



Cisco Unified CallManager 4.0-PBX Interoperability: Nortel Meridian-1 Release 25 PBX to a Cisco 6608 Gateway using T1 Q.SIG with MGCP for Nortel CallPilot MWI

Introduction

- This is an application note for the connectivity of a Nortel Meridian 1 Opt 11C PBX using Succession 4.0 software with a Cisco Unified CallManager using a Cisco Catalyst 6608-T1 QSIG interface as the MGCP gateway.
- The network topology diagram shows end-to-end interoperability between the Cisco Unified CallManager connected to the PBX via the Cisco 6608-T1 link as the MGCP Gateway.
- Connectivity is achieved by using the industry standard ISO QSIG protocol. The Nortel Meridian 1 can be configured as either Peer-master or Peer-slave.
- Nortel's Network Message Services (NMS) provides messaging services across Meridian 1 network using ISDN signaling. There are two NMS applications:
 - The Network Message Service – Message Center allows a caller transparent access to a centralized message center over an ISDN PRI/ISL network. Three types of Message Center configurations are supported:
 - a) ACD Message Center
 - b) DN Message Center
 - c) Attendant Message Center

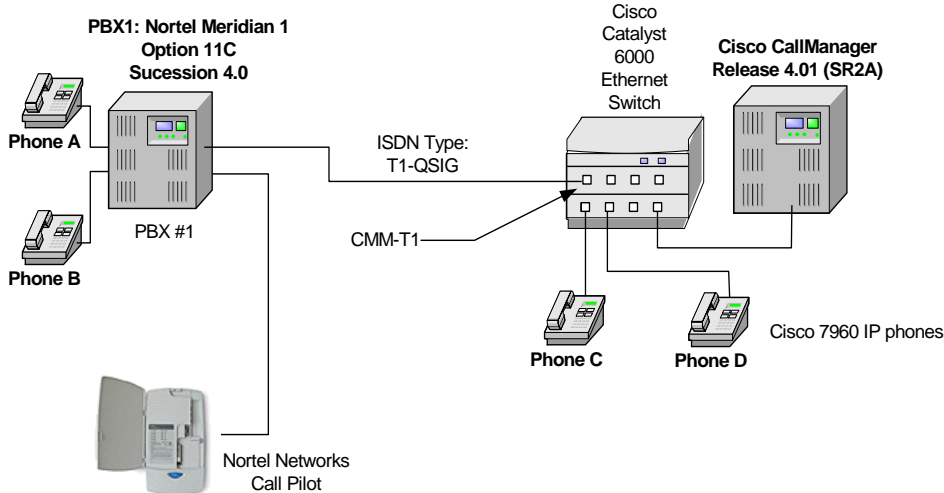
For these types of Message Centers, the message taker's set is used to activate and deactivate a user's Message Waiting Indicator. Message Indication Key (MIK) and Message Cancellation Keys (MCK) are used to turn on/off the Message Waiting Indication on a user telephone.

The Network Message Service – Meridian Mail offers access to the Meridian Mail system across the Meridian 1 network. Remote users defined as part of the NMS-MM server have access to all the Meridian Mail features available on the local switch. This type of configuration uses the existing Nortel Meridian 1 voice mail system (i.e. Meridian Mail or Nortel Call Pilot) as the network's voice mail hub while in the process of migrating to IP telephony.



Network Topology

Basic Call Setup End-to-End Configuration



Limitations

- For the Nortel Meridian 1 PBX to support the QSIG MWI feature, the PBX must at least have an Enterprise software level (to get ISDN Tie lines) with X11 Rel. 25.40 or 25.40B software (to get QSIG MWI).
- In addition to NMS software and Phantom TN Features, the following packages must be installed on the PBX:
 - PKG 305 (QSIG Generic Function)
 - PKG 316 (QSIG Supplementary Services)
 - PKG 263 (Qsig Basic Call/Name Display)
 - PKG 175 (Network Message Service)
- MCK and MIK keys do not work using the Network Message Service – Message Center setup. The following error is generated:

```
PRI5033 DCH: 18 Data: 4
```

This message is defined as follows::

An application has requested to send on a QSIG a non-call related message received on MCDN but the QSIG RCAP is not configured on the outgoing link or the service is not supported on QSIG. The message is rejected.

