



Configuration Notes 244

Mediatrix 4400 Digital Gateway VoIP Trunking with a Legacy PBX

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Proprietary

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Introduction

This document outlines the configuration steps to set up a Mediatrix® 4400 digital gateway to provide VoIP trunking with a legacy PBX.

Mediatrix 4400 Digital Gateway Overview

These configuration notes apply to the Mediatrix 4400 Series digital gateway products. The Mediatrix 4400 Series Digital Gateways allow enterprises to lower communications costs over any IP link. The platform features ISDN BRI interfaces. They provide an ideal solution for enterprise voice applications or for connecting to a service provider's broadband access.

Mediatrix® 4400 digital gateways are fully scalable in terms of number of ports and functionalities. They currently come in the following models:



Model	Interfaces	VoIP Call Capacity
Mediatrix 4401	1 BRI port	up to 2
Mediatrix 4402	2 BRI ports	up to 4
Mediatrix 4404	4 BRI ports	up to 8

The Mediatrix digital gateways link any standard BRI connection to the IP network and deliver the clarity of toll quality voice for a comprehensive VoIP solution.

T.38 FoIP, fax bypass, and modem bypass capabilities ensure that the Mediatrix digital gateways seamlessly transport voice and data services. The Mediatrix digital gateways offer flexibility and scalability for VoIP network integration and low bandwidth voice.

With configurable NT/TE BRI ports, call-switching, and user programmable call routing (including caller/called ID), Mediatrix digital gateways integrate smoothly into existing PBX and PSTN networks.

Key Features:

- Voice Routing
- Fax over IP support, including T.38
- Proven voice algorithms implemented on dedicated DSP for enhanced voice quality
- Up to 8 simultaneous calls
- SNMPv3 and web management
- Configuration file encryption
- Automatic firmware and configuration file download
- Optional PSTN Bypass feature
- Optional Power Over Ethernet
- Optional Power Feeding Module for BRI phones



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Deployment Scenario

Description

This configuration note is a step-by-step guide to set up one Mediatrix 4402 Series digital gateway to provide VoIP trunking with a legacy PBX. The Mediatrix 4402 is used to connect a branch office's PBX to an existing VoIP network. The configuration starts with the Mediatrix 4402 default configuration but can be easily customized for the 4404 and 4401, so from now on, the device will be referred to as the *Mediatrix 4400*. The following is the network topology to which we will refer in our sample deployment.

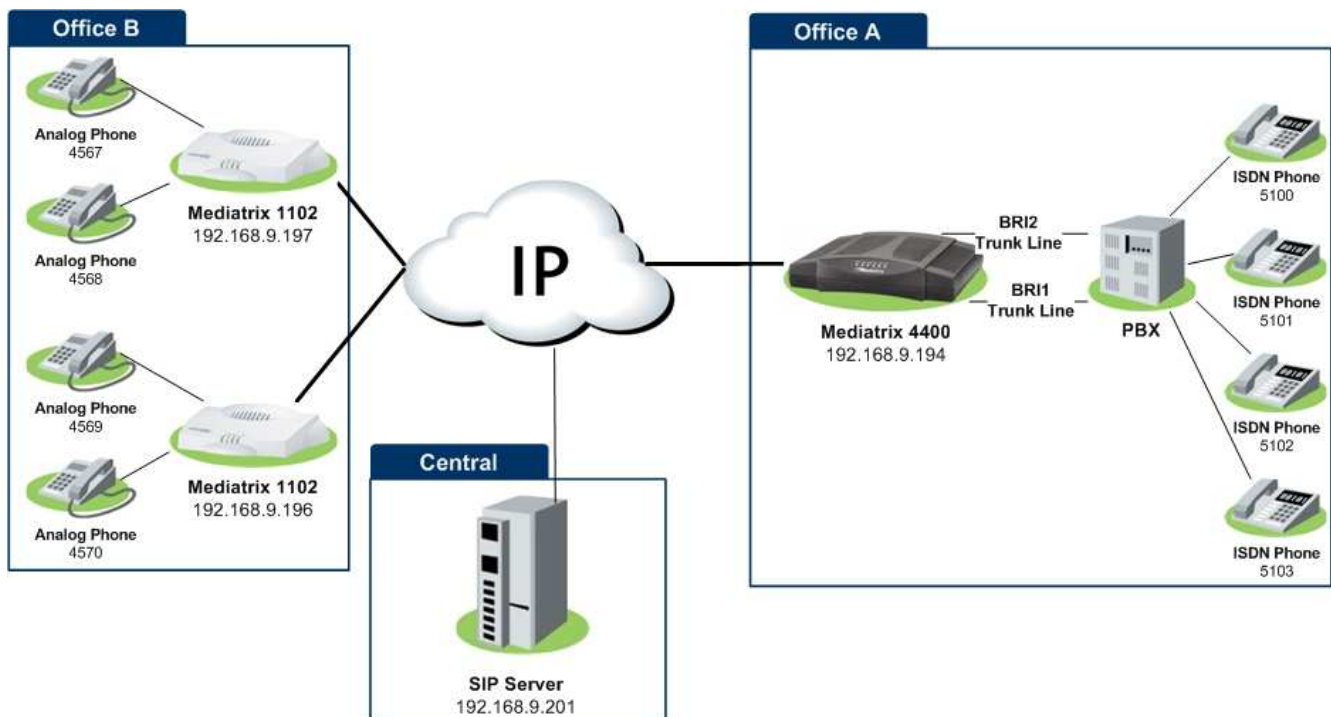


Figure 1 - Network Topology

Note: The network addresses and phone numbers shown above are sample values that will most probably vary in your specific setup. In the following pages, when referring to such a sample value, it will be visually outlined (e.g., 192.168.9.194), so whenever you see parameters outlined in that fashion, you should replace them with the values that are appropriate for your specific setup.

