



NetVanta Unified Communications Technical Note

Configuring the Dialogic Media Gateway

Introduction



The Dialogic 1000 and 2000 Media Gateway series allow integration with an existing PBX and the NetVanta UC server. The Media Gateway supports PBX systems from many different manufacturers including Alcatel, Avaya, Ericsson, Fujitsu, Hitachi, Intercom, Mitel, NEC, Nortel, Rohm, Siemens, and Toshiba, which allow you to bridge unified communications capability with your existing telephony system. This guide will assist you in configuring your media gateway and provide guidance on integrating your existing PBX system for IP telephony.

The following Dialogic part numbers are available through the Dialogic distribution channel.

Dialogic® 1000 Media Gateway Series

Dialogic Part Number	Description
DMG1008LSW	Analog Media gateway
DMG1008DNIW	Digital Station Emulation Gateway
DMG1008MTLDNIW	Digital Station Emulation Gateway for Mitel PBXs
DMG1008RLMDNIW	Digital Station Emulation Gateway for Rolm PBXs

Dialogic Part Number	Description
DMG2030DTI	Single span T1/E1/Q.SIG Media gateway to support up to 30 channels
DMG2060DTI	Dual span T1/E1/Q.SIG Media gateway to support up to 60 channels
DMG2120DTI	Quad span T1/E1/Q.SIG Media gateway to support up to 120 channels

Integration Topology

The Dialogic Media Gateways use the SIP protocol to communicate with the UC server and proprietary techniques to integrate with traditional PBXs. The UC server can support multiple gateways simultaneously to increase the number of channels to integrate with the PBX. The type of integration and the methods of integration can be found on the Dialogic web site:

<http://www.dialogic.com/support/helpweb/mg/integration.htm>

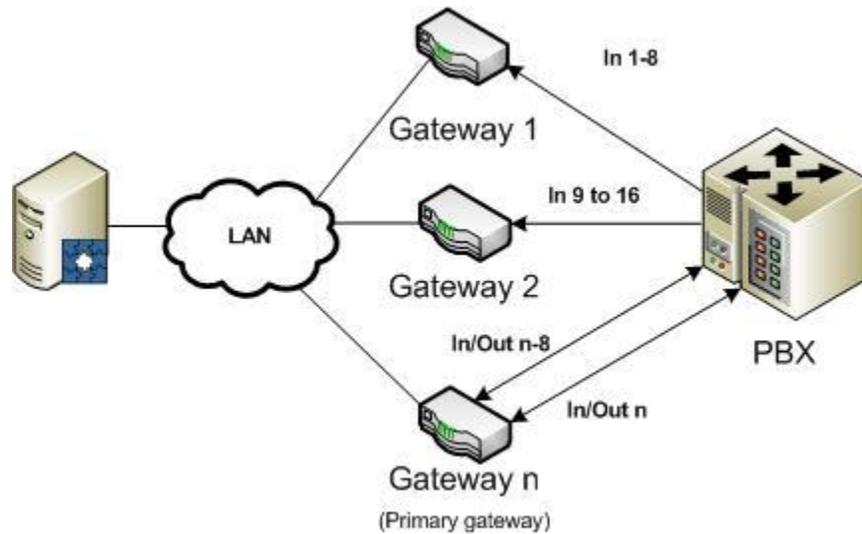
If you require more than one gateway to support the number of simultaneous calls for your application, you must take into consideration the PBX hunting type. “Hunting type” refers to the ordering technique the PBX uses to present incoming calls to the UC server – linear, circular – and the specific sequence that the PBX uses to send calls to the UC server.

Best practices:

1. Configure the incoming and outgoing ports to arrive in reverse order. As an example, incoming calls originate on the first gateway (non-prime) and if all the ports are busy, use the last gateway (prime). When originating calls, the UC server uses the last gateway and the PBX presents calls starting on the first gateway. This is done to reduce ‘glare’ or the possibility of collisions with incoming and outgoing calls.
2. Configure as many ports on the primary gateway as possible. For example, if the application requires an uneven number of gateways (for example, the application requires 12 ports but you have enough ports to configure 16) make sure that the last gateway (prime) is provisioned with as many ports as possible.

