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Revision History

Changes to the original guide are listed below:

<table>
<thead>
<tr>
<th>Change</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-03 Rev A</td>
<td>3/2016</td>
<td>Include support for Windows Mobile/CE.</td>
</tr>
</tbody>
</table>
Introduction

PTT Express voice client creates Push-To-Talk (PTT) communication capability between disparate enterprise devices. Leveraging existing Wireless Local Area Network (WLAN) infrastructure, this solution delivers simple PTT communication without the need of a voice communication server. The client also enables PTT communication with 2-way radios using the Radio Link Solution (RLS).

This guide is intended for use by any associate, manager, network engineer or IT administrator who will use the client.

⚠️ **NOTE** This guide refers to Android clients 3.1.x and Windows Mobile/CE clients 1.2.x. Screens, icons, and options may differ on each device.

Related Documents

Refer to the following documents for associated information about the system.

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTT Express Installation and Configuration Guide</td>
<td>Provides an overview, general requirements, installation and configuration instructions for the PTT Express. Provides troubleshooting information.</td>
</tr>
<tr>
<td>Support information for your target devices</td>
<td>View the website at: <a href="http://www.zebra.com/support">http://www.zebra.com/support</a>.</td>
</tr>
</tbody>
</table>

For the latest version of this guide and all guides, go to: http://www.zebra.com/support.

Chapter Descriptions

Topics covered in this guide are as follows:
• PTT Express Voice Client — This chapter provides an overview of PTT Express and gives a general description of the PTT Express Voice client.

• Advanced Features — This chapter describes the advanced features of the PTT Express Voice client.

• PTT Communication — This chapter describes PTT communication and other useful information.

• Client Configuration — This chapter provides information for modifying the configuration file used to configure the PTT Express Voice client.

Notational Conventions

The following conventions are used in this document:

• *Italic* text is used to highlight the following:
  • Chapters and sections in this and related documents
  • Dialog box, window and screen names
  • Drop-down list and list box names
  • Check box and radio button names
  • Icons on a screen.

• **Bold** text is used to highlight the following:
  • Key names on a keypad
  • Button names on a screen or window.

• bullets (•) indicate:
  • Action items
  • Lists of alternatives
  • Lists of required steps that are not necessarily sequential

• Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

✓ **NOTE** This symbol indicates something of special interest or importance to the reader. Failure to read the note will not result in physical harm to the reader, equipment or data.

⚠ **CAUTION** This symbol indicates that if this information is ignored, the possibility of data or material damage may occur.

⚠ **WARNING!** This symbol indicates that if this information is ignored the possibility that serious personal injury may occur.

Service Information

If you have a problem with your equipment, contact Zebra Support for your region. Contact information is available at: http://www.zebra.com/support.

When contacting Global Customer Support, please have the following information available:
• Serial number of the unit
• Model number or product name
• Software type and version number.

Zebra responds to calls by E-mail or telephone within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your Zebra business product from a Zebra business partner, contact that business partner for support.

Provide Documentation Feedback

If you have comments, questions, or suggestions about this guide, send an email to EVM-Techdocs@zebra.com.
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<td><strong>Glossary</strong></td>
<td></td>
</tr>
</tbody>
</table>
PTT Express Voice Client

Introduction

✓ **NOTE** PTT Express plays received audio ONLY in a hands free modality delivered through a speaker or a headset. Handset mode of operation is not supported by the PTT Express client.

The PTT Express voice client supports the following Push-To-Talk use cases:

- Group Call - One to Many
- Private Response - One to One
- Group Call with 2-Way Radios - One to Many (requires RLS).

The PTT Voice Client V1.2:

- allows users to listen to multiple Talk Groups at one time.
- allows a Talk Group to preempt another Talk Group.
- provides flexibility to configure multiple configurations and profiles.
- provides use of friendly names for Talk Groups.
- provides notification status icons to easily see current PTT Client status. (Applies to Android clients only.)
- is backward compatible with PTT Client V1.1.

The PTT Express Voice client can be configured to contain one or more Profiles. Each Profile can be assigned a unique name and has a set number of available Talk Groups. The Profile name and the Talk Group names are defined in the Configuration file.
<table>
<thead>
<tr>
<th>Device</th>
<th>Operating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC40</td>
<td>Android 4.1</td>
</tr>
<tr>
<td>MC40</td>
<td>Android 4.4</td>
</tr>
<tr>
<td>MC67</td>
<td>Android 4.1</td>
</tr>
<tr>
<td>MC92</td>
<td>Android 4.4</td>
</tr>
<tr>
<td>TC70</td>
<td>Android 4.4</td>
</tr>
<tr>
<td>TC75</td>
<td>Android 4.4</td>
</tr>
<tr>
<td>WT6000</td>
<td>Android 5.1</td>
</tr>
<tr>
<td>MC75A0/6/8</td>
<td>Microsoft Windows Embedded Handheld 6.5 Classic/Professional</td>
</tr>
<tr>
<td>MC55A0</td>
<td>Microsoft Windows Embedded Handheld 6.5 Classic</td>
</tr>
<tr>
<td>SB1</td>
<td>Microsoft Windows CE 6.0</td>
</tr>
<tr>
<td>Psion VH10</td>
<td>Microsoft Windows CE 6.0</td>
</tr>
</tbody>
</table>

*N.B.* When using Speaker/Mic with Push-to-Talk, the M1000 accessory is a must for PTT Express operation on the VH10. PTT Express does not support Bluetooth accessories.
Device Communication

There are two ways to communicate when operating the PTT Express client: Group Call and Private Response. Depending upon the device and the PTT Express Voice client configuration, these can be hard buttons on the device or soft buttons.

