

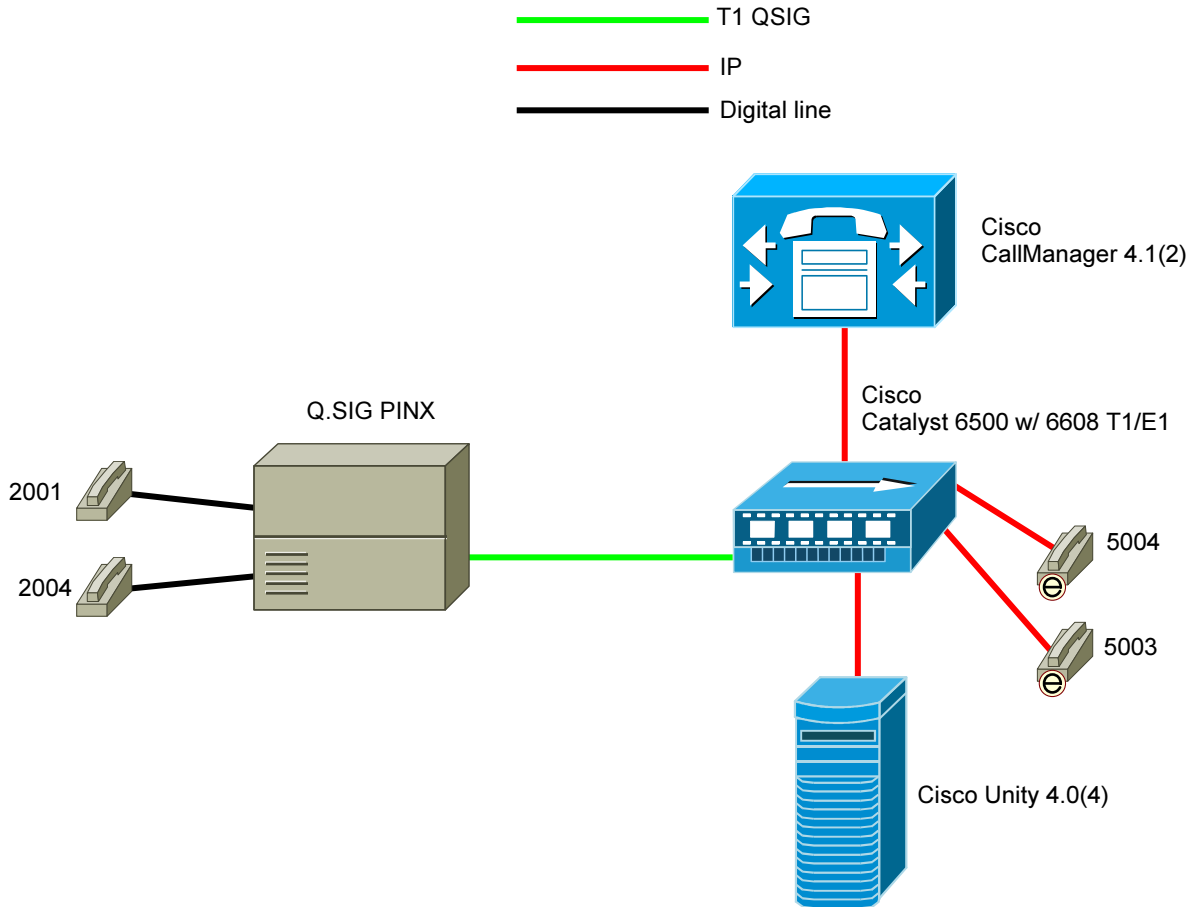
# Cisco CallManager 4.1-Voicemail Interoperability: Cisco Unity 4.0(4) with Cisco CallManager 4.1(2) Configured as Message Center PINX using Cisco Catalyst 6608 T1 Q.SIG with MGCP

## Introduction

- This Application Note uses the Cisco Catalyst 6608 T1/E1 voice gateway; however other Cisco voice gateways are also an option to use since Cisco CallManager QSIG implementation does not depend on the physical interface. Centralized voicemail services rely heavily on the inter-PBX protocol used to connect remote PBXs to the “Message Center” PBX. In the scenario represented/tested by this document, QSIG protocol and the Additional Network Features (ANF) supported by each vendor’s PBX will determine the actual features supported by this solution.
- This document contains lab performance criteria that describes the interoperability of Cisco CallManager Release 4.1(2) when used as a Message Center PINX in a QSIG private network with a Centralized Cisco Unity voicemail server using SCCP integration.
- The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco CallManager connected to a remote PINX via Catalyst 6608 T1/E1 blade port used as MGCP gateways configured as T1 ISO QSIG trunk, and a Cisco Unity used as a Centralized voicemail system using SCCP integration to the Message Center Cisco CallManager.

## Network Topology

Figure 1. Test End-to-End Topology



### Limitations

There are no known limitations with this feature.

