



WAVE™ 7000

**HIGH-PERFORMANCE, NETWORK-OPTIMISED
BROADBAND PUSH-TO-TALK**



WAVE™ 7000

Instantaneous, one-to-many communications through Push-To-Talk (PTT) has been a staple of group communications since the invention of two-way radios. Today, push-to-talk is more important than ever, as teams expect to be constantly connected in a mobile world. As the capabilities, capacity and coverage of Long Term Evolution (LTE) networks increase, many customers desire to leverage broadband networks to enhance and optimise their group communications services. WAVE 7000 provides a high-performance PTT platform that can be linked to a private or public LTE network and Land Mobile Radio (LMR) networks so that users can communicate across any network on any device.

OVERVIEW

Whether on a consumer smartphone, a ruggedised device or a two-way radio, WAVE 7000 offers a secure, optimised PTT experience. Because WAVE 7000 can be integrated at the network level today, it provides unrivaled reliability, sub-second call performance and crisp voice quality. WAVE 7000 is designed with a roadmap to meet 3GPP Release 13 standards called "Mission Critical PTT" for high-availability PTT over LTE.

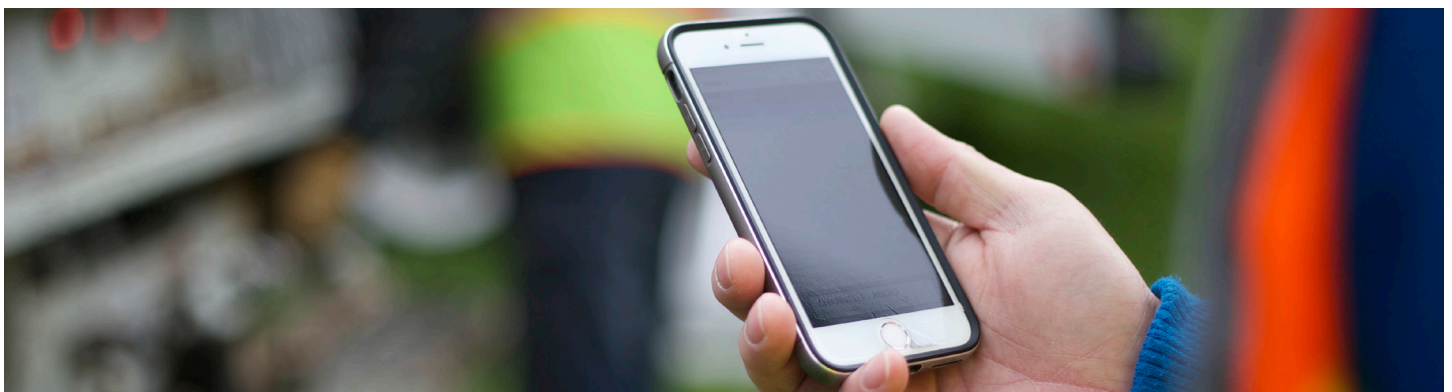
SCALE WITH EASE

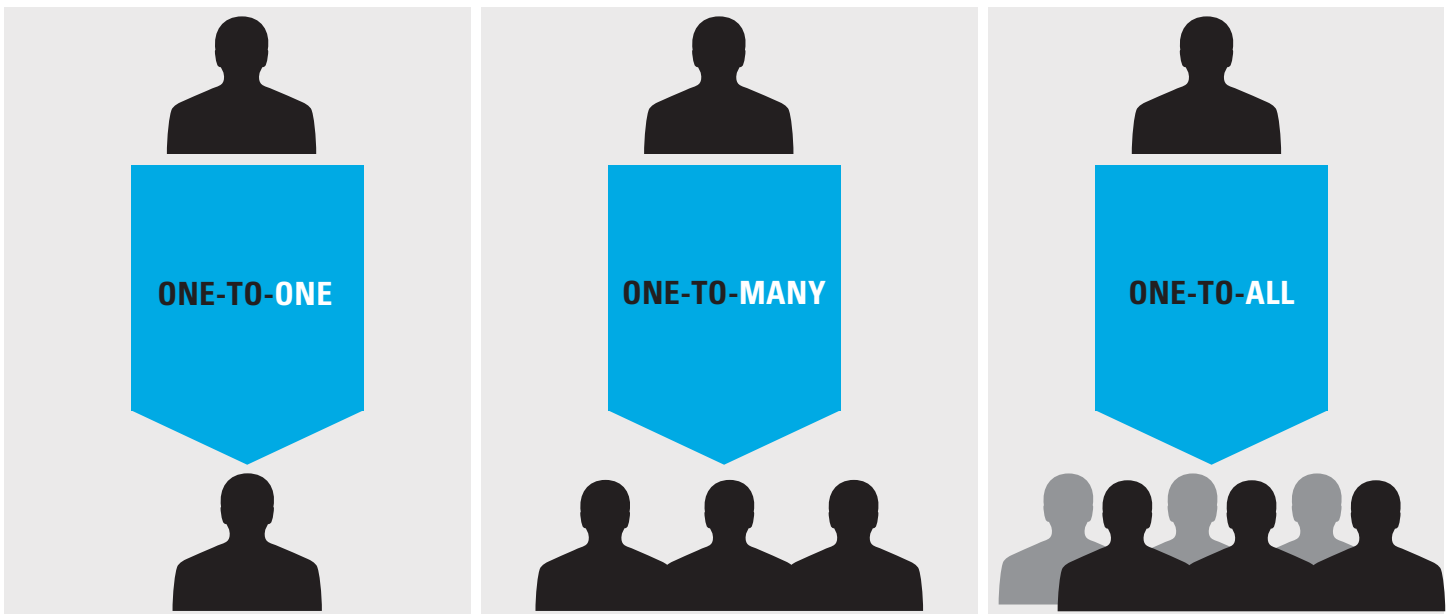
WAVE 7000 offers a high-capacity PTT solution that supports hundreds of thousands of users on a single server instance. With server clustering, you can easily add millions of PTT users, supporting even the largest of deployments.