The primary gateway, the SIP media gateway configured in the UC server, is used for all outbound calls and activating/deactivating message waiting lights. If you have more than one gateway, you must configure the PBX to terminate on the other gateways first.

It is a best practice, to arrange the incoming and outgoing calls to originate in opposite directions from each other. If you are using more than one gateway, make sure that the majority of your incoming calls do not originally get offered on the primary gateway.



The UC server is configured to have the Primary Gateway domain/IP address. The primary gateway provides the following capabilities:

1. Message Waiting Light gateway
2. Outgoing calls
 - a. Active Message Delivery
 - b. Pager notification
 - c. Outbound faxing
 - d. Outbound notification

Supported Features

The following are the features supported by the integration:

- Call forwarding to personal greeting
 - Busy
 - Ring-no-answer
 - Unconditional
- Direct call – Manage messages (prompt for mailbox password)
- Transfer Capabilities
 - Blind transfers¹
 - Supervised/Assisted transfers¹
- Message Waiting Lights²
- Caller ID (If supplied by PBX)
- Notification Services
 - Active Message Delivery
 - Pager Notification
 - E-mail Notification
- Fax support
 - Incoming Fax
 - Incoming DID Fax (direct to user's mailbox)

- Outgoing Fax (desktop fax)
 - Fax-on-demand
- Outbound notification (database integration with outbound notification)
 1. The media gateway attempts to use the same channel/port for performing transfers if it is a supported capability of the PBX. This minimizes the number of ports required for transfer applications like automated attendants.
 2. Some PBX integrations require the same ports to turn on and off Message Waiting Light. The Dialogic Gateways remember which port turned on a message waiting light for an extension. However, this information is lost if the gateway is reset.

PBX Compatibility

The Dialogic Media Gateways support a number of protocols, which allows for compatibility with a wide variety of PBX systems.

These protocols include:

- **Analog DTMF**
 - A method of inter-switch signaling that uses dual-tone multi-frequency (DTMF) tones for signaling call reason and calling/called party information.
- **Serial (RS-232)**
 - Standard for serial binary data signals connecting between a DTE (Data terminal equipment) and a DCE (Data Circuit-terminating Equipment).
 - There are a number of serial protocols (SMDI, MCI, MD110 formats). Ensure that the Media Gateway supports the specific format for your PBX.
- **CAS**
 - CAS (Channel-associated signaling) is a signaling protocol that control signals, such as those for synchronizing and bounding frames, in the same channels as voice and data signals.
- **QSIG**
 - QSIG is a common channel signaling protocol based on ISDN Q.931 standards and is used by many digital PBXs. QSIG is used for the establishment and release of calls and for the control of a large number of features.

The Dialogic Media Gateways are compatible with over 20 PBX systems from several manufacturers. Specific configuration of these PBX systems is provided by Dialogic. Refer to the Dialogic web site for compatibility and PBX configuration guides.

<http://www.dialogic.com/support/helpweb/mg/integration.htm>

Initial Configuration

There are two methods of configuration: Serial Port or via HTTP. The detailed instructions can be found in the *Dialogic Media Gateway Getting Started Guide*. A summary is provided for convenience.

- **Serial Interface:** Using the serial port, you can run the basic configuration and set the parameters for both the gateway and PBX. Refer to section **Error! Reference source not found.** for the 1000 series or section **Error! Reference source not found.** for the 2000 series.
- **Web configuration:** The default IP address of the Dialogic Media Gateway is 10.12.13.74. To access the configuration screen, configure the local computer with an IP address on the same subnet (for example, **10.12.13.75**) and, using a web browser, navigate to **http://10.12.13.74**.

