Workcloud Communication

Version 4.0.24101

PTT Express for Android™

Installation and Configuration Guide

ZEBRA

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About This Guide

The PTT Express solution is part of Zebra's comprehensive portfolio of high-performance, feature-rich, converged voice and data solutions that provide communication solutions to meet the needs of many different types of enterprises and enterprise users.

The purpose of this document is to describe the installation and configuration procedures necessary in order to prepare a site to take advantage of the PTT Express voice client.

NOTE: Screens, icons, and options may differ on each device.

Since wireless network infrastructure equipment varies from site to site, detailed network configuration is not included. However, this document provides guidelines to aid in selecting parameters of the wireless infrastructure that should ensure that the PTT Express client performs optimally.

This guide provides an overview of the PTT Express solution and procedures for deployment.

Notational Conventions

The following conventions are used in this document:

- **Bold** text is used to highlight the following:
  - Dialog box, window and screen names
  - Drop-down list and list box names
  - Checkbox and radio button names
  - Icons on a screen
  - Key names on a keypad
  - Button names on a screen.
- Bullets (•) indicate:
  - Action items
  - List of alternatives
  - Lists of required steps that are not necessarily sequential.
- Sequential lists (for example, those that describe step-by-step procedures) appear as numbered lists.

Icon Conventions

The documentation set is designed to give the reader more visual clues. The following visual indicators are used throughout the documentation set.

NOTE: The text here indicates information that is supplemental for the user to know and that is not required to complete a task.

IMPORTANT: The text here indicates information that is important for the user to know.

CAUTION: If the precaution is not heeded, the user could receive a minor or moderate injury.

WARNING: If danger is not avoided, the user CAN be seriously injured or killed.

DANGER: If danger is not avoided, the user WILL be seriously injured or killed.

Service Information

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

When contacting 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 email, telephone or fax within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Customer 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.

Revision History

Lists the changes to the guide.

Table 1 Revision History

Date	Description
4/2022	Remove Windows client and IWG information. Create Android client only guide.
5/2022	Add talkPermitToneDelay setting on Hard Button.
1/2024	Minor corrections and rebranded as Workcloud Communication.
5/2024	Updated to 4.0.24101 version.

Introduction

The PTT Express solution is one of Zebra's converged voice and data solutions which provide communication solutions for many different types of enterprises and enterprise users.

PTT Express Solution Portfolio

The PTT Express Solution portfolio spans across a number of device types.

PTT Express solutions include:

- PTT VoWLAN is a single mode solution designed to provide service to mobile users inside the enterprise without regard to their location inside the facility or throughout a campus environment. The solution provides mobile access over the enterprise Wireless Local Area Network (WLAN) to comprehensive voice and data services. This includes services such as telephony, Push-To-Talk (PTT), email, and text messaging that are typically tethered to the desk.

PTT Express client creates Push-To-Talk communication capability between different types of devices including PTT smartphones, and mobile computers. Leveraging existing WLAN infrastructure, this solution delivers simple communications across devices without the need for a voice communication server.

Supported Devices

The PTT Express client allows supported devices to create Push-To-Talk communication capability between different types of devices. Refer to the PTT Express User Guide for a list of supported devices.

Some of the devices listed may require a software download/install to add PTT Express to the device, but for many of the devices PTT Express comes pre-installed. The solution leverages existing WLAN infrastructure and does not require a server.

For supported Android devices, refer to the Android PTT Express Release Notes.

Establishing PTT Communication

A user starts a PTT communication by pressing the Group Broadcast button. Those receiving the communication can respond with another broadcast message or a private message.

NOTE: While the user presses the PTT communication key the user will not be able to use other device keys to perform separate tasks. In general, pressing multiple keys simultaneously will lead to inconsistent client behavior.

To establish PTT communication:

1. A user presses the Group Broadcast button to initiate communication.
2. The initial message is broadcast to all users in the form of a Group Broadcast.
3. After the initial broadcast message, the users have two options:
   - Any user can continue the Group Broadcast by pressing the Group Broadcast button.
   - The intended recipient can turn the conversation into a Private Response with the originator of the broadcast message, using the Private Response button.

Network

Many characteristics of a wireless local-area network (WLAN) impact its ability to be used for deployment of a Voice over Wireless LAN (VoWLAN) solution such as PTT Express. This section describes some of the parameters of the wireless network that should be considered to ensure the network‘s ability to successfully deliver voice traffic between devices running the PTT Express client.