- **Group Call**: Press and hold to start communicating with other voice client users.
- **Private Response**: Press and hold to respond to the originator of the last call.

Buttons on the device can be configured to perform various functions. Contact your system administrator for exact button functionality.

**Figure 1-1**  *Default PTT Express Screen*

}\hspace{2cm}^{\checkmark}  
**NOTE** While a PTT communication button is pressed the user will not be able to use other device buttons to perform separate tasks. In general, pressing multiple buttons simultaneously leads to inconsistent PTT Express Voice client behavior. Also, when PTT Express Voice client is installed on a mobile computer, the action button is no longer available.

**Figure 1-2**  *Default Group Call and Private Response Buttons*
Using PTT Express Voice Client

Table 1-2  Group and Private Key Assignment/Mapping

<table>
<thead>
<tr>
<th>Device</th>
<th>Recommended Group Key (Key Code)</th>
<th>Recommended Private Key (Key Code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC40</td>
<td>Left side top PTT button (L2)</td>
<td>Left side lower button (L1)</td>
</tr>
<tr>
<td>MC55A0</td>
<td>197-Single</td>
<td>125-Single</td>
</tr>
<tr>
<td>MC67</td>
<td>L2-Single</td>
<td>L1-Single</td>
</tr>
<tr>
<td>MC75A0/6/8</td>
<td>197-Single</td>
<td>114-Single</td>
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<td>MC92</td>
<td>L1-Single</td>
<td>L2-Single</td>
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<td>SB1</td>
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<td>135-Single</td>
</tr>
<tr>
<td>TC70</td>
<td>L2-Single</td>
<td>L2-Double</td>
</tr>
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<td>TC75</td>
<td>L2-Single</td>
<td>L2-Double</td>
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<td>VH10</td>
<td>7-Single</td>
<td>7-Double</td>
</tr>
<tr>
<td>WT6000</td>
<td>L2-Single</td>
<td>L2-Double</td>
</tr>
</tbody>
</table>

Soft Buttons

The PTT Express Voice client can be configured to use on-screen buttons for Group Call and Private Response. To use the on-screen buttons, touch and hold the button just as you would with the device’s hard buttons.

PTT Audible Indicators

The following tones provide helpful cues when using the PTT Express Voice client.

- **Talk Tone**: Double chirp. Plays when the Talk (or Private) button is pressed. This is a prompt for the user to start talking.
• **Access Tone**: Single beep. Plays when another user just finished a call or response. The user is now able to initiate a Group Call or Private Response.

• **Busy Tone**: Continuous tone. Plays when the Talk (or Private) button is depressed and another user is already communicating on the same talkgroup.

• **Network Tone**:
  - Three increasing pitch beeps. Plays when PTT Express Voice client has acquired the WLAN connection and the service is enabled.
  - Three decreasing pitch beeps. Plays when PTT Express Voice client has lost a WLAN connection or the service is disabled.

---

**PTT Express User Interface**

The PTT Express Voice client User Interface (UI) is highly configurable. The default UI provides basic PTT functionality and can be configured to use Profiles which provide additional customized functionality.

**Default User Interface**

The default UI provides for basic PTT communication and features.

![PTT Express Default User Interface Sample Configuration](image)

**Figure 1-4**  *PTT Express Default User Interface Sample Configuration*

- **PTT Express Notification Icons** - Indicates the current state of the PTT Express voice client. Applies to Android clients only.

- **Service Indication** - Indicates the status of the PTT Express Voice client. Options: **Service Enabled**, **Service Disabled** or **Service Unavailable**.

- **Enable/Disable Service Switch** - Turns the PTT service on or off.

- **Talk Groups** - Lists all 32 Talk Groups available for PTT communication.

- **Settings** - Opens the PTT Express Voice client settings screen. (Available on Android clients only)
Profile User Interface

The default UI can be configured to meet the needs of the customer’s solution. The client can be configured with:

- up to 12 Profiles.
- up to 32 Talk Groups in each Profile.
- both hard buttons and on-screen soft buttons for Group Calls and Private Responses.
- ability to display other buttons and controls.

Android User Interface

- **Service Indication** - Indicates the status of the PTT Express client. Options: **Service Enabled**, **Service Disabled** or **Service Unavailable**.
- **Enable/Disable Switch** - Turns the PTT service on or off.
- **Profile Name** - Displays the name of the current Profile.
- **Profile Enable/Disable Checkbox** - Indicates that the Profile is enabled (checked) or disabled (un-checked).
- **Previous/Next Profile Buttons** - Scrolls to the previous or next Profile screen. If at the first or last Profile, the button is not available.
- **Talk Groups** - Lists (up to 32) Talk Groups available for PTT communication.
- **Speaker Icon** - Mutes and un-mutes the client. If muted, a call cannot be heard or initiated.
- **Settings** - Opens the PTT Express Voice client settings screen. (Available on Android clients only)
Android Settings

Use the **Settings** to configure PTT Express Voice client settings.

![Android Settings Screen](image)

**Figure 1-6  Android Settings Screen**

- **Settings**
  - **Display Call Statistics** - Check to display call statistics on the screen.
  - **About** - Displays the PTT Express Voice client version number.

