User's Manual

14221-7100-2050

Rev. D, January 2026

XL Virtual™ Android™

Mobile Application

L3HARRIS®

FAST. FORWARD.

MANUAL REVISION HISTORY

REV.	DATE	REASON FOR CHANGE
–	Oct/24	Initial release.
A	Feb/25	Minor corrections throughout.
B	Feb/25	Minor update to Section 4.3.
C	Sep/25	Updated screen captures. Other minor updates throughout.
D	Jan/26	Updated for XL Virtual R07B.

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1. SAFETY SYMBOL CONVENTIONS

The following conventions are used to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere violates safety standards of design, manufacture, and intended use of the product. L3Harris assumes no liability for the customer's failure to comply with these standards.

The CAUTION symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in a risk of danger, damage to the equipment, or severely degrade the equipment performance.

The NOTE symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.

2. INTRODUCTION

XL Virtual™ (formerly BeOn®) is a Voice-over-IP (VoIP) based, Push-to-Talk (PTT) communications system operating over public or private wireless networks. The solution extends traditional Land Mobile Radio (LMR) services onto the broadband capable third generation (3G) and 4G/5G/LTE cellular networks. This includes the ability to provide highly integrated interoperability services between XL Virtual users on the cellular network and users of traditional LMR networks. L3Harris' VIDA® IP core network switching technology is the foundation for the XL Virtual application infrastructure. As a result, the application and product suite provide many advanced features not found in competing technologies and provide internetworking of those services between public and private communications networks. XL Virtual is currently supported on Android™ devices.

L3Harris is unable to and cannot guarantee either the extent or consistency of the wireless coverage and communications of a cellular commercial carrier's network or other third-party network, nor can L3Harris guarantee the quality of the data service provided. Given the dependency on commercial cellular and third-party networks, the operation of the XL Virtual solution, including location information, is not intended for mission critical communications but rather for administrative and other communications.

2.1 SUPPORTED FEATURES

Features are enabled or disabled at the UAS on a user-by-user basis. Changes are reflected in the XL Virtual interface after the next provisioning.

Table 2-1 lists the features that can be disabled, and how disabling affects the user interface.

Table 2-1: XL Virtual Features that can be Enabled/Disabled

FEATURE	WHEN DISABLED
Set Presence to Available	Presence will be silent, will not receive messages.
Tones	Tones are disabled.
Vibrate on PTT	Tones will not vibrate on PTT.
Smart Location	Client updates its location less frequently based on system default settings as opposed to tracking based on in-app time or distance intervals.
Remote Speaker Button	Disables remote speaker microphone.
Encrypt I-Calls	Will not encrypt using 256-bit Advanced Encryption Standard (AES)
Scan Settings	Unselected groups will scan.

The following features are supported by the XL Virtual application:

FEATURE	DESCRIPTION
P25 scanning	Ability to enable/disable scanning.
Group Calls	Make calls to P25 talk groups.
Individual Calls	• Make calls to individual VIDA users. • Manual Entry (ability to call VIDA users by entering IDs manually).
Distress Calls	Initiate group distresses and place distress calls.

FEATURE	DESCRIPTION
Mobility Support	• Modem connection: ability to use the phone's modem to make IP-based communications. • VIDA User Registration - register and deregister a user with or without authentication. • Roaming - support for maintaining the XL Virtual data connection between sites.
Band Optimization	4G/LTE, and 5G Cellular.
Call Ignore	Ability to ignore group or individual calls.
Multiple device/phone support	Mapping of PTT and distress keys on various devices.
Presence	• Self-presence - set your own presence. • Group member presence - retrieve the presence of group members.
GPS Location	Obtaining location of group members.
Conversations	Groupings of group and individual calls.
Event History	Allows review of prior calls, text messages, and distress events.
Storage of Call Audio	Calls are recorded for later review.
Bluetooth® support	Android: Supports the L3Harris Covert Bluetooth microphone (12082-0685-01) and other Bluetooth headsets.
Circuit Switch Call Interoperability	Seamless interoperability with ordinary circuit switch calls.
Patch/SimulSelect Support	Supports console-initiated patch calls and console-initiated SimulSelect calls.
Contact Management	XL Virtual contacts allow users to maintain individual aliases for XL Virtual users.
License File	Contains assignment server/user ID and APN connection information.
Individual Text Messaging	Send Text Messages to selected groups and individuals.
Geographic Mapping Support	See Sections 4.7.6.1.
Real-Time Presence Location	The ability to track presence and location of users in the system.
Announcement Group Calls	Dispatch-originated calls which span a select number of groups as configured by the administrator.
P25 Encryption	Supports 256-bit Advanced Encryption Standard (AES).
Airlink Encryption	Airlink encryption is enabled at the LAS. When enabled, a DTLS connection must be established for the phone to successfully connect to the LAP. If the connection is lost, the client will not try to connect with an unencrypted link.
User ID Support	XL Virtual clients support 10 million user IDs.
Contact List Provisioning	XL Virtual clients support Contact List Provisioning from the UAS via the LAP.

2.2 ICONS

Table 2-2 describes the icons displayed by the XL Virtual clients.

Table 2-2: Icons

ICON	DESCRIPTION
XL VIRTUAL™	Logo indicates the XL Virtual application is registered with the system.
	Home Page
	History
	Groups
	Contacts
	Maps
	Settings
	Available
	Do not Disturb
	Silent
	Offline
	PTT Button
	Key Loaded
	Not Key Loaded
	Group Key Loaded
	Playback
	Stop Playback
	Audio Settings
	Scanning On
	Texting
	Refresh Presence
	Individual Call
	Available
	Do Not Disturb
	Silent
	Offline
	Selected group
	Distress groups
	Distress Notifications
	Incoming Calls

ICON	DESCRIPTION
	Outgoing Calls
	Incoming iCall
	Outgoing iCall
	Incoming Text
	Outgoing Text
	Send text
	Map Layers
	Locate Self
	Locate Group
	Multiusers
	Distress Signals
	Inbound Signals
	Traffic Layer On Maps
	Building Layer On Maps
	Indoor Maps Layer
	Displays the Street view of the map
	Displays the Hybrid view of the map
	Displays the Satellite view of the map
	Displays the Physical view of the map
	Mapped Contact Silent
	Mapped Contact Offline
	Mapped Contact Distress
	Mapped Radio Available
	Mapped Radio Do Not Disturb
	Mapped Radio Silent
	Mapped Radio Offline
	Mapped Radio Distress
	Volume Down
	Volume Up
	Audio Device

ICON	DESCRIPTION
	Bluetooth Device
	Soundwave
	Add
	Delete
	Edit
	Search
	Close
	Success
	Info
	Failure
	Distress Signal

3. INSTALLATION PROCEDURES

3.1 XL VIRTUAL ANDROID APPLICATION

There are three methods to get the XL Virtual application onto the Android device for installation:

- Google Play™ Store
- Email delivery
- XL Virtual Installer Application (e.g., local website download)

3.1.1 Google Play Store

1. The XL Virtual Android app is available on the Google Play Store under the title **XL Virtual™**.
2. Tap **Install** to start the install of the app on the phone. After the installation is completed, proceed to Section 3.1.5.

3.1.2 Email Delivery

After receiving the email with the XL VirtualPTT.apk file attached, follow these steps to install XL Virtual:

1. Open the email using Gmail™ (the standard email application does not recognize APK files correctly and only allows saving them to the SD card).
2. Tap **Install** in the email for the XL Virtual.apk file.

3.1.3 XL Virtual Installer Application

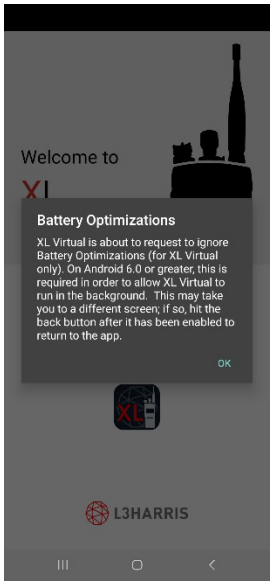
Refer to the *BeOn Installation Web Server Software Release Notes* (14221-7100-8120) for instructions on how download the app from a web site.

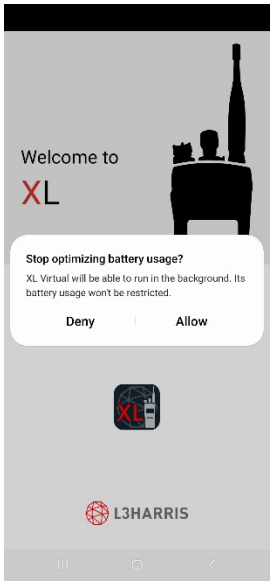
3.1.4 XL Virtual Application Sideloading Installation

1. Follow the prompts to install the application. If XL Virtual is already installed, the user is prompted to replace the existing application. Tap **OK** to proceed.
2. Tap **Install** to continue with installation of the application.
3. The application is installed.
4. At the “Application installed” screen, tap **Open** to run the XL Virtual application immediately, or tap **Done** to close the installer and run the PTT application later.

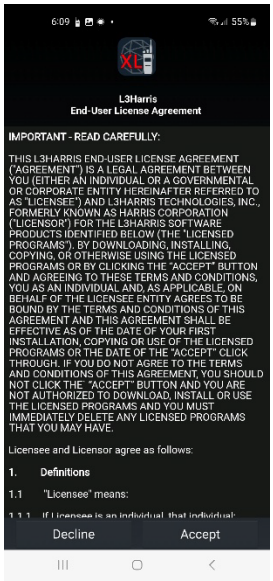
3.1.5 Open the Android XL Virtual App

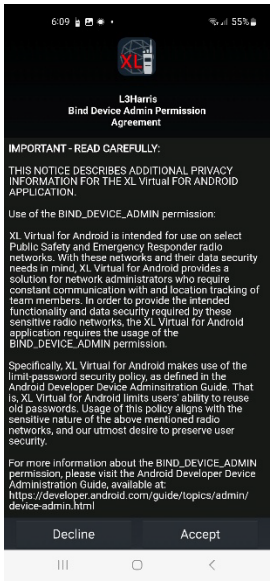
1. When you run XL Virtual for the first time (or after you have upgraded the application), the application prompts you to allow the following permissions.
2. If prompted, tap **Allow** to stop optimizing battery usage.



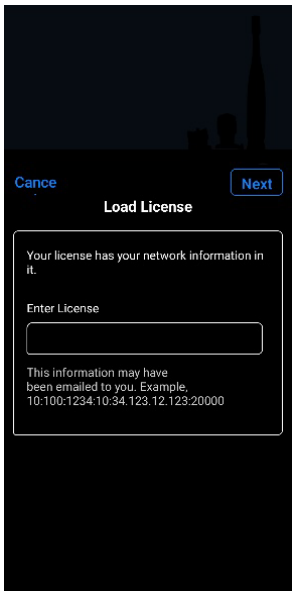


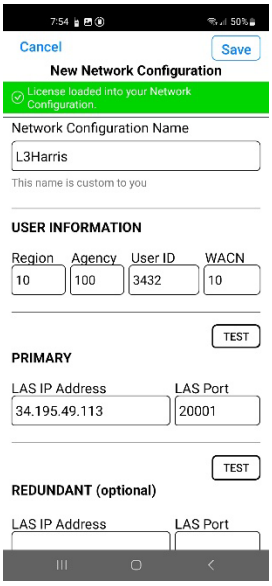
3. When you run XL Virtual for the first time (or after you have upgraded the application), accept the end user license agreement.





4. If running the application for the first time, copy and paste the license number which should have been emailed to you before installation. It will automatically fill in a new network configuration. Edit your User ID, WACN, and the IP address/Port and for LAS 1 as provided by your system administrator. If a second (optional) LAS is used in the system, enter the User ID, WACN, and the IP address/Port and for LAS 2. Tap **Update**. Access this screen and make changes at any time from the **Network Sign In** screen (Figure 4-1).





NOTE

If the User ID is updated to one that does not match the last successfully registered User ID, the application will shut down and the user must restart the application.

3.2 LICENSE SERVER

When a user registers to the BeOn/XL Virtual service for the first time, the BeOn license server allocates a BeOn/XL Virtual license to that device. If there are no licenses available, the user gets a “License exceeded error” message. More licenses must be made available on the license server. The user can register to the XL Virtual service on one device at a time. The user may register on devices on which other users had previously registered and subsequently deregistered.

NOTE

If the License Server is down, the user may receive a message stating “Connection Error.”

NOTE

If a newer (e.g., R3A/R4A) XL Virtual application registers with an older LAP version (e.g., R2B/R2C/R2D), a “Connection Error” occurs because the older LAP cannot process the newer protocol version presented to it by the UE.

4. OPERATION

4.1 START UP AND SIGN IN PROCEDURES

NOTE

If an XL Virtual-enabled smartphone is plugged into a computer via USB and "USB Connection Mode" is enabled, the XL Virtual application cannot function. This is due to the storage required by the XL Virtual Group Communications application being unavailable for use while in "USB Connection Mode."

