

Introducing OpenMCX

Mission-Critical Communication over LTE and 5G

OpenMCX

World's first opensource
MCX stack



PUBLIC SAFETY



DEFENCE



RAILWAYS



MARITIME



AVIATION

Guaranteed Communication • Policy-controlled QoS • Location • Secure Channels • Tailored Voice, Data & Video

How MCX Fits Critical Operations

Application priority can be translated into secure, policy-controlled network treatment.

QoS & PRIORITY

The MC service server requests policy on N5 (5G) or Rx (4G); PCF and SMF apply QoS at the radio and UPF.

Floor control, group calls and emergency pre-emption get the right speaker through.

LOCATION

Location services share UE position with dispatchers and drive location-based group and emergency workflows, via the MCX LMS and 5GS LCS (LMF / GMLC / NEF).

SECURITY

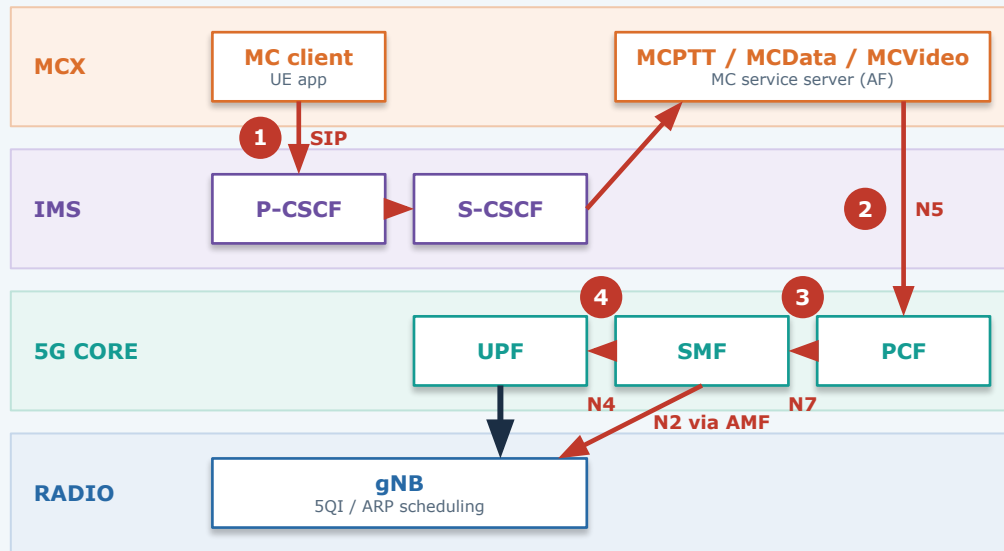
Identity, key management and protected signalling and media support controlled group communication.

Interoperable Harmonised Framework

Standardised by 3GPP from Release 13 (MCPTT) and Release 14 (MCData, MCVideo) onward, MCX runs within an interoperable, harmonised framework: unified protocols, multi-vendor compatibility and cross-border service continuity.

One Emergency Group Call, End to End

MCX asks for priority; the 5G system enforces it from core to radio.



Over 4G (EPS) the same flow uses Rx toward the PCRF and a dedicated bearer. Full architecture: backup slide.

- 1 Call setup**
The UE starts an emergency group call; SIP reaches the MCPTT server via IMS.
- 2 Policy request (N5)**
The MC server, acting as AF, asks the PCF for priority with Npcf_PolicyAuthorization.
- 3 Policy decision (N7)**
The PCF sends PCC rules to the SMF: 5QI 65/69 and ARP with pre-emption.
- 4 Enforcement (N4 / N2)**
The SMF programs the UPF and, via the AMF, sets up the QoS flow at the gNB.
- 5 Priority media**
Voice, data and video ride the critical flow; under load, lower-priority traffic yields.