Objectives

The steps described in the following pages will show you how to setup the Mediatrix 4400 so it can:

- A. receive calls from the PBX and route them to a remote branch through the VoIP network. (e.g., from Office A to Office B):
 1. a user from Office A picks up an ISDN phone and dials a number.
 2. the PBX uses one of its trunk lines to route the call to the Mediatrix 4400.
 3. the Mediatrix 4400 forwards the call to the appropriate Mediatrix 1102.
 4. the Mediatrix 1102 makes the appropriate analog phone ring.
 5. a user in Office B picks up the analog and the call is established.
- B. receive calls from remote branches through the VoIP network and route them on one of the local branch's PBX lines (e.g., from Office B to Office A):



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1. a user from Office B picks up an analog phone and dials a number.
2. the appropriate Mediatrix 1102 routes the call to the Mediatrix 4400.
3. the Mediatrix 4400 decides to which ISDN BRI interface route this call.
4. the Mediatrix 4400 routes the call to the PBX.
5. the PBX makes the appropriate ISDN phone ring.
6. a user from Office A picks up the ISDN phone and the call is established.

Assumptions

This configuration note focuses on configuring the Mediatrix 4400, and assumes that:

- extension numbers behind the PBX correspond to registered users in the SIP server (without authentication).
- the Mediatrix 4400 in Office A is connected to two trunk lines in the PBX.
- the Office B setup is functional, and the SIP users are correctly registered to the SIP server.

Steps

This configuration note will guide you through the following steps:

1. Physical connection of the Mediatrix 4400 to the network and PBX.
2. IP address discovery or configuration.
3. Web interface access.
4. SIP configuration.
5. ISDN configuration.
6. Call routing configuration.
7. Basic call establishment.



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Configuration of the Mediatrix 4400 Digital Gateway

Physical Connection of the Mediatrix 4400 to the Network and PBX

Please refer to the Mediatrix 4400 Quick Start booklet (packaged with the Mediatrix 4400) for instructions on hardware installation.

The Mediatrix 4400 Quick Start booklet can also be found online on the Mediatrix Download Portal at <https://support.mediatrix.com/DownloadPlus/Download.asp>.

IP address Discovery or Configuration

The purpose of this section is to be able to contact the Mediatrix 4400's management interface to start with unit configuration.

Once the physical connection is complete and the Mediatrix 4400 is powered up, the first thing to do is find out the IP address the Mediatrix 4400 is using. The Mediatrix 4400's IP address can be set either dynamically or statically. The default behaviour of the Mediatrix 4400 is to try to obtain a dynamic IP address through DHCP.

Dynamic IP Address Discovery

Before connecting the Mediatrix 4400 to the network, Mediatrix strongly suggests that you reserve an IP address in your DHCP server for the unit you are about to connect. DHCP servers reserve IP addresses for specific devices by using a unique identifier for each device. The Mediatrix 4400's unique identifier is its media access control (MAC) address. The MAC address appears on the label located on the bottom side of the unit.

If you have not reserved an IP address, you can discover which IP address has been assigned to the Mediatrix 4400 by either:

- consulting your DHCP server's logs to find out details on the DHCP lease that was given to the Mediatrix 4400.
- using a network packet sniffer (e.g., Ethereal) to examine the DHCP messages exchanged between the Mediatrix 4400 and your DHCP server while the Mediatrix 4400 boots up.

Default Static IP Address Configuration

If there is no DHCP server in your network, then the IP address has to be configured statically. The first thing to do is set the Mediatrix 4400 to its known default static IP address. You can do this by using the Mediatrix 4400's partial reset feature (see the section [Further Information and Configuration](#) for more details).

1. Once the Mediatrix 4400 has finished booting up (the *Power* LED is lit, not blinking), insert a small, unbent paper clip into the RESET/DEFAULT hole located at the rear of the Mediatrix 4400 and press the RESET/DEFAULT button. The *Power* LED will start blinking, and after a few seconds, all the LEDs will start blinking. Release the paper clip after all the LEDs start blinking and before they all stop blinking (between 7-11 seconds).

After a partial reset is performed, the Mediatrix 4400 uses the default 192.168.0.1 IP address. From now on, you can optionally change the Mediatrix 4400's IP address (see section [Further Information and Configuration](#) for more details).



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Web Interface Access

The purpose of this section is to log in to the Mediatrix 4400's web interface.

The Mediatrix 4400's web interface may be used to view the status of the Mediatrix 4400 and set its numerous parameters.

1. In your web browser's address field, type **192.168.9.194** (or the address of the Mediatrix 4400). The PC you use must be connected to the same subnet as the Mediatrix 4400 or to a network where it can reach the Mediatrix 4400's IP address. The following window appears:

A screenshot of the Mediatrix web interface login page. It features the Mediatrix logo at the top left, followed by a green prompt: 'Please enter your username and password'. Below this are two input fields: 'User Name:' and 'Password:'. A 'Login' button is positioned below the password field.