1. Start the XL Virtual application software by tapping **XL Virtual** from the phone's main display. The application proceeds to the **Network Sign In** screen:

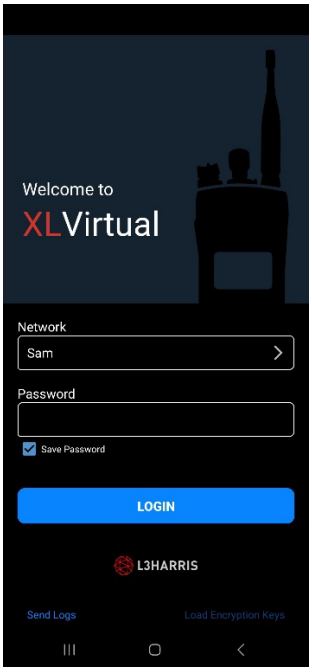


Figure 4-1: XL Virtual Application Login

2. On the **Network Sign In** screen, tap **Configure Network** to make any changes to the User ID, WACN, or LAS 1/LAS 2. Save a custom network configuration name.
3. Enter your password. Each character of the password is displayed briefly as it is typed. Contact your System Administrator if you have forgotten your password. Depending on the settings set by your System Administrator you may or may not have to provide a password.
4. Users can select "Save Password" below the password bar to enable the application to save the users password. This can be disabled at any time.
5. Press **LOGIN** when finished.
6. "Registering" is displayed on the screen during sign in, and "Updating active group" is displayed while user information is updated from the system (if applicable).

4.2 REGISTRATION AND PROVISIONING

After the user taps **LOGIN**, the application performs the following:

1. Registration with XL Virtual Access Server is attempted.
2. Processing of provisioning information is performed (if necessary).
3. Establishment of current scanning parameters is performed.

As the application proceeds with these phases, feedback to the user continues with each step and access to the underlying main window is prevented until the scanning information has been received, processed, and displayed where appropriate.

4.3 DEVICE CONTROLS

- If the XL Virtual enabled device has a dedicated PTT button, this can be used for PTT operations. This feature can be turned on in device settings and in-app settings.
- While XL Virtual Android should work on Android-based mobile phones (form factor dependent) running Android 9 and later, it has been tested on the following devices:

MANUFACTURER	DEVICE MODEL	OS VERSION
Google	Pixel® 6	Android 16
Samsung®	Galaxy® S21	Android 15
Samsung	X Cover® 7[1]	Android 15
Google	Pixel 9	Android 15
Samsung	Galaxy S22	Android 14
Samsung	Galaxy S24	Android 14
Samsung	X Cover 6 Pro[1]	Android 14
Samsung	Galaxy S25	Android 15

- The distress button next to the XL Virtual logo will send distress signals to a selected group, initiated five seconds after button press. This can be cancelled prior to the end of the countdown.

For a description of all other device controls, refer to the manufacturer's documentation for your device.

4.4 PHONE AND PTT CALL INTEROPERABILITY

This feature focuses on ensuring that standard phone calls interoperate with PTT communications within XL Virtual in a straightforward way. Some cellular networks support simultaneous voice (standard phone calls) and data communications (PTT communications), and others do not, so the XL Virtual user must be prompted to properly handle standard voice calls as they appear, and PTT communications must be treated according to the user's demands.

If standard phone calls and PTT calls can be supported simultaneously, the user can release the PTT button when a standard phone call arrives. Conversely, if the user is making a standard phone call, and a PTT call is received, the standard phone call continues uninterrupted and the PTT call is recorded but not played.

[1] External PTT Key has been tested on this device.

For cells that support simultaneous voice and data:

- If a PTT call is received during an ongoing circuit switched call:
  - XL Virtual does not play any sound unless the call is a distress call, then XL Virtual plays the normal distress tone.
  - XL Virtual gives a visual indication as it normally does for an incoming PTT.
  - The PTT call is recorded.
  - When the circuit switched call is over, the user hears the PTT call if it is still in progress.
  - The user can replay the missed PTT call at any time after the circuit switched call is done.
- If a circuit switch call is received during an ongoing PTT call:
  - The PTT call is interrupted once the Phone app is brought to the foreground.
  - XL Virtual continues to record the PTT call but does not play it.
  - When the circuit switched call is over, the user hears the PTT call if it is still in progress.
  - The user can replay the missed PTT call at any time after the circuit switched call is done.
  - If the user ignores or dismisses the circuit switched call, the PTT call continues to play if it is still in progress.

Some networks have cells that do not support simultaneous voice and data, for example, some EDGE cells:

- If a PTT call is received during an ongoing circuit switched call:
  - The data connection to XL Virtual is suspended, no information about the PTT call is received, and XL Virtual is unaware of the PTT call. Nothing is recorded in the **History** tab.
  - When the circuit switched call is over, the user hears the PTT call if it is still in progress. XL Virtual records the portion of the PTT call that occurs after the circuit switched call ends.
- If a circuit switch call is received during an ongoing PTT call:
  - Once the phone switches over to the Phone app, XL Virtual stops playing and recording the current PTT call.
  - During the circuit switched call, the data connection to XL Virtual is suspended, no information about incoming PTT calls is received, and XL Virtual is unaware of any PTT calls. Nothing is recorded in the **History** tab.
  - When the circuit switched call is over, the user hears the PTT call if it is still in progress. XL Virtual records the portion of the PTT call that occurs after the circuit switched call ends.
  - If the user ignores or dismisses the circuit switched call, the PTT call continues to play if it is still in progress.

4.5 ALERT TONES

Refer to Table 4-1, Table 4-2, and Figure 4-2 for the tones associated with the XL Virtual application.

Table 4-1: XL Virtual Alert Tones

NAME	DESCRIPTION
Call Queued	One short low-frequency tone followed by two short high-frequency tones. Indicates the call is queued and will be granted later.
Call Denied	Three short mid-frequency tones. Indicates the radio is out of coverage or group is active.
Grant	One short mid-frequency tone. After pressing the PTT button, indicates that it is ok to talk.
Call Removed	One long low-frequency tone. Notifies the user that their current call has been rejected or has failed.
Incoming Distress	Three short high-frequency tones. Sounds when the user receives a distress on a scanned group.
Incoming Call On Selected Group	Two short low-frequency tones.
Incoming Call On Scanned Group	Two short high-frequency tones.
Incoming Individual Call	One long high-frequency tone.
No Key Loaded	Six short mid-frequency tones. Sounds during encrypted groups/individual calls if no key is loaded.

Table 4-2: Tone Frequencies and Durations

Name	Frequency	Name	Duration
Low	800 Hz	Short	50 msec.
Mid	1400 Hz	Medium	100 msec.
High	1800 Hz	Long	150 msec.

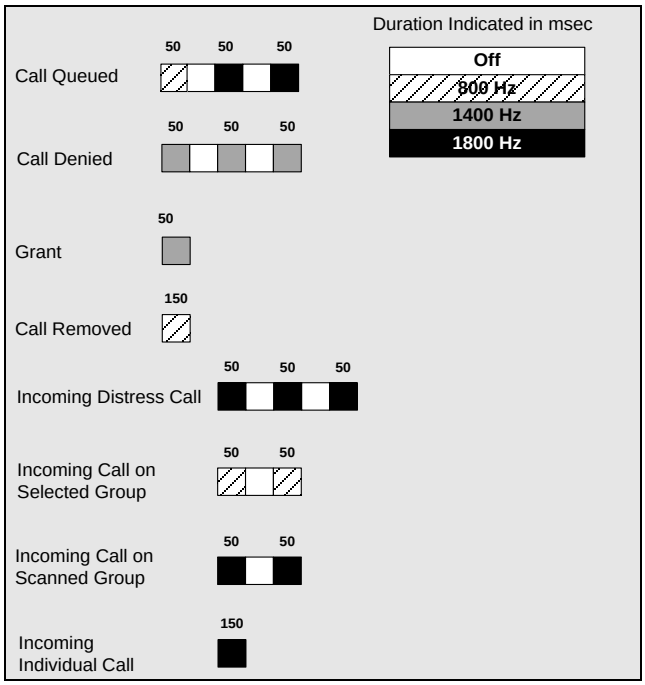


Figure 4-2: Alert Tones

4.6 BLUETOOTH OPERATION

The XL Virtual application supports the L3Harris Covert Bluetooth Microphone (product number 12082-0684-01) and the L3Harris Bluetooth Speaker Mic (product number 12082-0800-01). When the phone is paired with one of these microphones, users can transmit and receive calls using Bluetooth.

Additionally, the XL Virtual app supports most conventional wireless headsets that include a microphone and speaker.

Refer to the *L3Harris Covert Bluetooth Microphone User Manual* (14221-1600-2040) or the *L3Harris Bluetooth Remote Speaker Mic User Manual* (14221-1600-1010) for more information.

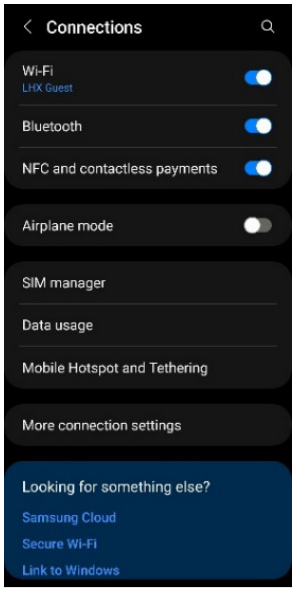
NOTE

Essential operation of the Covert Bluetooth Microphone requires an additional step beyond the pairing of the microphone in Android Bluetooth settings. The “Media audio” option in Android Bluetooth settings for the “Harris” pairing must NOT be checked. This allows the XL Virtual app to correctly connect and maintain the connection to the Covert Bluetooth Microphone.

4.6.1 Configuration

Perform the following to configure the Android XL Virtual client to use the Bluetooth Microphone:

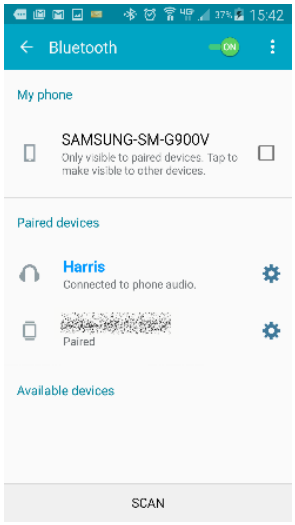
1. In the Android settings, enable **Bluetooth**.



2. Turn the 12082-0684-01 Covert Bluetooth Microphone on and initiate pairing by pressing and holding the power button until the light blinks blue and red.

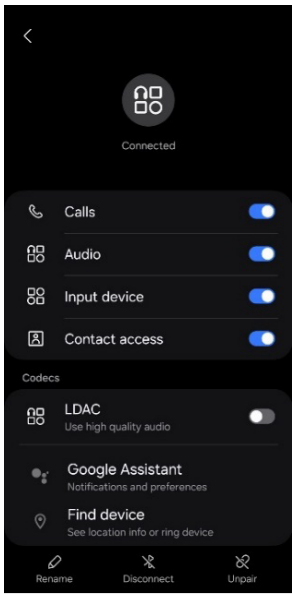
   To initiate pairing on Bluetooth Speaker Mic 12082-0800-01, power on the speaker mic. If the mic is not already paired, it automatically enters pairing mode. If it is already paired with a different device, perform a software reset on the speaker mic (refer to manual 14221-1600-1010 for more information).

3. Select the “Harris” device from the list once it appears.



4. The light on the Bluetooth Microphone blinks blue when connected to the phone.
5. Tap the gear icon next to the **Harris** entry.

6. Toggle on Calls, Audio, and Input device to hear audio input through Bluetooth.



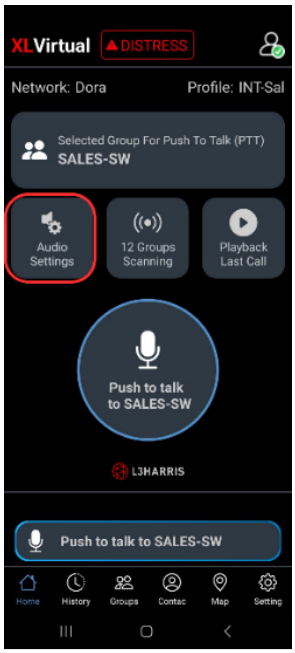
7. The 12082-0684-01 Covert Bluetooth Mic shows a steady blue light when connected and ready to use with XL Virtual. The 12082-0800-01 Remote Speaker Mic's LED blinks blue when connected and ready to use.

4.6.2 Covert Operation

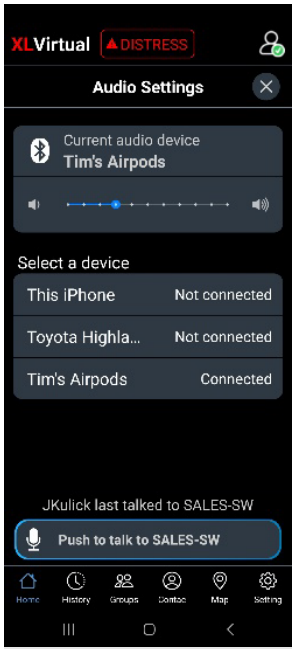
With XL Virtual on Android cell phones, users can plug ear buds with a built-in wired microphone into the phone or use Bluetooth earbuds and headphones to use the covert device as a PTT and emergency remote control. Users appear to be listening to music or participating in a phone call but are in full communication with their talk group.

For covert operation:

1. From the XL Virtual home screen, select **Audio Settings**. Ensure that Bluetooth pairing is paired to your device. You will see a menu of previous Bluetooth devices (if available) and the current connected Bluetooth device will automatically pair.



2. The following screen is displayed:



- Covert operation can be achieved by choosing the Bluetooth device within the select a device menu if a Bluetooth device is available.
- Regardless of whether a Bluetooth device is connected, a user can press the speaker button for louder audio playback.

4.7 USER INTERFACE

4.7.1 Home Display

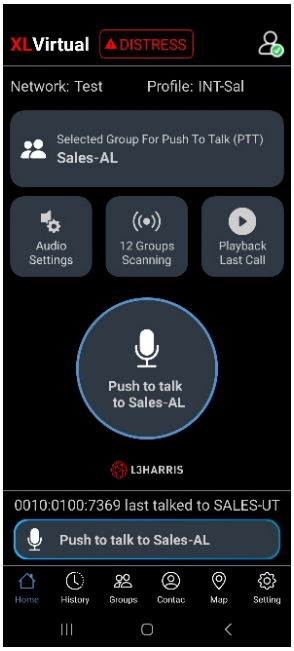


Figure 4-3 is a sample XL Virtual display. The top left of the display hosts the XL Virtual logo, the distress button, and presence button

The top center of display shows the group currently selected for Push To Talk. Press this button to change selected group.