Output: DCH or DSL number, PRI/BRIT type, Service identifier.

Service Identifier data 4 is defined as Network Message Center.



System Components

Hardware Requirements

- Cisco Hardware
 - Cisco Catalyst 6000 switch with Cisco 6608-T1 Gateway
 - Cisco Unified CallManager server
- PBX Hardware.
 - Nortel Meridian 1 Opt. 11C

Software Requirements

- Cisco CatOS 7.6
- Nortel Succession 4.0.
- Cisco Unified CallManager 4.01

Configuration

Note: The following working configuration uses the Network Message Service-Meridian Mail configuration. It was taken from an actual installation site wherein the customer maintains their existing Nortel Meridian 1 voice mail system (Nortel Call Pilot, in this case) as their network's voice mail hub while in the process of migrating to IP telephony. The MWI activate and deactivate messages were successfully passed from the Nortel side to the Cisco side.

Note: Due to the absence of a Nortel Voice Mail System such as Meridian Mail or Call Pilot, this configuration was not tested by Cisco.

Configuring the Nortel Meridian 1

D-Channel Configuration

```
ADAN      DCH 32
          CTYP TMDI
          CARD 32 --- defines card in slot 32 (loop 32) as the QSIG trunk to CCM
          PORT 1
          DES Qsig
          USR PRI
          DCHL 32
          OTBF 127
          PARM RS232 DTE
          DRAT 64KC
          CLOK EXT
          IFC ISGF --- defines switch-type ISO QSIG with GF platform
          PINX_CUST 0
```



```
ISDN_MCNT 300
CLID OPT0
CO_TYPE STD
SIDE USR
CNEG 1
RLS ID **
RCAP COLP QMWI --- enables MWI feature across QSIG trunk
MBGA NO
OVLN NO
OVLS NO
T310 120
T200 3
T203 10
N200 3
N201 260
K 7
```

Route Data Block Configuration

```
REQ: prt
TYPE: rdb
CUST 0
ROUT 32

TYPE RDB
CUST 00
DMOD
ROUT 32
DES QSIG
TKTP TIE
NPID_TBL_NUM 0
ESN NO
CNVT NO
```



SAT NO
RCLS EXT
VTRK NO
NODE
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
MODE PRA
IFC ISGF
SBN NO
PNI 00000
NCNA NO
NCRD NO
CHTY BCH
CTYP UKWN
INAC NO
ISAR NO
CPFXS YES
DAPC NO
INTC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH RRB
TRMB YES
STEP
ACOD 4000032
TCPP NO



TARG 01
CLEN 1
BILN NO
OABS
INST
IDC NO
DCNO 0 *
NDNO 0
DEXT NO
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
 IENB 5
 TFD 0
 VSS 0
 VGD 6
DRNG NO
CDR NO
VRAT NO
MUS NO
RACD 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
TTBL 0
ATAN NO
PLEV 2
ALRM NO
ART 0
SGRP 0

Trunk Data Block Configuration

TYPE: tnb
TN 32 1
DATE
PAGE
DES

DES QSIG
TN 032 01
TYPE TIE
CDEN SD
CUST 0
TRK PRI



PDCA 1

PCML MU

NCOS 5

RTMB 32 1 --- *ties the Route Data Block to the actual QSIG card/slot*

B-CHANNEL SIGNALING

TGAR 1

AST NO

IAPG 0

CLS UNR DTN WTA LPR APN THFD HKD

P10 VNL

TKID

AACR NO

DATE 31 AUG 2004



Configuring Cisco Unified CallManager

IP Phone Configuration

The screenshot shows the Cisco CallManager 4.0 Administration interface for configuring a phone. The browser window title is "Cisco CallManager 4.0 Administration - Phone Configuration - Microsoft Internet Explorer". The address bar shows the URL: `http://cm-bj/CCMAdmin/phoneconfig.asp?pkid={65927385-9DC1-4520-BB7C-5C61F561F3D2}`. The interface is divided into several sections:

- Phone Information:** Shows "Line 1 - 3152811" and "Line 2 - Add new DN".
- IP Address:** `10.208.3.101`
- Status:** Ready
- Buttons:** Copy, Update, Delete, Reset Phone
- Phone Configuration (Model = Cisco 7960):**
 - Device Information:**
 - MAC Address*: `00036BAACD79`
 - Description: `SEP00036BAACD79`
 - Owner User ID: (Select User ID)
 - Device Pool*: `Default` (view details)
 - Calling Search Space: `< None >`
 - AAR Calling Search Space: `< None >`
 - Media Resource Group List: `< None >`
 - User Hold Audio Source: `< None >`
 - Network Hold Audio Source: `< None >`
 - Location: `< None >`
 - User Locale: `< None >`
 - Network Locale: `< None >`
 - Device Security Mode: `Use System Default`
 - Built In Bridge: `Default`
 - Privacy: `Default`
 - Retry Video Call as Audio
 - Phone Button Template Information:**
 - Phone Button Template*: `Standard 7960` (view button list)



Directory Number (DN) Configuration

Directory Number Configuration [Configure Device \(SEP00036BAACD79\)](#)
[Dependency Records](#)

Associated With
SEP00036BAACD79
7960 (Line 1)

Directory Number: 3152811
Status: Ready
Note: Any update to this Directory Number automatically resets the associated devices

Update Remove from Device Reset Devices

Directory Number
Directory Number* 3152811
Partition <None>

Directory Number Settings
Voice Mail Profile 3077199
(Choose <None> to use default)
Calling Search Space <None>
AAR Group <None>
User Hold Audio Source <None>
Network Hold Audio Source <None>
Auto Answer Auto Answer Off

Call Forward and Pickup Settings

| | Voice Mail Destination | Calling Search Space |
|-------------------------|-------------------------------------|----------------------|
| Forward All | <input type="checkbox"/> | <None> |
| Forward Busy | <input checked="" type="checkbox"/> | <None> |
| Forward No Answer | <input checked="" type="checkbox"/> | <None> |
| No Answer Ring Duration | 9 (seconds) | |

Note: Voice Mail Profile(DN) is defined under Directory Number Settings



Gateway Configuration

Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

Assigned to Route Group: Qsig

Product : Cisco Catalyst 6000 T1 VoIP Gateway
Gateway : S0/DS1-0@SDA000164728D85
Device Protocol: Digital Access PRI
Registration: Registered with Cisco CallManager CM-B
IP Address: 10.208.2.100

Status: Ready

Device Information

| | |
|---------------------------|---|
| MAC Address* | <input type="text" value="000164728D85"/> |
| Description | <input type="text" value="test-qsig"/> |
| Device Pool* | <input type="text" value="Default"/> |
| Network Locale | <input type="text" value="United States"/> |
| Media Resource Group List | <input type="text" value="< None >"/> |
| Location | <input type="text" value="< None >"/> |
| AAR Group | <input type="text" value="< None >"/> |
| Load Information | <input type="text" value=""/> |

Multilevel Precedence and Preemption (MLPP) Information

| | |
|------------------------------|---------------------------------------|
| MLPP Domain (e.g., "0000FF") | <input type="text" value=""/> |
| MLPP Indication | <input type="text" value="Off"/> |
| MLPP Preemption | <input type="text" value="Disabled"/> |

Interface Information

| | |
|--------------------|---|
| PRI Protocol Type* | <input type="text" value="DPIISO-QSIG-T1"/> |
|--------------------|---|

Done Local intranet



Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

Assigned to Route Product : Cisco Catalyst 6000 T1 VoIP Gateway

Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

PRI Protocol Type* PRI ISDN QSIG T1

Protocol Side* Network

Channel Selection Order* Top Down

Channel IE Type* Timeslot Number

PCM Type* μ-law

Delay for first restart (1/8 sec ticks) 32

Delay between restarts (1/8 sec ticks) 4

Inhibit restarts at PRI initialization

Enable status poll

Call Routing Information

Inbound Calls

Significant Digits* All

Calling Search Space < None >

AAR Calling Search Space < None >

Prefix DN

Outbound Calls

Calling Line ID Presentation* Default



Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

Assigned to Route Product : Cisco Catalyst 6000 T1 VoIP Gateway

Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

Outbound Calls

| | |
|---------------------------------------|------------|
| Calling Line ID Presentation* | Default |
| Calling Party Selection* | Originator |
| Called party IE number type unknown* | National |
| Calling party IE number type unknown* | National |
| Called Numbering Plan* | ISDN |
| Calling Numbering Plan* | ISDN |
| Number of digits to strip* | 0 |
| Caller ID DN | |
| SMDI Base Port* | 0 |