DMG 1000 Series Configuration - Serial Interface

1. Connect the serial cable to the serial connector on the back of the unit labeled **diagnostics**, and connect the other end to the serial connector on your PC.
2. Using a terminal interface program such as **HyperTerminal**, create a connection using the following parameters:
 - **Baud rate:** 38400
 - **Parity:** None
 - **Data Bits:** 8
 - **Stop Bits:** 1
 - **Hardware Flow Control:** Off
3. Select **connect**.
4. Press the **Enter** key until the following prompt appears:
PIMG>
5. At the prompt, type **pwd** and press **Enter**.
6. When prompted, type the password for the admin user (the default is **IpodAdmin**) and press **Enter**.
7. At the prompt, type **quickcfg** and press **Enter**.
8. You are prompted to enter the following parameters:
 - Client IP Address:** Type the IP Address that you want to assign to the media gateway.
 - Client Subnet Mask:** Type the subnet mask that you want to assign to the media gateway.
 - Default Network Address:** Type the IP Address of the default network router.
 - Select Operating Mode:** Type **SIP**.
 - PBX Type:** Type the value that corresponds to your PBX.
9. Type **Restart** at the **PIMG>** prompt.

DMG 2000 Series Configuration – Serial Interface

1. Connect the serial cable to the COM 2 connector on the gateway, and connect the other end to the serial connector on your PC.
2. Using a terminal interface program such as **HyperTerminal**, create a connection using the following parameters:
 - **Baud rate:** 115200
 - **Parity:** None
 - **Data Bits:** 8
 - **Stop Bits:** 1
 - **Hardware Flow Control:** Off
3. Select **connect**.
4. Press the **Enter** key until the following prompt appears:
PIMG>
5. At the prompt, type **pwd** and press **Enter**.
6. When prompted, type the password for the admin user (the default is **IpodAdmin**) and press **Enter**.
7. At the prompt, type **quickcfg** and press **Enter**.
8. You are prompted to enter the following parameters:
Client IP Address: Type the IP Address that you want to assign to the media gateway.
Client Subnet Mask: Type the subnet mask that you want to assign to the media gateway.
Default Network Address: Type the IP Address of the default network router.
Select Operating Mode: Type **SIP**.
Line Mode: Type **T1** for a T1 digital link and **E1** for an E1 digital link.
Signaling Mode: You can type either **CAS** or **ISDN** depending on the type of digital link.
 - If you select **T1 CAS**, you are prompted to select the Loop Start protocol.
 - If you select **ISDN**, you are prompted to specify the T1 protocol to be used.
9. Type **Restart** at the **PIMG>** prompt.

Configuring the Media Gateway

The last steps required in configuring the media gateway is to configure the dial plan, adjust the advanced settings, configure the serial protocol (if required), and set up integration with the UC server.

Dialogic has PBX specific configuration files that can be imported into the Media Gateway to ensure that the custom PBX settings are configured correctly. The Dialogic Media Gateway software available from Dialogic contains the latest versions of configuration files for the PBXs that they support.

The following configuration steps are required to integrate with the UC server:

1. SIP Parameters
2. CPID Manipulation
3. Inbound VoIP Call Routing
4. Inbound TDM Routing
5. Call Connect Mode for answer supervision
6. Specific PBX Integration instructions available from Dialogic

The PBX integration configuration settings vary depending on the PBX manufacturer, PBX model and version and integration type. For specific instructions, see the specific Dialogic configuration guide for the PBX model and integration type.

To manage the media gateway

1. Open your web browser and enter the IP Address of your media gateway.
2. When the login prompt appears, enter the following:
Username: admin
Password: IpodAdmin

SIP

The SIP parameters ensure that the Media Gateway uses the appropriate configuration parameters to integrate with the UC server SIP PBX (via Gateway) Communications System. Any parameters not listed below must be set as the default configuration or as recommended by the relative PBX Integration guide provided by Dialogic.

Navigate to **Configure > VoIP > General** and ensure the following parameters are configured:

User-Agent

- Host and Domain Name:** IP Address or FQDN of the UC server
- Transport Type:** UDP (Match the transport type of UC Port)
- Call as Domain Name:** No
- SIP URI Scheme Enabled:** No
- Invite Expiration (sec):** 120

Server

- DNS Server Address:** As appropriate for network
- Registration Server Address:** <Blank>

TCP/UDP

UDP/TCP Transport enabled: Yes

TCP/UDP Server Port: 5060

TCP Inactivity Timer (sec): 30

TLS

TLS Transport Enabled: No

Proxy

Primary Proxy Server Address: <Blank>

Backup Proxy Server Address: <Blank>

Monitoring

Monitor Call Connections: No

Routing Table

The routing table describes a set of rules used to define the characteristics of a call routed through the gateway. The primary characteristics include the destination address and the CPID (call party identification) information. The dial plan affects calls originating from the VoIP side, and calls originating from the TDM (T1, E1, analog, and so on) side.

