

FREQUENTLY ASKED QUESTIONS

Industry Standards for Broadband Push-to-Talk

As a leader in standards-based broadband push-to-talk (PTT), Kodiak wants to ensure that there is a common understanding of the industry's past accomplishments in standards development and the status of its current broadband PTT standards initiatives. This set of FAQs address the current broadband PTT standards, the direction of future standards, and the role Kodiak has taken in the creation and implementation of current standards, and in defining new standards.

1. Is there an organization responsible for creating a standard for push-to-talk over cellular networks?

Yes, The Open Mobile Alliance (OMA), a global standards development organization for the mobile phone industry, has guided the creation and approval of standards for Push-to-talk over Cellular (PoC) communications.

2. What was the first OMA PoC standard?

The OMA PoC V1.04 was the first standard, approved in 2009, which established Push-to-talk over Cellular (PoC) as a form of immediate two-way communications for business and consumer customers of mobile networks. By pushing a button, a half-duplex voice communication session with an individual user or a broadcast to a group of users could be initiated. The V1.04 standard also defined two modes of answer, auto-answer that allowed receiving participants to hear the sender's voice either without any action on their part, and manual answer where the receiving party had to accept the call before listening to the sender's voice.

3. Is there an OMA PoC standard that includes interoperability between systems?

OMA's PoC V2.0 standard, approved in 2011, expanded on the voice communication enabled in V1.04, making

it possible to instantaneously share video, still images, text and files with a single recipient or between groups of recipients. In the 2.0 standard, OMA PoC also enabled interoperability among network entities, including an interworking functionality that allowed other external push-to-talk networks to interwork with a PoC service infrastructure.

4. What about standardization for multicast and other critical communication capabilities?

Approved in 2011, OMA's PoC V2.1 standard took push-to-talk communications beyond business and consumers, defining new functionalities for critical communication. OMA PoC V2.1 included critical communication functions such as multicast PoC, ad-hoc or pre-defined PoC group communications, prioritization and pre-emption, and dispatcher functions.

5. What's next for the OMA PoC standards?

OMA is currently working on the Push-to-Communicate for Public Safety (PCPS) V1.0 standard. PCPS V1.0 covers all OMA PoC V1.0, V2.0 and V2.1 requirements, including those for critical communication included in V2.1. OMA PCPS 1.0 supports ubiquitous coverage, management of resources, and levels of services for PTT communication across multiple access technologies, including LTE.

6. How has Kodiak participated in the creation and implementation of OMA PoC standards?

Kodiak has been a leader in the development of the OMA PoC standards, having been an architect of the OMA PoC V2.0 specification and a contributor to OMA's Push-to-Communicate for Public Safety (PCPS) project. The Kodiak contributions to PCPS include:

- PoC Control Plane technical spec
- XDM technical spec (PoC specific)
- Entire set of XML schemas

Kodiak has also been a leader in the implementation of the OMA PoC standards and has the largest installed base of OMA PoC-compliant PTT users.

7. What is Mission Critical Push to Talk and how does it relate to the OMA PoC standards?

In 2014, the 3rd Generation Partnership Project (3GPP) created a new Working Group to define the service requirements for the Mission Critical Push to Talk (MCPTT) application in LTE Release 13. The Working Group (SA WG6) is also to be the home for all future 3GPP mission critical application work.

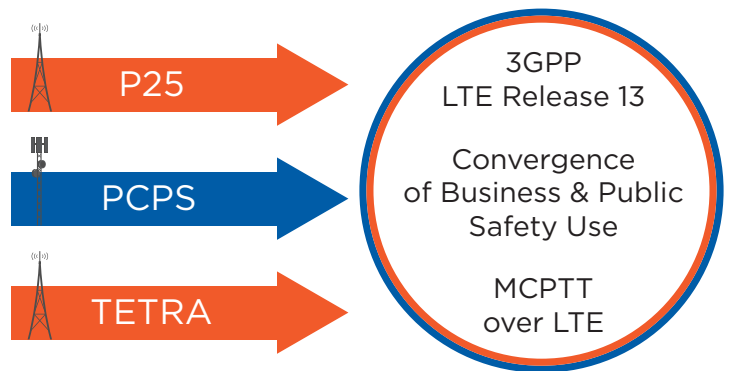
SA WG6 is working with OMA, as well as ETSI-TCCE, and other relevant standards development organizations to define a set of critical communication requirements that include functionalities from PCPS, as well as the PMR/LMR standards TETRA and Project 25 (P25).

By leveraging the strengths of LTE and adding a comprehensive set of features needed for public safety communications, Mission Critical Push to Talk brings technical unity to the commercial and mission critical aspects of PTT communications and, ultimately, a more cost effective solution for both business and public safety.

8. What is the difference between MCPTT and Mission Critical Voice (MCV)?

MCV is the standard definition developed by the National Public Safety Telecommunications Council (NPSTC) Broadband Working Group to provide a basis for a common understanding of the meaning of and the multiple requirements for mission critical voice.

- Per the NPSTC Broadband Working Group, for a network to fully support public safety mission critical voice communications it must support each of the elements included in the MCV definition.
- Direct or Talk Around: This mode of communications provides public safety with the ability to communicate unit-to-unit when out of range of a



wireless network OR when working in a confined area where direct unit-to-unit communications is required.

- Push-to-Talk (PTT): This is the standard form of public safety voice communications today. The speaker pushes a button on the radio and transmits the voice message to other units. When they are done speaking they release the Push-to-Talk switch and return to the listen mode of operation.
 - Full Duplex Voice Systems: This form of voice communications mimics that in use today on cellular or commercial wireless networks where the networks are interconnected to the Public Switched Telephone Network (PSTN).
 - Group Call: This method of voice communications provides communications from one-to-many members of a group and is of vital importance to the public safety community.
 - Talker Identification: This provides the ability for a user to identify who is speaking at any given time and could be equated to caller ID available on most commercial cellular systems today.
 - Emergency Alerting: This indicates that a user has encountered a life-threatening condition and requires access to the system immediately and is, therefore, given the highest level or priority.
 - Audio Quality: This is a vital ingredient for mission critical voice. The listener MUST be able to understand without repetition, and can identify the speaker, can detect stress in a speaker's voice, and be able to hear background sounds as well without interfering with the prime voice communications.
- MCV is one of the inputs being used by SA WG6 as it defines the comprehensive requirements for MCPTT, which will be part of the 3GPP LTE Release 13 standard.