

# BEEHD Framework for Future Railway Mobile Communication System (FRMCS)

Railways play a critical role in connecting modern societies at ever-increasing speed, and reliable future-proof communications are the backbone of modern railways. Future Railway Mobile Communication System (FRMCS) is a set of standards and technologies continuously developing by UIC, 3GPP, ETSI and other organizations to harness the power of 5G networks and bring secure reliable broadband network communications to the rail industry, making it more secure, safe, and efficient than ever before.

## Transition to FRMCS

Transition from GSM-R, an old technology behind railway communications today, to FRMCS, represents an excellent opportunity for railway communication solutions vendors to develop new breed of products, powered by 5G broadband network technologies. Developers of cab radios, telephony on-board (TOBA) gateways, European Train Control System (ETCS) and Automated Train Operation (ATO) solutions, trackside gateways, dispatch and command and control systems, passenger communication applications, railway testing equipment, and many others can start building their next generation FRMCS solutions today, using MCX capabilities as a foundation.

## MCX, the Foundation for FRMCS

Broadband Mission Critical Communications standard, MCX, developed by 3GPP, is the foundation for FRMCS communications. MCX enables support for all group communications capabilities (MCPTT, MCVideo, MCDData) including railway-specific requirements such as functional alias, multi-talker, railway emergency call and many other. Utilizing MCDData IPConn capability, MCX also offers highly secure and reliable transport for demanding FRMCS railway

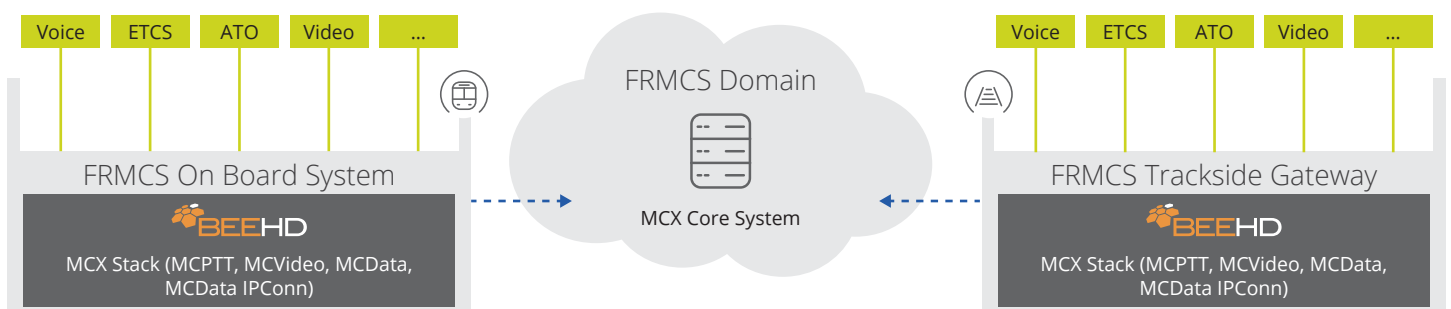
signaling applications, such as train control, automated train operation, automated train protection, passenger information system and more, as illustrated in the diagram below.

When developing an FRMCS solution for on-board or trackside applications, using standards-compliant, feature-rich, interoperable and future-proof MCX solution is a baseline necessity for successful FRMCS product implementation.

## BEEHD MCX Framework for FRMCS

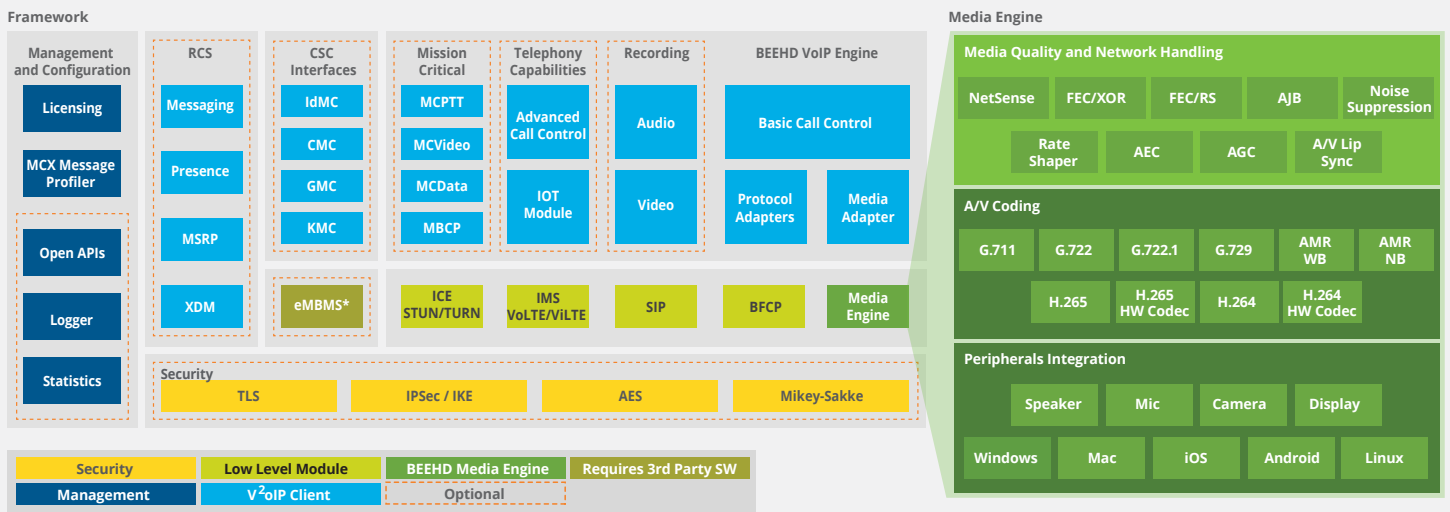
Softil's BEEHD is a cross-platform MCX/FRMCS framework (SDK) designed for developers of applications for Mission Critical Communication and FRMCS over 5G/LTE, offering functionalities such as Push-to-Talk (MCPTT), Push-to-Video (MCVideo), Group Chat, Short Data Service (MCDData), and MCDData IPConn for on-board gateways and cab radios, handheld devices, trackside gateways, and dispatch/command and control solutions, and more.

