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IP Migration of GSM-R

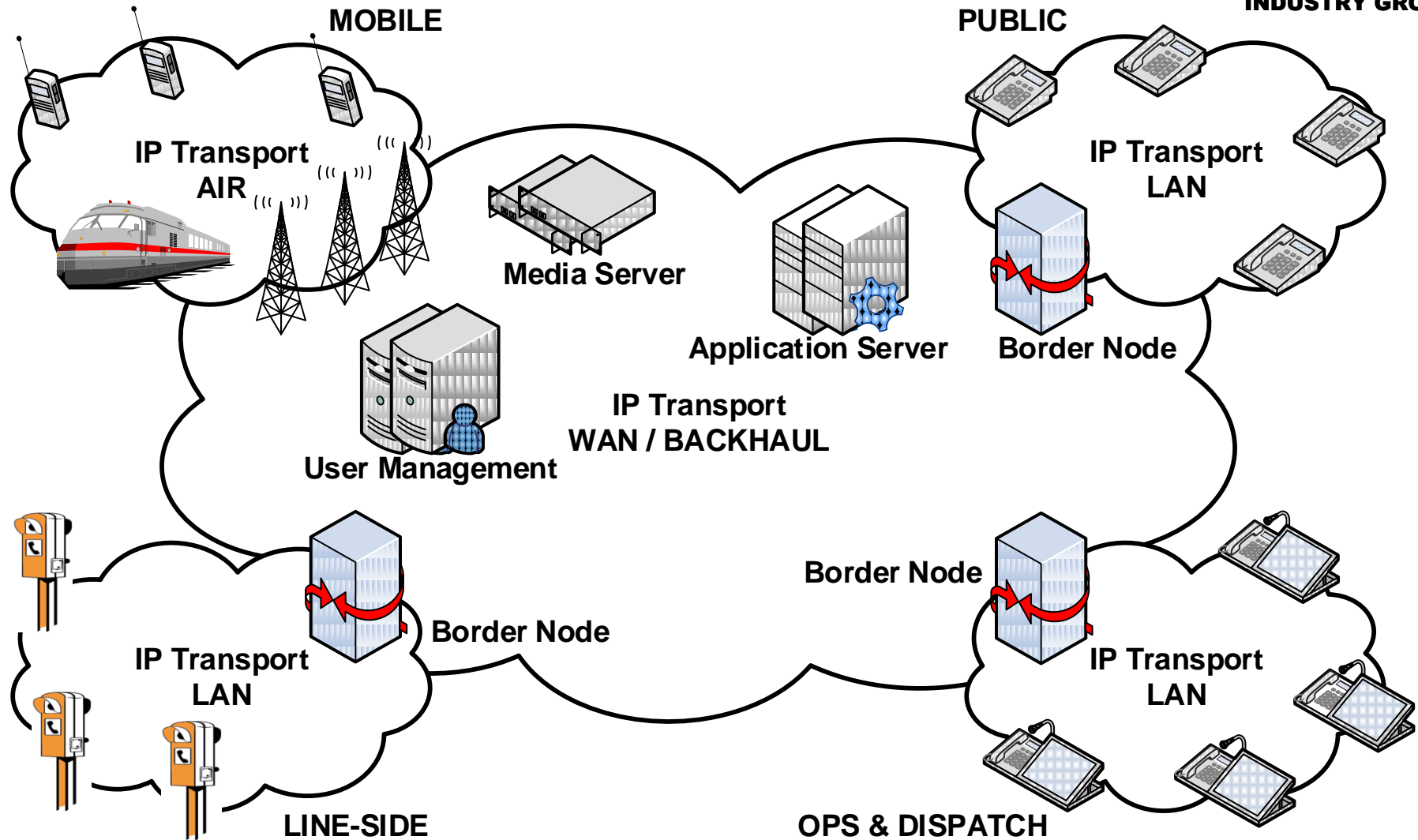
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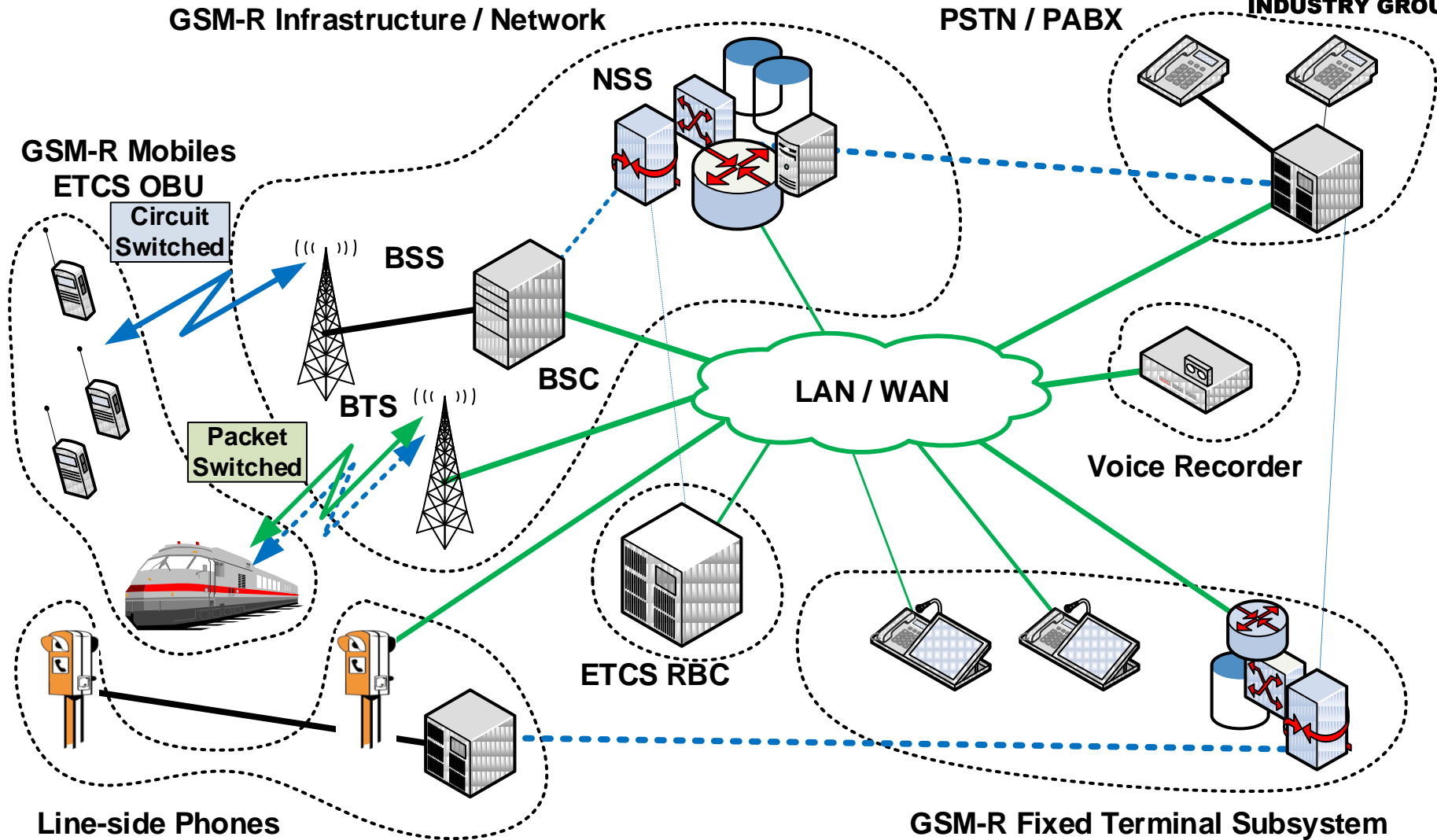
Topics