TDM Trunk Group

The TDM Trunk group will be used to route calls between the attached PBX and the UC server. Using regular expressions or wildcard characters you can define the range of ports that you will use.

To configure the TDM trunk group, follow these steps:

1. Using the left-hand menu navigate to **Configure > Routing Table**.
2. Select the **TDM Trunk Groups** radio button.
3. Ensure that entries for both voice and message waiting ports are included. The following table shows some possible values.
4. Select **Submit**.

Option Name	Voice	Message Waiting
Name	Any	TdmMwis
Selection Direction	Ascending	Descending
Selection Mode	Linear	Linear
Port/Channel Content	*	*

Note: The Port/Channel content can also include a restricted range of ports. The default configuration is the * character (for all channels)

Router Configuration

Inbound TDM Rules
 Inbound VoIP Rules
 TDM Trunk Groups
 VoIP Host Groups

TDM Trunk Groups				
	Name	Selection Direction	Selection Mode	Port/Channel Content
Delete	Any	Ascending	Linear	*
Delete	TdmMwis	Descending	Linear	*

The selected Trunk Group is referenced by the following rules:

[inbound TDM] To/From PBX (match Trunk Group)

[inbound VoIP] To/From UC Server (Primary Route)

VoIP Host Groups

The VoIP Host group identifies the UC server.

To configure VoIP Host Groups

1. Using the left-hand menu navigate to **Configuration > Routing Table**.
2. Select the **VoIP Host Groups** tab.
3. Ensure that there is an entry for the UC server that includes the following.

Option Name	UC Server
Name	UC Server
Load-Balanced	Ascending
Fault-Tolerant	Linear
Host List	<IP Address of UC Server>:5080

Router Configuration

Inbound TDM Rules
 Inbound VoIP Rules
 TDM Trunk Groups
 VoIP Host Groups

VoIP Host Groups				
	Name	Load-Balanced	Fault-Tolerant	Host Summary
Delete	UC Server	false	false	192.168.8.54:5080;

The selected Host Group is referenced by the following rules:

[inbound TDM] To/From PBX (Primary Route)

[inbound TDM] Anonymous Caller (Primary Route)

Host List

UC Server	
192.168.8.54:5080	Delete

4. Select **Submit**

Routing Inbound TDM Calls

The Inbound TDM Call Routing table is the main table used to route calls originating from the TDM interface (T1, E1, analog, and so on).

To configure the inbound TDM routing, follow these steps:

1. Using the left-hand menu navigate to **Configure > Routing Table**.
2. Select the **Inbound TDM Routing** radio button.
3. Modify or add a new rule.
4. Ensure the Inbound TDM Rules are configured as follow:

Option Name	Voice	Message Waiting	Anonymous
Inbound TDM Rules			
Enabled	Yes	Yes	Yes
Rule Label	To/From PBX	Message Waiting	Anonymous
Request Type	Call	Message	Call
Trunk Group	Any (As defined from above)	TdmMwis (as defined above)	Any
Inbound TDM Request Matching			
CPID Matching			
Calling name and number	*	*	*
Called Number and Name	*	*	*
Redirect Number and name	*	*	*
Outbound Routes			
Device Selection			
Outbound Destination	VoIP	VoIP	VoIP
Host Group	UC Server	UC Server	UC Server
CPID Manipulation			
Calling Number, Calling Name	S	S	“Unknown Number”

Called Number, Called name	D	D	D
Redirect Number and Name	R	R	R

Router Configuration

Inbound TDM Rules
 Inbound VoIP Rules
 TDM Trunk Groups
 VoIP Host Groups

Inbound TDM Rules				
Select	Enable	Rule Label	Request Type	Trunk Group
<input type="checkbox"/>	<input checked="" type="checkbox"/>	To/From PBX	Call	Any
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Message Waiting	Message	TdmMwis
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Anonymous Caller	Call	Any