2. Enter the user name **public**. Leave the *Password* field empty.

A screenshot of the Mediatrix web interface login page, identical to the previous one, but with the text 'public' entered into the 'User Name:' field. The 'Password:' field remains empty.

3. Click **Login**.

A screenshot of the Mediatrix web interface after a successful login. The Mediatrix logo is at the top left. A navigation menu at the top includes 'System', 'Network', 'ISDN', and 'SIP', each with a red square icon. Below this is another menu with 'Information', 'Services', and 'Syslog'. The 'Information' menu item is selected and highlighted in blue. Below the menu is a green prompt: 'Please enter your username and password'. Underneath is a table titled 'Current Status' with the following data:

Current Status	
System Description:	Mediatrix 4402
Serial Number:	001880000P132060025
Firmware Version:	1.1.4.23
MAC Address:	0090F802B298
System Uptime (D:HH:MM:SS):	0:00:03:50
SNMP Port:	161

You now have access to the Mediatrix 4400's configuration web interface.



SIP Configuration

The purpose of this section is to setup the Mediatrix 4400 to use your SIP server for registration and call routing, and to tell the Mediatrix 4400 to register SIP users for all the ISDN phones that are connected to the PBX.

The SIP configuration tells the Mediatrix 4400 which SIP servers, parameters and phone numbers to use. The following steps configure the Mediatrix 4400 as illustrated in the sample network topology.

1. Click the **SIP** menu, then the **Servers** sub-menu. The following window appears:

The screenshot shows the Mediatrix configuration interface with the 'SIP' menu selected. The 'Servers' sub-menu is active, displaying the 'SIP Default Servers' section. The 'Registrar Host' and 'Proxy Host' fields are both set to '192.168.10.10:0'. The 'Outbound Proxy Host' field is empty. Below this are sections for 'SIP Gateway Specific Registrar Servers' and 'SIP Gateway Specific Proxy Servers', both with 'Gateway Specific' set to 'No' and 'Registrar Host' set to '192.168.0.10:0'. The 'Outbound Proxy Host' is set to '0.0.0.0:0'. Buttons for 'Submit' and 'Submit & Refresh Registration' are visible at the bottom.

2. Set the *Registrar Host* field to the address of the central SIP Server **192.168.9.201**.
3. Set the *Proxy Host* field to the address of the central SIP Server **192.168.9.201**.

The screenshot shows the same Mediatrix configuration interface, but the 'Registrar Host' and 'Proxy Host' fields in the 'SIP Default Servers' section are now updated to '192.168.9.201'. The other settings remain the same as in the previous screenshot. The 'Submit' and 'Submit & Refresh Registration' buttons are still present at the bottom.

4. Click **Submit** to save the configuration changes. The Mediatrix 4400 is now configured to use your SIP server.



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- Click the **Registrations** sub-menu. The following window appears:

The screenshot shows the Mediatrix web interface with the 'Registrations' sub-menu selected. The 'Endpoints Registration' table is visible with the following data:

Endpoint	User Name	Friendly Name	Register	Gateway Name
Bri1	<input type="text"/>	<input type="text"/>	Disable	all
Bri2	<input type="text"/>	<input type="text"/>	Disable	all

The 'Unit Registration' section is currently empty, with a '+' button at the bottom right.

In this window, you can enter the extension numbers from the PBX to be registered in the SIP server.

- Click the **+** button at the bottom right of the *Unit Registration* section. An empty entry appears in the section.

The screenshot shows the Mediatrix web interface with the 'Registrations' sub-menu selected. The 'Unit Registration' section now contains one entry:

Index	User Name	Gateway Name
1	<input type="text"/>	all

The '+' button is now visible at the bottom right of the 'Unit Registration' section.

- Enter the phone number of the first ISDN phone from Office A of the sample network topology ([Figure 1](#)) in the *User Name* field (**5100** in our example).

The screenshot shows the Mediatrix web interface with the 'Registrations' sub-menu selected. The 'Unit Registration' section now contains one entry with the phone number '5100' entered in the 'User Name' field:

Index	User Name	Gateway Name
1	5100	all

The '5100' is circled in red in the original image.



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- Repeat steps 6 and 7 for all of the ISDN phones from Office A of the sample network topology (([Figure 1](#))). At the end of the process, the *Unit Registration* section looks like the following:

The screenshot shows the Mediatrix configuration interface. At the top, there are navigation tabs: System, Network, ISDN, SIP, Telephony, and Management. Below these are sub-tabs: Gateways, Servers, Registrations, Endpoints, Authentication, and Misc. The 'Registrations' sub-tab is active, showing a section titled 'Registrations' with a green arrow icon. Below this are two tables:

Endpoints Registration				
Endpoint	User Name	Friendly Name	Register	Gateway Name
Bri1	<input type="text"/>	<input type="text"/>	Disable	all
Bri2	<input type="text"/>	<input type="text"/>	Disable	all

Unit Registration			
Index	User Name	Gateway Name	
1	<input type="text" value="S100"/>	all	-
2	<input type="text" value="S101"/>	all	-
3	<input type="text" value="S102"/>	all	-
4	<input type="text" value="S103"/>	all	-
			+

At the bottom right of the interface, there are two buttons: 'Submit' and 'Submit & Refresh Registration'.

