

SAMSUNG

**Solving Critical Communication
Challenges with Mission Critical
Push-to-X**



Overview

Many industrial sectors like oil and gas, construction, manufacturing, mining, logistics, and transportation have been using two-way private Land Mobile Radio (LMR, using TETRA, P25, and DMR technologies) systems for decades to provide their workers a reliable and efficient technology for mission-critical voice communication needs.

With the advent of high-speed, low-latency mobile broadband, the nature of mission-critical communications is changing. Organizations are increasingly using bandwidth-hungry applications like video streaming, group video conferencing, real-time location services, and real-time collaboration for effective communications to solve urgent needs.

Today's solutions extend the capabilities that trunked-radio-based push-to-talk created. First responders, security services, and transportation companies that use 3GPP-compliant Mission Critical Push-to-X (MCPTX) services defined in Release 15 will rely on their systems to integrate with those of partner organizations operating on Release 15-compliant networks or on legacy networks. The use of a standards-defined approach for joint communication allows everyone access to the same conversation, video stream, and set of instructions at the same time. No longer are teams hampered or restricted by missing critical conversations, current maps, or updated plans.

Better Technology Creates Better Communication Tools

With the proliferation of IP-based communications, discussions about solutions to solve the limitations of LMR began before the turn of the century. Concerns regarding communication latency and bandwidth relegated the evolution of Push-to-Talk (PTT) from LMR to voice-based communications on cellular networks and video communications, or Push-to-Video (PTV,) over best-effort data networks. These solutions created some new services, but the Push-to-Talk Over Cellular (PoC) solutions lacked critical capabilities that were only available with better technology.

LTE's ability to support voice over IP (now commonly referred to as VoLTE) created the solid foundation needed for building the desired system. LTE's IP-based communications paved the way for the use of voice, video, file sharing, and augmented reality - applications that rely on better than the best-effort throughput used by prior solutions. With 3GPP Release 12, the network began supporting new levels of Quality of Service (QoS) by creating additional QoS Class Identifier (QCI) values to allow the system to identify specific traffic for flow handling. When LTE introduced these capabilities to prioritize wireless traffic according to a service's needs, the system became able to deliver high-quality real-time applications like voice and video that enable users to perform their roles as a first responder or dispatch-controlled service provider.

Industries Powered by MCPTX

- Public Safety/First Responders
- Public Utilities
- Trades (crew communications)
- Government Operations
- Logistics (delivery, airports, seaports, warehouses)
- Transportation (bus, taxi, shuttle)

Samsung Leadership

At the outset of discussions of the new services, key users of these solutions stated that any new push-to-talk capabilities required a consistent definition for the service and interfaces between elements. They also noted that any solution must be defined in a way that multiple sources can create the solution so that it would be available from many suppliers. These requirements meant that customers needed the same functionality, regardless of the vendor and network provider. Today's wireless ecosystem relies on the same specifications, making the 3GPP organization the correct choice for standardization of the services and interfaces.

Samsung MCPTX Success Points

- 3GPP Standards leadership
- First to market with 3GPP-compliant solutions
- Field-proven multi-vendor interworking

Being a long-term participant in 3GPP, and with end-to-end expertise in handsets, radio networks, and service networks, Samsung stepped in to lead 3GPP standardization of Mission Critical Communications (MCC). In addition to creating implementation standards for these services, the MCC team is driving Mission Critical Interworking function to bridge the new system back to legacy LMR-based services.

Using the 3GPP Release 13 standard for Mission Critical Communications, Samsung delivered the world's first Release 13 compliant solution in 2018 in support of the 2018 Winter Olympics. The solution deployed included Samsung RAN, Core, and the MCPTX application server that supported public safety and first responders who kept 2,952 athletes, more than 3,500 coaches and officials, and in excess of 1M attendees safe during the winter games.^{1,2} The network that covered the Winter Olympics areas expanded and replaced existing TETRA networks and now offers nationwide service to more than 400K public safety users in Korea.

Samsung Mission Critical Push-to-X

Samsung has experience in delivering PTT and MCPTX solutions. With deployments in Korea and India for a variety of different services, Samsung has proven deployment experience and the fully functional solution elements required to lead the industry in this space. Samsung's deployment experience in PTT and MCPTX is crucial in delivering MCC that interwork with previously deployed LMR-based services to ensure continuation of the critical communication services used by first responders.