Detailed Configuration for Inbound TDM Rule: **To/From PBX**

Inbound TDM Request Matching					
CPID Matching					
Calling Number	*	Called Number	*	Redirect Number	*
Calling Name	*	Called Name	*	Redirect Name	*

Outbound Routes			
Device Selection			
Outbound Destination	VoIP	Host Group	UC Server
Route Method	Bridged		

CPID Manipulation					
Calling Number	S	Called Number	D	Redirect Number	R
Calling Name	S	Called Name	D	Redirect Name	R

Primary
 Alt-1
 Alt-2
 Alt-3
 Alt-4

5. Select **Apply Changes**.

Routing Inbound VoIP Calls

The Inbound VoIP Call Routing table is the main table used to route calls originating from the VoIP interface. This is applicable for outbound fax, outbound IVR, and Supervised (assisted) transfers.

To configure VoIP call routing, follow these steps:

1. Navigate to **Configuration > Routing Table** using the left-hand menu.
2. Select the **Inbound VoIP Routing** tab.
3. Select **Add Rule Row**.
4. Ensure the dial plan rule is configured as follows:

Option Name	Voice	Message Waiting
Inbound VoIP Rules		
Enabled	Yes	Yes

Rule Label	To/From UC Server	InboundVoipMwi
Request Type	Call	Message
Originating VoIP Host Address	*	*
Inbound VoIP Request Matching		
CPID Matching		
Calling name and number	*	*
Called Number and Name	*	*
Redirect Number and name	*	*
Outbound Routes		
Device Selection		
Outbound Destination	TDM	TDM
Host Group	Any	TdmMwis
CPID Manipulation		
Calling Number, Calling Name	S	S
Called Number, Called name	D	D
Redirect Number and Name	R	R

5. Select **Submit**.

Router Configuration

Inbound TDM Rules
 Inbound VoIP Rules
 TDM Trunk Groups
 VoIP Host Groups

Inbound VoIP Rules

Select	Enable	Rule Label	Request Type	Originating VoIP Host Address
<input type="checkbox"/>	<input checked="" type="checkbox"/>	To/From UC Server	Call	*
<input type="checkbox"/>	<input checked="" type="checkbox"/>	InboundVoipMwi	Message	*

Detailed Configuration for Inbound VoIP Rule: **To/From UC Server**

Inbound VoIP Request Matching

CPID Matching

Calling Number	Called Number	Redirect Number
Calling Name	Called Name	Redirect Name

Outbound Routes

Device Selection

Outbound Destination	Trunk Group	Route Method
TDM	Any	Bridged

CPID Manipulation

Calling Number	Called Number	Redirect Number
Calling Name	Called Name	Redirect Name

Select Primary / Alternate Route

Primary
 Alt-1
 Alt-2
 Alt-3
 Alt-4

VoIP Media Settings

1. Select **Configuration > VoIP > Media**
2. Ensure **Voice Activity Detection** is set to **Off**.

Specific PBX Integration Instructions

Refer to the Dialogic website for specific integration instructions for your PBX.

<http://www.dialogic.com/support/helpweb/mg/integration.htm>

Message Waiting Lights

The UC server is replacing an existing voice mail so the message waiting lights status is out of sync. Follow the PBX manufacturer's instructions to reset the message waiting lights.

Accessing PBX Trunk Facilities for Outgoing Calls

You must configure the PBX according to the vendor's instructions to allow the following UC server features to work correctly.

- Outgoing Fax
- Active Message Delivery
- Pager Notification
- Transfer to external telephone numbers (including trunk-to-trunk connections)

You must also ensure best practices to reduce or eliminate issues with fraudulent use of telecommunications services. The PBX and the UC server must be configured as a system to eliminate Toll Fraud.

Outgoing PBX Feature Access Codes

The UC server must be configured with the appropriate dialing plan feature access codes to dial external telephone numbers. Most PBXs require an external dialing access code (for example, **9**) for accessing outgoing lines.