PTT Express allows 63 users to communicate across a single sub-net. The Group Broadcast feature only permits a single user to transmit to the other members of the Talkgroup at a given moment in time. Additionally, it is assumed that at most half of the Talkgroup members (that is, approximately 32 users) are served by a single access point. As members in the Talkgroup reply via the Private Call feature, they may communicate privately to one another and Group Broadcasts may continue.

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.

Each device is configured to transmit to and receive from this address. Table 7 Group Call/Private Response Transport/Timers Settings on page 16 provides the default value for this address 'ipBroadcastGroup', along with the 'ipBasePort' (Group Broadcast port) that is required to be available on each device. These values may be modified from their default values as described in Android Configuration File Settings on page 12 section, but each device in the group must be configured with the same values for the parameters. The PTT Express client Private Response communication utilizes SIP (Session Initiation Protocol) for call signaling and sends audio packets via unicast transmissions between the devices in the Private Response. The ‘sipLocalPort’ (SIP Private Response port) must be the same value on all devices.

The PTT Express client Private Response communication utilizes SIP (Session Initiation Protocol) for call signaling and sends audio packets via unicast transmissions between the devices in the Private Response. The PvtLocalPort (SIP Private Response port) must be the same value on all devices.

Network Recommendations

This section provides general recommendations for network configuration.

If possible, preference should be given to running PTT Express in an 802.11a network because of common interference sources in the frequency bands used by 802.11b/g. However, many 802.11b/g environments exist and PTT Express can be installed on devices that operate in those frequency bands used by 802.11b/g. When PTT Express is deployed in those 802.11b/g environments, preference should be given to using 802.11g to avoid any 802.11b devices that would force the network to operate at slower speeds.

When using 802.11b/g, configure the network to operate on channels 1, 6, and 11 to minimize the frequencies in use that interfere with one another. These channels are recommended when using 802.11b/g equipment. Also, some devices which support 802.11b/g may be pre-configured to only scan for 802.11 beacons on these channels.

NOTE:

The use of DFS Channels is not recommended.

The country code associated with network Access Points (APs) and the enterprise devices must be in agreement. It is necessary that you assign the country code of the AP based on the country of operation and that the same country code be assigned on the enterprise device.

Recommended WLAN Access Point Configuration

PTT Express communicates half-duplex voice traffic at a QoS of VOICE with sample rates of 200 ms for Group and 100 ms for Private calls. It is recommended that the network support a DTIM of 1 or 2 based on a Beacon Interval of 100 ms. To ensure timely delivery against lower priority traffic a QoS of VOICE should be honored across the network by supporting WMM.

Multicast rates on the AP configuration should be optimized. There is some variation between manufacturers (Cisco, Zebra etc). Customers should use the following guidelines to set the multicast rates on their APs to optimize performance.

Multicast Rate Selection

- Choosing a Multicast Rate - PTT Express uses multicast distribution to implement Group Call. In contrast to unicast mode, each AP in the ESS transmits the multicast packet once (no retries), at a fixed rate. Choice of MC rate is similar to picking a Beacon rate, and should strike a balance between:
  - Lower rates propagate further. Multicast Tx rate should be low enough for a reception rate of at least 90% anywhere within a cell, by all of the target mobile devices.
  - However, an MC rate lower than necessary wastes airtime, and contributes to co-channel interference.
- Setting the Multicast Rate - The MC rate policy varies with AP vendor, but usually cues on the Basic Rate settings. Two examples:
  - Setting the Multicast Rate The MC rate policy varies with AP vendor, but usually cues on the Basic Rate settings. Two examples:
  - Cisco: MC rate is different for the Wireless Controllers and standalone APs:
    - Access points running recent Cisco IOS versions are transmitting multicast and management frames at the highest configured basic rate, and is a situation that could cause reliability problems.
    - Access points running LWAPP or autonomous IOS should transmit multicast and management frames at the lowest configured basic rate .... If reliable reception is a goal, then multicasts should be transmitted at a low data rate.
- Summary - Determine how the multicast rate is derived, typically from the Basic Rate settings, for the specific vendor, model, and firmware revision in play. Then, lower multicast rate as described above.
  - Quick Start - Use just one basic rate. Start with 24 Mb/sec basic, and adjust downwards for good performance. As a safety margin, drop the rate one more step.

Other Settings

IGMP Snooping - Must be enabled.

Session Timer - The infrastructure session timer should be disabled or set to longer than the default value (24 hours is the suggested value).

Installation

It is recommended (but not required) that the enterprise device is associated on the network before installing the PTT Express client on the device. Since at the end of the installation procedure, the device reboots and a start up tone is played to indicate that the PTT Express application is functional.