REDUNDANCY

WAVE 7000 is built on a fully redundant, high-availability, architecture. Local redundancy provides an additional server within the same location as your primary server, ensuring that even if your hardware fails, WAVE does not. Geo-redundancy provides additional servers in separate geographic regions, protecting your network against catastrophic events.





HIGHLY SCALABLE TALKGROUPS

- Add thousands of users to talkgroups
- Assign users from across multiple user organisations to a talkgroup
- Provision priority levels across talkgroups (e.g., a broadcast talkgroup would have higher priority than a regular talkgroup)

FLEXIBLE CALL TYPES

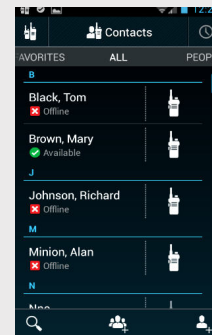
- Group calls
- Personal group calls
- Ad-hoc group calls
- Private calls
- "Polite" private calls
- Broadcast calls

MAPPING WITH REAL TIME AWARENESS

- At a glance, know the location and presence of your team, whether they are carrying a radio or a smartphone
- Reduce map clutter and distraction by selecting layers of data to see different work teams or resources
- Message, PTT or call individuals or groups based on their location
- Instantly create geo-fenced groups for PTT and messaging
- Personalise maps with your own specific data

MESSAGING

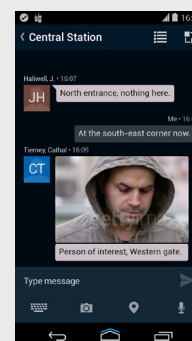
- Increase your team's situational awareness with images, video and audio clips
- Create incident groups so response teams can quickly and easily share content



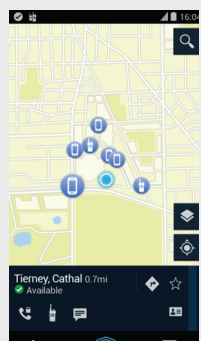
See the presence of team members and call directly from your contact list.



Instantly connect with team members on secure talkgroups.



Provide additional intelligence with multi-media messaging.



Increase awareness with integrated mapping of team members.

NETWORK OPTIMISED FOR TRUE PRIORITY AND PREEMPTION

A major event occurs and you have hundreds, possibly thousands of users in a small geographic area. The network is congested and everyone is trying to use Push-To-Talk. Who gets access?

WAVE goes beyond static QoS (application level Quality of Service) and in-call floor priority and preemption. When linked with an LTE network, WAVE 7000 offers the capability of prioritising and preempting users and PTT groups calls at the LTE network level, where high-priority users and emergency group calls can be provided network resources and high voice quality, even in the most adverse congestion conditions.

One easy way to think about this is to imagine people waiting in line for the next customer service window. As new people join the line, prioritisation allows you to reshuffle the line from high to low so that the highest priority customers are always at the front of the line. Preemption, also known as “ruthless” preemption, goes a step further and allows you to remove the lowest prioritised customer already at the service window so that the preemption customer can begin their transaction immediately.

In congested network conditions: an incident commander will still be able to communicate and emergency or broadcast calls will still get through to other PTT users. Plus, with WAVE's advanced radio integration, priority and preemption rules can be applied across broadband and radio users. So, when an emergency call comes in over radio, that call can be given priority over a normal broadband call taking place at that moment, and can even preempt a low-priority broadband call if necessary. Don't need these high-performance features? While WAVE 7000 can leverage network optimisations on a public safety LTE network to offer a high-performance PTT experience, it can also offer basic PTT services for users accessing it over non-optimised networks.