Windows Mobile/CE User Interface

![PTT Express Profile User Interface Sample Windows Mobile/CE Configuration](image)

**Figure 1-7  PTT Express Profile User Interface Sample Windows Mobile/CE Configuration**

- **Enable/Disable Checkbox** - Turns the PTT service on (selected) or off (unselected).
Using PTT Express Voice Client

- **Profile Name** - Displays the name of the current Profile.

- **Profile Enable/Disable Checkbox** - Indicates that the Profile is enabled (checked) or disabled (un-checked).

- **Previous/Next Profile Buttons** - Scrolls to the previous or next Profile screen. If at the first or last Profile, the button is not available.

- **Talk Groups** - Lists (up to 32) Talk Groups available for PTT communication.

- **Mute Checkbox** - Mutes (if selected) and un-mutes (unselected) the client. If muted, a call cannot be heard or initiated.

- **About** - Displays the PTT Express Voice client version number.

- **OK** - Closes the PTT Express User Interface. PTT service continues to run in the background.

**Windows Mobile/CE About Window**

![Windows Mobile/CE About Window](image)

**PTT Express Notification Icons**

Indicates the current state of the PTT Express Voice client. Available on Android clients only.

<table>
<thead>
<tr>
<th>Status Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Indicates that PTT Express Voice client is disabled.</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Indicates that PTT Express Voice client is enabled but not connected to a WLAN.</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Indicates that PTT Express Voice client is enabled, connected to a WLAN and listening on the Talk Group indicated by the number next to the icon.</td>
</tr>
</tbody>
</table>
Audio Feedback

For Android Clients

The PTT Express Voice client (when configured) provides audio feedback for:

- Channel number - whenever the user presses a hard button to change to another Talk Group/Channel, the device speaks the channel number or name. For example, “Channel 3” or “Apparel.”
- Profile name - whenever the user presses a hard button to change to another profile, the device speaks the profile name. For example, “Groceries.”

By default, audio feedback is enabled. It can be enabled or disabled for each configured profile by modifying the configuration file. The PTT Express client can also be configured to set Profiles to different languages. The languages supported are those installed on the device. To view supported languages select Settings > Language & input > Text-to-Speech-output > Preferred Engine > Settings > Language.

For Windows Mobile/CE Clients

There is a small difference in Audio Feedback functionality for Windows Mobile/CE clients. The audio clips for Profile and Channel are not included in the installation. The Administrator has to prepare and store audio clips in a specified folder for the client to use them at run time.

The Audio clips used to announce Profile and Talk Group changes are located in the following folder:
\Application\PttExpress\Audio\<language>

The <language> setting is part of the Profile in the configuration (See Table 4-11 on page 9). For example:

<profile id="1" name="Groceries" enable="true" language="en">

In the example, language="en" means that audio clips shall be placed in the following folder:
\Application\PttExpress\Audio\en

Talk Group/Channel Audio Clip file name format: channel_0000X.wav (Where X = Channel Id).
Profile Clip Audio file name format: profile_0000X.wav (Where X == Profile Id).

The audio clips should be .wav files with 8000 samples per second and mono (1) channel.
Free third party tools (for example, Jampal Text To Speech) are available, which allow you to convert text to speech and save the output in .wav format.

Profiles

The PTT Express Voice client can be configured to contain one or more Profiles. Each Profile can be assigned a unique name and have a set number of available Talk Groups. The Profile name and the Talk Group names are defined in the Configuration file.

Switching Between Profile Screens

If the PTT Express client is configured for more than one Profile, the user can switch (if configured) between Profiles by:

- swiping the screen to the left or right (Applies to Android clients only)
- touching the Previous/Next Profile buttons
- pressing a hard button.

When the user swipes the screen or touches the Previous/Next Profile buttons, the new Profile screen appears but is not enabled. The user must touch the Profile Enable/Disable checkbox to enable the current Profile.

If configured, pressing a hard button switches the client to the next Profile from the currently enabled Profile. The new profile then automatically becomes enabled. The user can continue this process until the desired Profile screen is enabled.

Selecting Talk Groups

Each Profile screen can display a list of up to 32 Talk Groups. The home Talk Group is highlighted in blue. To switch to another Talk Group:

- touch the Talk Group on the screen
- quickly press the configured button (if configured to change the talk group on a button press).

The selected Talk Group becomes blue. If the Audio Feedback feature is enabled, the device speaks the Talk Group name or number.
Advanced Features

Introduction

This chapter describes the advanced features of the PTT Express Voice client.

Listening to Multiple Talk Groups

The client monitors multiple Talk Groups at the same time. If multiple Talk Group conversations are detected, the client determines which message is heard based on configuration parameters.

For example, multiple groups are communicating in a department store. The Manager's PTT Express Voice client scans all Talk Groups (Hardware and Paint).

Figure 2-1  Client Listening to All Talk Groups
Advanced Features

Based on PTT Express Voice client configuration, the client determines which Talk Group conversation will be heard by the Manager. In this example, the Hardware Talk Group.

![Figure 2-2](image)  *Selected Hardware Talk Group*

The Manager can then communicate with the Hardware Talk Group.

![Figure 2-3](image)  *Manager Communication with Selected Talk Group*
Preemptor Feature

When configured, a user on a Talk Group can preempt a conversation between other users on that Talk Group. For example, employees are communicating on the Hardware and Paint Talk Group. The Manager hears the conversation between the employees.

![Figure 2-4](image)

For some reason the Manager wants to communicate with all employees, he can interrupt the conversations and send a message to all employees.