- Click **Submit & Refresh Registrations**. This saves the configuration in the Mediatrix 4400 and causes it to send the appropriate SIP REGISTER messages to the SIP server so each ISDN phone has a registered SIP user associated with it.
- OPTIONAL STEP: if your SIP server requires SIP authentication, further configuration steps are necessary so the Mediatrix 4400 has all the needed information to authenticate to the server (see the section [Further Information and Configuration](#) for more details).



ISDN Configuration

The purpose of this section is to configure the Mediatrix 4400's ISDN BRI interfaces in Network mode (NT) for a point to point line. This requires that the PBX be configured in Terminal Equipment (TE) mode and point to point lines. If your setup differs, please refer to the section [Further Information and Configuration](#) for more details.

The ISDN configuration tells the Mediatrix 4400 how its ISDN BRI interfaces should behave. You must configure the ISDN parameters of the Mediatrix 4400 digital gateways for each interface you intend to use.

1. Click the **ISDN** menu, then the **Basic Rate Interface** sub-menu. The following window appears:

The screenshot shows the Mediatrix web interface. At the top, there are navigation tabs: System, Network, ISDN, and SIP. Below these are sub-tabs: Status and Basic Rate Interface. The main heading is 'Basic Rate Interface'. A dropdown menu 'Select Interface:' is set to 'Bri1'. Below this are two main configuration sections:

Hardware Configuration	
Clock Reference (Applies to all interfaces):	None

Interface Configuration	
Endpoint Type:	TE
Connection Type:	Point To Point
Signalling Protocol:	DSS1
Network Location:	User
Preferred Encoding Scheme:	G.711 a-Law
Fallback Encoding Scheme:	G.711 u-Law
Channel Allocation Strategy:	Ascending
Maximum Active Calls:	0
Signal Information Element:	Disable
Inband Tone Generation:	Enable
Inband DTMF Dialing:	Enable
Overlap Dialing:	Enable
Calling Name Max Length:	34
Exclusive B-Channel Selection:	Disable
Sending Complete:	Enable
Calling Line Information Presentation:	Disable
Calling Line Information Restriction:	Disable
Calling Line Information Restriction Override:	Disable
Send Restart On Startup:	Enable

At the bottom right of the configuration area is a 'Submit' button.

2. Select the interface for which you want to apply the changes in the *Select Interface* drop-down menu. Depending on the model of Mediatrix 4400 you are using, you may have 1, 2, or 4 interfaces available in the drop-down menu.

This close-up shows the 'Select Interface:' dropdown menu. The current selection is 'Bri1'. The dropdown list is open, showing 'Bri1' and 'Bri2' as options. A red circle highlights the dropdown menu area.



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- In the *Interface Configuration* section, set the *Endpoint Type* field to **NT** and *Connection Type* field to **Point to Point**. Leave all other parameters to their default values.

NOTE: Depending on the model of Mediatrix 4400 you are using, there may or may not be a *Power Feeding* field in the *Hardware Configuration* section.

System
Network
ISDN
SIP

Status
Basic Rate Interface

Basic Rate Interface

Select Interface: Bri1

Hardware Configuration	
Clock Reference (Applies to all interfaces):	None

Interface Configuration	
Endpoint Type:	NT
Connection Type:	Point To Point
Signalling Protocol:	DSS1
Network Location:	User
Preferred Encoding Scheme:	G.711 a-Law
Fallback Encoding Scheme:	G.711 u-Law
Channel Allocation Strategy:	Ascending
Maximum Active Calls:	<input style="width: 80px;" type="text" value="0"/>
Signal Information Element:	Disable
Inband Tone Generation:	Enable
Inband DTMF Dialing:	Enable
Overlap Dialing:	Enable
Calling Name Max Length:	<input style="width: 80px;" type="text" value="34"/>
Exclusive B-Channel Selection:	Disable
Sending Complete:	Enable
Calling Line Information Presentation:	Disable
Calling Line Information Restriction:	Disable
Calling Line Information Restriction Override:	Disable
Send Restart On Startup:	Enable

Submit

- Click **Submit** to apply the configuration changes made to this interface.



System ■ Network ■ ISDN ■ SIP ■

Status Basic Rate Interface

Some changes require to restart a service to apply new configuration. Please click this link to access the services table: [Services](#)

✦ Basic Rate Interface

Select Interface:

Hardware Configuration	
Clock Reference (Applies to all interfaces):	<input type="text" value="None"/>

Interface Configuration	
Endpoint Type:	<input type="text" value="NT"/>
Connection Type:	<input type="text" value="Point To Point"/>

- The parameters that have just been configured require a restart of the ISDN service. A service is a logical grouping of features. Restarting a service is a required mechanism for certain elements in the configuration. However, you can finish with the ISDN configuration steps before doing that. Once the ISDN configuration is over, follow the instructions from [Appendix A - Restarting a Service](#) to restart the ISDN service as required.
- Repeat steps 2-3-4 for all of the ISDN BRI interfaces listed in the *Select Interface* field.
- Restart the ISDN service as described in [Appendix A - Restarting a Service](#).

