Communication Multi connectivity Platform

Technological Description

The Communication Multi connectivity Platform responds to the connectivity demands of the Future Railways. It is a modular platform that seamlessly supports critical, performance, and business applications, both FRMCS and non-FRMCS compliant, this modular platform stands at the forefront of innovation, adaptability, and resilience within the rail landscape.

It deals with multiple radio bearers used concurrently to serve the future railways' needs. It integrates various FRMCS application types, including Critical, Performance, and Business applications; and includes FRMCS-compliant and non-compliant applications. Moreover, it allows a decoupling between the application and the radio bearer.

Application

Achieving seamless compatibility and integration between onboard and trackside systems leads to a multifaceted enhancement in flexibility, risk reduction, scalability, and cost efficiency. These cumulative advantages work together to establish a resilient, adaptable, and cost-effective train-to-track communication infrastructure. In doing so, the capabilities of the infrastructure manager tasked with overseeing rail operations are bolstered.

Communications Vehicle – Infrastructure for critical and non-critical applications including FRMCS. Among the applications considered:

- **Critical applications,** such as ETCS (ATP) and ATO.
- **Performance applications,** such as non-critical real-time High-Quality video communication.
- **Business applications,** including Gigabit Wi-Fi for passengers.
- **MNO applications,** specifically VoWiFi, are explored to be provided directly from MNO using the bearers used for business applications.

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Technical specifications

Among the communication technologies covered:

- **5G MNO** optimizes connectivity by tailoring solutions to specific use cases, enhancing mobile broadband with faster data speeds, extensive IoT connectivity, and ultra-reliable low-latency communication.
- **5G NR-based FRMCS** operating in the sub-GHz and 1900 MHz bands ensures heightened reliability, meeting the stringent requirements of critical use cases with lower bandwidth needs and dedicated spectrum for safety-critical scenarios.
- **SATCOM:** the global coverage and disaster recovery services of satellite communications.
- **Wi-Fi 802.11ad** cost-effective, high-speed wireless communication, making it an ideal choice for supporting diverse services in regional lines within localized areas, particularly in regions where Service Providers may be hesitant to invest in connectivity.

Benefits

1. Seamless vehicle trackside communications.
2. Increased coverage/availability.
3. Applications priority management.
4. Optimised comm infrastructure.
5. Flexibility for new applications.

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Knowledge driving the Railway Industry
CEIT research in Communication for Railways is focused on the integration and management of different Communication technologies following FRMCS.