![Figure 2-5](image)

When the Manager is done communicating, employees can continue communicating with each other.
Alternative Channels Feature

The Alternative Channel feature allows the PTT Express user to temporarily select another Talk Group other than the Home Talk Group. The user can then communicate on that Talk Group. After a configured time frame, the PTT Express client will return to the user’s Home Talk Group.
PTT Communication

Introduction

PTT communication may be established as a Group Call, Group Call with 2-Way Radio, or a Private Response.

NOTE  For additional information about enterprise devices, see the website at: http://www.zebra.com/support.

Group Call

A group call is a call that is sent from one device to all devices on the same Talk Group. To initiate a Group Call:

NOTE  This procedure also applies for communicating with 2-Way radios.

1. If configured, select a Profile.
2. Select a Talk Group.
3. Press and hold the configured Group Call button.
4. Listen for the talk tone to play.
   • If you hear the busy tone, release the Group Call button and wait for a moment before you press and hold the Group Call button to make another attempt.
   • If you do not hear a tone, make sure the PTT Express Voice client is enabled and on the network.
5. Start talking immediately after the talk tone plays.
6. Release the Group Call button when you finish talking.
Responding to a Group Call

You can respond to a Group Call by:

- responding with another Group Call
- responding with a Private Response.

Responding with a Group Call

To respond to a Group Call with another Group Call:

1. Wait until you receive an access tone.
2. Press and hold the configured Group Call button.
3. Listen for the talk tone to play.
   - If you hear the busy tone, release the Group Call button and wait for a moment before you press and hold the Group Call button and make another attempt.
   - If you do not hear a tone, make sure your client is enabled and on the network.
4. Start talking immediately after the talk tone plays.
5. Release the Group Call button when you finish talking.

Responding with a Private Response

A Private Response can only be initiated once a Group Call has been established. The initial Private Response is made to the originator of the Group Call. The steps for making the first Private Response and all subsequent Private Responses are the same. Users cannot initiate Private Responses to 2-way radios.

To establish a Private Response:

1. After the Group Call is completed, wait until you receive an access tone.
2. Press and hold the configured Private Response button.
3. Listen for the talk tone to play.
   - If you hear the busy tone, release the Private Response button and wait for a moment before you press and hold the Private Response button and make another attempt.
   - If you do not hear a tone, make sure your client is enabled and on the network.
4. Start talking immediately after the talk tone plays.

NOTE
This procedure also applies for communicating with 2-Way radios.
Actual Group Call and Private Response buttons are dependent upon client configuration.
Selection of Profile and Talk Groups are dependent upon client configuration.

NOTE
A Private Response can only be initiated once a Group Call has been established. The initial Private Response is made to the originator of the Group Call. The steps for making the first Private Response and all subsequent Private Responses are the same. Users cannot initiate Private Responses to 2-way radios.
Actual Group Call and Private Response buttons are dependent upon client configuration.
Selection of Profile and Talk Groups are dependent upon PTT Express Voice client configuration.
5. Release the Private Response button when you finish talking.

Operating Information

Use the following information to operate the PTT Express Voice client:

- Use the device volume control buttons to change the client volume.
- Only one user at a time can initiate a Group Call on the Talk Group. Other users on the same Talk Groups get the busy tone.
- Users can talk for up to 60 seconds (configurable) at a time when communicating on the network.
- A private response is possible for up to 60 seconds (configurable) after receiving a Group Call.
- The initiator of a Group Call cannot initiate a private response until a response (either group or private) is received.
- If you do not hear a talk or busy tone when initiating a Group or Private Response, check 1) the device network status indicator to make sure device is on the network, 2) the client is enabled, 3) the volume level.
- PTT Express communication has been designed to minimize end-to-end audio delay. However, audio delay may be up to two seconds or more depending on conditions of the network.
- While a PTT communication key is pressed, the user is not able to use other device keys to perform separate tasks. In general pressing multiple keys simultaneously leads to inconsistent client behavior.

See PTT Express Installation and Configuration Guide or contact view the website at: http://www.zebra.com/support for additional PTT Express voice client details.
Client Configuration

Introduction

Configuration of the PTT Express voice client is controlled by a configuration XML file. The configuration file is divided into:

- Application settings
- Profile List settings
- Channel settings.

Application Settings

The Application setting control PTT Express Voice client functionality.

- General Settings
- Diagnostic settings
- Coexistence settings
- Hard Button settings
- GUI settings
- Group Call/Private Response Transport/Timers settings.

Windows Mobile/CE Clients

To change the application settings, modify `ptt_settings.xml` located at:

\Application\PttExpress\n

✓ **NOTE** For VH10, `ptt_settings.xml` is located at:

\Flash Disk\PttExpress
### Android Clients

To change the application settings, modify `ptt_settings.xml` located at:

\enterprise\device\settings\ptt

### General Settings

**Table 4-1 General Settings**

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>enable</td>
<td>true, false</td>
<td>true</td>
<td>Enable or disable the PTT service.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>True = Enabled, False = Disabled</td>
</tr>
<tr>
<td>&lt;setting name=&quot;enable&quot;&gt;true&lt;/setting&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>defaultProfileID</td>
<td>1 through 12</td>
<td>1</td>
<td>Numeric identifier of the default profile.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;defaultProfileID&quot;&gt;1&lt;/setting&gt;</td>
</tr>
<tr>
<td>disablePTTClient</td>
<td>true, false</td>
<td>false</td>
<td>Enable or disable the PTT Express Voice client. If the value is true, PTT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Express Voice client functionality is disabled. This settings is optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and is not shown in the default XML file.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;disablePTTClient&quot;&gt;false&lt;/setting&gt;</td>
</tr>
<tr>
<td>ignoreKeysInLockMode</td>
<td>true, false</td>
<td>false</td>
<td>Ignore keys in lock mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Available on Android clients only.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;ignoreKeysInLockMode&quot;&gt;false&lt;/setting&gt;</td>
</tr>
<tr>
<td>muteExitTimer</td>
<td>0 to 10000 ms</td>
<td>0</td>
<td>The amount of time (in milliseconds) that has to elapse after which the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>device will come out of the mute state. Decimal value in milliseconds: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>implies an infinite switch. Minimum = 0 ms. Maximum = 8640000 ms. Default</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>= 0 ms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;muteExitTimer&quot;&gt;0&lt;/setting&gt;</td>
</tr>
</tbody>
</table>
Diagnostic Settings

Table 4-2  Diagnostic Settings

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>logLevel</td>
<td>None</td>
<td>None</td>
<td>Set the type of logs that will be collected.</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td></td>
<td>None = No logs collected.</td>
</tr>
<tr>
<td></td>
<td>Warning</td>
<td></td>
<td>Error = Only error logs collected.</td>
</tr>
<tr>
<td></td>
<td>Info</td>
<td></td>
<td>Warning = Only warning logs collected.</td>
</tr>
<tr>
<td></td>
<td>Debug</td>
<td></td>
<td>Info = Only informational logs collected.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Debug = Only debug logs collected.</td>
</tr>
</tbody>
</table>

<setting name="logLevel">None</setting>

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>logDir</td>
<td>&lt;path&gt;</td>
<td>PTT</td>
<td>Sets the path storage to store the PTT log files.</td>
</tr>
</tbody>
</table>

<setting name="logDir">PTT</setting>

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>enableCDR</td>
<td>true</td>
<td>false</td>
<td>Enable or disable the CDR logs.</td>
</tr>
</tbody>
</table>

<setting name="enableCDR">false</setting>

Coexistence Settings

Table 4-3  Coexistence Settings

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fullDuplexClient Coexistence</td>
<td>true</td>
<td>false</td>
<td>Allows the PTT Express client to coexist with full duplex clients installed on the same device.</td>
</tr>
</tbody>
</table>

<setting name="fullDuplexClientCoexistence">false</setting>

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vibrateOnVoiceCall</td>
<td>true</td>
<td>true</td>
<td>Allows full duplex incoming calls to vibrate the device when PTT Express Voice client is in call.</td>
</tr>
</tbody>
</table>

<setting name="vibrateOnVoiceCall">true</setting>

Hard Button

These settings determine the buttons that can switch profile screens and a headset button.

For Windows Mobile/CE clients, use the virtual key code for the key to be used.
Table 4-4  Client Options

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>profileSwitchKey</td>
<td>L1-Single</td>
<td>L1-Double</td>
<td>Sets the key used to switch profiles. Contains two parts: 1. the key code and 2. Single or double press. The parts are separated by a hyphen. Refer to device’s Integrator Guide for key mappings.</td>
</tr>
<tr>
<td></td>
<td>L1-Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>L2-Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>L2-Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td>allowProfileSwitchFromKey</td>
<td>true</td>
<td>true</td>
<td>Allows Profile screen switching using defined button.</td>
</tr>
<tr>
<td>headsetKey</td>
<td>R2</td>
<td></td>
<td>Sets the Headset key. (Available on Android clients only.)</td>
</tr>
</tbody>
</table>

<setting name="profileSwitchKey">L1-Double</setting>
<setting name="allowProfileSwitchFromKey">true</setting>
<setting name="headsetKey">R2</setting>

GUI

These settings determine the screen options.

Table 4-5  GUI Settings

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>allowProfileSwitchFromUI</td>
<td>true</td>
<td>true</td>
<td>Allows Profile screen switching on the screen.</td>
</tr>
</tbody>
</table>

<setting name="allowProfileSwitchFromUI">true</setting>

Group Call/Private Response Transport/Timers

These settings set Group Call and Private Response options.

Table 4-6  Group Call/Private Response Transport/Timers Settings

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipBroadcastGroup</td>
<td>&lt;ipaddress&gt;</td>
<td>239.192.2.2</td>
<td>Sets the multicast address used for Group Call communications.</td>
</tr>
</tbody>
</table>

<setting name="ipBroadcastGroup">239.192.2.2</setting>

| ipBasePort        | <port>        | 5000      | Sets the IP Port number of the multicast address used for Group Call communications. Decimal value.                                           |

<setting name="ipBasePort">5000</setting>

| sipLocalPort      | <port>        | 4080      | Sets the client IP Port to be used for Private Response communications. Decimal value.                                                        |

<setting name="sipLocalPort">4080</setting>
Profile List Settings

The PTT Express client must have at least one Profile and can have up to 12 Profiles. Each Profile must have its own configuration settings in the XML file.