### System Components

#### Hardware Requirements

- Cisco Catalyst 6500 switch with Cisco 6608 T1/E1 blades
- Cisco CallManager 4.1(2) MCS server

#### Cisco Unity 4.0(4) MCS server Software Requirements

- Cisco CallManager Release 4.1(2)
- Cisco Unity 4.0(4)



## Features

The following features are supported:

- Station forward to personal greeting (busy/ring no answer/all calls)
- Reply to messages left in telephone answering mode
- Direct call
- Message Waiting Indication
- Support of Message Waiting indication on remote PINX stations is dependent on whether the PBX software used on the remote PINX supports QSIG MWI. Please refer to PBX manufacturer's technical documentation for further information. Also, refer to Cisco Interoperability Application Notes, found in the Cisco Interoperability portal, located at the following URL:  
[www.cisco.com/go/interoperability](http://www.cisco.com/go/interoperability)

## Configuration

### Configuration Sequence and Tasks

**Note:** The configuration examples shown in this document is an example to typical settings only. Prior to configuring the “central” Definity G3 and Cisco CallManager, the following should be installed and tested for proper functionality:

- Cisco Unity - Test for proper functionality of Cisco Unity voicemail server for local Cisco CallManager users.
- Cisco CallManager – Test for proper Q.SIG features transparency between Cisco CallManager and remote PINX.

### Configuration Menus and Commands

#### Configuring Cisco CallManager for QSIG

1. Configure the QSIG-related system parameters
2. Configure the MGCP gateway
3. Configure the MWI Off/On directory numbers
4. Configure the Cisco Unity ports



For detailed information on how to configure MGCP gateways connecting to specific manufacturers' PBX, refer to the proper application notes located in the Cisco Interoperability website, found at the following URL:

[www.cisco.com/go/interoperability](http://www.cisco.com/go/interoperability)Configuring Cisco CallManager

### Configuring the Cisco Catalyst 6608 T1/E1 Voice Gateway

The following screen captures depict a typical configuration of a Cisco Catalyst 6608 T1 blade configured for QSIG functionality:

## Gateway Configuration

[Back to Find/List Gateways](#)  
[Dependency Records](#)

**Product : Cisco Catalyst 6000 T1 VoIP Gateway**  
**Gateway : S0/DS1-0@SDA0001C9D93A9B**  
**Device Protocol: Digital Access PRI**  
**Registration: Registered with Cisco CallManager 172.20.236.2**  
**IP Address: [172.20.236.16](#)**

Status: Ready

### Device Information

|                           |  |
|---------------------------|--|
| MAC Address*              | <input type="text" value="0001C9D93A9B"/>      |
| Description               | <input type="text" value="Cat 6500 port 5/4"/> |
| Device Pool*              | <input type="text" value="Default"/>           |
| Call Classification*      | <input type="text" value="OnNet"/>             |
| Network Locale            | <input type="text" value="United States"/>     |
| Media Resource Group List | <input type="text" value="&lt; None &gt;"/>    |
| Location                  | <input type="text" value="&lt; None &gt;"/>    |
| AAR Group                 | <input type="text" value="&lt; None &gt;"/>    |
| Load Information          | <input type="text"/>                           |

### Multilevel Precedence and Preemption (MLPP) Information



### Multilevel Precedence and Preemption (MLPP) Information

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

### Interface Information

|  |   |
|--|---|
| PRI Protocol Type*   | <input type="text" value="PRI QSIG T1"/>        |
| Protocol Side*   | <input type="text" value="User"/>               |
| Channel Selection Order*   | <input type="text" value="Bottom Up"/>          |
| Channel IE Type*   | <input type="text" value="Use Number when 1B"/> |
| PCM Type*  | <input type="text" value="μ-law"/>              |
| Delay for first restart (1/8 sec ticks)                                    | <input type="text" value="32"/>                 |
| Delay between restarts (1/8 sec ticks)                                     | <input type="text" value="4"/>                  |
| <input checked="" type="checkbox"/> Inhibit restarts at PRI initialization |   |
| <input type="checkbox"/> Enable status poll                                |   |



### Call Routing Information

#### Inbound Calls

|                          |  |
|--------------------------|--|
| Significant Digits*      | <input type="text" value="All"/>             |
| Calling Search Space     | <input type="text" value=" &lt; None &gt;"/> |
| AAR Calling Search Space | <input type="text" value=" &lt; None &gt;"/> |
| Prefix DN                | <input type="text"/>                         |

#### Outbound Calls

|                                       |  |
|---------------------------------------|--|
| Calling Line ID Presentation*         | <input type="text" value="Allowed"/>           |
| Calling Party Selection*              | <input type="text" value="Originator"/>        |
| Called party IE number type unknown*  | <input type="text" value="Cisco CallManager"/> |
| Calling party IE number type unknown* | <input type="text" value="Cisco CallManager"/> |
| Called Numbering Plan*                | <input type="text" value="Cisco CallManager"/> |
| Calling Numbering Plan*               | <input type="text" value="Cisco CallManager"/> |
| Number of digits to strip*            | <input type="text" value="0"/>                 |
| Caller ID DN                          | <input type="text"/>                           |
| SMDI Base Port*                       | <input type="text" value="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\*\*
- Send Calling Name In Facility IE
- Interface Identifier Present\*\*