PRI Protocol Type Specific Information

- Display IE Delivery
- Redirecting Number IE Delivery - Outbound
- Redirecting Number IE Delivery - Inbound
- Send Extra Leading Character In DisplayIE***
- Setup non-ISDN Progress Indicator IE Enable****
- MCDN Channel Number Extension Bit Set to Zero**



Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

Assigned to Route **Product : Cisco Catalyst 6000 T1 VoIP Gateway**

Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

Send Calling Name In Facility IE

Interface Identifier Present**

Interface Identifier Value**

Connected Line ID Presentation (QSIG Inbound Call)*

Connected PBX Model

Product Specific Configuration

Clock Reference*

TX-Level CSU*

FDL Channel*

Framing*

Audio Signal Adjustment into IP Network*

Audio Signal Adjustment from IP Network*

Yellow Alarm*

Zero Suppression*

Digit On Duration(50-500ms)*

Interdigit Duration(50-500msec)*



Route Pattern Configuration

The image shows two overlapping browser windows from Cisco CallManager 4.0 Administration. The top window is titled "Gateway Configuration" and shows a product of "Cisco Catalyst 6000 T1 VoIP Gateway". The bottom window is titled "Route Pattern/Hunt Pilot Configuration" and displays the configuration for a route pattern with ID 3077199. The configuration includes fields for Partition, Description, Numbering Plan, Route Filter, MLPP Precedence, and Gateway or Route/Hunt List. The "Route Option" section is set to "Route this pattern".

Route Pattern/Hunt Pilot Configuration

Route Pattern/Hunt Pilot: 3077199

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

| | | |
|--|--|--|
| Route Pattern/Hunt Pilot* | 3077199 | |
| Partition | < None > | |
| Description | 307 to Option 11 | |
| Numbering Plan* | North American Numbering Plan | |
| Route Filter | < None > | |
| MLPP Precedence | Default | |
| Gateway or Route/Hunt List* | Qsig (Edit) | |
| Route Option | <input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern (Not Selected) | |
| <input type="checkbox"/> Provide Outside Dial Tone | <input type="checkbox"/> Allow Overlap Sending | <input type="checkbox"/> Urgent Priority |

Note: Route Pattern "3077199" routes the call over to QSIG trunk to Nortel



Voice Mail Profile Configuration

The screenshot shows two overlapping browser windows. The top window is titled "Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer" and shows a configuration page for a "Cisco Catalyst 6000 T1 VoIP Gateway". The bottom window is titled "Cisco CallManager 4.0 Administration - Voice Mail Profile Configuration - Microsoft Internet Explorer" and displays the configuration page for a voice mail profile.

Voice Mail Profile Configuration

Voice Mail Profile: 3077199

Status: Ready

Copy Update Delete Restart Devices

Voice Mail Profile Name* 3077199

Description 3077199

Voice Mail Pilot ** 3077199/<None >

Voice Mail Box Mask

Make this the default Voice Mail Profile for the system

* indicates required item

** The Voice Mail Pilot is comprised of the Voice Mail Pilot Number and it's corresponding Calling Search Space Name (<Voice Mail Pilot Number>/<Calling Search Space>).



Voice Mail Pilot Configuration

The screenshot shows two overlapping browser windows. The top window is titled "Cisco CallManager 4.0 Administration - Gateway Configuration" and shows a product of "Cisco Catalyst 6000 T1 VoIP Gateway". The bottom window is titled "Cisco CallManager 4.0 Administration - Voice Mail Pilot Configuration" and displays the following content:

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Voice Mail Pilot Configuration

[Add a New Voice Mail Pilot Number](#)
[Back to Find/List Voice Mail Pilots](#)
[Dependency Records](#)

Voice Mail Pilot Number : 3077199 / < None >
Status: Ready

Update Delete Reset Devices

Voice Mail Pilot Number: 3077199
Description: Call Pilot
Calling Search Space: < None >