In the `<profile_list>` section, each Profile has the following options:

- Profile attributes
- Profile channel attributes
- Profile UI attributes

### Table 4-6  Group Call/Private Response Transport/Timers Settings

<table>
<thead>
<tr>
<th>Name</th>
<th>Options</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>gcJitterSize</td>
<td>2 to 4</td>
<td>3</td>
<td>One group call packet holds 200 ms data. Decimal value: min = 2, max = 4, default = 3: which means the maximum data the jitter holds is 600 ms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pcJitterSize</td>
<td>2 to 4</td>
<td>3</td>
<td>One private response packet holds 100 ms data. Decimal value: min = 2, max = 4, default = 3: which means the maximum data the jitter holds is 300 ms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gcFloorHoldTimer</td>
<td>0 (disabled) 10000 to 90000</td>
<td>60000</td>
<td>In a group call, the amount of time the user is allowed to hold the floor (talk without interruption). Decimal value in milliseconds. disable = 0.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pcFloorHoldTimer</td>
<td>0 (disabled) 10000 to 90000</td>
<td>60000</td>
<td>In a private response, the amount of time the user is allowed to hold the floor in the private response (talk without interruption). Decimal value in milliseconds. disable = 0.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gcHangTimer</td>
<td>0 (disabled) 1000 to 10000</td>
<td>10000</td>
<td>The amount of time that has to elapse after which a Private Response cannot be made to the last known talker in the session. Decimal value in milliseconds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pcHangTimer</td>
<td>0 (disabled) 1000 to 10000</td>
<td>10000</td>
<td>The amount of time that has to elapse after which the Private Response can not be initiated. Decimal value in milliseconds. Min = 1000 ms. Maximum = 10000 ms. Default = 10000 ms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Profile Attributes

These settings determine the profile attributes.

Table 4-7  Profile Attributes Descriptions

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>1 - 12</td>
<td>1</td>
<td>Set the Profile identifier. Each Profile has to have a unique number.</td>
</tr>
<tr>
<td>name</td>
<td>&lt;blank&gt;</td>
<td></td>
<td>Assigns an ASCII string name to the Profile. The name can consists of a 16 alphanumeric character string that can include symbols. This name displays on the Profile screen.</td>
</tr>
<tr>
<td>enable</td>
<td>true</td>
<td>false</td>
<td>Enables or disables the Profile. When set to true, the Profile can be selected during Profile switching.</td>
</tr>
<tr>
<td>language</td>
<td>en</td>
<td></td>
<td>Set the audio feedback language for the Profile. The value for language attribute should be a locale string defined as per <a href="http://developer.android.com/reference/java/util/Locale.html">http://developer.android.com/reference/java/util/Locale.html</a>. (Available for Android clients only)</td>
</tr>
</tbody>
</table>

**Example:**

```
<profile id="1" name="Groceries" enable="true" language="en"/>
```

Profile Channel Attributes

These settings determine the channel attributes.

Table 4-8  Profile Channel Attributes Descriptions

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>scanOnlyHome</td>
<td>true</td>
<td>false</td>
<td>If this parameter is true, the device will only listen on the channel it is set to transmit upon. i.e. that scan only the HOME channel (as in 1.1).</td>
</tr>
</tbody>
</table>

**Example:**

```
<setting name="scanOnlyHome">true</setting>
```

| alternativeChannelSwitchTimer | 0 to 8640000 | 0 | The amount of time, in milliseconds, that has to elapse after which the current channel will change from Alternative Channel to Home Channel. 0 implies an infinite switch. |

**Example:**

```
<setting name="alternativeChannelSwitchTimer">0</setting>
```

| enablePriority | true   | false | The value true implies that the per channel priority settings will be honored, else it will be ignored. |

**Example:**

```
<setting name="enablePriority">false</setting>
```
Profile Screen Attributes

These settings determine the Profile screen attributes.

Table 4-9  Profile Screen Attributes Descriptions

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pttClientStatusUILock</td>
<td>true</td>
<td>false</td>
<td>Allow the PTT Express Voice client to be enabled/disabled from screen.</td>
</tr>
<tr>
<td></td>
<td>false</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;pttClientStatusUILock&quot;&gt;false&lt;/setting&gt;</td>
</tr>
<tr>
<td>allowChannelSwitchFromUI</td>
<td>true</td>
<td>true</td>
<td>Allow switching Talk Groups on the screen.</td>
</tr>
<tr>
<td></td>
<td>false</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;allowChannelSwitchFromUI&quot;&gt;true&lt;/setting&gt;</td>
</tr>
<tr>
<td>allowChannelSwitchFromKey</td>
<td>true</td>
<td>true</td>
<td>Allow switching Talk Groups using a hard button.</td>
</tr>
<tr>
<td></td>
<td>false</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;allowChannelSwitchFromKey&quot;&gt;true&lt;/setting&gt;</td>
</tr>
<tr>
<td>allowMuteFromUI</td>
<td>true</td>
<td>false</td>
<td>Allow muting or unmuting operation from the screen.</td>
</tr>
<tr>
<td></td>
<td>false</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;setting name=&quot;allowMuteFromUI&quot;&gt;false&lt;/setting&gt;</td>
</tr>
</tbody>
</table>

Profile Hard Buttons

These settings determine the Profile hard button attributes.
### Table 4-10  Profile Hard Buttons Descriptions