Directly under the Selected Group button are the Audio Settings button, Groups Scanning Button, and the Playback button. The main PTT button outlined in blue is featured in the center of the phone screen.

The bottom of the XL Virtual application features a tabbed user interface that allows users to quickly access key features:

- The **Home** tab is displayed when the application starts and hosts several settings and the PTT button.
- The **History** tab lists all incoming and outgoing calls, conversations, text messages, location (GPS) requests, distress initiations, and distress cancellations (see Section 4.7.5).
- The **Groups** tab displays the configured talk groups (see Section 4.7.6.1).
- The **Contacts** tab displays all the contacts in the PTT address book (see Section 4.7.7).
- The **Maps** tab allows you to see the selected display group's location near you.
- The **Settings** tab displays XL Virtual settings related to your device (see Section 4.7.8).

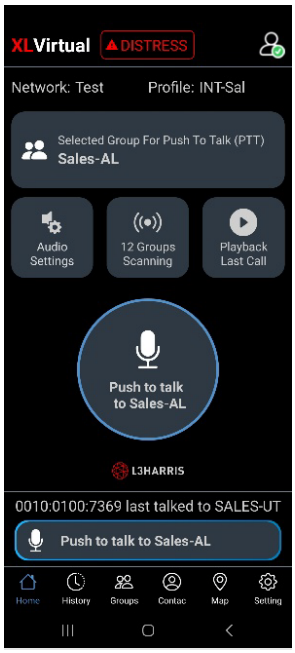


Figure 4-3: XL Virtual Sample User Interface

4.7.2 Status Bar

Towards the bottom of the display, above the menu tab, lies the Status Bar. The Status Bar acts as the main PTT interface and displays the group or user currently selected for the next call when PTT is pressed, as well as the last call transmitted or received.

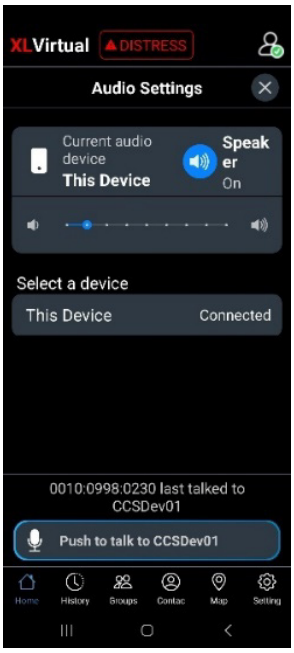
The color of the Status Bar changes based on the current activity:

- Blue background indicates "Idle" mode (i.e., no active call).
- Green background indicates outgoing calls.
- Yellow background indicates incoming calls.
- Red background indicates "distress" mode.

When distress calls are placed/received and the user is also in distress, the entire call status area has a red background.

4.7.3 Audio Settings

The Audio Settings menu is the central control panel for managing how XL Virtual routes volume. If you have paired an auxiliary Bluetooth device with your system, it appears in this menu for easy access. To adjust the volume output, slide the marker along the slider bar to increase or decrease the sound level emitted from your device. You can also choose to use speaker mode for incoming calls by tapping **Speaker On** with the icon. Underneath these settings is a section that says **Select a device**. If you have a paired Bluetooth device, it will appear in this menu. Press the desired Bluetooth device if needed.



4.7.4 Home

The **Home** tab is displayed when the application starts and hosts a main PTT button, as well as general information related to XL Virtual functionality. This pertains to the current talk group, Audio Settings, Scanning Groups, and Playback Last Call.

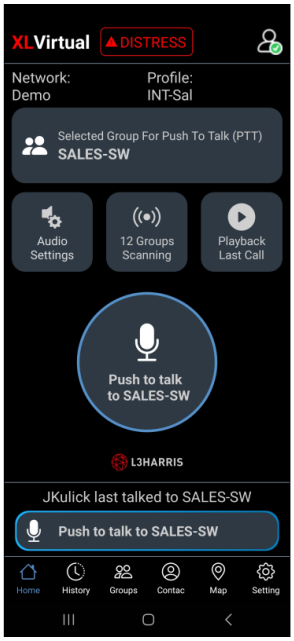


Figure 4-4: Home Tab

4.7.5 History Tab

The **History** tab (Figure 4-5) lists incoming and outgoing calls, conversations, and text messages. Up to 200 audio-based events and up to 250 total events (including text messages, distress initiations/cancellations) can be stored in history. After reaching 200, new events overwrite existing events, starting with the oldest first.

Tap the playback icon at the right of the event to play back its audio. Tap to stop playback of that audio.

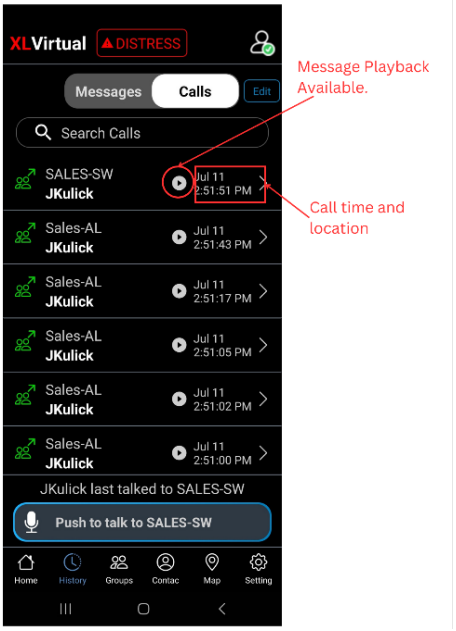


Figure 4-5: History Tab

The History section is broken into two sections: **Messages** and **Calls**.

A log of communications specific to the user accrues as entries in chronological order. Each entry displays the talk group and speaker. To view more details, press the side arrow on the entry. The call details page displays the speaker, their latitude and longitude, and presence. It also displays the receiving contact or talk group, the date of the call, and a recording of the call.

Scroll through the history page to view past calls and messages. To edit or remove specific calls and messages, press the blue **Edit** button. From there, select individual records to delete or clear all communications by pressing **Delete All**. This ensures that your history is managed according to your operational needs and privacy requirements.

4.7.6 Groups

The XL Virtual Android application allows the tracking of up to 38 contacts OR a single group with up to 38 of its registered users.

Tap the **Groups** tab to view the configured talk groups. Tapping one of the group rows selects the talk group. Selecting a new group updates the Status bar for the next PTT.

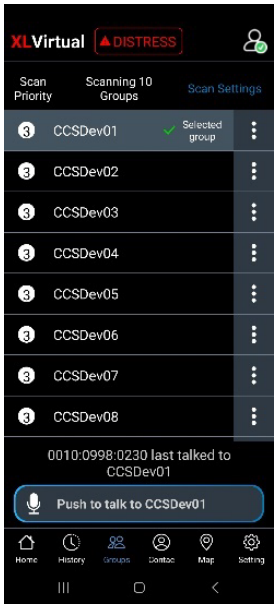


Figure 4-6: Groups Tab

Customizing Active Scan Settings:

To tailor your active scan preferences, access the 'Scan Settings' menu. Here, you can toggle the talk groups you wish to monitor. Tap the corresponding switch to include or exclude a talk group from your active scan list.

In-Depth Talk group Interaction:

For more detailed management of each talk group, click on the three vertical dots adjacent to the talk group name. This action reveals a suite of options that enhance your interaction with the talk group:

The choices allow the XL Virtual user to send a group text, see other registered users in the talk group, review the call history for a talk group, or view the talk group on the map.

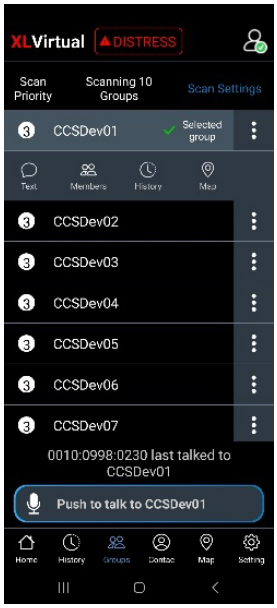


Figure 4-7: Group Context Menu

- **Text** allows text messaging to groups. See Section 4.8.3.
- **Members** displays the individuals that make up the group. There is a row entry for each group member showing the presence icon, member name, supervisor status, and the VIDA ID.

  The title row shows the group name with a count of how many members are in the group. This is the count of registered members listed. The list is restricted to no more than approximately 40 users due to system limitations. The member details provided are determined by the VNIC.

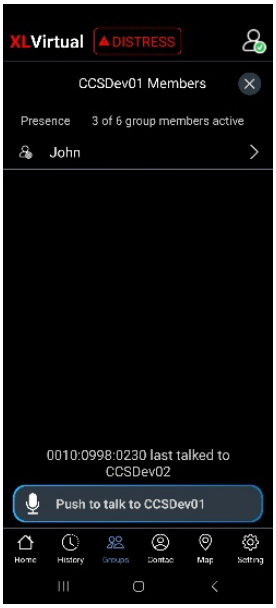


Figure 4-8: Group Members

- **History** displays the call history for that group.
- **Map** displays members' locations on the map.

4.7.6.1 Geographic Mapping

XL Virtual utilizes Google Maps™ as part of its situational awareness capability. There are small indicators in each corner of the map that provide information or change the map's focus when touched:

Allows access to map layers and types.

Switch between different talk groups on map view. Users can select groups or contacts on the drop-down menu.

Re-zooms the map to allow all users on the map to be within the current viewable area.

Re-zooms the map to make the current user the central focal point.

Wherever possible, User IDs are displayed as descriptive alias names if the User ID has a contact entry. When a VPS (Status Aware) is available in the system, the XL Virtual client receives information about the type of equipment an individual is carrying (e.g., XL Virtual, LMR, etc.). This affects the displayed icon.

Three map layers and four map types are available and can be accessed from the Layer and Assets menu in the upper right of the screen(Figure 4-9).

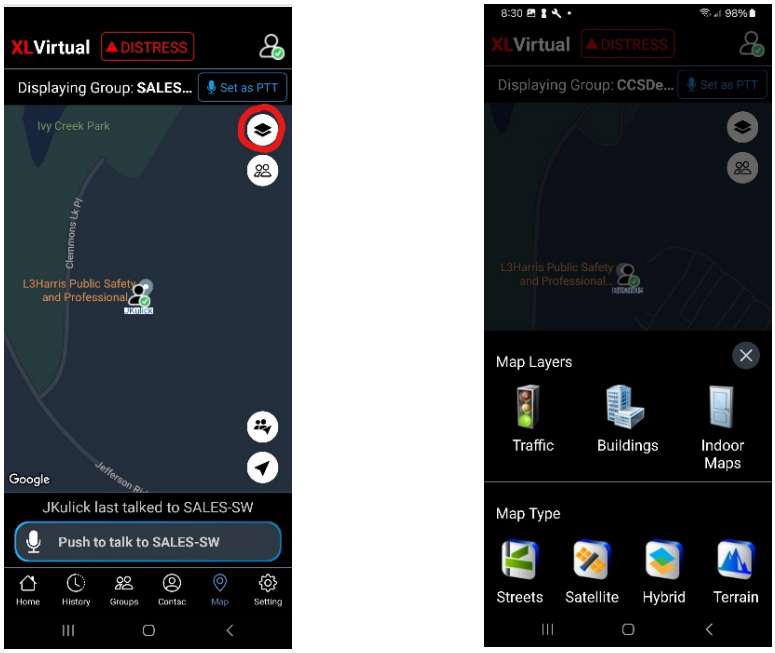


Figure 4-9: Access the Layer and Asset Menu

- Traffic reveals traffic status on roads and highways.
- Buildings display buildings.
- Indoor Maps allow users to access a building's floor plan when indoor maps are available.
- Underneath Map Layers, users can choose between four map type options.
  - Streets - display the default road map view.
  - Satellite - displays Google Earth™ satellite images.
  - Hybrid - displays a mixture of normal and satellite views.
  - Terrain - displays a physical map based on terrain information.

4.7.6.2 Call Indications

If the Map is displayed during a call and the person making the call is visible on the map, the user's icon has a blinking radio wave icon around it during the entire call. The radio wave is blue during normal calls.

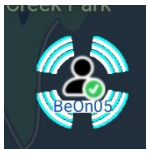


Figure 4-10: Normal Call Indication

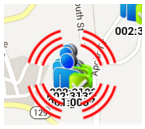


Figure 4-11: Distress Call Indication

4.7.6.3 Smart Location Update

CAUTION

The Smart Location Update feature allows the user to configure time and distance intervals to settings which could be detrimental to the device's battery life if values are used with very short, elapsed time or distance between location updates. Each location update requires power from GPS, Wi-Fi, Cell, and other radios.

Maps are updated when notified by the phone that the location has changed. The Smart Location Update feature allows the user to specify the frequency of location updates sent to the network. The VNIC presence service provides location updates to subscribers in the same enterprise/agency. Smart Location Update parameters are configured via the Settings menu (see Section 4.7.8).

The Time interval, Distance interval, and Maximum update frequency parameters are selectable even if Smart Location Update is disabled. These parameters are used for normal location requests for local use. When Smart Location Update is disabled, location updates are only sent to the network in the following circumstances:

- Initiation of a Group Call, Individual Call, or Distress Call.
- With Text Messages.
- When sending SDS acknowledgements in response to location queries.
- With presence state changes.