NOTE: The default keys used for triggering PTT Express calls need to be remapped when installing PTT Express on the devices. See Device Configuration.

In order to obtain application software or any available update files please go to the Zebra website http://www.zebra.com/support. Once purchased, the requestor is assigned a username and password to access and download the client.

IMPORTANT:

You cannot install PTT Express version 4.0.x on devices with Android 10 or below.

NOTE:

Only PTT Express version 4.0.x and higher, can be installed on specific Zebra mobile computer devices running Android 11 and above. Earlier versions of PTT Express are pre-installed on Zebra devices.

PTT Express Android client v3.1.46 and above requires a Zebra license to use the application. Refer to the Zebra Licensing User Guide for information on installing license for this application.

PTT Express is not supported on Non-Zebra devices.

Installing on an Android Device Using the USB Connection

Use the USB connection to install the application onto the device.

CAUTION: When connecting the device to a host computer and mounting the microSD card, follow the host computer's instructions for connecting and disconnecting USB devices, to avoid damaging or corrupting files.

1. Connect the device to a host computer using the Rugged Charge/USB cable.
2. On the device, pull down the Notification panel and touch **Charging this device via USB**. By default, No data transfer is selected.
3. Touch **File Transfer**.
4. On the host computer, open a file explorer application.
5. On the host computer, copy the application APK file from the host computer to the device.

CAUTION: Carefully follow the host computer's instructions to unmount the microSD card and disconnect USB devices correctly to avoid losing information.

6. Disconnect the device from the host computer.
7. Swipe the screen up and select to view files on the Internal Storage.
8. Locate the application APK file.
9. Touch the application file.
10. Touch **Continue** to install the app or **Cancel** to stop the installation.
11. To confirm installation and accept what the application affects, touch **Install** otherwise touch **Cancel**.
12. Touch **Open** to open the application or **Done** to exit the installation process.
13. The application appears in the App list.

Uninstalling from an Android Device

For Android devices, only updated versions of PTT Express can be uninstalled. Uninstalling an updated versions of PTT Express replaces the updated version with the factory default version.

To uninstall the PTT Express app:

1. Touch **Settings**.
2. Touch **Apps**.
3. Select **PTT Express**.
4. Touch **Uninstall updates**.
5. Touch **OK**.

Verifying Installation and Operation

After installation the user should verify the installation.

Ensure the device is connected to the network, with at least one other PTT Express enabled device and perform the following tests to confirm successful operation:

1. Confirm that a Group Broadcast, or page communication can be initiated and that other devices receive the spoken voice from the originating device.
2. Once a Group Broadcast communication has been successfully established, confirm that a page-to-private, or Private Response, can be established.
3. While in a WAN call, ensure that page communication cannot be heard.

Android Configuration File Settings

Configuration of the PTT Express 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 client functionality.

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

Android Clients

Change the application settings by modifying `ptt_settings.xml` located at: `/enterprise/device/settings/ptt/`.

To retrieve the settings on Android 11 devices, use the following ADB command:

```
adb pull /enterprise/device/settings/ptt/ptt_settings.xml
```

To push and save the settings, use the following ADB commands:

```
adb push .\ptt_settings.xml /data/tmp/public/ptt_settings.xml

adb shell cp /data/tmp/public/ptt_settings.xml /enterprise/device/settings/ptt/
ptt_settings.xml
```

General Settings

List of general settings.

Table 2 General Settings

Name	Options	Default	Description
enable	true false	false	Enable or disable the PTT service. True = Enabled False = Disabled
`<setting name="enable">true</setting>`			
defaultProfileID	1 through 12	1	Numeric identifier of the default profile.
`<setting name="defaultProfileID">1</setting>`			
disablePTTClient	true false	false	Enable or disable the PTT Express client. If the value is true, PTT Express client functionality is disabled. This settings is optional and is not shown in the default XML file.
`<setting name="disablePTTClient">false</setting>`			
ignoreKeysInLockMode	true false	false	Ignore keys in lock mode. (Available on Android clients only.)
`<setting name="ignoreKeysInLockMode">false</setting>`			
muteExitTimer	0 to 10000 ms	120000	The amount of time (in milliseconds) that has to elapse after which the device will come out of the mute state. Decimal value in milliseconds: 0 implies an infinite switch. Minimum = 0 ms. Maximum = 8,640,000 ms. Default = 120,000 ms.
`<setting name="muteExitTimer">0</setting>`			

Diagnostic Settings

List of diagnostic settings.

