Update on 3GPP SA6 – Mission Critical Standards

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Outline

- What is 3GPP, how it works!
- History and Evolution of Mission Critical Standards
- Rel-16 Features
- Rel-17 and beyond
- Conclusions
The 3GPP Eco-system

Developing Recommendations

ITU-R/T

Reference to 3GPP specs

Cross reference of specs

Developing internet protocol specs

Developing Mobile application specs

Cross reference

Requirements

Terminal certification based on 3GPP specs

Partners referring to 3GPP specs for the local use. Partners publish the official standard.

3GPP Market Partners

EU
Japan
Korea
China
North America
India

Referring to specs

Reference to 3GPP specs

Partners referring to 3GPP specs for the local use. Partners publish the official standard.
3GPP Working Groups

TSG RAN
Radio Access Network
- RAN WG1
  Radio Layer 1 spec
- RAN WG2
  Radio Layer 2 spec
  Radio Layer 3 RR spec
- RAN WG3
  lub spec, Iur spec, Iu spec
  UTRAN O&M requirements
- RAN WG4
  Radio Performance
  Protocol aspects
- RAN WG5
  Mobile Terminal
  Conformance Testing
- RAN WG6
  GSM EDGE
  Radio Access Network

TSG CT
Core Network & Terminals
- CT WG1
  MM/CC/SM (Iu) ('end to end')
- CT WG3
  Interworking with external networks
- CT WG4
  MAP/GTP/BCH/SS ('core network')
- CT WG6
  Smart Card Application Aspects

TSG SA
Service & Systems Aspects
- SA WG1
  Services
- SA WG2
  Architecture
- SA WG3
  Security
- SA WG4
  Codec
- SA WG5
  Telecom Management
- SA WG6
  Mission-critical applications
### 3GPP Process – Mission Critical Standards

**Stage 1: Requirements**
- SA1: Requirements normally come from service providers (operators, governments)
- SA2: High Public Safety presence from all global regions (Asia, Europe, US) for Mission Critical applications

**Stage 2: Architecture**
- SA3: Overall LTE (4G, GSCE, ProSe) system architecture
- SA4: Security protocols
- SA6: (Mission Critical) application architecture

**Stage 3: Interfaces & Protocols**
- CT1: Core protocols
- CT3: Policy & QoS
- CT4: Database aspects
- SA3: Security architecture and protocols

**Change Requests**

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+ **RAN** groups for radio specifications

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History – Mission Critical Standards

MC standardization was initiated in 2013
• Initiated by public safety departments of Korea, USA, UK, France, Germany, Netherlands, TCCA, ETSI, ATIS, TTA

3GPP identified as the home for global Mission Critical Services (MCX) Standards
• Over 600 user requirements were developed with inputs from TETRA, P25 and mobile broadband industry
• New Working Group dedicated for Mission Critical Applications (SA6) – first expansion in 20 years!

First global MCPTT standard published in 2016 (Rel-13)
• MC standardization continues to evolve....
Evolution – Mission Critical Standards

Standards Timeline

- **Rel-13**
  - March 2016
  - MCPTT
  - MCPTT 2.0
  - MCVideo
  - MCData

- **Rel-14**
  - June 2017
  - MCPTT 3.0
  - MCVideo 2.0
  - MCData 2.0
  - Interworking
  - Railways

- **Rel-15**
  - June 2018
  - MCPTT 4.0
  - MCData 3.0
  - Interworking 2.0
  - Railways 2.0
  - MC MBMS API
  - MCOver5GS (Study)
  - MCSAA (Study)

- **Rel-16**
  - December 2019

* Non-exhaustive
### Rel-16 Overview - Snapshot

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#### Normative Work
- [Technical Specification]
  - Study
    - [Technical Report]

**SA Plenary**
- #81
- #82
- #83
- #84
- #85

**SA6**
- #25
- #26
- #27
- #28
- #29
- #30
- #31
- #32
- #33

**enh2MCPTT** – TS 23.280, 23.379, 23.281, 23.282, 23.283

**eMCDATA2** – TS 23.282, 23.280

**eMCSI** – TS 23.280, 23.379, 23.281, 23.282, 23.283

**eMCCl** – TS 23.283

**MBMSAPI_MCS** – TS 23.479

**MONASTERY2_ARCH**

**FS_FRMCS2** – TR 23.796

**FS_MCSAA** – TR 23.778

**FS_MCLOG** – TR 23.784

**FS_MCOver5GS** – TR 23.783
MCPTT Enhancements [enh2MCPTT]

Key features

- Group regroup using pre-configured groups
- User regroup using pre-configured groups
- Broadcast group/user re-group call
- Affiliation status in group management server
- Extending talker location with floor request
- MBMS listening status report with bearer reception quality
- Group creation procedure with Group ID provisioning
MCData Enhancements [eMCData2]

- Content server/Media storage
  - Separation of storage function from MCData server

- Message store for conversation history
  - Dedicated and secure storage server (SDS, FD)
  - Supported operations: retrieve, search, delete, update, synchronize
  - Folder management: create, move, copy, list

- File distribution over MBMS/xMB
  - MCData group standalone file distribution
MC MBMS UE API [MBMSAPI_MCS]

Specified UE MBMS API for MC services
- Enables 3\textsuperscript{rd} party MC apps to access MBMS functionality on the UE

Supported API functions
- Application registration/de-registration
- MBMS bearer registration/de-registration
- Get MBMS SAI/update notification
- Get cell info/update notification
- MBMS bearer notification
- Open/close media
- Retrieve capability
Railway Communications [MONASTERY2]

Based on the MCX core specifications

Conducted a detailed study
  • Technical Report (TR) 23.796

Key features in Rel-16
  • Support for functional alias
    • all services and call types
  • Commencement modes for MCPTT group calls
  • Call forwarding support for MCPTT private calls
  • IP connectivity for Point-to-Point and Group communication/Gateway UE

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MC over IOPS [FS_MCSAA]

IOPS – Isolated E-UTRAN operations for Public Safety
- Based on 3GPP “local EPC” architecture

Key issues - MC services over IOPS (no backhaul)
- Switching to/from IOPS system
- Data synchronization data between IOPS and Primary MC system
- Determining list of registered users on IOPS

Conclusions
- Functional model that does not require synchronization
- Off-network based model (IP connectivity only)
- Use of presence-like solution for user discovery
Discreet Listening & Logging [FS_MCLOG]

Discreet listening
• MCPTT and MCVideo private calls
• MCPTT and MCVideo group calls
• MCVideo pull and push
• MCDATA SDS and file distribution

Logging
• MC logging function
• MC replay equipment
MC services over 5G [FS_MCOver5GS]

Key Objective

• How to support MC services over 5G?

Progress

• Identified gaps required to enable MC services over 5G
  • Use of multicast
  • Use of ProSe
  • Deployment scenarios
  • Resource control (QCI vs. 5QI)

• Key issue on 5G Network Slicing impacts

Expected to complete in Sep 2020
Rel-17 – What’s coming!

New work-items

- eMONASTERY2 - Enhancements to Application Architecture for the Mobile Communication System for Railways Phase
- MCIOPS - MC services support on IOPS mode of operation

Conclude on the FS_MCOver5GS study

Further enhancements to MCX Services, if any
Conclusions

✓ 3GPP has established a mature set of MCX standards
  • Enhancements will continue!

✓ Implementation feedback is critical to robust standards
  • ETSI Mission Critical Plugtests™

✓ Participation is essential – please join us!
  • Contribution-driven approach
Thank you for your attention!

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