4.7.7 Contacts

The Contacts screen contains one entry for each of the contacts in the PTT address book. The first and last name, VIDA user ID, display name, and current presence (if applicable) of each contact are displayed. Refer to Table 2-2 for a description of the icons displayed for each contact.

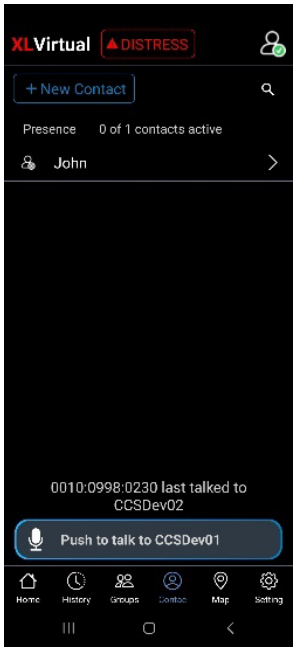
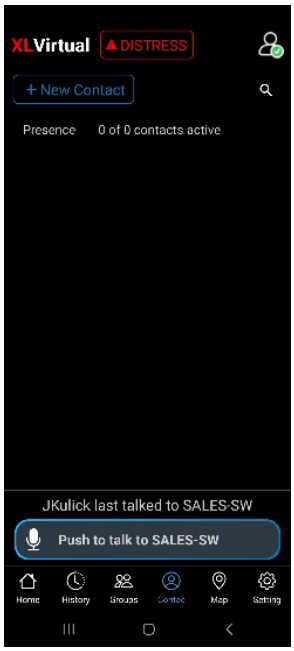


Figure 4-12: Contacts Tab

4.7.7.1 Add a New Contact

1. While on the Contacts tab, tap **New Contact.**



2. Enter the contact's name, display name, Region, Agency, User ID and WACN. Contact type refers to the new contact's version, either BeOn or XL Virtual. Select the appropriate version.
3. Tap **Save**.

4.7.7.2 Contacts Context Menu

Tap and hold anywhere on the contact row to open a context menu.

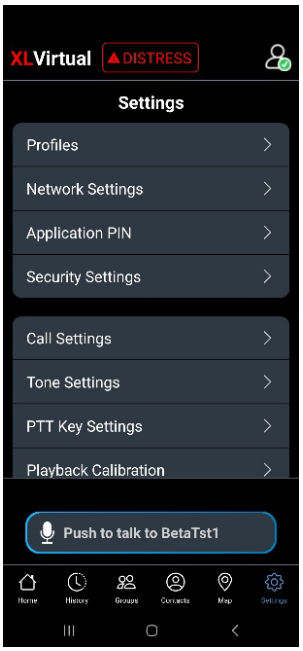
The user has the following options:

- **Call History**: Views message history of this contact.
- **Text**: Sends a text message to the selected contact.
- **Map**: Displays the contact's location on the map.
- **Refresh Presence**: Retrieves the current presence state of the contact. The presence icon, displayed to the left of the first name, is updated according to the presence state.

Figure 4-13: Contacts Context Menu

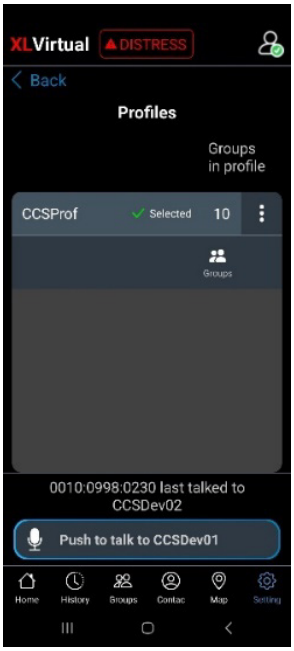
4.7.8 Settings

From the XL Virtual app bar, select **Setting** to access the Settings Menu.

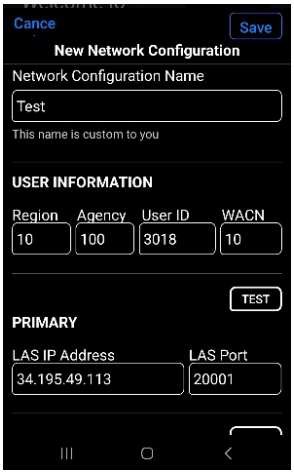


4.7.8.1 Profiles

View available profiles from the **Profiles** tab. Every XL Virtual subscriber has a personality which can contain up to 16 profiles. Profiles allow the XL Virtual subscriber to quickly change the organization associations of the device for different roles, activities, or regional communications. Each profile can contain up to 16 groups. When a profile becomes the 'active' profile, the device scans all groups contained in that profile. A check mark indicates the 'active' profile. Only one profile is active at a time. Click on the three vertical dots and select the **Groups** icon to see the number of different groups within that respective profile.



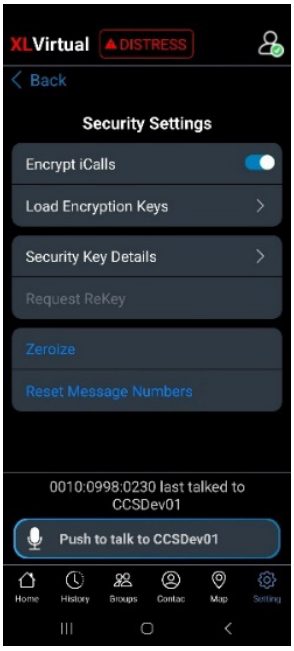
4.7.8.2 Network Settings



In network settings, once logged into the XL Virtual app, a user can see their subsequent User ID, WACN, and their primary and secondary LAS address and port configuration. To change this information, log out of the XL Virtual application and configure network settings in the login screen. Press **Save** to save changes or **Cancel** to exit.

Users can also enable “Auto Sign In” within the network settings. To enable this feature, ensure “Save Password” is enabled on the login screen. Then, navigate to “Network Settings” within the “Settings” tab and select ‘Auto Sign In.” Upon relaunching the application, the user is automatically signed in.

4.7.8.3 Security Settings



- Encrypt iCalls:

  An iCall is a call made to an individual user. Toggling this setting encrypts/unencrypts iCalls. This is subject to encryption keys being loaded onto the device.

- Load Encryption Keys:

  Load encryption keys to your device so that your device can encrypt communications based on that known key. To load keys, press this button and import the desired keys from your files.

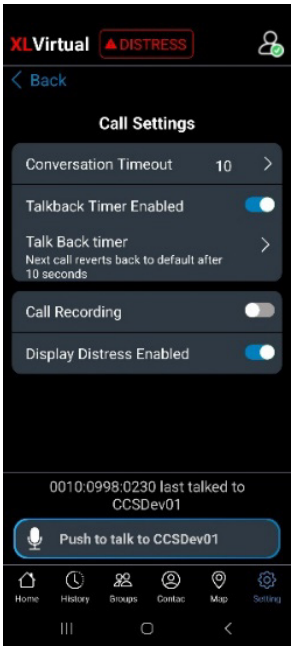
- Security Key Details:

  Displays OTAR Enabled status, KMF Status, provisioned Storage Location Number (SLN) bindings and key presence.

  - OTAR Enabled:
    - Yes: RSI from the UAS matches the RSI included in the ukek file.
    - No: RSIs do not match (could be an RSI=0 problem; do a force update).
  - KMF Status:
    - Configured: KMF IP address is present.
    - Not Configured: App does not have KMF IP address.
    - Registered: KMF has completed the registration process with client.
    - Unregistered: Client has not registered with the KMF.

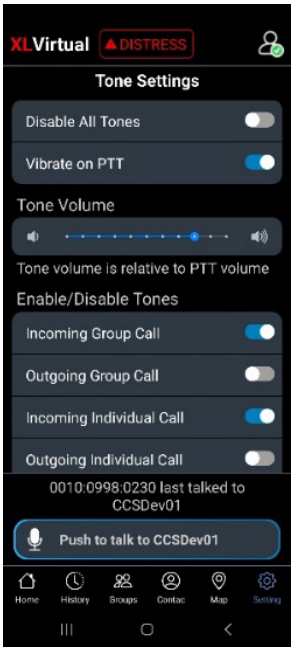
- Zeroize: Removes encryption keys from the device.
- Reset Message Numbers

4.7.8.4 Call Settings



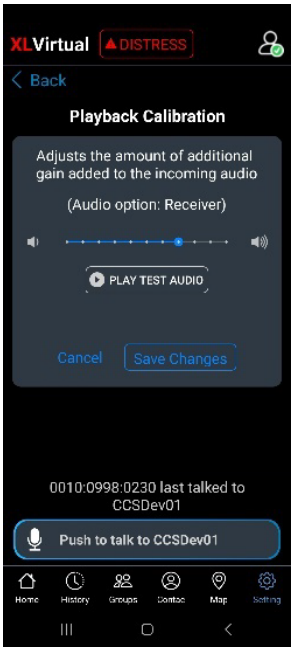
- Conversation Timeout - Group and individual calls are consolidated into conversation entries in the **History** tab based on this value. Calls made after this time expires are not grouped in the conversation, but instead cause another event entry to be created. To change the conversation time out time, tap the **Conversation Timeout** button and enter your desired value. Range: 1 to 86400 seconds; Default: 10.
- Turn on Talk Back timer - When checked, after receiving a call, the caller (Individual or Group) is temporarily assigned as the Next Call for the number of seconds entered in the Talk Back Timer field (a timer counts down in the lower left of the screen). This allows the user to return the call within that time. The Talk Back timer will not show the countdown if the Next Call already displays the same group/user as the incoming call.
- Talk Back Timer - Duration in seconds of the Talk Back timer (see previous setting). Default is 10 seconds, and acceptable values are 1 to 30. When the “Turn on Talk Back timer” setting is unchecked, this setting is disabled.
- Call Recording - When enabled, recording of calls is disabled.
- Display Distress Enabled - When enabled, confirmation is displayed when a distress is initiated.

4.7.8.5 Tone Settings



- Disable All Tones - When enabled, all tones are disabled. Default: Disabled.
- Vibrate on PTT - Enable or disable vibration on PTT.
- Tone Volume - Move the slider to adjust Tone Volume.
- Tone Settings - Enable/disable the following tones and adjust tone volume.
  - Incoming Group Call
  - Outgoing Group Call
  - Incoming Individual Call
  - Outgoing Individual Call
  - Incoming Text
  - Distress Started
  - Call Queued
  - Call Denied
  - Call Proceed
  - Call Failed
  - Encryption Failed Warning

4.7.8.6 Playback Calibration

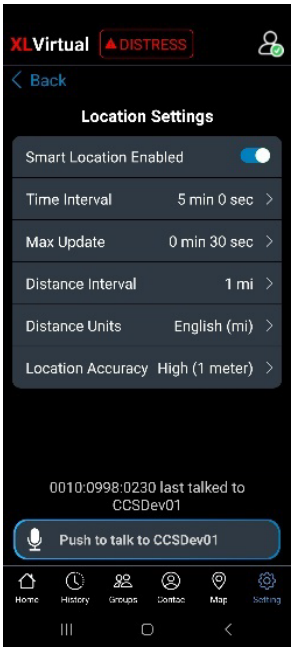


Playback Calibration – Displays a screen allowing the user to adjust the phone speaker volume gain for incoming audio. Tap **Play Test Audio** and adjust the slider to adjust the volume of the audio as it is being played. This setting affects the volume of all incoming PTT calls. Tap **Save Changes** to save the setting or reset to avoid changing the setting after having adjusted it.

4.7.8.7 Remote Speaker Button

Allows access to the PTT microphone with the XL Virtual app running in the background.

4.7.8.8 Location Settings



Smart Location is disabled by default. If enabled, you can customize the following settings:

- Time interval - Specify the time interval at which the subscriber device will update its location. Range: 10 seconds to 1 hour in second intervals. Default: 5 minutes.
- Max update frequency - Range: 1 sec to 1 hour in second increments. Default: 30 seconds.
- Distance Interval - Specify the distance at which to update the location. Default: 1 mile.
- Distance Units - Specify the units (Metric or English) used for “Distance interval.”
- Location Accuracy - Determines how accurate the location reading is. Options include: High (1 meter), Medium (100 meters) - default, Low (10 kilometers), and Off. When **Off** is selected, the XL Virtual application will not ask Android for location updates, but location updates may be given to the XL Virtual application if other apps are expressing an interest in location.

The “High (1 meter)” option allows for very accurate location but consumes a large amount of battery power. The “Medium (100 meters)” option is relatively accurate but consumes a smaller amount of battery to function. The “Low (10 kilometers)” option consumes the least battery power.

4.7.8.9 Logging Settings

Log Level – Choose between the different UI logging settings:

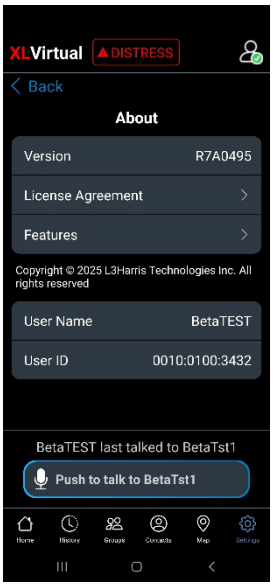
- None
- Trace
- Debug
- Info
- Warning
- Error

4.7.8.10 Send Logs

Exports the logs to be taken out of the app and diagnosed by the L3Harris team.

4.7.8.11 About

- Version – The current build version of the XL Virtual app.
- License Agreement – Displays the End User License Agreement.
- Features – The features that your app is configured with.
- Username – The username configured to your XL Virtual User ID
- User ID – The configuration string that connects you to the LAS.



