

Dual Tone Multi frequency (DTMF) Configuration

All Mediatrix Products

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Basic DTMF Concepts

Dual Tone Multi Frequency (DTMF)

DTMF (dual tone multi frequency) is the signal that is generated from a touch key of a phone and that is sent to the phone company.

DTMF, also commonly called Touchtone, has replaced loop disconnect dialing, also called pulse dialing. With DTMF, each key of the phone combines one tone from a high-frequency group of tones and a tone from low frequency group.

Key digit	Low frequency (Hz)	High Frequency (Hz)
1	697	1209
2	697	1336
3	697	1477
4	770	1209
5	770	1336
6	770	1477
7	852	1209
8	852	1336
9	852	1477
0	941	1209
*	941	1336
#	941	1477

DTMF In-band Transport Method

This is the most used transport method for DTMFs transmission. In this case, the DTMFs and the voice are transmitted together in the RTP stream.

This transport method is only reliable with G.711 or G.729 codecs. The DTMF In-band transport method is configurable by endpoint, or the same method can be selected for all the endpoints of the unit. In general, FXS, FXO, R2, and E&M endpoints are configured to use the In-band transport method for DTMF transmission.

DTMF Out-of-Band Transport Method

When using the Out-of-Band transport method, the DTMFs and the voice are transmitted in two different streams where the voice is sent over RTP, but DTMF is sent either in RTP or SIP depending on the chosen transport method (**Out-of-Band using RTP** or **Out-of-Band using SIP**). However, the Out-of-Band transport method can only be used if the SIP peer supports the method, otherwise the DTMF transport method falls back to In-band.

Because some compression codecs such as G.723.1 and G.729 effectively distort voice because they lose information from the incoming voice stream during the compression and decompression phases. For normal speech this is insignificant and becomes unimportant. In the case of pure tones (such as DTMF) this distortion means the receiver may no longer recognize the tones. The solution is to send this information as a separate packet to the other endpoint, which then plays the DTMF sequence back by regenerating the true tones. Such a mechanism is known as Out-of-Band DTMF. The Mediatrix unit receives and sends Out-of-Band DTMFs as per ITU Q.24. DTMFs supported are 0-9, A-D, *, #.

The DTMF Out-of-Band (using either SIP or RTP) transport method is configurable by endpoint, or can be selected for all the endpoints of the unit. ISDN endpoints are normally configured to use an Out-of-Band transport method for DTMF transmission.

Basic DTMF Tasks

Configuring DTMF Transport for all Endpoints

Steps

- 1) Go to **Media/Misc.**
- 2) From the **Select Endpoint** drop down list, choose **Default**.
- 3) From the **Transport Method** drop down list, choose the transport method set in the VoIP server.
 - a) **In-band**
 - b) **Out-of-Band using RTP**, (RFC2833). This is usually the preferred method. Remember to set the payload type if different (e.g.: 96, 101 or 110 in some cases)
 - c) **Out-of-Band using SIP**. For Cisco or Avaya systems, from the **SIP Transport Method** field use **Info DTMF Relay**. For legacy Nortel and others, leave **Draft Choudhuri SIP Info Digit 00**.
 - d) **Signaling Protocol Dependent** choose this method if unsure. It will try to use the method negotiated by the VoIP server.
- 4) Click **Apply**.

Result

The selected DTMF transport will be applied to all endpoints unless an endpoint was specifically configured using [Configuring DTMF Transport for a Specific Endpoint](#) (p.5) .

DTMF Transport		
Transport Method:	Out-of-Band using RTP	▼
SIP Transport Method:	Draft Choudhuri SIP Info Digit 00	▼
Payload Type:	101	

Configuring DTMF Transport for a Specific Endpoint

Steps

- 1) Go to **Media/Misc.**
- 2) From the **Select Endpoint** drop down list, choose the endpoint for which you wish to configure DTMF transport.
- 3) In the **DTMF Transport** table, from the **Endpoint Specific** drop down list, choose **Enable**.