Table 3 Diagnostic Settings

Name	Options	Default	Description
logLevel	None Error Warning Info Debug	None	Set the type of logs that will be collected. None = No logs collected. Error = Only error logs collected. Warning = Only warning logs collected. Info = Only informational logs collected. Debug = Only debug logs collected.
`<setting name="logLevel">None</setting>`			
logDir	<path>	PTT	Sets the path storage to store the PTT log files.
`<setting name="logDir">PTT</setting>`			
enableCDR	true false	false	Enable or disable the CDR logs.
`<setting name="enableCDR">false</setting>`			
cdrSize	100 to 25,000	5,000	Size of the CDR log file in kilobytes.
`<setting name=”cdrSize”>5000</setting>`			

Coexistence Settings

List of coexistence settings.

Table 4 Coexistence Settings

Name	Options	Default	Description
fullDuplexClient Coexistence	true false	true	Allows the PTT Express client to coexist with full duplex clients installed on the same device.
`<setting name="fullDuplexClientCoexistence">false</setting>`			
vibrateOnVoiceCall	true false	true	Allows full duplex incoming calls to vibrate the device when PTT Express client is in call.
`<setting name="vibrateOnVoiceCall">true</setting>`			

Hard Button

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

Table 5 Hard Button Settings

Name	Options	Default	Description
profileSwitchKey	L1-Single L1-Double L2-Single L2-Double	L1-Double	Sets the key used to switch profiles. Contains two parts: 1. the key code and 2. Single or double press. A hyphen separates the parts. Refer to the device's Integrator Guide for key mappings.
`<setting name="profileSwitchKey">L1-Double</setting>`			
allowProfileSwitchFrom Key	true false	true	Allows Profile screen switching using the defined button.
`<setting name="allowProfileSwitchFromKey">true</setting>`			
headsetKey		R2	Sets the Headset key. (Available on Android clients only.)
`<setting name="headsetKey">R2</setting>`			
talkPermitToneDelay		50	The amount of time that Permit Tone playback will be delayed by when the wired headset is connected. Decimal value in milliseconds: min=50ms max=1000ms.
`<setting name="talkPermitToneDelay">50 </setting>`			

GUI Settings

These settings determine the screen options.

Table 6 GUI Settings

Name	Options	Default	Description
allowProfileSwitch FromUI	true false	true	Allows Profile screen switching on the screen.
`<setting name="allowProfileSwitchFromUI">true</setting>`			

Group Call/Private Response Transport/Timers Settings

These settings set Group Call and Private Response options.

Table 7 Group Call/Private Response Transport/Timers Settings

Name	Options	Default	Description
ipBroadcastGroup	<ipaddress>	239.192.2. 2	Sets the multicast address used for Group Call communications.
`<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>`			
gcJitterSize	2 to 4	3	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.
`<setting name="gcJitterSize">3</setting>`			
pcJitterSize	2 to 4	3	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.
`<setting name="pcJitterSize">3</setting>`			
gcFloorHoldTimer	0 (disabled) 10000 to 90000	60000	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.
`<setting name="gcFloorHoldTimer">60000</setting>`			
pcFloorHoldTimer	0 (disabled) 10000 to 90000	60000	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.
`<setting name="pcFloorHoldTimer">60000</setting>`			
gcHangTimer	0 (disabled)1000 to 10000	10000	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.

Table 7 Group Call/Private Response Transport/Timers Settings (Continued)

Name	Options	Default	Description
`<setting name="gcHangTimer">10000</setting>`			
pcHangTimer	0 (disabled) 1000 to 10000	10000	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
`<setting name="pcHangTimer">10000</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
- Profile hard buttons
- Profile user attributes.

Profile Attributes

These settings determine the profile attributes.

Table 8 Profile Attributes Descriptions

Settings	Value	Default	Description
id	1 - 12	1	Set the Profile identifier. Each Profile has to have a unique number.
name	<blank>		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.
enable	true false	true	Enables or disables the Profile. When set to true, the Profile can be selected during Profile switching.
language		en	Set the audio feedback language for the Profile. The value for language attribute should be a locale string defined as per http://developer.android.com/reference/java/util/ Locale.html. (Available for Android clients only)
`<profile id="1" name="Groceries" enable="true" language="en">`			

Profile User Attributes

These settings determine the Profile user attributes.