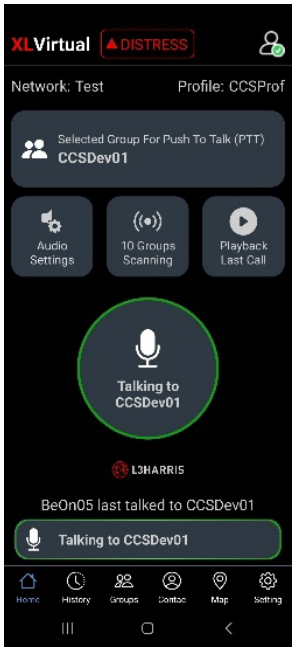
4.8 USING THE SOFTWARE

4.8.1 Group Calls

4.8.1.1 Transmit to a Group

Select a call record from the History tab (Section 4.7.5), or select a group from the Groups tab (Section 4.7.3). The last selected Group or Contact name always appears in the Status bar (see Figure 4-3).

1. Press PTT and begin speaking. The PTT button is in the center of the Home Display and at the bottom of the screen. When transmitting, the PTT button and Status bar are green.



2. When finished transmitting, release the PTT.

4.8.1.2 Incoming Group Calls

During an incoming group call, the Status bar is orange and displays the Caller ID. After the talk spurt ends, the call log is updated. The Status window is cleared after approximately two seconds.

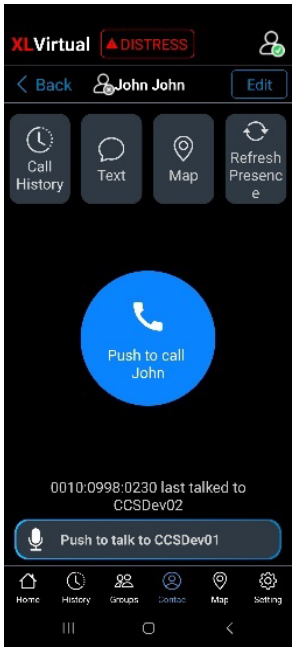
If the Talkback Timer is enabled in the Settings menu (Section 4.7.8) and a call is initiated on a scanned group, not your default group, the group's name is displayed as the next call with a timer counting down. Press the PTT button before the timer expires to respond to the group. When the timer expires, the Next Call displayed returns to the default group.

4.8.2 Individual Calls

4.8.2.1 Transmit to an Individual

Pre-Stored or Received Individual Calls

1. Select the contact from the **History** tab or select the **Contacts** tab.
2. Tap a contact from the list to make it the next call.
3. Press PTT to initiate the call. Call information is displayed in the Status window.



4.8.2.2 Incoming Individual Calls

During an incoming individual call, the status bar is green and displays the Caller Alias and/or VIDA ID depending on what information is currently available.

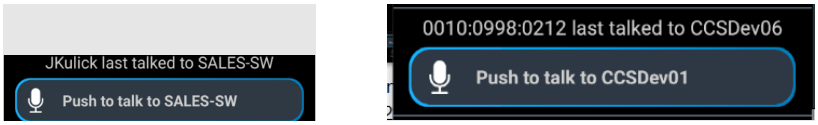


Figure 4-14: Incoming Individual Call

Group and individual calls are consolidated into conversation entries in the **History → Calls** tab based on the **Conversation Timeout** value in **Call Settings** (Section 4.7.8). If any call is either placed or received and its source (group or individual) matches the last call placed or received, the previous and current calls are placed into a conversation and the conversation entry is displayed in the **History** tab (see Section 4.7.5).

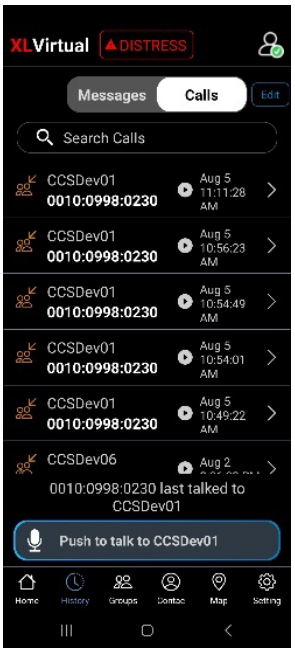
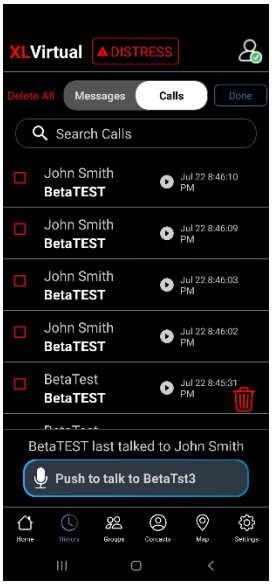


Figure 4-15: Conversations

Tap ▶ to play the entire conversation. A tone is heard between each call (refer to Section 4.5). Once playback of a conversation has begun, tap ■ to stop playback for that conversation. The individual calls in the conversation can be viewed by tapping the conversation entry in the **History** tab. The usual group and contact menus are available in the context menu, based on the source and destination of the conversation. Tap **Edit**, select conversations to delete and all the calls associated with it, and then tap **Done**.

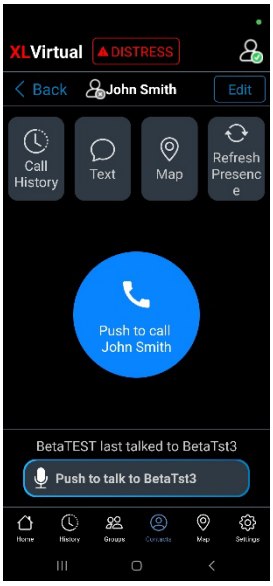


4.8.3 Sending a Text Message

1. From the **Contacts** tab or the Group Members screen, tap the three dots next to the member's name to open the context menu. Tap the **Text** icon.

   Or

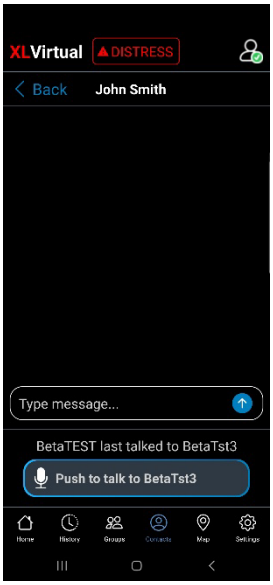
   From the **Groups** menu, tap the three vertical dots and press the text message button.



2. Enter a message, up to 214 characters, and tap **Send Text**.

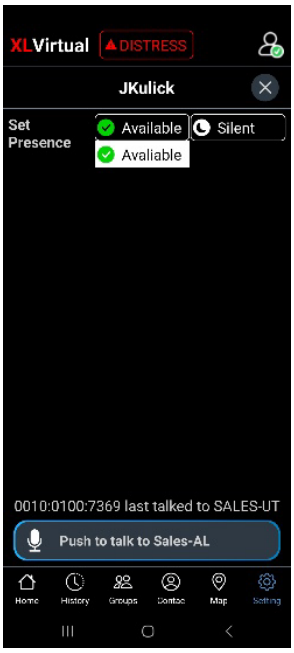
   Depending on system configuration, the following Report Type options may be available when sending a group text:

   - None - No receipt required.
   - One recipient - The originator receives a receipt if at least one target device receives the message.
   - Count recipients - The originating device receives a count of the acknowledgements received from the receiving devices until a timeout.



4.8.4 Presence

User and group presence services support the transmission of the status of users and groups to interested users.



Perform the following to set your presence options:

1. Tap the Presence icon (e.g.,).
2. Select the desired option:
   - **Available** - The XL Virtual user is registered in the system.
   - **Silent** - Indicates that the provider is not presently listening to PTT calls. The XL Virtual client records incoming calls during the Silent/Vibrate state but plays neither received audio nor floor control tones.

   Agency specific states can also be set up by the System Administrator (for example, “In Transit” or “Out to Lunch”).

4.8.5 Scanning

When a profile becomes ‘active,’ the device is scanning all the groups contained in that profile. Only one profile is active at a time. Refer to Section 4.7.8.1 for more information on profiles.

4.8.5.1 Scanning Priority

When scanning is enabled, a higher priority incoming call overrides the receive audio of a lower priority incoming call.

The following lists the scan priority order from highest to lowest:

1. Distress call
2. Individual call
3. Priority 1 (P1) call
4. Priority 2 (P2) call
5. Priority 3 (P3) call

4.8.5.2 Disable Scanning

When the scanning feature is disabled, only the selected group is monitored by the XL Virtual application. To disable scanning, select **Disable Scanning** from the application context menu while displaying the **Groups** tab.

4.8.5.3 Enable Scanning

When scanning is enabled, all groups in the currently active profile are monitored by the XL Virtual application. To enable scanning, select **Enable Scanning** from the application context menu while displaying the Groups tab.

4.8.6 Distress

Distress behavior is defined by the currently active profile. The following distress behaviors are supported:

- None.
- Distress alert only. The user must clear the alert.
  - There is no group state, only an individual state.
  - The declaring user can clear the individual distress state.
  - A console user can clear the individual state at the VNIC, but not the user's local state.
- Distress alert *and* distress call on the default distress talk group. Tapping **Cancel Distress** clears both. The user must clear the alert locally.
  - The declaring user or console can clear the individual distress state on the network.
  - Only the declaring user can clear the local state.
  - An authorized entity such as a console, supervisor, or network management system can clear the group distress.
  - Declaring users who are authorized to clear group distresses can clear both the individual and group distress.

- Distress alert *and* distress call on the selected talk group. Tapping **Cancel Distress** clears both. The user must clear the alert locally.
  - The declaring user or console can clear the individual distress state on the network.
  - Only the declaring user can clear the local state.
  - An authorized entity such as a console, supervisor, or network management system can clear the group distress.
  - Declaring users who are authorized to clear group distresses can clear both the individual and group distress.
- Distress call on the default distress talk group. Tapping **Cancel Distress** clears the group distress.
  - An authorized entity such as a console, supervisor, or network management system can clear the group distress.
  - Declaring users who are authorized to clear group distresses can clear the group distress.
- Distress call on the selected talk group. Tapping **Cancel Distress** clears the group distress.
  - An authorized entity such as a console, supervisor, or network management system can clear the group distress.
  - Declaring users who are authorized to clear group distresses can clear the group distress.

4.8.7 Initiating a Distress

1. Press 

.
2. Confirm the distress at the prompt. The distress is initiated on the distress group which may be different than your currently selected group.
3. The Status bar is red during a distress. If the auto-key feature is enabled, an automatic PTT occurs for a configurable length of time following the initiation of a distress on a group. Pressing PTT during this time interrupts the auto-key timer.

Depending on the distress behavior defined by the system administrator, you may not be able to change the next call, profile, or scanning until the distress is cleared.

4.8.8 Clearing a Distress

Only a supervisor can clear a distress for a group. Non-supervisors can only clear a distress for themselves.

1. Tap the distress indication in the Status Bar of the display.
2. Tap **Cancel Distress** to clear the distress for yourself and/or for the group in distress (if you have supervisor privileges). If you are not the supervisor, you can only clear the distress for yourself.

4.9 ENCRYPTION

4.9.1 Voice Encryption

4.9.1.1 Overview

XL Virtual supports P25 encrypted communication using 256-bit Advanced Encryption Standard (AES). Encryption keys are loaded manually or by using Over-the-Air-Rekeying (OTAR) methods. Data Encryption Standard (DES) is not currently supported by XL Virtual. Encryption options are available under **Settings→ Security Settings**. See Section 4.7.8. Refer to Appendix B for information on configuring and enabling voice encryption for a XL Virtual user. Also, refer to the following documentation as required:

MANUAL NUMBER	DESCRIPTION
MM-008069-001	OTAR Overview Manual
MM-008070-001	Network Key Manager Installation and Configuration Manual
MM-008068-001	Unified Administration System (UAS) Key Management Application Manual
MM1000019423	Key Manager Key Admin Overview and Operation Manual
MM1000019424	Key Manager Key Loader Overview and Operation Manual

4.9.1.2 Configuring System for Encryption

The following are necessary for encrypted voice communication on XL Virtual devices:

- The key number in L3Harris Key Manager must match the Storage Location Number (SLN) binding number for the Crypto Net.
- The Key ID in L3Harris Key Manager must match the active key ID in the Unified Administration System (UAS).
- The XL Virtual user must be added to the Crypto Net.
- Groups must be added to L3Harris Key Manager (for that key ID) and the Crypto Net in the UAS.

4.9.1.3 Group and Crypto Net Administration

The “Delete Key” operation on an End User in the “Manage Crypto Nets” section of the UAS is not currently supported in XL Virtual. The user must use the “Zeroize” function in Preferences of the XL Virtual client application to remove key material.

In the UAS, define a Crypto Net that contains the users and groups targeted for encrypted communications.

- Users and groups must be added to the Crypto Net to participate in encrypted communications.
- Make a note of Crypto Net SLN and Active Key IDs.
- The SLN binding number must match the key number entered in the Key Admin tool.
- The Active Key ID in the UAS must match the Key ID in the Key Admin tool.

Refer to the *L3Harris UAS Key Management Application Manual* (MM-008068-001) for instructions on how to configure a Crypto Net.

4.9.1.4 Distributed Key File Generation (.dkf)

The L3Harris Key Manager tool allows entry of key information and export of that key information into a distributed key file (.dkf) that can then be added to the XL Virtual application to support encrypted voice communications.

- Groups targeted for encrypted communications must be added to the L3Harris Key Manager to allow for encrypted communications.
- The key number entered in the L3Harris Key Admin tool must match the key SLN binding number entered in the UAS.
- The Key IDs entered in the Key Admin tool must match the SLN binding number chosen in the UAS.
- The Key Admin tool can then be used to generate a .dkf for later import on the XL Virtual phone.

