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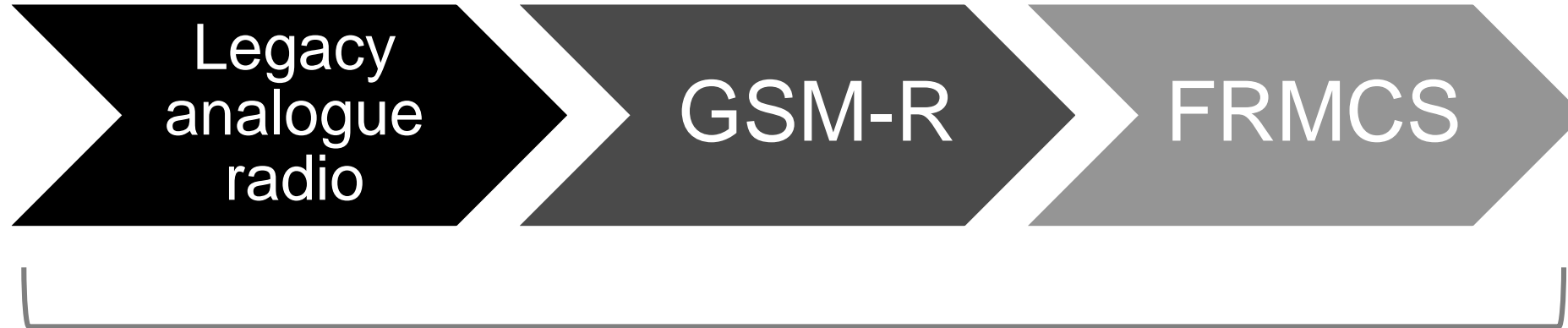
**ERA CCRCC 2017**