Call Routing Configuration

The purpose of this section is to configure the Mediatrix 4400's call router so it can route calls to/from the VoIP network and the PBX as described in the Deployment Scenario section.

You must configure the call router parameters of the Mediatrix 4400 digital gateways so that the calls can properly terminate. Remember that the purpose of this configuration note is to achieve the sample deployment scenario shown in [Figure 1](#). Your specific setup may vary.

Planning the Call Router

The goal of planning the Call router configuration is to summarize the rules incoming calls will follow when passing through the Mediatrix 4400.

This is:

- Call sources and destinations.
- Calls allowed and rejected.
- Call properties manipulations.
- All routing possibilities.

Before going further with the configuration steps, you should refer back to the two types of calls described in the [Deployment Scenario](#) section.

The most basic call scenario implies at least configuring *Routes*. In the current deployment scenario, you will also configure a *Hunt Group* to support step 3 of call scenario B defined in the [Deployment Scenario](#) section (see [Further Information and Configuration](#) for more details).

- A Route is a virtual connection made inside the Mediatrix 4400 between call sources and destinations. Routes are part of the Mediatrix 4400's Route table. When a call comes in, the Mediatrix 4400 uses its Route table to decide to which destination route the call.



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- A Hunt Group is a virtual entity that regroups different call destinations in one group. This entity can then be used as a call destination in a Route. When an incoming call is routed to a Hunt, the Hunt uses an algorithm to decide which one of its internal destinations the call is effectively routed to

Configuring the Call Router

Hunt Group

The purpose of this subsection is to configure a Hunt Group in the Mediatrix 4400, so it can be later used as a route's destination.

In the current scenario, you will use a Hunt Group to group both of the Mediatrix 4402's ISDN BRI interfaces as one virtual call destination.

1. Click the **Telephony** menu, then the **Call Routing Config** sub-menu. The following window appears.

The screenshot shows the Mediatrix web interface for configuring call routing. The top navigation bar includes System, Network, ISDN, SIP, Telephony, and Management. The 'Telephony' menu is expanded to show 'Call Routing Config' and 'Misc'. The main content area is titled 'Call Routing Config' and contains several sections, each with a table and a '+' button for adding new entries:

- Config Modified:** A simple text field containing 'no'.
- Route:** A table with columns: Index, Source, Properties Criteria, Expression Criteria, Mappings, Signaling Properties, Destination, and Actions.
- Mapping Type:** A table with columns: Index, Name, Criteria, Transformation, and Actions.
- Mapping Expression:** A table with columns: Index, Name, Criteria, Transformation, Sub Mappings, and Actions.
- Signaling Properties:** A table with columns: Index, Name, Early Connect, Early Disconnect, Destination Host, Allow 180 SDP, Allow 183 without SDP, and Actions.
- Hunt:** A table with columns: Index, Name, Destinations, Selection Algorithm, Timeout (seconds), Causes, and Actions.

At the bottom right of the interface, there are 'Apply' and 'Rollback' buttons.

2. Locate the *Hunt* section at the bottom of the window.



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- Click the **+** button at the bottom right of the *Hunt* section. The following window appears.

The screenshot shows the Mediatrix web interface. At the top, there are navigation tabs: System, Network, ISDN, SIP, Telephony, and Management. Below these are sub-tabs: DTMF Maps, CODECS, Call Routing Status, Call Routing Config, and Misc. The 'Call Routing Config' sub-tab is active, showing a 'Configure Hunt End' form. The form has a table with columns 'Value' and 'Suggestion'. The 'Name' field is empty. The 'Destinations' field is empty, and the 'Suggestion' dropdown is set to '--- Suggestion ---'. The 'Selection Algorithm' is set to 'Sequential'. The 'Timeout (seconds)' is set to '0'. The 'Causes' field contains '31, 34, 38, 41, 42, 43, 44, 47'. The 'Suggestion' dropdown is set to '--- Suggestion ---'. At the bottom right, there are 'Submit' and 'Cancel' buttons.

To create a Hunt Group:

- Set the *Name* field to *hunt_PBX*.
- Use the *Suggestion* drop-down list to select and add the possible destinations that will be part of the Hunt Group.

This screenshot is similar to the previous one, but the 'Name' field now contains 'hunt_PBX' and the 'Suggestion' dropdown is open, showing a list of suggestions: '--- Suggestion ---', '--- Suggestion ---', 'isdn-Bri1', 'isdn-Bri2', 'sip-default', 'route-', 'hunt-', 'Clear', and '--- Suggestion ---'. The 'Name' field and the suggestion list are circled in red. The 'Submit' and 'Cancel' buttons are still visible at the bottom right.



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- Following the *Deployment Scenario*, select one by one both of the Mediatrix 4400's ISDN BRI interfaces (**isdn-Bri1**, which corresponds to port BR1 and **isdn-Bri2**, which corresponds to port BR2). The interfaces will be automatically added as destinations for that Hunt Group.
- Leave the other fields with their default value.