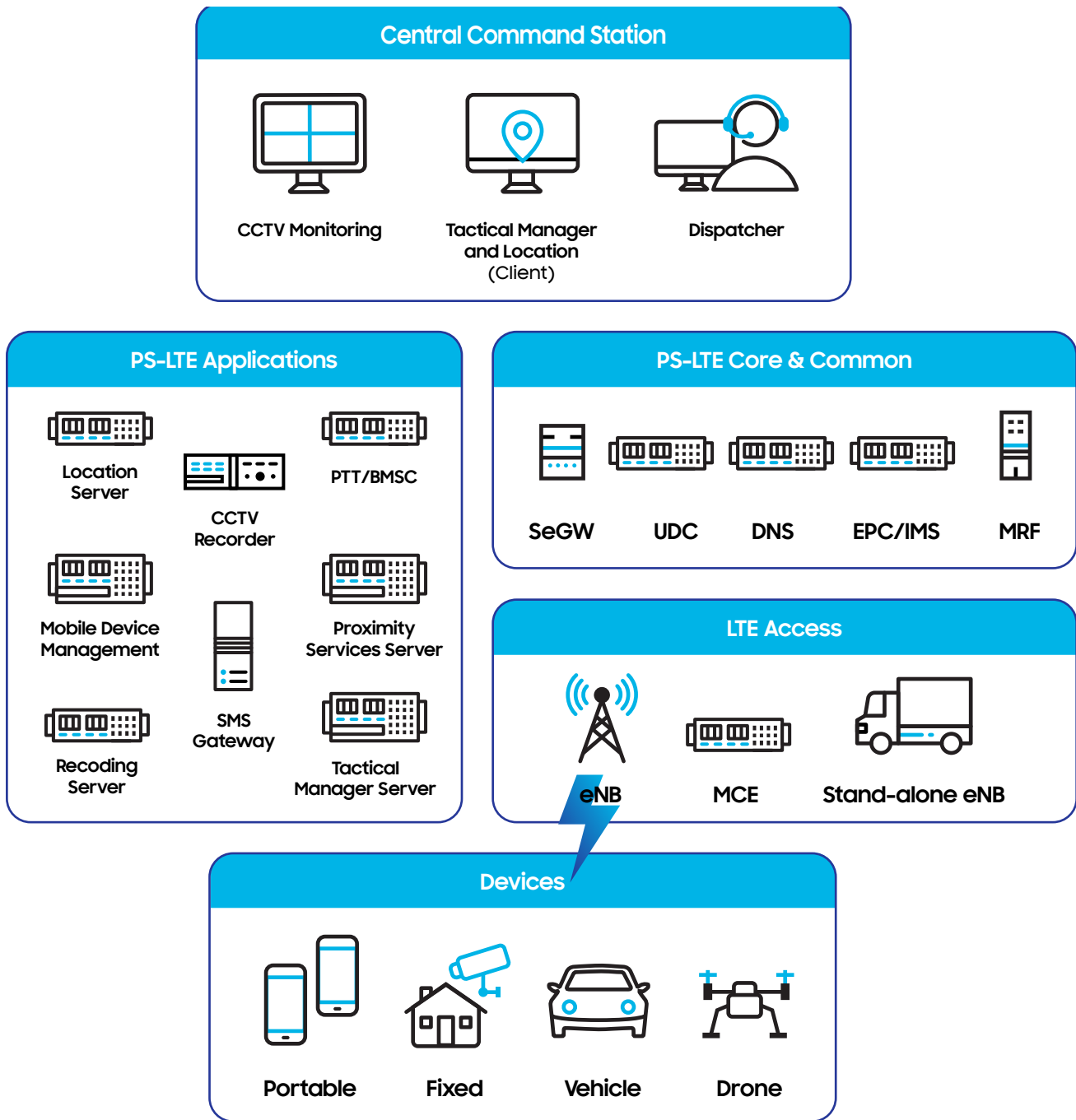
Fast and Effective User Communications

Samsung's MCPTX solution enables public safety compliant capabilities for instant access to voice, video, and data communications. The client on the service-compliant device allows private conversations – a one-to-one call – or group calls - one-to-many-users conference calls. One of the primary MCPTX capabilities defines one user as the dispatcher, who uses one-to-one or one-to-many communications to coordinate and distribute resources. The solution from Samsung identifies the dispatcher role and provides them with the information to efficiently allocate – or “dispatch” - resources as needed. These resources might be first responders or dispatch services used by transportation and trades. In the group calling mode, the solution grants a single user, typically the person who initiates the session, with media sharing capabilities to the group call participants. Participants in the call can request access to “the floor” by pressing a button on the device screen to share their media/voice during the event. This floor access request is one of the fundamental components of the Push to X Service.



¹ <https://www.forbes.com/sites/christinasettimi/2018/02/08/by-the-numbers-the-2018-pyeongchang-winter-olympics/#50aa68057fb4>

² http://aroundtherings.com/site/A__62872/Title__Angela-Ruggiero-Disappointed-in-Richard-Pound---PyeongChang-Update/292/Articles



The MCPTX solution offers quick set-up of full communication capabilities, which may be voice, video, or messaging, between single users or with pre-established groups or on-demand ad-hoc groups. The devices used in the MCPTX solution set also provide location information to the tactical server. From this information, the person providing strategic oversight and management of participants during the event or service knows the locations of all persons supporting or available to support the event, which allows direct control and allocation of available people in support of the service.

Easy Service Management Functions

Samsung's MCPTX solution includes easy-to-use, highly flexible service and group management capabilities. The ability to adjust group membership is one of the long-time challenges with which users of LMR systems continue to struggle. The MCPTX Group Management function resides on the common core. With user management applications at a central command station, oversight and tactical managers have full group management and assignment control.

The central command station also receives location information from each user, which allows leadership to make on-the-spot assignments of resources based on the location of those assets via the dispatch capabilities. With the recording server and CCTV recorder, the central command station is keeping a complete record of the event for debriefing later.

Access to location information, conversations, and video streams allows the dispatch manager to make resource assignments and distribute video streams among the group as needed. The broadcast multicast service efficiently distributes the appropriate voice and video streams to the group participants.



Summary

The new capabilities provided by IP-enabled networks sets the right function for a cost-effective solution that delivers real-time person-to-person and group communications during critical times. The need for these services in the public safety environment is well known, but these capabilities can also improve operations in many business environments: trades and construction companies, organizations needing on-site on-call support, and any business that needs location-tracking dispatch services.

Samsung continues delivering solutions to customers to address their challenging requirements. By leveraging our expertise in designing and building devices and radio networks and deploying real-time instant communications solutions and integrating them with existing proprietary solutions, Samsung seeks to solve our toughest customer challenges. No other company today can deliver all these solutions in the mission-critical communications market.

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