



EVIDEN

Lifelink MCx IWF

Interoperability with Legacy Systems

Seamless Integration, Supporting Migration

The MCx IWF plays a crucial role to allow parallel operation of different mission critical communication technologies and to facilitate the transition from narrowband systems to broadband MCx. Typical use cases can be found e.g. in transportation, public safety, ports and utilities.

Eviden's Interworking Function (IWF) enables seamless integration and operation of legacy communication systems such as GSM-R, SIP PABX or PPDR systems with MCx and facilitates a smooth transition and migration from GSM-R to FRMCS or PPDR to MCx.

Standards compliance

The IWF is compliant with the relevant ETSI / 3GPP specifications like ETSI TS 23 283, ETSI TS 24 483 and ETSI TS 103 792.

Interoperability Scenarios

Scenario	Seamless interworking with	Availability
MCx ↔ IWF ↔ SIP	PABX or SIP soft clients	✓
MCx ↔ IWF ↔ SIP-R	For a smooth migration from GSM-R to FRMCS	✓
MCx ↔ IWF ↔ MCx	Integration with 3 rd party MCx servers for distributed, edge-based architectures to enhance resilience and fault tolerance. Scenarios for IWF deployment: • For <u>untrusted</u> 3rd party MCx servers • To <u>restrict / isolate</u> communication between MCx servers • MCx servers with <u>incompatible multiplexing / codec</u> capabilities	✓
MCx ↔ Narrowband	Gateway to legacy LMR systems (TETRA, DMR, P25, ...)	On-demand

**Multiple Ecosystems Connected into ONE Unified Environment
Enabling Migration, Interoperability, and Resilience**

IWF Core Functions

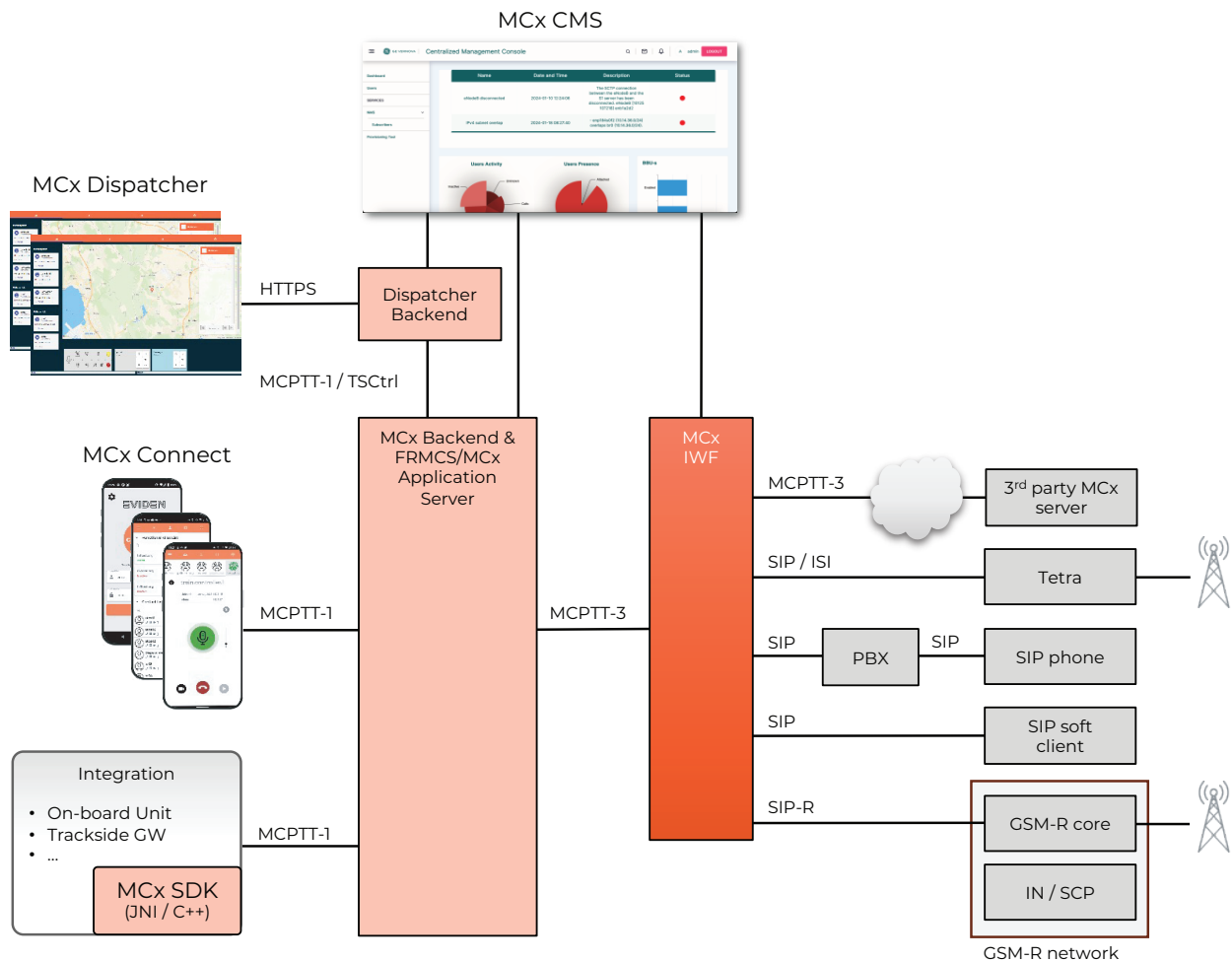
- Addressing & Identity Mapping
MSISDN / FN and role / functions ↔ SIP URI and MCx identities / FAs
- Signalling Interworking
SIP R-based (CSC) SGW/MGW ↔ SIP / MCx
- Media Adaptation and Codec Negotiation
Circuit switched (MGW) ↔ RTP
Transcoding (FR, PCMu/a, opus, AMR-WB) ↔ AMR-WB
- Voice Services Interworking
GSM-R voice services ↔ MCPTT services (P2P, group, broadcast, ...)
- Messaging Interworking
SMS ↔ MCDATA / IP-based messaging
- Preservation of Railway Features
Mapping of EIRENE functionalities (FA, LDA, REC, VBS/VGCS,...)