Make this the default Voice Mail Pilot for the system

* indicates required item



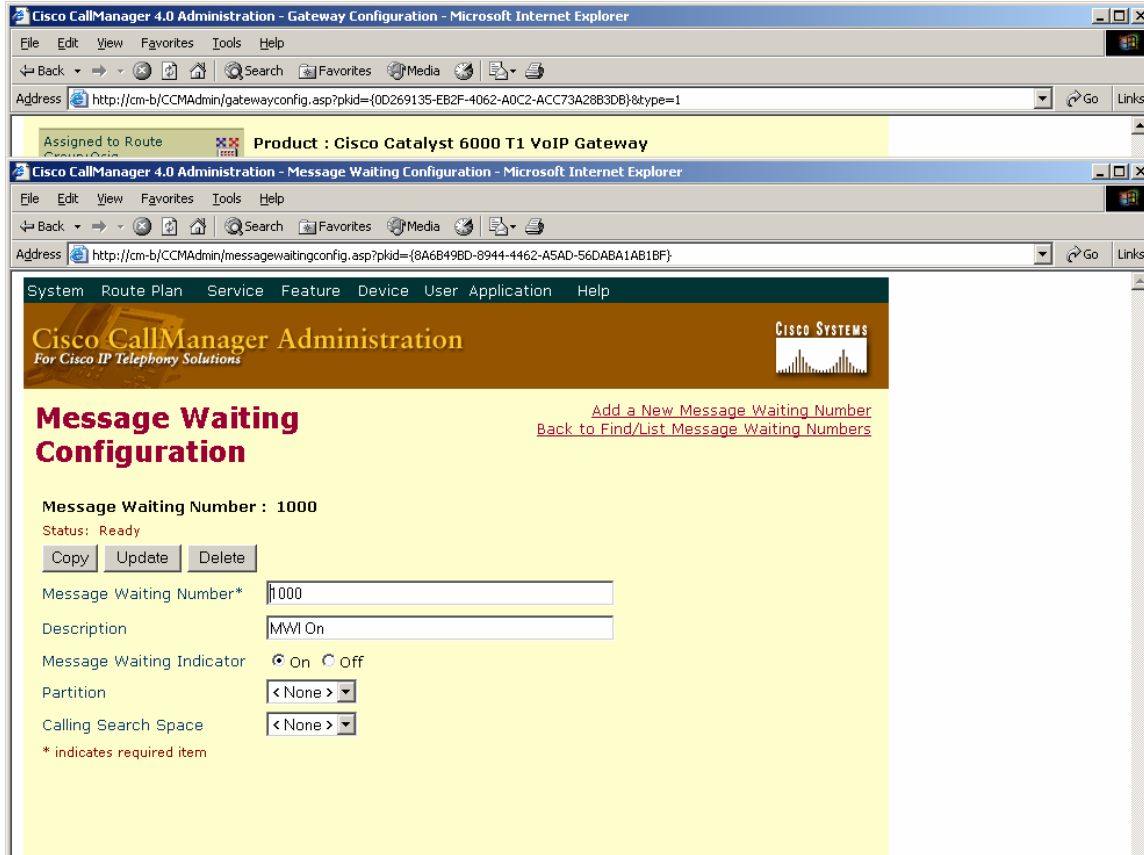
MWI Configuration

MWI OFF

The screenshot shows two overlapping browser windows. The top window is titled "Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer" and shows a configuration page for a "Cisco Catalyst 6000 T1 VoIP Gateway". The bottom window is titled "Cisco CallManager 4.0 Administration - Message Waiting Configuration - Microsoft Internet Explorer" and displays the "Message Waiting Configuration" page. The page has a yellow background and a dark blue header with the Cisco logo and navigation tabs: System, Route Plan, Service, Feature, Device, User, Application, Help. The main content area shows "Message Waiting Configuration" with a "Message Waiting Number : 1001" and a status of "Ready". There are "Copy", "Update", and "Delete" buttons. Below these are input fields for "Message Waiting Number*" (1001), "Description" (MWI Off), "Message Waiting Indicator" (radio buttons for On and Off, with Off selected), "Partition" (dropdown menu showing <None>), and "Calling Search Space" (dropdown menu showing <None>). A note at the bottom states "* indicates required item".



MWI ON



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