Refer to the *L3Harris Key Manager Key Admin Overview and Operation Manual* (MM1000019423) for more information on how to enter key information and export keys to a .dkf file.

4.9.1.5 OTAR

OTAR operations are supported in the XL Virtual application. Prior to enabling OTAR in XL Virtual, an administrator must follow the instructions above in Section 4.9.1.2.

Once the UAS has provisioned the KMF with group information, crypto net information, and key bindings, the KMF generates a set of Traffic Encryption Keys (TEKs) for each of the crypto nets and for other traffic. The KMF also generates Key Encryption Keys (KEKs) and Unique Key Encryption Keys (UKEKs) for each user. There are two types of encryption files: UKEK and UKEKX. The difference between the two is that UKEKs have no password set and UKEKX has a password set when created via the KMF. After the UKEK is transferred to the XL Virtual device's SD card and the XL Virtual app is launched, there is no popup. When you launch the XL Virtual app with UKEKX, there is a popup screen asking you to enter the password.

An administrator uses the KMF to generate a UKEK file for each user and distributes these files to the appropriate users.

Perform the following to load the UKEK file into the XL Virtual application on the phone:

1. Enable USB storage on the XL Virtual device to allow copying of files between the computer and the XL Virtual device's SD card.
2. Transfer the UKEK file to the XL Virtual device's SD card and disable USB storage mode once the file is confirmed to have been transferred successfully. Refer to your phone's documentation on how to disable USB storage mode, as this mode is adjusted differently from phone model to phone model.
3. Start the XL Virtual application. If a UKEK file is detected in /mnt/sdcard, a list of available key files is displayed. Select the UKEK file.

4. If the UKEK File is password-protected (i.e., *.ukekx), a password entry box appears:

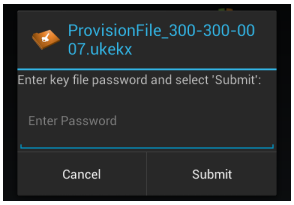


Figure 4-16: Enter Password

5. If the user entered the password correctly, the key(s) are added to the XL Virtual Application database, the key file is erased, and the application displays a message notifying the user of a successful key load. For security reasons, if the password is not entered correctly, the UKEK file is still deleted from the phone and the administrator just transfer the UKEK file to the phone and start back at step 3.
6. After acknowledging the successful key load, the app continues with registration as normal. The XL Virtual application can then participate in OTAR operations.

4.9.2 Airlink Encryption

When configured, this feature encrypts all XL Virtual traffic sent from the client through the transport layer to the XL Virtual LAP. Airlink encryption for XL Virtual systems is implemented as Datalink Transport Layer Security (DTLS). DTLS (1) is an update to TLS (2) for use with UDP/IP. DTLS end points are configured at the handset and access point. The handset negotiates a DTLS connection with its initial assignment server as well as its assigned access point and any concurrent access point it changes to due to handoff or roaming. A public key infrastructure (PKI) is used for authentication of access points and DTLS encryption.

For more information about this feature and how to configure it, refer to the *BeOn Access Point and Assignment Server Installation and Configuration Manual* (14221-7100-3010).

Encrypted Connection:

Once the feature is enabled, and the Android client has registered and the airlink form the client to the LAP is confirmed as encrypted, the user will notice the registration icon with an added ‘lock’ on it.

5. CONTACT LIST MANAGER (CLM)

With the Contact List Manager (CLM) plugin on the UAS server, the full contact list (all end users in the same agency as the individual) can be provisioned to XL Virtual phones automatically. The CLM is a separately deployable package that runs independently of the UAS on the same JBoss J2EE server environment. The CLM retrieves contact information from the UAS database and pushes contact lists to the LAP through a CLM-initiated TLS connection. Refer to the *CLM Software Release Notes*, 14221-7100-8200, for more information.

6. ERROR MESSAGES

This section provides information regarding error messages for the XL Virtual application. For other hardware or software failures, refer to the manufacturer's documentation supplied with your device.

ERROR MESSAGE	SOLUTION
You are not a member of any group	Appears in place of the list in the Groups tab when no profiles and groups have been assigned to a user's personality. See your agency administrator to correct this.
No Next Call	Appears in bottom left of screen when scanning parameters have not been set at startup. Verify that the phone's data connection is established and working.
No Recent Calls	Appears in the call Status Bar when there are no call events in the XL Virtual database.
Scan Parameters update failed	Attempt to inform the VIDA system of current scan parameters failed. Verify that the phone's data connection is established and working.
XL Virtual Application Failed to Start	The XL Virtual application could not initialize its internal components. Attempt to restart the application or contact L3Harris TAC if this problem persists.
Registration timed out	Attempt to register with the system failed. Verify that the phone's data connection is established and working.
Request has timed out	Attempt to inform the VIDA system of current scan parameters failed. Verify that the phone's data connection is established and working.
Registration failed	Attempt to register with the system failed. Verify that the phone's data connection is established and working.
Invalid login credentials	The User identified in the license file is not a valid user in the system. Obtain a correct license from the agency administrator for the user.
You are logged in de-registered	Registration could not be completed during initialization of the application. Verify that the phone's data connection is established and working.
Active profile was not found	The active profile could not be initialized at startup. Contact L3Harris TAC for assistance.
Unstable network connection	Attempt to inform the VIDA system of current scan parameters failed. Verify that the phone's data connection is established and working.
Unread XL Virtual Notification(s)	Appears in the notification window when there are unprocessed XL Virtual notifications. Tap the top bar and drag downwards to expose the notifications window on mobile devices. Tap on the XL Virtual notification row to see the pending notifications.
Show group members request timed out	Attempt to get presence status for members of a group failed. Verify that the phone's data connection is established and working.
Text Message Received	Appears when a XL Virtual text message is received by another user. Access the text message via the XL Virtual notifications screen or by viewing details of the Text Message event in the Events tab.

ERROR MESSAGE	SOLUTION
Send Failed	A XL Virtual text message could not be sent. Verify that the phone's data connection is established and working.
UE Not Registered	A XL Virtual text message could not be sent because the sender is not registered on the system. Verify that the phone's data connection is established and working.
Dest Not Registered	A XL Virtual text message could not be sent because the recipient is not registered on the system. Verify that the phone's data connection is established and working.
Connection Error	The VNIC could not be reached. Contact L3Harris TAC for assistance.
There are no distresses at the present time	Displayed in the Distress Status screen when the user and no groups are currently in distress state.
No external storage found. Please make sure external storage is mounted	Displayed when the XL Virtual application no longer detects the presence of an SD card. XL Virtual will shut down after confirmation of this message. XL Virtual cannot run without an SD card present in the device.
Location Request Failed	Attempt to get location from another user failed. Target user may not have GPS enabled on their device or was unreachable at the time of the request.
<group> was placed in Distress state at <time>	Displayed in the notification details when a group is placed into distress state. <group> is the name of the group, and <time> is the time at which the distress was started.
Distress state for <group> was cleared at <time>	Displayed in the notification details when a group's distress state is cleared. <group> is the name of the group, and <time> is the time at which the distress was started.
A number between <min> and <max> is required. Setting value to <default>	Displayed while modifying a value in the Preference screen when the value exceeds the allowable range. <min> is the minimum value, <max> is the maximum value, and <default> is the default value that gets applied after the message is confirmed.
Unable to retrieve presence state for	Attempt to get presence from another user failed. Target user may not exist in the presence database of the VNIC or was unreachable at the time of the request.
Unsupported action: the group you selected is not in your current scan parameters	Chosen group cannot become the next call because it does not exist in the current scanning parameter set. A profile containing the chosen group must be selected as the active profile prior to making the chosen group the next call.
RSI Mismatch: Please contact your crypto officer	The Radio Set Identifier (RSI) that the UE received from the UKEK load (via manual load or OTAR) is out of sync with the RSI that the UAS believes that the unit possesses. Contact the crypto officer to correct the key load.

7. CUSTOMER SERVICE

7.1 CUSTOMER CARE

If any part of the system equipment is damaged on arrival, contact the shipper to conduct an inspection and prepare a damage report. Save the shipping container and all packing materials until the inspection and the damage report are completed. In addition, contact the Customer Care center to arrange for replacement equipment. Do not return any part of the shipment until you receive detailed instructions from an L3Harris representative.

Contact the Customer Care center at https://www.l3harris.com/all-capabilities/pspc-customer-care or:

North America:

Phone Number:	1-800-368-3277
Fax Number:	1-321-409-4393
E-mail:	PSPC_CustomerFocus@l3harris.com

International:

Phone Number:	1-434-385-2857
Fax Number:	1-321-409-4394
E-mail:	PSPC_InternationalCustomerFocus@l3harris.com

7.2 TECHNICAL ASSISTANCE

The Technical Assistance Center's (TAC) resources are available to help with overall system operation, maintenance, upgrades, and product support. TAC is the point of contact when answers are needed to technical questions.

Product specialists, with detailed knowledge of product operation, maintenance, and repair provide technical support via a toll-free (in North America) telephone number. Support is also available through mail, fax, and e-mail.

For more information about technical assistance services, contact your sales representative, or contact the Technical Assistance Center directly at:

North America:	1-800-528-7711
International:	1-434-385-2400
Fax:	1-434-455-6712
E-mail:	PSPC_tac@l3harris.com

7.3 TECH-LINK

For more information about this and other L3Harris PSPC products, visit our Tech-Link service at https://premier.pspc.harris.com/. Tech-Link provides access to Technical Documentation (downloadable PDFs), Software Revisions, Feature Encryption, pictorials of parts and accessories, and other information pertaining to our products.

APPENDIX A OPTIMIZING BATTERY LIFE

The amount of power used by the device depends on the device type, the state of the battery, the other applications in use, and the amount of time sending and receiving communication over XL Virtual.

The following list provides guidelines for improving battery life while using XL Virtual:

- **Screen**

  The number one consumer of battery life is the screen. It does not matter what application is running or even if you are on the OS home screen. Having the screen on significantly reduces your battery life.

  Most smartphones can be set to reduce the brightness of the screen. This can extend the battery life significantly. Most smartphones allow you to change the background color. Changing it to a dark color is best, black is optimal.

  Using an XL Virtual device with a PTT accessory and leaving the screen off is the best option.

- **Wi-Fi Use**

  XL Virtual requires a data connection - either cellular or Wi-Fi. Most smartphones allow both to operate simultaneously. If you turn off Wi-Fi, XL Virtual will connect over cellular. Turning off Wi-Fi prevents the phone from using Wi-Fi reception and thus increases battery life.

- **Closing Other Applications**

  Using XL Virtual while all other applications are closed will optimize battery life by preventing those applications from consuming battery power. Media playback applications such as MP3 players and games will consume battery power quickly.

- **GPS**

  Using location services consumes a lot of power. On Android, XL Virtual uses 25% more power with Location Services turned on. Many phones allow location services to use GPS satellites, Wireless network, or both.

  Disabling the GPS satellites for locations services can significantly extend the battery life of the XL Virtual device when "Share Location" is enabled. On the XL Virtual device, press the **Settings** button and clear the **Share Location** option.

  If disabling GPS is not an option, decreasing the frequency of updates will also extend the battery life to some extent.

- **Android GPS Controls**

  Press the **Settings** button and then tap **Location Services**. From here you can turn off several GPS options. Android devices may vary. Consult the documentation provided with your device.

APPENDIX B VOICE ENCRYPTION IN XL VIRTUAL

This section describes the process needed to configure and enable voice encryption for a XL Virtual user.

B.1 PREREQUISITES

The following prerequisites are required to ensure the tools and system elements needed to configure and enable voice encryption for a XL Virtual user are present and available:

- The UAS and KMF are installed and configured.
- In the UAS, ensure the Key ID Ranges are defined under Region scope for System Admin.

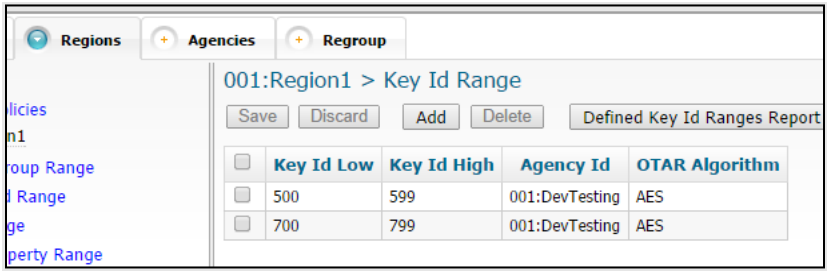


Figure B-1: Key ID Range Settings in UAS

- The Region, Agency, talk groups, and users are configured in the UAS administration section.
- Enable Part 1025 in the KMF (refer to the KMF release notes, MS-008859-001).
- Install the XL Virtual client application(s).

B.2 UAS CONFIGURATION

B.2.1 Agency Administration

Each end user in the administration system must have its “Enable P25 AES OTAR” setting set to “true.”

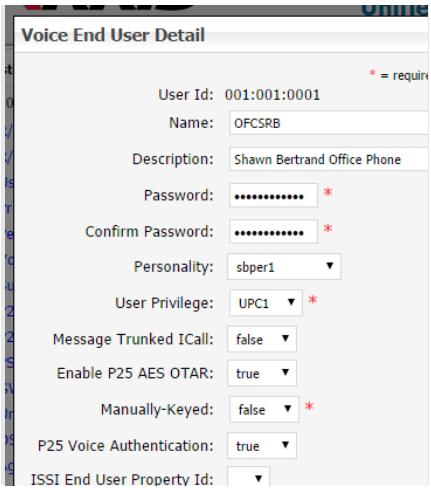


Figure B-2: Voice End User Settings in UAS

If a subscriber unit has not been created for each XL Virtual user, create one and make sure the Protocol Type is “XL Virtual” (see Figure B-3).