System Network ISDN SIP Telephony Management

DTMF Maps CODECS Call Routing Status Call Routing Config Misc

Call Routing Config

Configure Hunt End

Value	Suggestion
Name: hunt_PBX	
Destinations: isdn-Bri1, isdn-Bri2	--- Suggestion ---
Selection Algorithm: Sequential	
Timeout (seconds): 0	
Causes: 31, 34, 38, 41, 42, 43, 44, 47	--- Suggestion ---
Config Status	

Submit Cancel

- Verify if the ISDN interfaces have been successfully added to the configuration by checking the *Destinations* field, then click **Submit** to apply changes and save the new Hunt Group.

System Network ISDN SIP Telephony Management

DTMF Maps CODECS Call Routing Status Call Routing Config Misc

Call Routing Config

Config Modified: yes

Route	Index	Source	Properties	Criteria	Expression	Criteria	Mappings	Signaling	Properties	Destination	Actions
											+

Mapping Type	Index	Name	Criteria	Transformation	Actions
					+

Mapping Expression	Index	Name	Criteria	Transformation	Sub Mappings	Actions
						+

Signaling Properties	Index	Name	Early Connect	Early Disconnect	Destination Host	Allow 180 SDP	Allow 183 without SDP	Actions
								+

Hunt	Index	Name	Destinations	Selection Algorithm	Timeout (seconds)	Causes	Actions
	1	hunt_PBX	isdn-Bri1, isdn-Bri2	Sequential	0	31, 34, 38, 41, 42, 43, 44, 47	Edit + -

Apply Rollback




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9. You are brought back to the **Call Routing Config** sub-menu, and you can see the *Hunt Group* you have just created in the *Hunt* section.

You can also see a yellow Yes that warns you that the configuration has been modified but not applied (i.e., the **Call Routing Status** differs from the **Call Routing Config**). The *Call Routing Config* sub-menu is a working area where you build up a Call Router configuration. While you work in this area, the configured parameters are saved but not applied (i.e., they are not used to process incoming calls). The yellow Yes flag warns you that the configuration has been modified but is not applied. You will apply the configuration later when it is complete.

Route

The purpose of this subsection is to configure the Mediatrix 4400 so it makes virtual “connections” between call sources and destinations.

1. Locate the *Route* section at the top of the window.
2. Click the  button at the bottom right of the *Route* section. The following window appears.

Configure Route End	Value	Suggestion
Source	<input type="text"/>	--- Suggestion ---
Properties Criteria	None	
Expression Criteria	<input type="text"/>	--- Suggestion ---
Mappings	<input type="text"/>	--- Suggestion ---
Signaling Properties	<input type="text"/>	--- Suggestion ---
Destination	<input type="text"/>	--- Suggestion ---
Config Status		

Submit Cancel

3. To create a route from SIP (**sip-default**) to ISDN (**hunt_PBX**), set the *Source* field to **sip-default** and the *Destination* field to **hunt-hunt_PBX**. You can use both fields' associated *Suggestion* drop-down list to help you fill them. This route will satisfy call scenario B described in section *Deployment Scenario*, where SIP users from Office B call ISDN phones from Office A.

Configure Route End	Value	Suggestion
Source	sip-default	--- Suggestion ---
Properties Criteria	None	
Expression Criteria	<input type="text"/>	--- Suggestion ---
Mappings	<input type="text"/>	--- Suggestion ---
Signaling Properties	<input type="text"/>	--- Suggestion ---
Destination	hunt-hunt_PBX	--- Suggestion --- isdn-Bri1 isdn-Bri2 sip-default hunt-hunt_PBX route-hunt-
Config Status		

Submit Cancel



- Click **Submit** to apply changes and save the new route.

The screenshot shows the Mediatrix web interface for 'Call Routing Config'. At the top, there are navigation tabs for System, Network, ISDN, SIP, Telephony, and Management. Below these are sub-tabs for DTMF Maps, CODECS, Call Routing Status, Call Routing Config, and Misc. The 'Call Routing Config' sub-tab is active.

A 'Config Modified:' status bar shows 'yes' in a yellow box. Below this is a table for 'Route' configuration:

Route Index	Source	Properties	Criteria	Expression Criteria	Mappings	Signaling Properties	Destination	Actions
1	sip-default	None					hunt-hunt_PBX	Edit + -

Below the route table are sections for 'Mapping Type', 'Mapping Expression', 'Signaling Properties', and 'Hunt', each with its own table and a '+' button to add new entries. At the bottom right, there are 'Apply' and 'Rollback' buttons.

- You are brought back to the **Call Routing Config** sub-menu, and you can see the route you just created in the *Route* section. You can also see the yellow Yes that warns you that the configuration has been modified but not applied (i.e., the **Call Routing Status** differs from the **Call Routing Config**).
- Repeat steps 2-3-4-5 twice to create two additional routes. These new routes will satisfy call scenario A described in [Deployment Scenario](#), where ISDN phones from Office A call SIP users from Office B:
 - one from Source **isdn-Bri1** to Destination **sip-default**, and
 - one from Source **isdn-Bri2** to Destination **sip-default**.



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- After completing all the route configuration steps, you will see your three routes.

