

BEEHD Framework for FRMCS and Public Transportation Communication Clients

In the last decade, LTE mobile networks have evolved to become the next generation technology for a new ecosystem of Mission Critical Communication solutions, taking the place of legacy technologies based on narrowband, such as P25, TETRA and analog systems.

Public transportation and railway communication systems are shifting towards the new communication solutions, which replace 2G and 3G with 5G/LTE, and GSM-R with FRMCS. The broadband-based solutions promise improved audio and video quality, and faster data sharing from the engine to the dispatch and from the bus to the operations center - a completely new ecosystem for those who are in charge of hundreds of millions of commuters and passengers every day.

Softil's BEEHD is a cross-platform client SDK, designed for communication systems vendors, device manufacturers, integrators, and developers looking to accelerate development of applications for Voice, Video, and Mission Critical Communication over 5G/LTE (VoLTE, ViLTE and MCC), offering functionalities such as Push-to-Talk, Push-to-Video, group communication, and Voice and Video for on-board terminals, handheld and cabin-mounted systems.

BEEHD is a standard-based framework supporting 3GPP Mission Critical Communication (MCX) over 5G/LTE, GSM IR.92 and IR.94 as well as Rich Communication Suite functions. It provides highly intuitive and flexible APIs that accelerate development and save time, thus enabling highly-interoperable, carrier-grade, and standard-compliant communication clients.

Mission Critical Communication Clients

- **Voice and Video:** Calls over IP and 5G/LTE
- Secured media and signaling
- **Push-to-Talk (MCPTT):** Broadcasting live audio to members of a specific group, in accordance with 3GPP MCX standards
- **Push-to-Video (MCVideo):** Transmission of video stream to a specific group
- **High Quality Audio and Video:** Ensuring clear voice and high definition video from and to the communication client
- **Instant Messaging and Chat (MCData):** Group messages to recipients

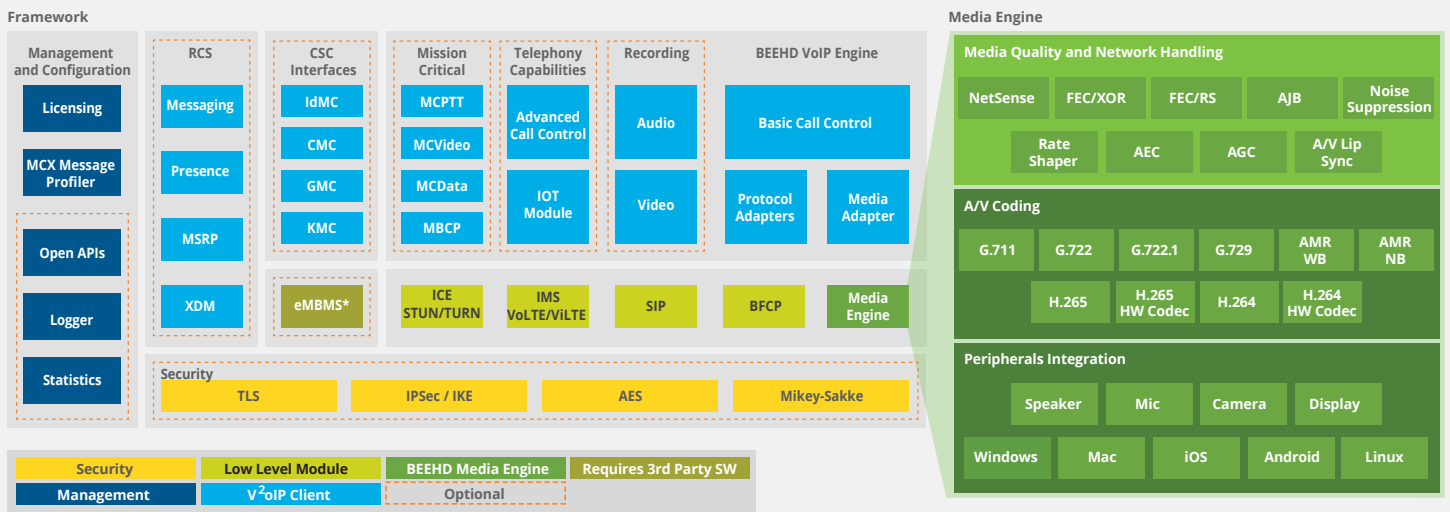
- **Rapid data sharing (MCData)** and exchange of information between vehicle/engine and dispatch
- **Presence:** Providing online data of the client and its availability
- **Floor control,** group-talk management utilizing Multimedia Burst Control Protocol (MBCP standard of 3GPP)
- **Emergency Alerting:** Prioritized/urgent access to the network