BEEHD supports standards-based 3GPP Mission Critical Communication (MCX) over 5G and LTE. It provides highly intuitive and flexible APIs that accelerate development and saves time, enabling highly-interoperable, carrier-grade, and standard-compliant communication solutions.



# BEEHD Framework for MCX and FRMCS Features and Highlights

- **Push-to-Talk (MCPTT), Push-to-Video (MCVideo)** over 5G and LTE
- **Functional Alias, Railway Emergency Call, Multi-talker**
- **MCDData IPConn**
- **MCDData** for Short Data Service (SDS), group chat, file & image transfer.
- **High Quality** Audio and Video with numerous media quality algorithms
- **Highly secure** media and signaling
- **Location management**
- **Presence:** Providing online data of the client and its availability
- **Emergency Alerting:** Prioritized/urgent access to the network
- **Ready-to-use, Multi-platform, Multi OS consolidated framework** for signaling, security, media and call control.
- **Interoperability:** Highly flexible and customizable
- **Standard-compliant,** latest 3GPP MCX and FRMCS standards.
- **Integration with Hardware:** optimized hardware integration for multiple chipsets and peripherals.



## Product Specifications

|  |  |   |  |
|--|--|---|--|
| <b>Mission Critical</b>                        | ■ IdMC, GMC, CMC, KMC  | ■ MCPTT, MCVideo, MCDData   | ■ eMBMS  |
| <b>Signaling Protocols</b>                     | ■ SIP (RFC 3261)<br>■ IMS/VoLTE/ViLTE SIP  | ■ HTTP/HTTPS<br>■ MSRP  | ■ FW/NAT Traversal: ICE, STUN TURN<br>■ XDM  |
| <b>Operating Systems</b>                       | ■ Android (software codecs)<br>■ iOS (software codecs)   | ■ Windows<br>■ Mac OS/X   | ■ Linux  |
| <b>FRMCS Features</b>                          | ■ Functional Alias (FA)<br>■ Multi-talker  | ■ Multi-talker Location<br>■ MCDData IPConn   | ■ Railway Emergency Call (REC)   |
| <b>Security</b>                                | ■ AES-128/256, CM/GCM<br>■ TLS   | ■ IPsec<br>■ SRTP   | ■ Mikey-Sakke<br>■ IKE   |
| <b>Voice and Video Call Types and Services</b> | ■ Group Call (ad-hoc, pre-established)<br>■ Emergency and Immediate Peril Calls<br>■ Early Media | ■ Push to Talk, Push to Video<br>■ Private Call<br>■ Ambient Listening/Viewing                | ■ 1-to-1, 1-to-Many<br>■ Group Chat<br>■ Hold, Mute, Transfer, Forward                             |
| <b>Quality</b>                                 | ■ Reed Solomon FEC (Forward Error Correction)<br>■ Automatic Gain Control (AGC)                  | ■ NetSense™ bandwidth estimation and adaptation technology<br>■ Audio Echo Cancellation (AEC) | ■ Noise Suppression (NS)<br>■ Audio Packet Loss Concealment (PLC)<br>■ Hardware Codec Acceleration |
| <b>Audio</b>                                   | ■ G.711, G.722, G.722.1, G.729   | ■ AMR WB, AMR NB, EVS   | ■ Audio Recording  |
| <b>Video</b>                                   | ■ H.264, H.265   | ■ 1080p/30 fps  | ■ Video recording  |
| <b>Interoperability</b>                        | ■ Interoperable with all major vendors and MC systems  |   |  |
| <b>Additional Capabilities</b>                 | ■ Stand Alone Messaging  | ■ Location<br>■ Image Transfer  | ■ SIMPLE presence<br>■ File Transfer   |

For more information, contact Softil at [info@softil.com](mailto:info@softil.com)

© 2023 Softil, Ltd. All of the company names and/or brand names and/or product names and/or logos referred to in this document, including the name "Softil" and its logo device, are either registered trademarks or trademarks pending registration in accordance with relevant national laws. All rights reserved. Specifications subject to change without notice. Rev. A | 06/23