UNIFIED FLOOR PRIORITY ACROSS BROADBAND AND LAND MOBILE RADIO USERS



WAVE 7000 PRIORITY AND PREEMPTION SCENARIO



1. A MAJOR EVENT OCCURS

Many LTE users are gathered in a small area for a major event.

2. OVERFLOW OF USER TRAFFIC CONGESTS THE NETWORK

A concentrated volume of streaming video, texts and other data requests creates congestion on the LTE network.

3. EMERGENCY BUTTON PRESSED

An officer sends an emergency call on WAVE, causing two immediate reactions on the network level:

- ▶ **LOW-PRIORITY APPLICATIONS ARE REMOVED FROM THE NETWORK**
- ▶ **IN-PROGRESS, LOW-PRIORITY PTT CALLS ARE PREEMPTED**

4. CRITICAL INFORMATION COMMUNICATED DESPITE CONGESTION

WAVE 7000's best-in-class priority and preemption capabilities ensure that critical communications are instantly and successfully transmitted, even in the most adverse congestion conditions.

BENEFITS OF PARTNER COLLABORATION

Motorola works closely with our LTE partners on the development of new features and functionality. For example, we are working with Ericsson to conduct field trials of PTT over eMBMS technology to enable multicast services for PTT subscribers. Our joint technology and feature development enables comprehensive testing and maturation of network features, so your users enjoy fewer disruptions and a more streamlined PTT experience on the LTE network you use.

MULTI-TENANT ADMINISTRATION

With WAVE 7000, you are provided with multi-layer administrative control over access and provisioning. Administrators from your organisation can securely log in from any web client to easily provision PTT users, contacts, talkgroups and more.

SECURITY

WAVE 7000 supports multiple levels of authentication and security to ensure your communication stays private and secure. A user's device and credentials are both authenticated by the WAVE server prior to providing PTT service. WAVE 7000 utilises Transport Level Signaling (TLS) protocol with AES-256 encryption using mutually authenticated keys. TLS ensures your sensitive voice communications are accessible only by the initiator and the intended recipient(s), minimising the risk of eavesdropping and interception from outside parties. Users with mission critical devices such as the LEX L10 can enjoy the benefits of end-to-end FIPS 140-2 Level 3 compliant voice encryption for broadband-to-broadband and broadband-to-TETRA calls using CRYPTR micro hardware security modules (HSM). Or users with consumer devices can leverage end-to-end FIPS 140-2 Level 1 compliant software encryption of voice.

DISPATCH

WAVE 7000 provides an Application Programming Interface (API) for third-party control room or dispatch application vendors to easily extend broadband PTT functionality into their solutions. This API provides you the flexibility to choose from a variety of established vendors to find the best fit for your needs.

LEADER IN LMR

Easily integrate Land Mobile Radio (LMR) networks and broadband PTT for unified communications with key work partners and agencies. WAVE 7000 leverages Motorola's expertise in deploying, maintaining and integrating LMR networks using wireline IP integration into DIMETRA and ASTRO 25 networks. With wireline integration, you decrease integration costs while enjoying enhanced functionality, such as unified priority and preemption rules across broadband and LMR. For integration with other LMR networks, we will support standards-based interfaces.

DESIGNED FOR PUBLIC SAFETY

WAVE 7000 was designed specifically with public safety use cases in mind. Features such as emergency calls, ambient listening, call scanning and more replicate the experience public safety users are familiar with while leveraging broadband capabilities to bring more richness and context to the end users.

