSIG General** tab within the **PBX Type** tab
 1. Telephony Type = **Dialogic QSIG**
 2. Under PBXs ensure **NT M-1 (QSIG)** is selected
 3. Select **OK** to save changes

- Next access the **General** tab within the **Telephony Interface (Dialogic-QSIG)** tab
 1. **Playback Volume** = 2
 2. **Maximum Concurrent Calls** = Enter the number of ports connected to the PBX (i.e. 23)
 3. **Port** = Ports are enabled by default
Note: The MAS service must be restarted to allow port disabling
 4. Select **OK** to save changes

- Next access the **General** tab within the **PBX Integration**
 1. **QSIG** = Enable by checking the box
 2. Access the **QSIG/DSE** tab
 3. **Port Group Name** = MWI (or name used in Port Groups)
 4. **Max MWI Sessions** = 1
 5. **Indicator On/Off signals must use same port** = Leave Blank
 6. **MWI On Field** = Leave as default
 7. **MWI Off Field** = Leave as default
 8. Select **OK** to save changes

After making these changes, return to "Configuring the voicemail system" within the Message Application Server Installation Guide. Ensure you are prompted to restart the Message Application Server services to apply these changes.

Important notes regarding this integration

8.0 CONSIDERATIONS/ALTERNATIVES

- 8.1** If a switch does not send a QSIG CallReroute() message when an outgoing (MM server to switch) call is diverted then the following registry change is required to stop tromboning:

DWORD value

`\\HKLM\Software\Octel\Geneva\Vcm_TelephonyServiceMgr\QSIG\AntiTromboneDTMFDisable`

should be set to 0.

- 8.2** We recommend the “Background Task 30” be disabled in the configuration data block (LD 17) of the PBX. Otherwise, problems with integration and Message Waiting will occur.

- 8.3** Within the **Voice Mail System Configuration**, access the "Telephone User Interface," and under the "Receptionist" tab, DO NOT select "Inform Subscriber Transfer is from Auto Attendant" (leave unchecked). Otherwise we will see issues with tromboning and Path Replacement.

- 8.4** Using a comma for a delay with Find Me, Call Me, etc., does not work.

- 8.5** The following Registry Entries must be added:

- Open up Registry Editor on the MAS by going to **START -> Run -> "regedit"**
- Map: **My Computer -> HKEY_LOCAL_MACHINE -> SOFTWARE -> Octel -> Geneva -> Vcm_TelephonyServiceMgr -> QSIG**
In this folder add a new DWORD value named **AntiTromboneDTMFDisable** and set it with value **0**
- Add another new DWORD value named **UMAnswerDetectWait** and set it to **1200** decimal.

- 8.6** **Routing to Nortel Symposium Call Center is not supported.**
The Symposium does not process QSIG properly.

- 8.7** **Some maintenance routines** on the Nortel PBX may cause channels to show out of service condition on the PBX side. In some cases channels that sit idle for too long a time period may also show the same indication. It is advisable to distribute calls so ports do not sit idles for long periods of time.

- 8.8** **With outcalls** to various off-PBX devices such as PDAs, cell phones, etc. may require the addition of a registry key to increase the TUI Ring Count. This will be used to increase the

time needed to reach the device so the MM does not pull back the call prematurely.

8.9 Call transfers may not display the Call ID to ringing phones.

The Call ID is not provided with Nortel PBXs as the PBX does not refresh the station display.

- This issue was resolved in MM 3.0 where the Calling Party Number (number only, not the name) is displayed.
- Starting with MM 5.1, both name and calling party number will be displayed on ringing phones. Please note, for name to be displayed the PBX must send the MAS the Calling Name using the QSIG Name Identification Supplementary Services Protocol (ECMA-164).

8.10 Transfers to ringing may use additional ports. When Find Me is used additional ports are in use until the call is answered or the caller disconnects from the message server. Additional ports may be required to support Find Me. Note that with supervised transfers, callers are not provided with music on hold, but are instead prompted to wait during the silence. The called party will hear a "Connecting" prompt as he/she answers the call.

8.11 Some Nortel PBXs may run out of call registers when MWI is activate/deactivate by the QMWI feature. One call register is "lost" for every activate/deactivate request sent from MM. To correct this Nortel patch MPLR21463 must be installed on the PBX.

CHANGE HISTORY		
Version	Issue Date	Reason for Change
Version A	07/26/06	Initial release - GA
Version B	12/22/2006	Added consideration 8.7 and 8.8
Version C	06/01/07	Added Consideration 8.9
Version D	01/18/08	Added note for RCAP on page 6; Updated Consideration 8.9

Version E	01/25/08	Added Section 5.3.
Version F	03/08	Added Consideration 8.10
Version G	05/05/08	Updated to support MM 4.0
Version H	05/16/08	Updated diagram page 1, removed Dialogic Driver released from Section 2.0
Version I	05/22/08	Added Consideration 8.11
Version J	05/27/08	Added new information for PR_TRIGS settings and also updated Note regarding this in RCAP programming section for PBX.
Version K	2/02/09	Updated to support MM 5.0; Changed Limit Requests for MWI in Section 6.0
Version L	5/21/09	Updated section 3.1 regarding Succession 5.0 and no support for Nortel Multi-Customer on Succession.
Version M	07/09	Updated for MM 5.1; Added note regarding collocated PBX/MM on page 1
Version N	07/20/09	Updated Consideration 8.9 to reflect calling party number/name display on ringing phone and PBX requirements needed
Version O	01/19/10	Added note indicator to titles of Section 2.0 and 3.1; added corresponding note in sidebar; removed word “supported” in same sections for MAS releases and PBX Software releases.

©2010 AVAYA Inc. All rights reserved. All trademarks identified by the ®, SM and TM are registered trademarks, servicemarks or trademarks respectively. All other trademarks are properties of their respective owners. The above information is based on knowledge available at the time of publication and is subject to change without notice. Printed in U.S.A.

AVAYA Inc.
 1033 McCarthy Blvd
 Milpitas, CA 95035
 (408) 577- 7000
<http://www.avaya.com>