Trunk-to-Trunk Connectivity

If there is a requirement to be able to transfer incoming external calls to an external telephone number, the PBX must be configured to allow this capability. Consult the PBX Manufacturer's directions to allow trunk-to-trunk connections.

Integrations using digital trunk based facilities, such as T1/E1 CAS, PRI or Q.SIG, Trunk to Trunk Connectivity **MUST** be enabled on the PBX for outgoing calls to succeed.

Configuring the UC Server

The UC server must be configured to integrate with the Dialogic Media Gateway. The media gateway communicates with the UC server on port **5080** for voice mail and related services.

You can create the Dialogic Gateway either through the Server Configuration Wizard or manually through the the UC client **Administrator** interface.

Server Configuration Wizard

Configuring a communications system is a step in the Server Configuration Wizard.

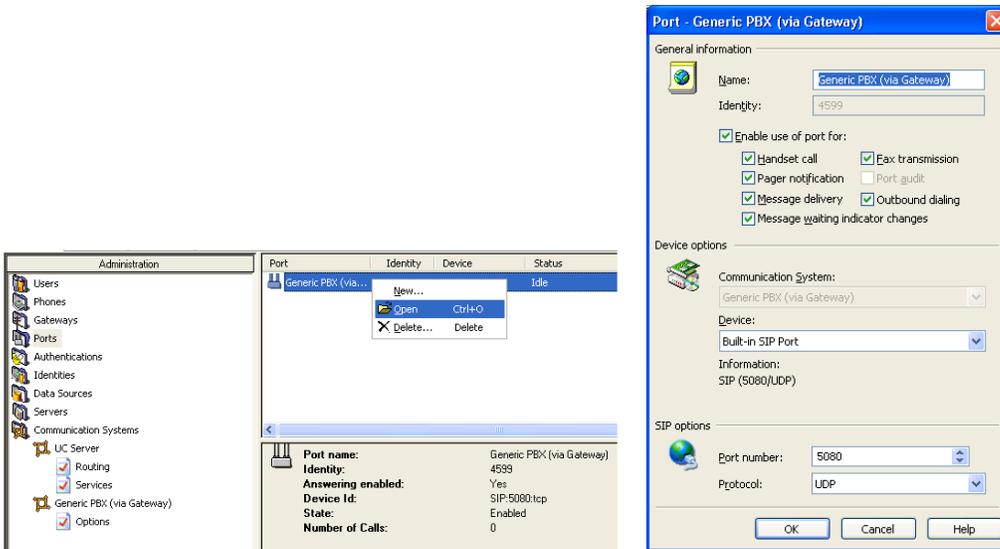
Consult the Server Configuration Wizard for detailed information.

To configure the Communications System, follow these steps:

1. Select **Generic PBX (via Gateway)** from the list of supported communications systems.
2. Configure the name (the default name is **Generic PBX (via Gateway)**).
3. Specify the answering group number. This is the number that a user dials to retrieve voice messages.
4. Select the appropriate network adapter. Generally, you need to consider this step only if the UC server has more than one network adapter.
5. Choose whether or not you want the Server Configuration Wizard to modify the Windows Firewall. The default is enabled.

After you finish the Server Configuration Wizard, ensure that the Port Configuration has the correct SIP options by doing the following:

1. Launch the the UC server client application.
2. In the **Administration** tab, select **Ports > Generic PBX (via Gateway)**.
3. Ensure the gateway is configured to match the transport protocol and the UC server port. By default, it is recommended to use UDP transport and UDP port **5080**.

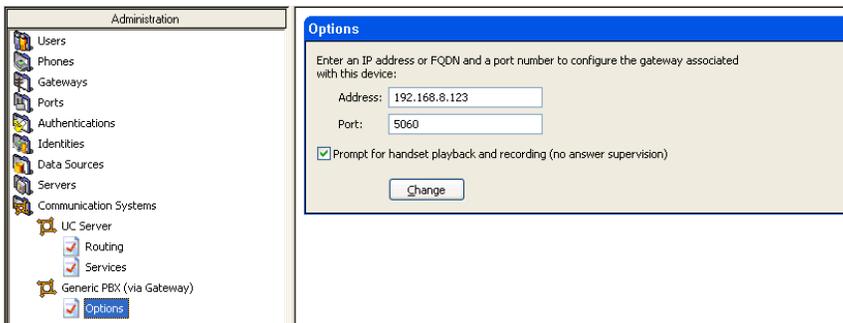


Note: If your port number or protocol options have changed, you must stop and restart the **UC Server Application Services** from the **Services** control panel.