Highlights

- **Ready-to-use, Multi-platform Client Engine:** Consolidated framework for signaling, security, media and call control.
- **Shortest Time to Market:** Reduces development and integration efforts by up to 70%.
- **Guaranteed High Quality of Experience:** Utilizes advanced algorithms to ensure superb video quality even in harsh network conditions.
- **Interoperability:** Highly flexible and customizable for customer and operator needs.
- **Standard-compliant,** with the most up-to-date Mission Critical Communication clients for mobile devices.
- **Integration with Hardware:** Provides an optimized solution for multiple chipsets and seamless integration with peripherals.
- **Operating Systems:** Supports Android, iOS, Windows, Linux, and Mac OS X.

BEEHD Framework for MCC LTE-R Railway and Public Transportation Communication Clients

Modular Architecture:



Product Specifications			
Mission Critical	<ul style="list-style-type: none"> VoLTE IR.92 and ViLTE IR.94 MCVideo MCDData 	<ul style="list-style-type: none"> MCPTT One-to-many Audio and Video MCDData IP Connectivity 	<ul style="list-style-type: none"> eMBMS FRMCS
Signaling Protocols	<ul style="list-style-type: none"> SIP (RFC 3261) IMS/VoLTE/ViLTE SIP 	<ul style="list-style-type: none"> HTTP/HTTPS Presence and IM: SIMPLE 	<ul style="list-style-type: none"> FW/NAT Traversal: ICE, STUN TURN MBCP Floor Control
MC Management Interfaces	<ul style="list-style-type: none"> CSC-1 - IdMC - Identity Management Client CSC-2 - GMC - Group Management Client 	<ul style="list-style-type: none"> CSC-4 - CMC - Configuration Management Client CSC-8 - KMC - Key Management Client 	
Operating Systems	<ul style="list-style-type: none"> Android (software codecs) iOS (software codecs) 	<ul style="list-style-type: none"> Windows Mac OS/X 	<ul style="list-style-type: none"> Linux
Hardware Codec Acceleration	<ul style="list-style-type: none"> Qualcomm Snapdragon Samsung Exynos 	<ul style="list-style-type: none"> Intel Atom Texas Instruments 	<ul style="list-style-type: none"> NVIDIA MediaTek
Management	<ul style="list-style-type: none"> Configuration and provisioning logger RESTful Open APIs 	<ul style="list-style-type: none"> Call history SIP server-less operation 	<ul style="list-style-type: none"> Contact list management
Security	<ul style="list-style-type: none"> AES-128 and AES-256 TLS 	<ul style="list-style-type: none"> IPsec S RTP 	<ul style="list-style-type: none"> Mikey-Sakke IKE
Voice and Video Call Types and Services	<ul style="list-style-type: none"> Group Call (ad-hoc, pre-established) Emergency and Immediate Peril Calls Early Media 	<ul style="list-style-type: none"> Push to Talk, Push to Video Private Call Ambient Viewing 	<ul style="list-style-type: none"> 1-to-1, 1-to-Many Group Chat Hold, Mute, Transfer, Forward
Quality	<ul style="list-style-type: none"> Reed Solomon FEC (Forward Error Correction) Automatic Gain Control (AGC) 	<ul style="list-style-type: none"> NetSense™ bandwidth estimation and adaptation technology Audio Echo Cancellation (AEC) 	<ul style="list-style-type: none"> Noise Suppression (NS) Audio Packet Loss Concealment (PLC)
Audio	<ul style="list-style-type: none"> G.711, G.722, G.722.1, G.729 	<ul style="list-style-type: none"> AMR WB, AMR NB, EVS 	<ul style="list-style-type: none"> Audio Recording
Video	<ul style="list-style-type: none"> H.264 AVC, H.264 High Profile H.265 BFCP 	<ul style="list-style-type: none"> Resolution: CIF/VGA/SVGA/720p/1080p External H.264 camera support Capture snapshot to JPEG file 	<ul style="list-style-type: none"> Text overlay Video recording Frame rate: up to 30fps
Interoperability	<ul style="list-style-type: none"> Interoperable with all major vendors and MC systems 		
RCS and Advanced Services	<ul style="list-style-type: none"> Option based Capability exchange Stand Alone Messaging CPM, CPIM based Instant Messaging IM large message mode (MSRP) 	<ul style="list-style-type: none"> Multiple recipients (multi 1-1 IM) Store & Forward HTTP/HTTPS Provisioning Integrated Messaging Inbox, including SMS 	<ul style="list-style-type: none"> Voice and Video Calls SIMPLE presence File Transfer XDM

For more information, contact Softil at info@softil.com