System Network ISDN SIP **Telephony** Management

DTMF Maps CODECS Call Routing Status **Call Routing Config** Misc

Call Routing Config

Config Modified: **yes**

Route Index	Source	Properties	Criteria	Expression Criteria	Mappings	Signaling Properties	Destination	Actions
1	sip-default	None					hunt-hunt_PBX	Edit ↓ + -
2	isdn-Bri1	None					sip-default	Edit ^ ↓ + -
3	isdn-Bri2	None					sip-default	Edit ^ + -

Mapping Type Index	Name	Criteria	Transformation	Actions
				+

Mapping Expression Index	Name	Criteria	Transformation	Sub Mappings	Actions
					+

Signaling Properties Index	Name	Early Connect	Early Disconnect	Destination Host	Allow 180 SDP	Allow 183 without SDP	Actions
							+

Hunt Index	Name	Destinations	Selection Algorithm	Timeout (seconds)	Causes	Actions
1	hunt_PBX	isdn-Bri1, isdn-Bri2	Sequential	0	31, 34, 38, 41, 42, 43, 44, 47	Edit + -

Apply Rollback

- Click **Apply**. This applies all the parameters from **Call Routing Config** to the system. You can also see that the yellow *Config Modified* **yes** flag is cleared.



9. The call routing parameters can be seen in the **Call Routing Status** window.

The screenshot shows the Mediatrix web interface with the 'Call Routing Status' window open. The navigation menu includes System, Network, ISDN, SIP, and Telephony. The 'Call Routing Status' window contains the following sections:

- Call Routing Status**
 - Config Modified: no
- Route**

Route	Source	Properties Criteria	Expression Criteria	Mappings	Signaling Properties	Destination
	sip-default	None				hunt-hunt_PBX
	isdn-Bri1	None				sip-default
	isdn-Bri2	None				sip-default
- Signaling Properties**

Name	Early Connect	Early Disconnect	Destination Host	Allow 180 SDP	Allow 183 without SDP
hunt_PBX					
- Hunt**

Hunt Name	Destinations	Selection Algorithm	Timeout (seconds)	Causes
hunt_PBX	isdn-Bri1, isdn-Bri2	Sequential	0	31, 34, 38, 41, 42, 43, 44, 47
- Available Interface (ISDN endpoints and SIP Gateways)**

Name
isdn-Bri1
isdn-Bri2
sip-default

The configuration note has prepared the system to perform calls in both directions.

Basic Call Establishment

Once this configuration procedure is completed, you are ready to start making basic calls through your new Mediatrix 4400, considering that the rest of your network's setup is configured properly.

Perform Basic Call (Scenario A)

- Pickup the ISDN phone that has the phone number **5100**.
- Dial **4567**.
- The analog phone number **4567** rings.
- Pick up the analog phone number **4567**.
- The call is established.
- Hang up both phones to end the call.

Perform Basic Call (Scenario B)

- Pick up the analog phone number **4567**.
- Dial **5100**.
- The ISDN phone number **5100** rings.
- Pickup the ISDN phone number **5100**.



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- The call is established.
- Hang up both phones to end the call.

Further Information and Configuration

You can refer to the following documents/sections for further information on configuration parameters and features used in this configuration note.

All documents are available online on the Mediatrix Download Portal at <https://support.mediatrix.com/DownloadPlus/Download.asp>.

- 1- For more information on the Partial Reset feature, and on what to do after performing a Partial Reset to recover a unit which you had lost contact with, refer to the *Partial Reset* section of the *Mediatrix 4400 Digital Gateway Software Configuration Guide*.
- 2- For more information on configuring level 2 network links, level 3 network interfaces and IP addresses, refer to the *Interfaces Configuration* section of the *Mediatrix 4400 Digital Gateway Software Configuration Guide*.
- 3- For more information on configuring the Mediatrix 4400's ISDN BRI interfaces in TE or NT mode and additional parameters, refer to the *ISDN Configuration* section of the *Mediatrix 4400 Digital Gateway Software Configuration Guide*.
- 4- For more information on configuring the Mediatrix 4400 to work with SIP servers that require SIP authentication, refer to the *SIP Authentication* section of the *Mediatrix 4400 Digital Gateway Software Configuration Guide*.
- 5- For information on how to configure the Mediatrix 4400 so it processes dialed DTMFs according to specific dialing plans, refer to the *DTMF Maps Configuration* section of the *Mediatrix 4400 Digital Gateway Software Configuration Guide*.
- 6- For more information on call routing including routes, mappings, signaling properties, and hunts, refer to the *Call Router Configuration* section of the *Mediatrix 4400 Digital Gateway Software Configuration Guide*.



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Appendix A - Restarting a Service

The Mediatrix 4400's features are divided in logical entities called **Services**. Some parameters in the Mediatrix 4400 require that the service to which they belong be restarted when they are configured in order for their new configuration value to be correctly applied. When this happens (usually after you click a **Submit** button), a message and a **Services** link are displayed at the top of the window stating that a service must be restarted.

In this example, a parameter of the ISDN services requires that this service be restarted.

The screenshot shows the Mediatrix configuration web interface. At the top, there are navigation tabs for 'System', 'Network', 'ISDN', and 'SIP'. Below these are sub-tabs for 'Status' and 'Basic Rate Interface'. A red warning message states: 'Some changes require to restart a service to apply new configuration. Please click this link to access the services table: [Services](#)'. Below the message is a green heading 'Basic Rate Interface' and a dropdown menu for 'Select Interface:' with 'Bri1' selected. There are two main configuration sections: 'Hardware Configuration' and 'Interface Configuration'. The 'Hardware Configuration' section has a 'Clock Reference (Applies to all interfaces):' dropdown set to 'None'. The 'Interface Configuration' section has 'Endpoint Type:' set to 'NT' and 'Connection Type:' set to 'Point To Point'.