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>gcKey</td>
<td>L2-Single, R2-Single</td>
<td>L2-Single, R2-Single</td>
<td>Sets the key to use for making a Group Call. Contains two parts. 1. the key code and 2. Single or double press. The parts are separated by hyphen. Dependent upon available device buttons. Refer to device’s Integrator Guide for key mappings. See Table 1-2 on page 4 for Windows Mobile/CE clients.</td>
</tr>
<tr>
<td>pcKey</td>
<td>L1-Single, R2-Double</td>
<td>L1-Single, R2-Double</td>
<td>Sets the key to use for making a Private Response. Contains two parts. 1. the key code and 2. Single or double press. The parts are separated by hyphen. Dependent upon available device buttons. Refer to device’s Integrator Guide for key mappings. See Table 1-2 on page 4 for Windows Mobile/CE clients.</td>
</tr>
<tr>
<td>muteKey</td>
<td></td>
<td></td>
<td>Sets the key to use for muting and unmuting the application. Contains two parts. 1. the key code and 2. Single or double press. The parts are separated by hyphen. Dependent upon available device buttons. Refer to device’s Integrator Guide for key mappings.</td>
</tr>
<tr>
<td>alternativeChannelSwitchKey</td>
<td></td>
<td></td>
<td>Sets the key to use to switch to an alternative channel. Contains two parts. 1. the key code and 2. Single or double press. The parts are separated by hyphen. Dependent upon available device buttons. Refer to device’s Integrator Guide for key mappings.</td>
</tr>
<tr>
<td>oneKeyTimerDelay</td>
<td>400 - 1000 ms</td>
<td>600 ms</td>
<td>One key timer delay. Decimal value in milliseconds. Minimum = 400 ms. Maximum = 1000 ms. Default = 600 ms.</td>
</tr>
</tbody>
</table>
Client Configuration

Table 4-10  Profile Hard Buttons Descriptions

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>oneKeyTimerDelay</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>allowMuteFromKey</td>
<td>true</td>
<td>false</td>
<td>Enables muting operation using a key.</td>
</tr>
</tbody>
</table>

Profile User Attributes

These settings determine the Profile user attributes.

Table 4-11  Profile User Attributes Descriptions

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>disablePrivateCall</td>
<td>true</td>
<td>false</td>
<td>Disable or enable a Private Response.</td>
</tr>
<tr>
<td>audioFeedback</td>
<td>Off</td>
<td>Default</td>
<td>Controls audio feedback feature. Set to Off to disable audio playback. Set to Default to play the Profile and Talk Group names while switching Profiles or Talk Groups.</td>
</tr>
<tr>
<td>callKeyConfiguration</td>
<td>0</td>
<td>1</td>
<td>Determines whether the Group Call and Private Response buttons are hard or soft buttons. Set to 1 to enable the device hard buttons as defined in the gckey and pckey settings. Set to 0 to enable on-screen soft buttons. <strong>Notes:</strong> Setting callKeyConfiguration to &quot;0&quot; is not supported on VH10 and VC80x devices. The soft button can only be pressed for up to 30 seconds on TC51, TC56, TC70x, and TC75x devices with the Android Nougat operating system.</td>
</tr>
</tbody>
</table>

Channel List Settings

Each Profile can have a list of Talk Groups. In the `<channel list>` section, list each Talk Group (up to 32) as follows:

```xml
<channel id="1" name="" priority="1" type="Alternative" replyable="true" preemptor="false" cdr="false"/>
```
Adding Soft Buttons to a Profile

To add soft buttons to a Profile, set the `callKeyConfiguration` setting to 0.

```
<setting name="callKeyConfiguration">0

    <description>Set as 0 to use soft key for GC and PC. Set as 1 to use hard keys as defined by key codes in XML for Group Call, Private Response</description>

</setting>
```
Configuring a Profile with Three Talk Groups

To configure a Profile to have three Talk Groups with individual names:

- Talk Group 1 = Everyone
- Talk Group 2 = Apparels
- Talk Group 3 = Household

Set the following:

```
<channel_list>
  <channel id="1" name="Everyone" priority="1" type="Alternative" replyable="false" preemptor="true" cdr="false"/>
  <channel id="2" name="Apparels" priority="2" type="Home" replyable="true" preemptor="true" cdr="false"/>
  <channel id="3" name="Household" priority="2" type="Alternative" replyable="true" preemptor="true" cdr="false"/>
</channel_list>
```
Glossary

**A**

**Active Voice Call.** Active Voice Call means user has either accepted the incoming call or remote party has accepted the outgoing call.

**Alternative Channels.** The Alternative Channels are non-default transmit channels, or in other words, the non-default channels that the voice stream is sent upon. The device can only transmit on one single channel at any given moment. By default, the device transmits on the Home Channel. The device can switch to other channels to transmit (automatically or manually).

**NOTE:** From end user's point of view, Home Channel is to do with defaulting to this channel during idle time and after time expiry. Defining a list of Alternative Channels is to allow switching from UI/using keys. Scan Group is a list of channels to which you can listen to but can't switch from UI/using keys, but can engage in a conversation if it's replyable.

**Alternative Channel Switch Button.** Alternative Channel Switch Button: the button used to switch to a configured Alternative Channel. By pressing the button repeatedly, user can iterate through all configured Alternative Channels.

**AP.** Access Point or Access Port

**C**

**Channel.** A channel is physical representation (multicast group) of a Talkgroup. There are 32 channels defined in this document.

**Conversation.** A Conversation is defined as a set of voice streams between two or more users on one channel bound together by a deterministic start and end.

**Current Channel.** The Current Channel is the channel which the voice stream currently can be transmitted upon. The PTT button is always associated with the Current Channel.
Emergency Channel. Emergency Channel: Traffic on the Emergency Channel will preempt/interrupt all PTT communications either inbound or outbound from an end-point. Device will always listen to Emergency Channel even when not scanning. Communication on Emergency Channel will be preceded by an Attention-Getting tone, not a Bonk tone. During an Emergency communication the device will not play any tones - specifically, if the user is in an outbound group call (i.e., has Group Call Button pressed) no bonk tone will be played. Key presses will simply be ignored during emergency call. If in a private response the private session will be terminated with a failure code. There should only be one configured Emergency channel in a deployment.