OpenMCX Platform

Built on 3GPP Release 19 MCX services

MCX SERVER

Common Service Core

- Identity • Groups
- Configuration
- Location • Keys

MCPTT server

- Voice • Floor • Emergency Alerts

MCDATA server

- Messages • Files • IP Connectivity

MCVideo server

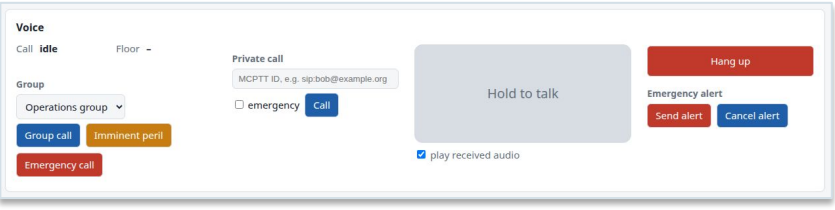
- Video • Emergency Alerts

LINUX CLIENT

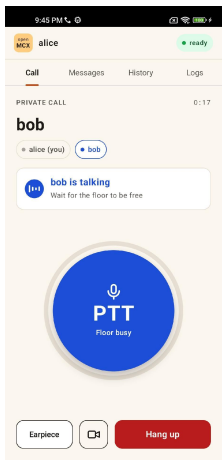
C++ client · UE emulator



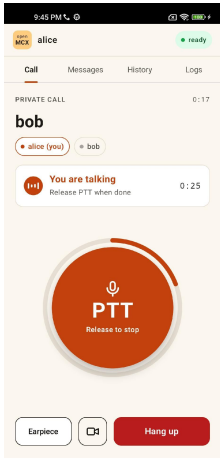
DISPATCHER CLIENT



ANDROID CLIENT

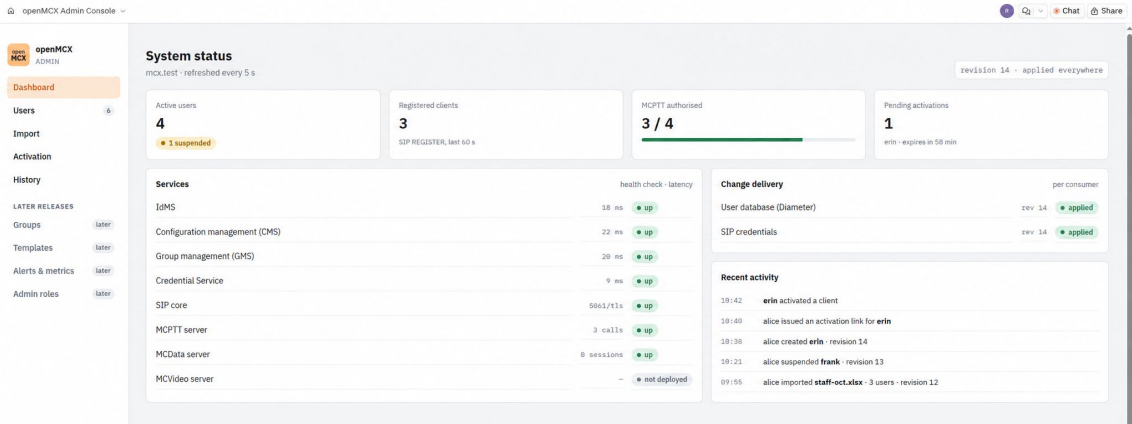


FLOOR BUSY



PTT HELD

MCX ADMIN CONSOLE



Provisioning: users, groups, rights and service status

OAI Integration Verticals for Critical Infrastructure

Connect service policy, data-plane treatment, radio scheduling and UE positioning.

5GS SIGNALLING

- MC service server as AF: Npcf_PolicyAuthorization on N5 with afAppId and flow descriptions.
- PCF to SMF on N7; SMF supplies UE/gNB QoS information and N4 UPF rules.
- Test setup and changes for group calls and emergency priority.

✓ Validated with 5GC and RFSimulator

Scope

N5 → N7 → N4 / N1 / N2 policy trace

OAI UPF

- Classify MCX service data flows with SDF filters and PFCP rules.
- Enforce QFI-aware forwarding, gating and rate policy under load.
- Measure delay, loss and flow counters for voice, data and video.

Planned

Scope

Voice / data / video load test

OAI gNB

- Admit 5QI / ARP flows, map QFI to DRB and schedule critical traffic.
- Measure priority and latency under cell loading and mobility.
- Test MCX bands: n100 / n101 (FRMCS rail, EU) and n14 (US public safety).

Planned

Scope

Radio KPIs under load; railway UE test

OAI LMF

- Use OAI UL-TDoA / NRPPa positioning with AMF and gNB measurements.
- Bridge privacy-authorized LCS exposure through GMLC / NEF to MCX LMS.
- Test on-demand, periodic and emergency location in MCX workflows.

Planned

Scope

Location age and accuracy at MCX LMS

Thank You !!