Bridge Legacy Communication with Broadband MCx

Customer Value

- Interoperability across systems from different vendors
- Enable coexistence of legacy/MCx systems in parallel like GSM-R/FRMCS or SIP PABX / MCx
- Supporting migration scenarios with limited operational disruption (parallel operation)
- Decouples deployment timelines (5G RAN, 5G core, service domain, applications)
- Allow independant evolution of technology lifecycles (e.g. GSM-R and FRMCS)

High-Level Architecture



Generic capabilities

- IWF-1 (MCPTT), IWF-2 (MCData), IWF-3 (Group management)
- MCPTT, MCVIDEO, MCData interworking
- Call & Floor control
- Participating & controlling functions
- Codec negotiation & reconciliation
- RTP/media mediation
- Multiplexing of audio for group communication
- Emergency calls
- Group/private call interworking
- SIP protocol support
- SIP-R protocol support
- FRMCS v2 participating role or controlling role
- Codecs: G.711 (PCMA/PCMU), Opus, AMR-WB, GSMR FR

Product Datasheet

Features	Supported
► Capabilities, based on 3GPP Rel 18	
IWF-1 (MCPTT), IWF-2 (MCData), IWF-3 (Group management) protocol support	✓
MCPTT, MCVIDEO, MCData interworking support	
• Call control • Floor control • Emergency calls • Group/private call interworking • Codec negotiation & reconciliation • RTP/media mediation	✓
► IWF SIP	
SIP protocol support	✓
Private MCx ↔ SIP private communications (one2one full-duplex)	✓
MCx group ↔ SIP user communication (SIP becomes member of static or dynamic MCx groups - multitalker or full duplex)	✓
Multiplexing of audio for group communication	✓
Supported call initiation:	
• MCx private call → SIP endpoint • SIP private call → MCx endpoint	✓
Supported call initiation:	
• MCx group → SIP endpoint • SIP endpoint → MCx group (future support)	✓
Supported codecs: G.711 (PCMA/PCMU), Opus, AMR-WB	✓
► IWF SIP-R	
SIP-R protocol support	✓
FRMCS v1 mainly participating role:	
• MCx private call → SIP-R number (incl. CT5) or function • MCx group call → SIP-R number (except CT5 group calls and FTA) • SIP-R private call → MCx number or function • SIP-R group call → MCx number (GSM-R in controlling role)	✓
Geo-Area mapping FRMCSv1	✓
FRMCS v2 participating role or controlling role:	
• MCx side - all calls of type AHGC • FRMCS Exact Addressing (EA) • FRMCS LocationDependentAddressing (LDA) • FRMCS LocationDependentAddressing with DynamicParticipants (LDA-DP) • FRMCS REC • MCx AHGC maps to either private or group SIP-R call	✓
Geo-Area mapping FRMCSv2	✓
CTx mapping support	
• MCx AHGC criteria for LDA • All non LDA CTx on exact mapping to MCx AHGC criteria	✓
GSM-R REC support - leave and terminate handling	✓
Multiplexing of audio for group communication	✓
Supported codecs: G.711 (PCMA/PCMU), Opus, AMR-WB, GSMR FR	✓
Proprietary LMR/LMS integration (device locations behind SIP-R is sent to MCx by IWF)	✓
Call Hold & Forward support	✓

► IWF MCx	
IWF-1 (MCPTT), IWF-2 (MCData), IWF-3 (Group management) protocol support	✓
Flexible mappings between own MCx server and 3 rd party MCx server	✓
Support vendor agnostic interoperability - mediate multiplexing / transcoding challenges	✓
► Deployment	
High-availability architecture	✓
Support for various modes of deployment (Bare metal / KVM / Hypervisors)	✓
► Management	
Integrated with Lifelink CMS	✓
Monitoring and fault management	✓
Management of partner systems MCx, SIP, SIP-R	✓
Management of MCx / SIP / SIP-R endpoints	✓

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Let's start a discussion together



About Eviden

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