Hardware Configuration	
Clock Reference (Applies to all interfaces):	None

Interface Configuration	
Endpoint Type:	NT
Connection Type:	Point To Point



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1. Click the **Services** link, which brings you to the **Services** page. In this page, each service that requires to be restarted has a "*" besides its name, as illustrated in the following window.

Note: A "*" beside the service name indicates that the service must be restarted to apply new configuration.

Services

Service	Class	Status	Action	Comment
Authentication, Authorization and Accounting (AAA):	System	Started	<input type="button" value="Restart"/>	
Basic Network Interface (BNI):	User	Started	<input type="button" value="Restart"/>	
Call Routing (CROUT):	User	Started	<input type="button" value="Restart"/>	
Certificate Manager (CERT):	System	Started	<input type="button" value="Restart"/>	
Configuration Manager (CONF):	System	Started	<input type="button" value="Restart"/>	
Device Control Manager (DCM):	System	Started	<input type="button" value="Restart"/>	
Endpoint Administration (EPADM):	User	Started	<input type="button" value="Restart"/>	
Endpoint Services (EPSERV):	User	Started	<input type="button" value="Restart"/>	
Ethernet Manager (ETH):	System	Started	<input type="button" value="Restart"/>	
Firmware Pack Updater (FPU):	System	Started	<input type="button" value="Restart"/>	
Host Configuration (HOC):	System	Started	<input type="button" value="Restart"/>	
* Integrated Services Digital Network (ISDN):	User	Started	<input type="button" value="Restart"/>	
Local Quality Of Service (LQOS):	System	Started	<input type="button" value="Restart"/>	
Media IP Transport (MIPT):	User	Started	<input type="button" value="Restart"/>	
Notifications and Logging Manager (NLM):	User	Started	<input type="button" value="Restart"/>	
Process Control Manager (PCM):	System	Started	<input type="button" value="Restart"/>	
Service Controller Manager (SCM):	System	Started	<input type="button" value="Restart"/>	
SIP Endpoint (SIPEP):	User	Started	<input type="button" value="Restart"/>	
Simple Network Management Protocol (SNMP):	User	Started	<input type="button" value="Restart"/>	
Telephony Interface (TELIF):	User	Started	<input type="button" value="Restart"/>	
Web (WEB):	User	Started	<input type="button" value="Restart"/>	


2. Restart each service that has a "*" besides its name by clicking the **Restart** action so it correctly applies its new configuration.

* Integrated Services Digital Network (ISDN):	User	Started	<input type="button" value="Restart"/>
Local Quality Of Service (LQOS):	System	Started	<input type="button" value="Restart"/>
Media IP Transport (MIPT):	User	Started	<input type="button" value="Restart"/>



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- Restarting a service may require other services to be restarted. This is why you would see a few services go from the stopping to starting to started states, even if you only restarted one service. The displayed status may be refreshed at any time by clicking the **Services** submenu or the **here** link.



System
Network
ISDN
SIP
Telephony
Management

Information
Services
Syslog

Note: A '*' beside the service name indicates that the service must be restarted to apply new configuration.

➤ Services

Successfully sent the restart command to the service.
Service statuses may have changed while the current page was loading, please click [here](#) to get the latest statuses.

Service	Class	Status	Action	Comment
Authentication, Authorization and Accounting (AAA):	System	Started	<input type="button" value="v"/>	
Basic Network Interface (BNI):	User	Started	<input type="button" value="v"/>	
Call Routing (CR.OUT):	User	Stopping	<input type="button" value="v"/>	
Certificate Manager (CERT):	System	Started	<input type="button" value="v"/>	
Configuration Manager (CONF):	System	Started	<input type="button" value="v"/>	
Device Control Manager (DCM):	System	Started	<input type="button" value="v"/>	
Endpoint Administration (EPADM):	User	Stopping	<input type="button" value="v"/>	
Endpoint Services (EPSERV):	User	Stopping	<input type="button" value="v"/>	
Ethernet Manager (ETH):	System	Started	<input type="button" value="v"/>	
Firmware Pack Updater (FPU):	System	Started	<input type="button" value="v"/>	
Host Configuration (HOC):	System	Started	<input type="button" value="v"/>	
Integrated Services Digital Network (ISDN):	User	Stopping	<input type="button" value="v"/>	
Local Quality Of Service (LQOS):	System	Started	<input type="button" value="v"/>	
Media IP Transport (MIPT):	User	Stopping	<input type="button" value="v"/>	
Notifications and Logging Manager (NLM):	User	Started	<input type="button" value="v"/>	
Process Control Manager (PCM):	System	Started	<input type="button" value="v"/>	
Service Controller Manager (SCM):	System	Started	<input type="button" value="v"/>	
SIP Endpoint (SIPEP):	User	Stopping	<input type="button" value="v"/>	
Simple Network Management Protocol (SNMP):	User	Started	<input type="button" value="v"/>	
Telephony Interface (TELIF):	User	Stopping	<input type="button" value="v"/>	
Web (WEB):	User	Started	<input type="button" value="v"/>	

Thank you for using Mediatrix solutions!