Table 9 Profile User Attributes Descriptions

Settings	Value	Default	Description
disablePrivateCall	true false	false	Disable or enable a Private Response.
`<setting name="disablePrivateCall">false</setting>`			
audioFeedback	Off Default	Default	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.
`<setting name="audioFeedback">default</setting>`			
callKeyConfiguration	0 1	1	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. **NOTE:** Setting callkeyConfiguration to “0” is not supported on VH10, VC80x, and VC8300 devices. The soft button can only be pressed for up to 30 seconds on devices with the Android operating system.
`<setting name="callKeyConfiguration">1</setting>`			

Profile Screen Attributes

These settings determine the Profile screen attributes.

Table 10 Profile Screen Attributes Descriptions

Settings	Value	Default	Description
pttClientStatusUILoc	true false	false	Allow the PTT Express client to be enabled/ disabled from screen.
`<setting name="pttClientStatusUILock">false</setting>`			
allowChannelSwitch FromUI	true false	true	Allow switching Talk Groups on the screen.
`<setting name="allowChannelSwitchFromUI">true</setting>`			

Table 10 Profile Screen Attributes Descriptions (Continued)

Settings	Value	Default	Description
allowChannelSwitch FromKey	true false	true	Allow switching Talk Groups using a hard button.
<setting name="allowChannelSwitchFromKey">true</setting>			
allowMuteFromUI	true false	false	Allow muting or unmuting operation from the screen.
`<setting name="allowMuteFromUI">false</setting>`			

Profile Channel Attributes

These settings determine the channel attributes.

Table 11 Profile Channel Attributes Descriptions

Settings	Value	Default	Description
scanOnlyHome	true false	true	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).
`<setting name="scanOnlyHome">true</setting>`			
alternativeChannel SwitchTimer	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.
`<setting name="alternativeChannelSwitchTimer">0</setting>`			
enablePriority	true false	false	The value true implies that the per channel priority settings will be honored, else it will be ignored.
`<setting name="enablePriority">false</setting>`			

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:

```
<channel id="1" name="" priority="1" type="Alternative" replyable="true"
preemptor="false" cdr="false"/>
```

Table 12 Channel List Descriptions

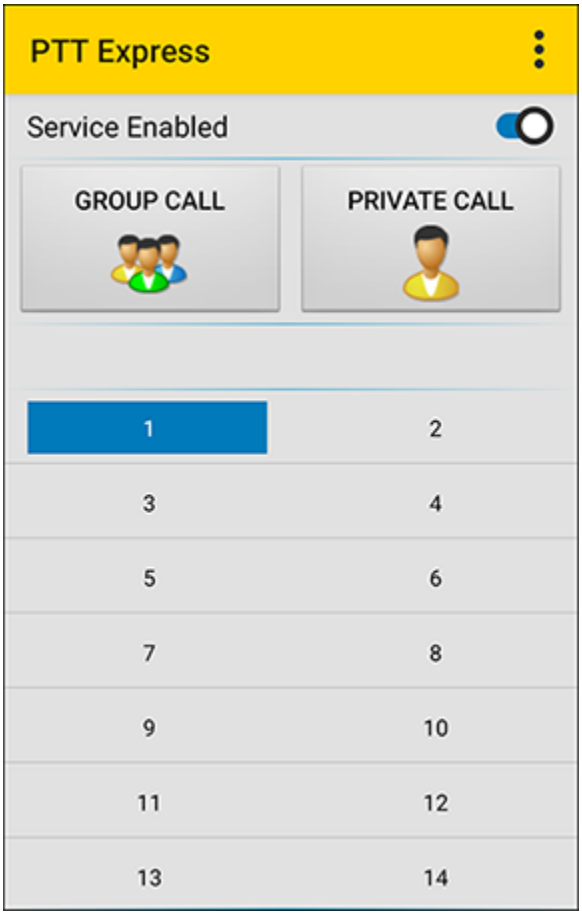
Settings	Value	Default	Description
id	1 through 32	N/A	Identifies the Talk Group number.
name	<alphanumeric>	N/A	Sets the name for the Talk Group. A 16 character alphanumeric string that includes symbols. This name displays on the Profile screen.
priority	1 through 32	N/A	Set the priority of the Talk Group. Where 1 is the highest priority and 32 is the lowest priority.
type	Home Alternative Scan Disabled	N/.	Talk Groups that are not mentioned in the list will be disabled from scan group and from UI,
replyable	true false	true	When set to true, allows a Talk Group to be in a conversation in response to an inbound traffic on this Talk Group.
preemptor	true false	false	When set to true, a pre-emptor Talk Group of higher priority can preempt a conversation on lower priority Talk Group.
cdr	true false	false	Enables or disables CDR logging for this channel.

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>
```

Figure 1 Android App Soft Buttons



Configuring a Profile with Three Talk Groups

A profile can have Talk Groups with multiple names.

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>
```