PUBLIC SAFETY GRADE PTT



BASIC FEATURES

FEATURE NAME	SUMMARY	CUSTOMER BENEFIT
Group & Private Calls over Broadband (3G, 4G/LTE, Wi-Fi)	Instant PTT to talkgroups and individuals.	Simple team communications from any network.
User Presence	Provides real-time, provisionable user status, showing the availability of team members (e.g. available, busy or offline).	Avoid failed calls when a user is not available.
Broadcast Calls	Allows designated users to initiate and control the floor for certain group calls. The client switches to a broadcast call on the Rx side automatically.	Enables system-wide announcements that reach all target users.
Call Alert / Polite Calls	Allows a user to politely signal a request to other users to call back for a one-to-one call.	Avoid private calls when not desired (e.g. in a meeting).
Ad-Hoc Groups	Allows users to create temporary groups	Flexible and efficient group set-up on-the-fly
Multi-Tenant Provisioning	Create and manage up to 10,000 independent enterprises (e.g. agencies such as Police, Fire, etc), each having up to 25,000 users provisioned.	Provide sub groups with full, secure control over their users/access provisioning while maintaining your own controls.
Android, iOS & Windows Clients	Support for all major commercial operating systems.	Device flexibility for agencies and users.
Scan and Priority	Users or administrators can create a prioritised scan list that automatically switches the application to the highest priority talkgroup when scanning.	Users never miss high-priority group calls when in range.
3GPP Standard Rx Interface with QoS for Application priority	Supports a Diameter interface (RFC 6733) for authentication and authorisation to the PCRF core. Supports a configurable QoS policy at the PTT server.	PTT service can be given a higher QoS compared to other enterprise applications, ensuring your critical communications get through.
End-To-End Media Encryption	AES-256-based software encryption of audio for all call types.	Secure PTT communications on all devices.
Dispatch Software Development Kit (SDK) and Application Programme Interface (API)	API for basic PTT features on a dispatch console.	Choose from a wide variety of the 3rd-party dispatch consoles to best meet your needs.

HIGH-PERFORMANCE FEATURES

FEATURE NAME	SUMMARY	CUSTOMER BENEFIT
Quality of Service (QoS) Over Standard 3GPP Rx Interface, Offering Priority and Preemption of LTE Bearers Resources	Uses the 3GPP-defined Rx interface between the PTT Server and the LTE Core (PCRF) to set up Guaranteed Bit Rate (GBR) bearers for each call leg in a PTT call. WAVE 7000 can be used with any LTE Carrier's Network that supports PCRF. This interface allows organisation-defined, high-priority talkgroups (e.g. emergency groups, broadcast groups or other high-priority groups) or users to obtain higher QoS unicast bearers as required.	Operator can differentiate service to subscribers. For example, offering higher QoS to PTT over streaming video, ensuring all PTT users in a group call would receive guaranteed consistent voice quality and predictable latency during network congestion. Or, in congested networks where users may not otherwise be able to connect to the network, preemption immediately clears the path for high-priority users/groups/calls, even to the point of knocking others off of the system - ensuring the PTT call gets through.
Emergency Call Functionality	Allows users to configure an emergency button on their PTT device. Emergency calls are automatically treated with the highest priority. A "hot mic" option can also be enabled to allow a user to talk without pressing a PTT button.	Ensures that users can communicate in critical situations.
Support for Hardware Encryption on Devices with Hardware Security Module (HSM)	Make encrypted calls on a device with a FIPS 140-2 Level 3 validated Hardware Security Module such as a LEX L10 Mission Critical Handheld.	Enables high-assurance calls for true end-to-end encryption.
Voice Recording API	Provides a server and dispatcher-based API for voice logging by third-party voice logging solutions.	Log and store PTT conversations for replay and audit purposes.
Centralised and Secure Key Management	Enables secure management and distribution of keys within the broadband network and devices. Select LMR networks can also be integrated for unified key management across broadband and LMR.	You maintain full control over the generation and distribution of the cryptographic keys for your network.
Ambient Listening	Enables discreet and remote activation of PTT calls by dispatch or authorised users.	Improves situational intelligence for a dispatcher or response teams when a user is in distress, mimicking the functionality land mobile radio users are most familiar with.



LAND MOBILE RADIO (LMR) INTEROPERABILITY

FEATURE NAME	SUMMARY	CUSTOMER BENEFIT
DIMETRA		
Direct wireline IP interface to DIMETRA 8.2+ systems	A WAVE 7000 system can be remotely located from a DIMETRA system and yet integrated via IP interface.	Provides a simple, cost-effective way to integrate DIMETRA systems with broadband that offers enhanced functionality when compared to wireless (donor radio) integration.
Clear Group Calls Across Broadband and DIMETRA	User-friendly group calls with with Talker ID and Aliasing across broadband and DIMETRA users.	Improved intelligence for PTT users.
ASTRO® 25		
Direct wireline IP interface to ASTRO 25 systems (FDMA, TDMA)	A WAVE 7000 system can be remotely located from an ASTRO 25 system and yet integrated via IP interface.	Provides a simple, cost-effective way to integrate ASTRO 25 systems with broadband that offers enhanced functionality when compared to wireless (donor radio) integration.
Clear Group Calls Across Broadband and ASTRO 25	User-friendly group calls with with Talker ID and Aliasing across broadband and ASTRO 25 users.	Improved intelligence for PTT users.
Secure Group Calls Across Broadband and ASTRO 25	Secure talkgroups supported across broadband and ASTRO 25 users.	Increased security and privacy during PTT calls.

For more information on WAVE 7000 go to motorolasolutions.com/WAVE

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