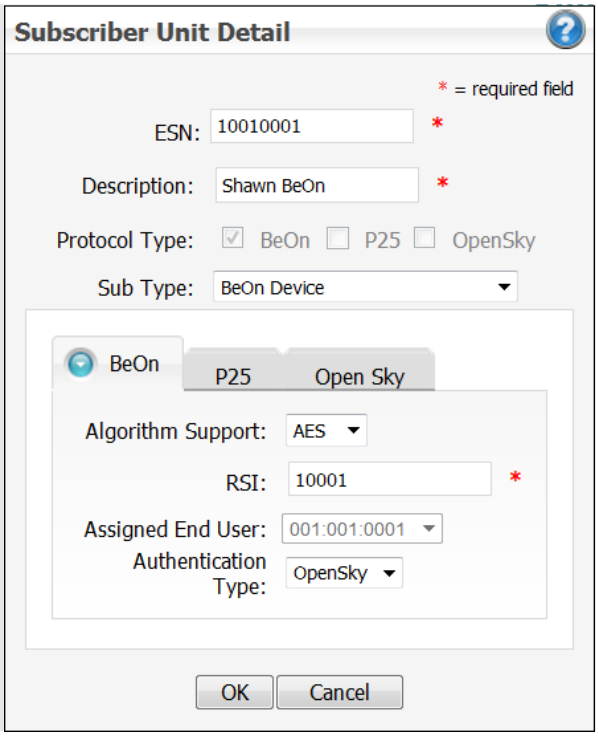


Figure B-3: Subscriber Unit Settings in UAS

B.2.2 Crypto Officer Administration

1. Access the UAS as the Crypto Officer Administrator (COA) user and create a crypto officer:

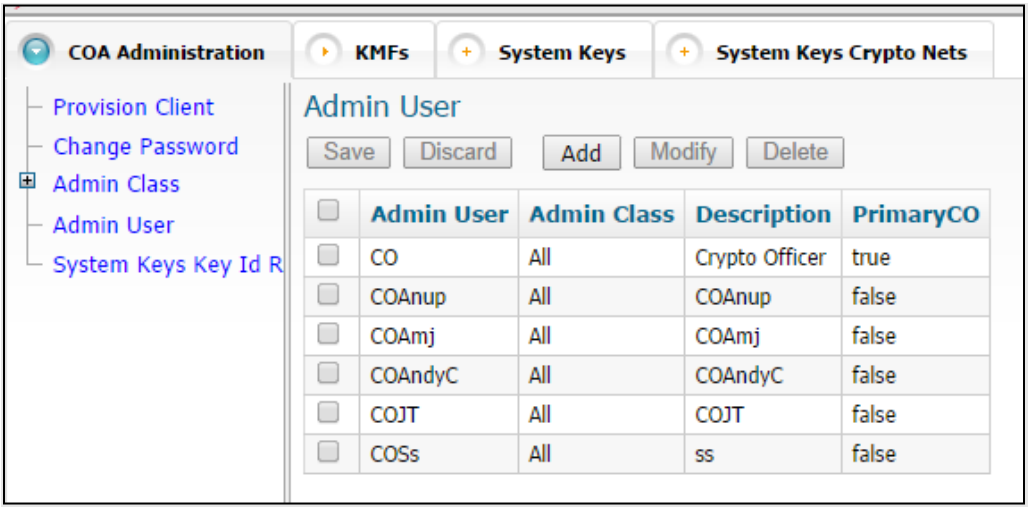


Figure B-4: Crypto Officer Settings in UAS

2. Next, create a KMF entry under the “KMFs” tab:

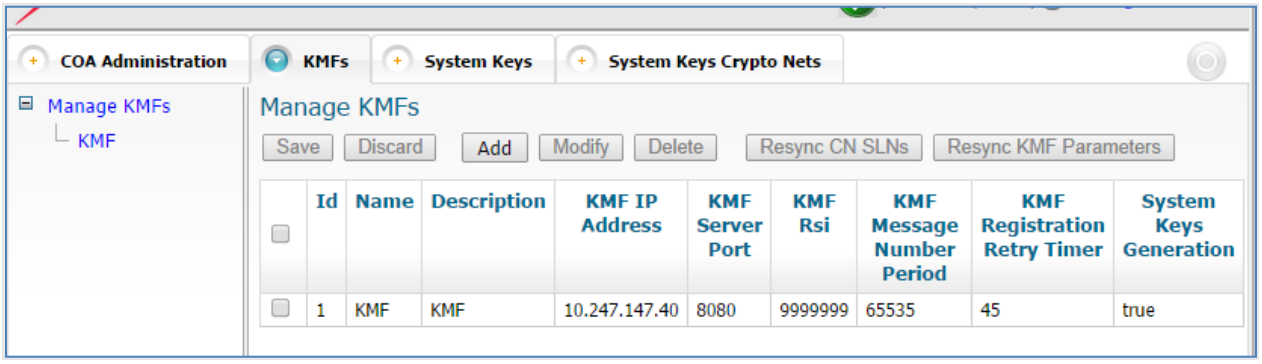


Figure B-5: KMF Settings in UAS

3. Add your agency(ies) to the Admin Class in use by the newly created Crypto Officer (CO) to enable the CO to create crypto nets in which to add your XL Virtual Users:

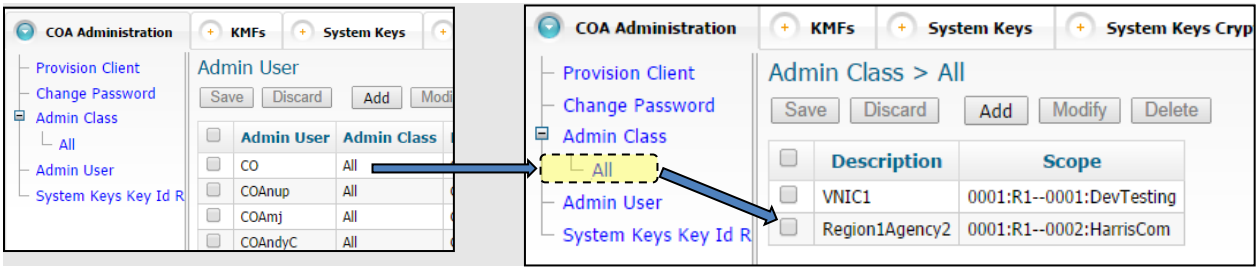


Figure B-6: Admin Class Settings for Crypto Officer in UAS

4. Add the CO to the KMF created in Step 2:

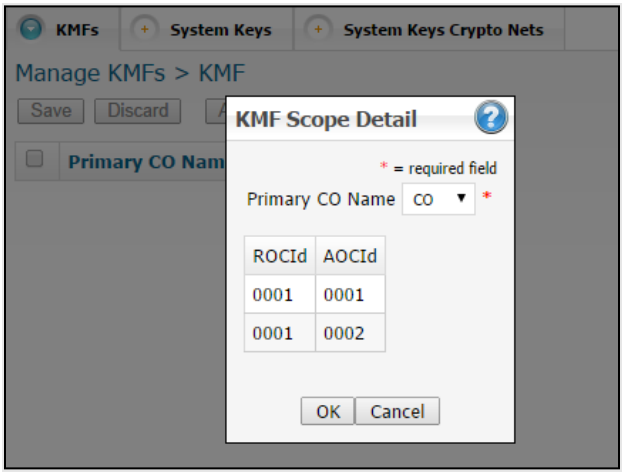


Figure B-7: KMF Settings in UAS

5. Create crypto nets for end users and talk groups, utilizing the Key ID ranges added when you configured your agency:

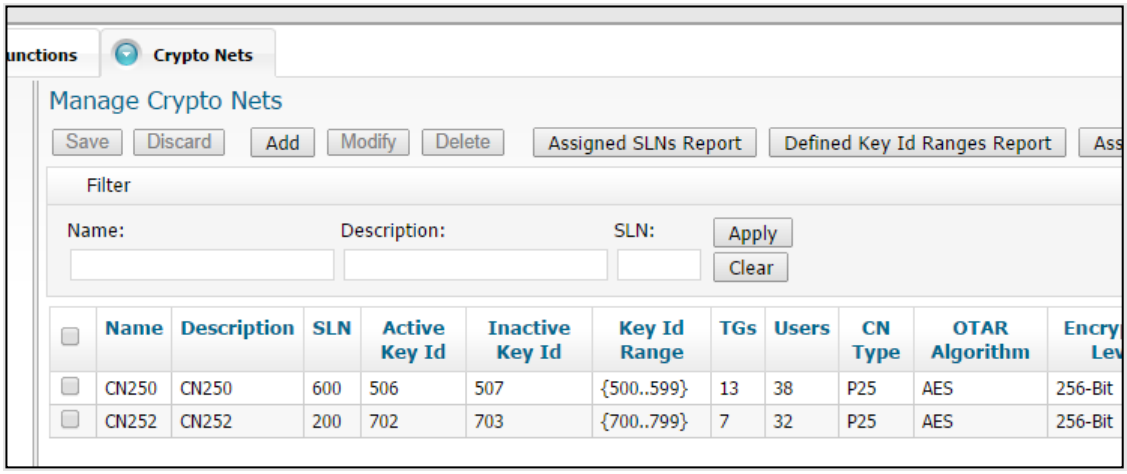


Figure B-8: Crypto Net Settings in UAS

6. With the crypto net created, add your talk groups and end users to the crypto net:

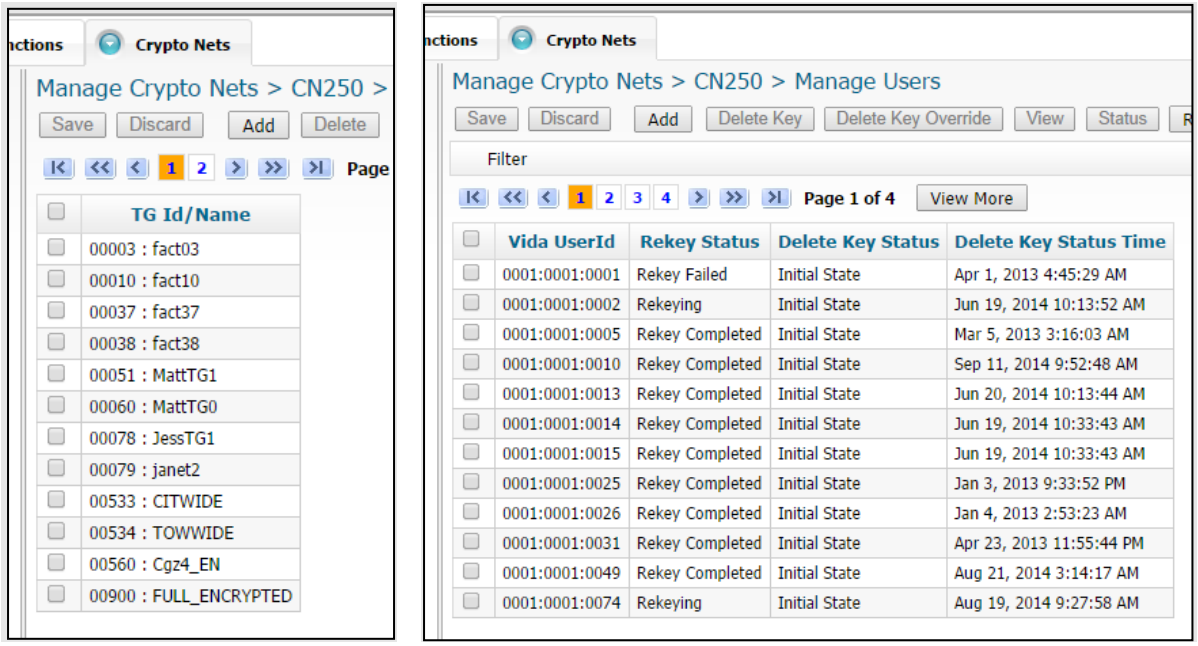


Figure B-9: Talk Group and End User Settings in a Crypto Net

7. Configuration of the data elements needed for voice encryption on the administration side is now complete. Issue a “Warm Start” on the users configured for voice encryption:

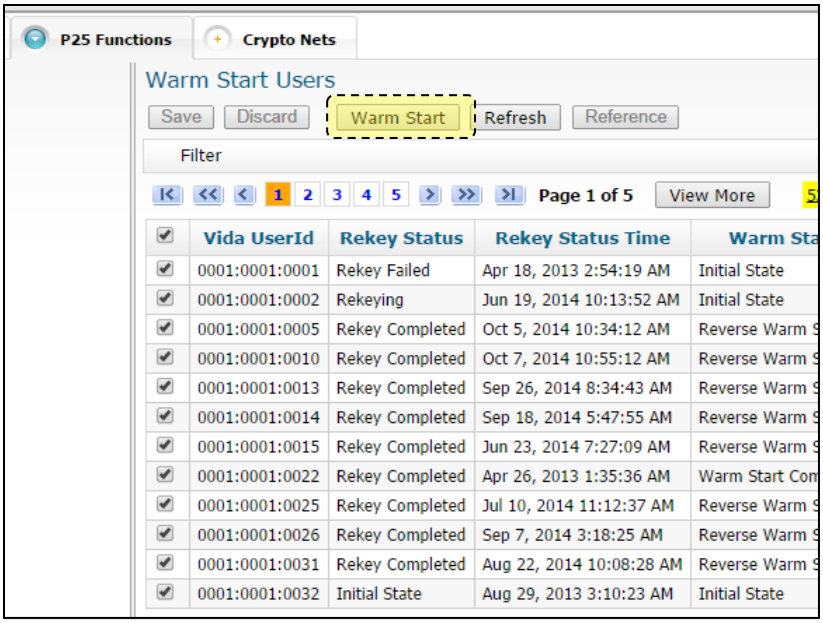


Figure B-10: Warm Start Operation in UAS

The configuration and setup in the UAS are now complete. The following steps involve the Key Management Facility (KMF) – specifically the Network KMF Management Console – and the XL Virtual clients.