- WHAT to migrate and to standardize
- WHY to do this
- WHICH work is done by WHOM and WHERE
- HOW this will influence future systems

We will end up with a revolution ...



... but go for an evolution, hence migration!



IP based applications, sub-systems and interfaces

- Applications and services evolving to IP → Recording, ETCS
- Sub-systems evolving to IP → NSS, FTS, Mobiles
- Interfaces evolving to IP → between and within sub-systems
- Future IP based architecture and interfaces
 - “all over IP“ as e.g. LTE
- Chosen interface technology → SIP, IP
 - Basis of future systems
 - e.g. LTE → IP, IMS → SIP

Motivation and goals for migration

- Apply new technology, IP, where feasible → overcome obsolescence
- Follow commercial market and products → decrease cost
- Do not change the whole system at once → secure investments

→ Gain from IP benefits but address challenges!

IP benefits & challenges

- Benefits
 - One multi-service network for different types of applications
 - Increase of reliability & availability (resilient architecture)
 - Efficient use of limited capacity at the interfaces in question
- Challenges
 - Quality-of-service
 - Security
 - “Interconnection and interworking with legacy, already rolled-out systems
 - Future proof implementation vs. decreasing life-cycle of off-the-shelf components

Standardisation concerning IP migration










- UIC / ERA
 - Guidelines
 - Change requests and requirements
 - FRMCS project to compile requirements for next generation system
- GSM-R TIG
 - Review of change requests and requirements
 - technical feasibility
 - commercial impact
- ETSI Technical Committee for Railway Telecommunication
 - Technical specifications
 - Dedicated working group for next generation system (NG2R)

Update on “IP and SIP Interfaces” at ETSI



- Interface between NSS and FTS (ETSI TS 103 389 – v3.0.0)
 - NSS/FTS to Voice Recording System
 - Supplementary services (in line with EIRENE requirements)
- “A over IP” (NSS – BSS)
 - Change requests prepared by TC RT under approval within ETSI and 3GPP
- “A-bis over IP” (BSC – BTS)
 - Working on definition of a Technical Report (TR) for “Abis over IP”
- “GRPS/EDGE requirements for ETCS” (ETSI TS 103 320)
 - Define which (already published standards) are applicable to rail
- “AT commands for GPRS/EDGE operation”
 - Interface within the On-Board Unit
 - Interface to the GSM-R mobile termination changes because of the bearer

Implementation works and roll-out

- Evolution & migration of GSM-R core network from “Release 99” to “Release 4”
 - Austria, Germany, Great Britain, Norway, ...
   
- Roll-out of IP based controller equipment (core nodes and terminals)
 - Norway, Ireland, Lithuania, ...
  
- Possible implementation of SIP based interface between NSS and FTS
 - Germany, ...
- ETCS over GPRS
 - Great Britain, ...

Going beyond evolutionary approach for IP

- **IP is already defined** as basic technology for next generation communication (by UIC, ERA and industry)
- Current IP evolution enables future path to an IP based railway communication system → will end up in “**next generation architecture**”
- **IP capable user-devices** are continuously rolled-out
- Services, including railway specifics, will be accessible **independent of access technology** and service distribution
- Other domains support and drive standardisation, e.g. 3GPP MCPTT and OMA PCPS → **standards for mission critical services expected 2016**

→ MIGRATION to FRMCS is already on the way and progresses!

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On track!

Thank you.