EWP. Enterprise Wi-Fi Phone

G.729a. Codec used to Encode/Decode CVC walkie-talkie packets.

Group Call. A Group Call is the active transmission of half-duplex audio directed from one member of a Talkgroup to the other members in that Talkgroup.

Group Call Button. Button used to initiate group call.

Group Call Period. The maximum recording duration of a Group Call PTT communication.

Group Call Timer. Timer that controls when and how long the user talk in single Group Call.

Group Page. A Group Page is the initial transmission of a Group Call. It is referred to as a Group Page in the context of the Page-to-Private functionality, in which the initial transmission is effectively a paging request to the group in order to obtain a reply from an individual (e.g.-Private Response). Other than the context in which the terms Group Page and Group Call are used, there is no difference between them; both are 1:N transmissions.

GUI. Graphical User Interface.

Group to Private Communication. Group Call and Private Response PTT Communication.

Home Channel. The Home Channel is the channel that the voice stream is sent upon by default when the PTT button is pressed, or in other words, the default transmit channel.

ID. Identifier

IP. Internet Protocol
**L**

**Listen Only.** An attribute of channel that defines how a received voice stream on that channel should be interrupted. Listen Only traffic is treated as standalone playable voice streams and not considered part of a conversation. They can be interrupted by user with button presses and they cannot be replied to with either Group Call or Private Response unless the channel is configured as an Alternative and user switches to it.

**M**

**MC.** Mobile Computer

**Muting.** Muting PTT Express client temporarily disables the ability to communicate.

**P**

**Preemptive.** An attribute of channel, working together with Priority. For a channel with preemptive attribute set to true, traffic on this channel can interrupt on-going traffic on other channels with lower priority however traffic of the same priority cannot.

**Page-to-Private.** Page-to-Private is the name of a feature that enables a user to reply to a Group Page with a Private Response.

**Priority.** Priority: An attribute of a channel used in decision logic to arbitrate conflicts that occur when multiple channels are seen active at the receiver concurrently. A numeric priority between 1 and 32 is assigned to a channel, with 1 the highest and 32 the lowest. Multiple channels can have the same priority in which case arbitration is based on first come first serve.

NOTE: Priority is only applied when device is scanning multiple channels.

The Home/Alternative Channel has a unique priority - it always takes precedence over a numeric assignment to ensure that when you are operating on the Home/Alternative Channel, the voice streams on the Home/Alternative Channel take precedence. More specifically, Priority is defined in the following way (in descending order):

1. Emergency Channel
2. Home/Alternative Channel
3. Numeric Priority (1 - 32)

**Private Response.** A Private Response is the active transmission of half-duplex audio directed from one device to a single other device.

**Private Response Button.** Button used to initiate private response.

**Private Response Period.** The maximum recording duration of a Private Response PTT communication.

**Private Response Timer.** Timer that controls when and how long the user talk in single Private Response.
Profile. A Profile is a set of configuration parameters. Profiles are a means to change a large number of configuration parameters for the device in a single step. Most of configuration parameters are set on a per-profile basis; when one switches profiles, one can change many configuration parameters at once. The rationale for profiles is there could be differences in configuration for various departments, jobs or roles (lumber, cashier, plumbing, manager, etc) and so when a particular user selects a device, they select the proper profiles for their job, role or department.

Profile Switch Button. Profile Switch Button: the button used to switch between profiles. By pressing the button repeatedly, user can iterate through all profiles.

NOTE: Button could be hardware button, could be software button; one button could be overloaded with multiple functions; button could be on device, could be on headset. In other words, Group Call or PTT button, Private Response Button, Channel Switch Button, Profile Switch Button are logical concepts. For convenience, we use these definitions thereafter unless otherwise specified.

PTT. Push-To-Talk. Half duplex voice communication.

PTT Express Voice Client. Voice client that enables Multiple Talk Group and Private Response PTT communication.

R

RAN. Radio Access Network

Reply-able. An attribute of channel that defines how a received voice stream on that channel should be interrupted. Reply-able traffic is assumed to be part of a conversation. When a voice stream is heard the client switches to that channel allowing time at the end for the user to reply either through Group or Private Response. Buttons are automatically assigned for that period allowing the user to reply with manually switching to the channel. Voice streams played as part of a conversation can't be interrupted by button press and can only be preempted by traffic of a higher priority.

RLS. Radio Link Solution. Gateway that enables communication with 2-Way radios.

S

Scan Group. A Scan Group is a group of channels that are listened to. The device can listen to any number of channels (up to 32) at the same time. If configured so, the voice streams on the monitored channel will be passed through to the user. If multiple channels have voice streams going on at the same time, channels' attributes, including priority, will be used to arbitrate selection.

SD. Storage Device

T

Talkgroup. A Talkgroup is a logical collection of devices capable of transmitting and receiving audio communication amongst them all.
Glossary

U

URL. Uniform Resource Locator

V

Voice Client. Term used for full-duplex telephony clients like Cellular/WAN Client or a VoIP client (e.g. IPBlue, Jabber or Skype).

VoIP. Voice over Internet Protocol

VoWLAN. Voice over Wireless Local Area Network

W

WLAN. Wireless Local Area Network
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