B.3 KMF CONFIGURATION

1. Start the Network KMF Management Console application on the KMF server, and check the Event Log to make sure there are no errors:

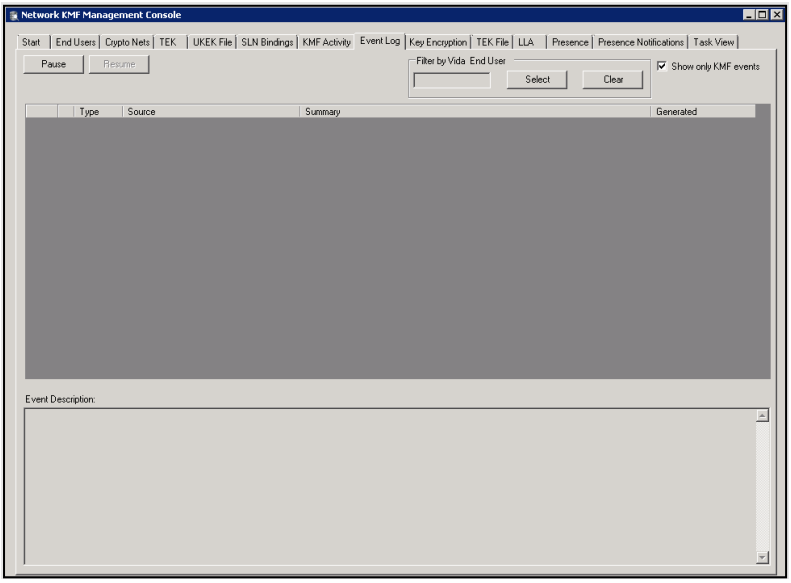


Figure B-11: Event Log in Network KMF Management Console

2. Check the Task View tab to make sure the warm start process is complete:

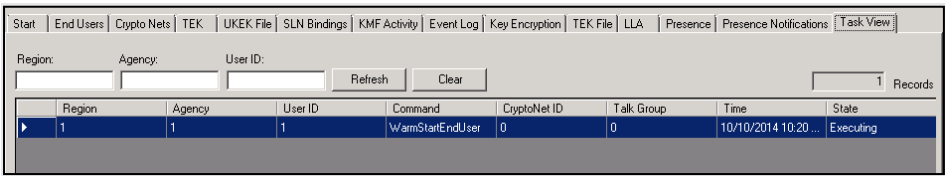


Figure B-12: Task View Tab in Network KMF Management Console

3. On the End User tab, the user(s) that were just warm started should be listed and their respective crypto nets should be listed in the status area below the user list:

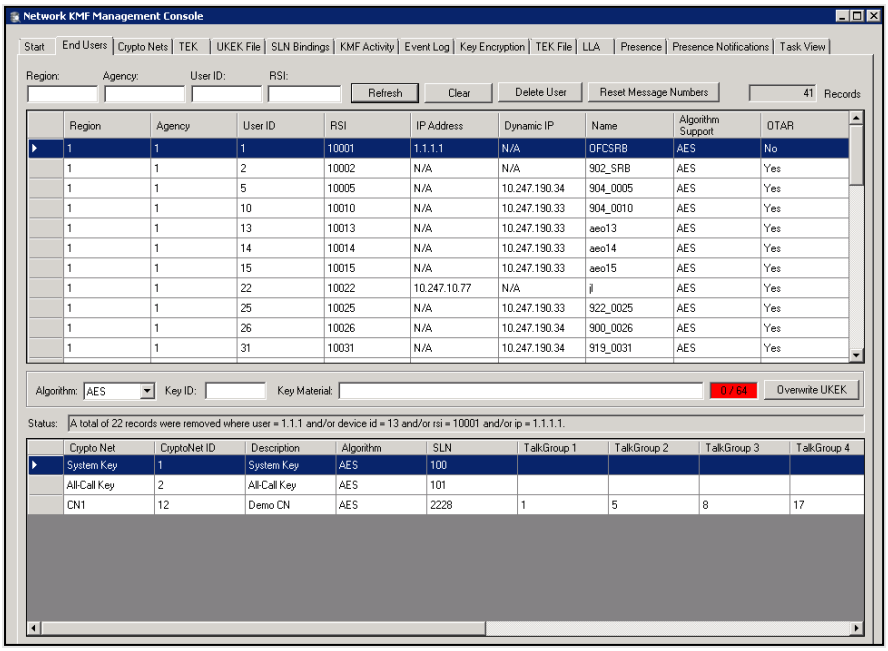


Figure B-13: End Users Tab in Network KMF Management Console

4. Generate a binding report to use later to compare against keys displayed in the XL Virtual app. Do this on the Binding Report tab, as shown below. The report is in XML format.

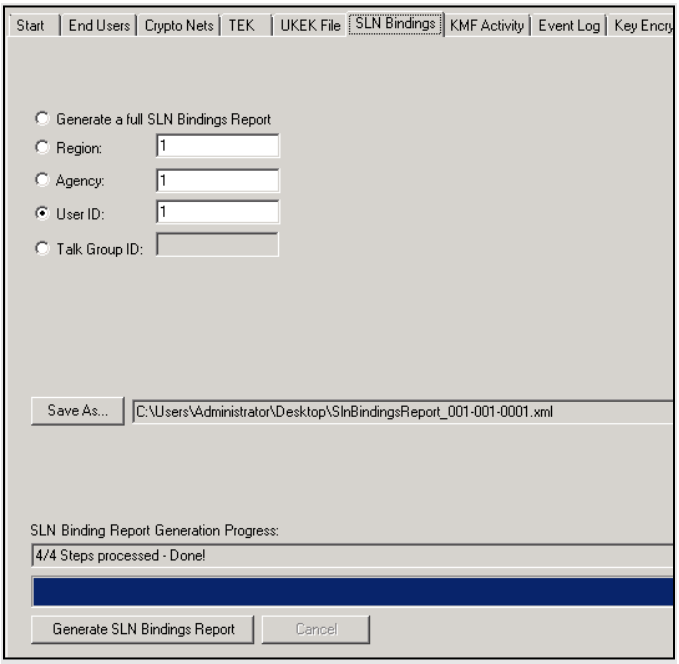


Figure B-14: Binding Report in Network KMF Management Console

5. If you intend to provision key information over the air (OTAR), check that the OTAR column in the End User list is “Yes” for all the users configured for voice encryption:

	Region	Agency	User ID	RSI	IP Address	Dynamic IP	Name	Algorithm Support	OTAR
▶	1	1	1	10001	1.1.1.1	N/A	OFCSRB	AES	Yes

Figure B-15: OTAR Value for End Users in Network KMF Management Console

6. Export the ukek or ukekx file for each end user on the UKEK File tab:

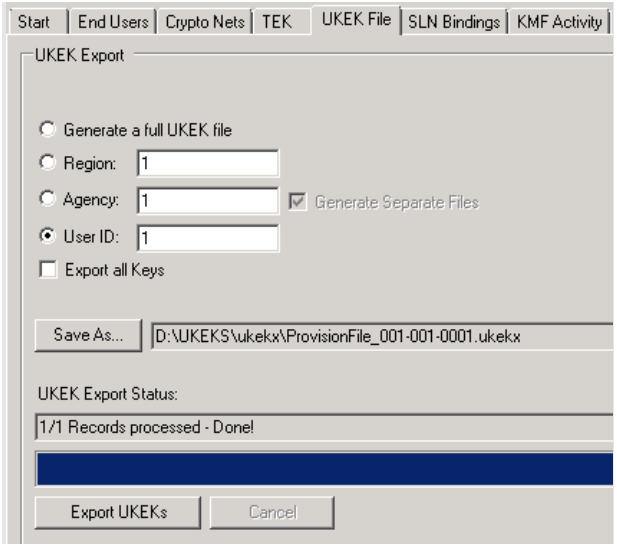


Figure B-16: Exporting UKEK File in Network KMF Management Console

7. With all key files generated for the end users, transfer the files to XL Virtual clients based on instructions found in Section 4.9.
8. Verify that the key file was loaded successfully, and that the XL Virtual client has successfully communicated with the KMF by accessing the Security Key Details screen in the client's Preferences menu.

B.4 TROUBLESHOOTING

If "OTAR Enabled" is "No" or the "KMF Registered" fields are not what you expected, consider these troubleshooting tips:

1. Ping the KMF IP address from the LAP.

   If not reachable, check firewall rules.

2. Warm Start Failed?

   Check "Enable P25 AES OTAR" and "Manually-Keyed" options for the end user under agency administrator; one or the other should be checked, not both.

APPENDIX C ABBREVIATIONS AND ACRONYMS

Table C-1: Abbreviations and Acronyms

Abbreviation	Description
3G	Third Generation Wireless Systems
4G	Fourth generation of the cellular wireless standard
APN	Access Point Name
BCI	XL Virtual Client Installer
COTS	Commercial Off-The-Shelf
DTM	Dual Transmission Mode
EDGE	Enhanced Data Rates for Global Evolution
EULA	End User Licensing Agreement
GPRS	General Packet Radio Services
GSM	Global System for Mobile communication
ISP	Internet Service Provider
LAP	LMR Access Point
LAS	LMR Assignment Server
LMR	Land Mobile Radio
LTE	Long Term Evolution, also known as 4G
MSP	Managed Service Provider
OS	Operating System
PMR	Private (or Professional) Mobile Radio (see LMR)
PTT	Push-To-Talk
SMS	Short Message Service
SPS	Software Provisioning Server
SU	Subscriber Unit (also see UE)
UAS	Unified Administration System
UE	User Equipment
VIDA	Voice, Interoperability, Data, and Access
VNIC	VIDA Network Interconnect (VIDA audio switch)
VoIP	Voice over IP
WCDMA	Wideband Code Division Multiple Access
XML	eXtensible Markup Language

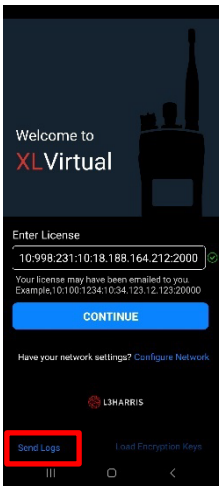
APPENDIX D TROUBLESHOOTING

D.1 LOG FILES

The XL Virtual app on Android, by default, writes a limited amount of information to its log files. The following files are created by the Android app for purposes of further analysis should the need arise:

- XL Virtualptt.log – primary log file
- XL Virtualptt.log.1
- XL Virtualptt.log.2

All log files are stored in the app's private storage area. They can be retrieved and sent via email using the "Send Logs" option:



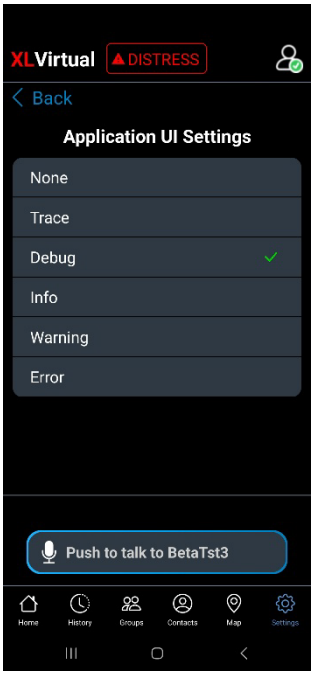
Selecting this option presents the user with various email-based options. The user should add detail to the email as to what was happening when the problem occurred and any other information that would inform the XL Virtual team during their analysis:

The email is sent directly to the XL Virtual team, and in most cases, an L3Harris Technical Assistance Center (TAC) case will be opened to track the issue.

D.2 DEBUG LEVEL

The Android app allows the user to adjust the logging level of various components in the app. Select **Settings → Logging Settings** to access.

For each of these components, the log level can be adjusted. The default is INFO but can be changed to other levels, thereby increasing the amount of output in the log files. For instance, the "CallProcessor" component is related to the processing of all types of PTT calls:



Adjusting the level to "Debug" or "Trace" increases the level of logging for the CallProcessor component. To ensure the right logging is captured for the issue or question at hand, consider adjusting the components based on the associated categories listed below:

CATEGORY	COMPONENTS
App Startup	DataUpgrade DataProcessor DatabaseHandler MainActivity MainApplication TabControl TabControlCommon
Registration/Deregistration	XL VirtualPersonality MobilityProcessor P3000Factory UIXL VirtualEventBroadcaster OutputSubsystem
PTT	CallProcessor P3000Factory UIXL VirtualEventBroadcaster

CATEGORY	COMPONENTS
Distress	CallProcessor EmergencyManager
Encryption	KeyMgmtProcessor KmtLibImpl P1006Factory
Presence/Location	XL VirtualLocation DeviceLocationService LocationUpdater P3000Factory UIXL VirtualEventBroadcaster UserServicesProcessor
Mapping	AbstractMapGenerator GoogleM4BMapGenerator HomeTab MapActivityHelper
Text Messaging	UserServicesProcessor P1014Factory
PTT Audio/Tones	AudioPlayer AudioRecordingThread P25VoiceFormatter

Once you have adjusted the correct components, attempt to reproduce the problem, and use the "Send Logs" option to send the logs.

About L3Harris Technologies

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space, and cyber domains.