**Session II  
Next Generation  
Communication  
System**

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# Path to FRMCS



## Ensuring an interoperable transition

Evolutionary migration instead of replacement

Protecting railway investments in GSM-R

FRMCS standardized and interoperable again

# FRMCS requirements – and how to address

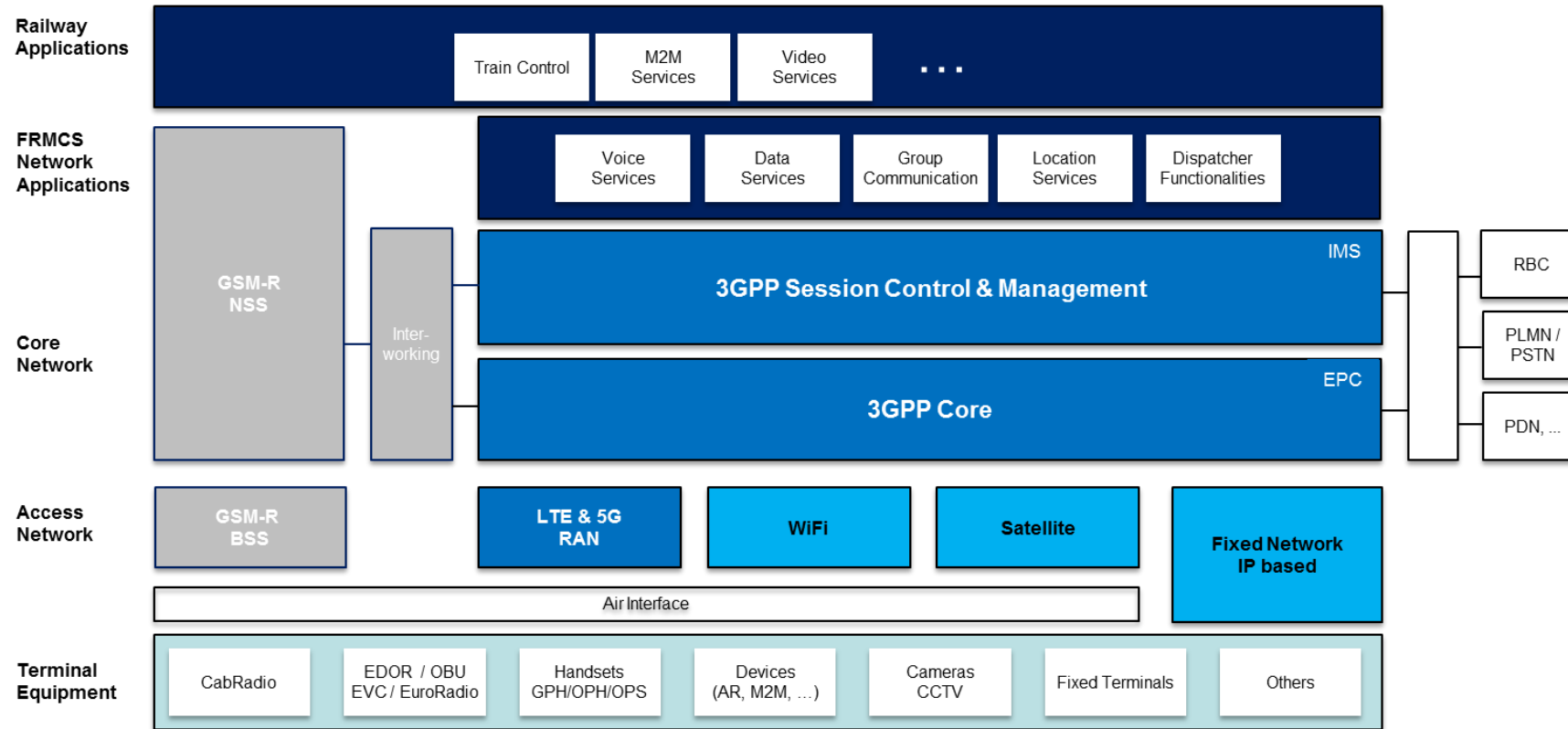
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- **Key requirements are raised for a FRMCS system**
  - Application based realization
  - Bearer flexibility: mobile, satellite, WiFi. Fixed network support.
  - Suitable for Main Line, Mass Transit/Metro and Freight
  - Addressing European and non European railway operator requirements
  - Interworking capabilities with GSM-R
- **Benefits following the 3GPP evolution:**
  - Interoperability and interworking
  - Reliability and robustness
  - Flexible service architecture for application orchestration -> IMS
  - Multiple access technologies with aggregation options in core and radio
  - Quality of Service, Efficiency, Cyber Security
  - Mission Critical Communication functionality

**-> Economy of scale of a world wide technology!**

# 3GPP based End to End System Architecture

– concepts under evaluation in ETSI TC RT



**Design target: Railway specific function on application layer.**

# Migration towards FRMCS ROC IG support

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- By preparing GSM-R network and terminals/cab radios to be capable to support a smooth evolution and migration
- By building solutions to fulfil railway requirements for reliable communication as a base for ETCS - first step with ETCS over GPRS
- By relying on our experience when it comes to standardization and TSI related certification support
- By proofing capabilities of new technologies in early trials (e.g. Metro trials on LTE for critical voice and data)

-> Spectrum decision needed to allow the industry to complete the development

# Migration towards FRMCS

## ROC IG support on product evolution

|               |  |   |   |   |
|---------------|--|---|---|---|
| Network       | Introduction of IP technology in core and transmission             | R4 core network with interworking capabilities to 3GPP IMS based networks | HLR evolves towards HSS   | Control Room enhancements for support of various domains technology             |
|               | Introduction of ETCS over GPRS. Packet Core for multi radio access | IN/SCP with IP/SIP interface  | Distributed BTS allowing for flexible site reuse. Multi technology option | SIP interface for dispatcher  |
| Terminals/CAB | ETCS / Data support  | CAB Radio with multiple technology support:<br>Dual mode GSM-R/ LTE       | Voice over LTE and MCPTT support  | Functionality enhancements:<br>Remote condition monitoring via data connections |

# Summary

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- ROC IG members are committed to ensure GSM-R support and to provide the foundation for an interoperable transition to FRMCS
- Helping operators by maximum reuse of the deployed assets following 3GPP evolution
- Providing standardized & TSI compliant solutions
- **GSM-R is a success story – let's continue for FRMCS**

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Thank you