- 4) From the **Transport Method** drop down list, choose the transport method set in the VoIP server.
- a) **In-band**
 - b) **Out-of-Band using RTP**, (RFC2833). This is usually the preferred method. Remember to set the payload type if different (e.g.: 96, 101 or 110 in some cases)
 - c) **Out-of-Band using SIP**. For Cisco or Avaya systems, from the **SIP Transport Method** field use **Info DTMF Relay**. For legacy Nortel and others, leave **Draft Choudhuri SIP Info Digit 00**.
 - d) **Signaling Protocol Dependent** choose this method if unsure. It will try to use the method negotiated by the VoIP server.
- 5) Click **Apply**.

Result

The selected DTMF transport method will be applied to the selected endpoint. All other endpoints, unless they are specifically configured, will use the transport method selected in the [Configuring DTMF Transport for all Endpoints](#) (p.5)..

DTMF Transport	
Endpoint Specific:	Enable ▾
Transport Method:	Out-of-Band using RTP ▾
Payload Type:	101

Advanced DTMF Parameters

Although the services can be configured in great part in the Web browser, some aspects of the configuration can only be completed with the configuration parameters by :

- using a MIB browser
- using the CLI
- creating a configuration script containing the configuration parameters

For more details on the following parameters, refer to the [DGW Configurationn Guide - Reference Guide](#) published on the [Media5 Documentation Portal](#).

DTMF Detection

- To set the Rise Time criteria: **Telif.InteropDtmfDetectionRiseTimeCriteria**
- To set the Detection Positive Twist: **Telif.InteropDtmfDetectio.PositiveTwist**
- To set the Detection Negative Twist: **Telif.InteropDtmfDetection.NegativeTwist**
- To set the Max Power Threshold: **Telif.InteropDtmfDetection.MaxPowerThreshold**
- To set the Min Power Threshold: **Telif.InteropDtmfDetection.MinPowerThreshold**
- To set the Detection Break Power Threshold:
Telif.InteropDtmfDetection.BreakPowerThreshold

Using the Payload Type Found in the Answer

- To use the payload type found in the answer:**SipEp.InteropUseDtmfPayloadTypeFoundInAnswer**

Initial quantity of RTP packets, only available when using the Out-of-Band using RTP transport method.

- To set the initial quantity of RTP packets: **Mipt.InteropDtmfRtpInitialPacketQty**

Online Help

If you are not familiar with the meaning of the fields and buttons, click **Show Help**, located at the upper right corner of the Web page. When activated, the fields and buttons that offer online help will change to green and if you hover over them, the description will be displayed.

DGW Documentation

Mediatrix devices are supplied with an exhaustive set of documentation.

Mediatrix user documentation is available on the [Media5 Documentation Portal](#).

Several types of documents were created to clearly present the information you are looking for. Our documentation includes:

- **Release notes:** Generated at each GA release, this document includes the known and solved issues of the software. It also outlines the changes and the new features the release includes.
- **Configuration notes:** These documents are created to facilitate the configuration of a specific use case. They address a configuration aspect we consider that most users will need to perform. However, in some cases, a configuration note is created after receiving a question from a customer. They provide standard step-by-step procedures detailing the values of the parameters to use. They provide a means of validation and present some conceptual information. The configuration notes are specifically created to guide the user through an aspect of the configuration.
- **Technical bulletins:** These documents are created to facilitate the configuration of a specific technical action, such as performing a firmware upgrade.
- **Hardware installation guide:** They provide the detailed procedure on how to safely and adequately install the unit. It provides information on card installation, cable connections, and how to access for the first time the Management interface.
- **User guide:** The user guide explains how to customise to your needs the configuration of the unit. Although this document is task oriented, it provides conceptual information to help the user understand the purpose and impact of each task. The User Guide will provide information such as where and how TR-069 can be configured in the Management Interface, how to set firewalls, or how to use the CLI to configure parameters that are not available in the Management Interface.
- **Reference guide:** This exhaustive document has been created for advanced users. It includes a description of all the parameters used by all the services of the Mediatrix units. You will find, for example, scripts to configure a specific parameter, notification messages sent by a service, or an action description used to create Rulesets. This document includes reference information such as a dictionary, and it does not include any step-by-step procedures.

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