Interface Identifier Value\*\*

Connected Line ID Presentation (QSIG Inbound Call)\*

### UUIE Configuration

- Passing Precedence Level Through UUIE

Security Access Level



### Product Specific Configuration



|  |  |
|--|--|
| Clock Reference*                         | <input type="text" value="Network"/>     |
| TX-Level CSU*                            | <input type="text" value="0dB"/>         |
| FDL Channel*                             | <input type="text" value="ATT 54016"/>   |
| Framing*                                 | <input type="text" value="ESF"/>         |
| Audio Signal Adjustment into IP Network* | <input type="text" value="NoDbPadding"/> |
| Audio Signal Adjustment from IP Network* | <input type="text" value="NoDbPadding"/> |
| Yellow Alarm*                            | <input type="text" value="Bit2"/>        |
| Zero Suppression*                        | <input type="text" value="B8ZS"/>        |
| Digit On Duration(50-500ms)*             | <input type="text" value="100"/>         |
| Interdigit Duration(50-500msec)*         | <input type="text" value="100"/>         |
| SNMP Community String                    | <input type="text" value="public"/>      |
| Disable SNMP Set operations*             | <input type="checkbox"/>                 |
| Debug Port Enable*                       | <input checked="" type="checkbox"/>      |
| Hold Tone Silence Duration*              | <input type="text" value="0"/>           |
| Port Used for Voice Calls*               | <input checked="" type="checkbox"/>      |
| Port Used for Modem Calls*               | <input checked="" type="checkbox"/>      |
| Port Used for Fax Calls*                 | <input checked="" type="checkbox"/>      |



### Fax and Modem Parameters

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| Fax Relay Enable*                     | <input checked="" type="checkbox"/> |
| Fax Error Correction Mode Override*   | <input checked="" type="checkbox"/> |
| Maximum Fax Rate*                     | 14400bps                            |
| Fax Payload Size*                     | 20                                  |
| Non Standard Facilities Country Code* | 65535                               |
| Non Standard Facilities Vendor Code*  | 65535                               |
| Fax/Modem Packet Redundancy*          | <input type="checkbox"/>            |
| NSE Type*                             | Non-IOS Gateways                    |

### Playout Delay Parameters

|                        |     |
|------------------------|-----|
| Initial Playout Delay* | 40  |
| Minimum Playout Delay* | 20  |
| Maximum Playout Delay* | 150 |

### Echo Canceller Configuration

|                       |       |
|-----------------------|-------|
| Echo TailLength (ms)* | 32 ms |
| Minimum ERL (db)*     | 6 db  |

\* indicates required item

\*\* applicable to DMS-100 protocol only

\*\*\* applicable to DMS-100 protocol and DMS-250 protocol only



## Configuring Cisco CallManager QSIG-related Service Parameters

The following screen captures show QSIG-related service parameters, as found on Cisco CallManager 4.1(2) software:

| Clusterwide Parameters (Feature - Forward)              |                                     |                                |
|---|-------------------------------------|--------------------------------|
| Parameter Name  | Parameter Value                     | Suggested Value                |
| Forward Maximum Hop Count*                              | <input type="text" value="12"/>     | 12                             |
| Forward No Answer Timer (sec)*                          | <input type="text" value="12"/>     | 12                             |
| Max Forward Hops to DN*                                 | <input type="text" value="12"/>     | 12                             |
| Retain Forward Information*                             | <input type="text" value="False"/>  | False                          |
| Forward By Reroute Enabled*                             | <input type="text" value="True"/>   | False                          |
| Forward By Reroute T1 Timer (sec)*                      | <input type="text" value="10"/>     | 10                             |
| Include Original Called Info for Q.SIG Call Diversions* | <input type="text" value="Always"/> | Only after the first diversion |



| Clusterwide Parameters (Feature - Path Replacement) |                                   |                 |
|---|-----------------------------------|-----------------|
| Parameter Name                                      | Parameter Value                   | Suggested Value |
| Path Replacement Enabled*                           | <input type="text" value="True"/> | False           |
| Path Replacement on Tromboned Calls*                | <input type="text" value="True"/> | True            |
| Start Path Replacement Minimum Delay Time (sec)*    | <input type="text" value="0"/>    | 0               |
| Start Path Replacement Maximum Delay Time (sec)*    | <input type="text" value="0"/>    | 0               |
| Path Replacement T1 Timer (sec)*                    | <input type="text" value="30"/>   | 30              |
| Path Replacement T2 Timer (sec)*                    | <input type="text" value="15"/>   | 15              |
| Path Replacement PINX ID                            | <input type="text" value="5555"/> |                 |

### Configuring Cisco Unity for Centralized Voicemail Services

Whether using Cisco Unity as a centralized voicemail server in a Q.SIG private network or to provide voicemail services to Cisco CallManager users only, configure the platform as per the Cisco CallManager 4.1 Integration Guide for Unity 4.0, found at the following URL:

[http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod\\_configuration\\_guide09186a00802933d0.html](http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_configuration_guide09186a00802933d0.html)

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