The UC Client Administrator

If you have not previously configured a PBX and port(s) using the Server Configuration Wizard for Dialogic Media Gateway integration, then use the following instructions.

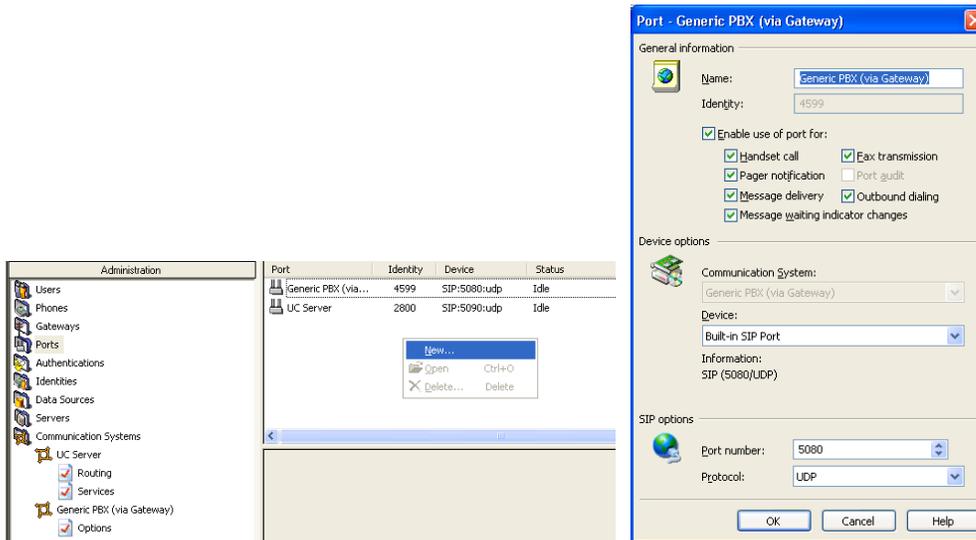
1. Add the Generic PBX (via Gateway) communications system.
2. Enter the IP Address or domain name and IP port of the Dialogic Media gateway.
If you are configuring more than one Dialogic Media Gateway, ensure that the gateway that you select will be used for Message Waiting requests and outgoing call requests (that is, Active Message Delivery, Outgoing Fax, Pager Notification, and Outbound notification requests).



3. Create a Port for that gateway.
The UC server answering port includes the transport protocol and port that the UC server monitors for incoming call requests.

Transport Port and protocol: The transport protocol can be one of TCP, UDP or TCP and UDP.

Port Number: By default, it is recommended to use IP port **5080**. Ensure the gateway is configured to match the transport protocol and the UC server port.



4. Add the users in the UC client to the generic PBX communication system.

Testing the Configuration

To make sure that the Dialogic Media Gateway configuration is working, you must run the following tests.

Pre-Testing Setup

To ensure you can properly test the gateway

1. Create a couple of users on the PBX and the UC server.
2. Create an identity for those users.
3. Create an auto-attendant identity to test incoming calls.

Testing Procedures

1. Internal Direct – Call to voicemail

Place a call to the voice mail access number and set the voice mail password for that user.

2. Forwarded Call

Place a call from one user to another, and then transfer the call to an external number.

3. Leave a voice mail

Place a call from one user to another and wait for the call to be transferred to voice mail. Leave a message and check that the message waiting indicator is turned on.

4. Listen to voice mail

Place a call to voice mail from the user you left a message for. Listen to the message and delete it when prompted. Check that the message waiting indicator is turned off.

5. Transfer from auto-attendant

Call into the auto-attendant and transfer to an extension. Make sure the call is transferred and the destination is ringing. Check that you verify all the possible failure conditions:

- a. Transfer to valid extension
- b. Transfer to invalid number
- c. Transfer to busy number