TSDSI SG2 Organized Seminar

Public Safety
(SESSION II: 3GPP MCPTT Overview)

Mission Critical Push To Talk

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Introduction

- What is 3GPP MCPTT?
  - A system for mission-critical voice communication.
  - Designed keeping public safety agencies as primary users, with following technical requirements:
    - High availability/reliability
    - Secure and arbitrated communication
    - Low latency
      - KPI 1 - MCPTT Access time < 300 ms
      - KPI 2 - End-to-end MCPTT Access time < 1000 ms
      - KPI 3 - Mouth-to-ear latency < 300 ms
  - Worked on by 3GPP in Rel-13, finalized in March 2016.
  - Definition from 3GPP TS 22.179
    “A group communication service with fast setup times, ability to handle large groups, strong security and priority handling.”
Operation Modes

- **On-network**
  - Communication channels through the network
  
  - 3GPP IMS compliant
  - Voice

- **Off-network**
  - Direct device-to-device communication

Direct Communication (3GPP ProSe based)

ProSe Discovery

ProSe Communication
Service requirements and Functionalities

- **Service Management**
- **Membership and Affiliation**
- **Security**
- **Service continuity**
- **Group Communications**
- **Private Communications**
- **Floor Control**
- **Call Enhancements**
- **Pre-established communications**
- **Location Reporting**
- **MBMS**
Functionalities

- Group Management
- Identity Management
- Configuration Management

- Group Membership
- Affiliation
- De-affiliation

- Service Authorization
- User Authentication
- Encryption (control and media)

Service Management
Membership & Affiliation
Security

Pre-established Communications
Service Continuity

Control plane signalling is established in advance
Bearers are reserved
Push of PTT button triggers the call

UE-to-Network Relays
Remote UEs channel control and media through relays
Transparent to user

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Services
Group Communications

- Group calls
  - Chat group calls
  - Pre-arranged group calls
- Broadcast group calls
- Emergency and Imminent Peril group calls
- Emergency Alerts
- Audio cut-in enabled group calls

On-network Group Call
- 3GPP IMS compliant
- Voice

Off-network Group call

Audio cut-in enabled group calls
- Stop! Last vehicle is compromised
- Everything is fine in front. We need to......
Private Communications

- Private calls
  - Automatic commencement calls
  - Manual commencement calls
- Emergency private calls
- Ambient listening calls
  - Locally initiated
  - Remotely initiated
- Call-back requests

On-network Group Call
- EPC
- IMS
- MCPTT
- 3GPP IMS compliant
- Voice

Off-network Private call
- eNodeB
- Dispatcher

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Floor Control

- Arbitrated communications using floor control server
  - Allow only one user to speak at a time
  - Queueing
  - Priority handling
- Group call and Private call
- On-network and Off-network
Call Enhancements

- Remotely initiated MCPTT calls
  - Authorized users can trigger UEs to make MCPTT calls
  - No restriction on type of the call

- First-to-answer calls
  - Incoming call notification goes to the group
  - Call establishes only with the first user who answers
Common Functionality Architecture

- Common components across Mission Critical Services (PTT, Video, Data)

- Service Management
- Membership and Affiliation
- Security
- Service continuity
- Pre-established communications
- Location Reporting
- MBMS
Thank You