



Session 4 TELECOM

GSM-R IG: More efficient ETCS data transport with GPRS and eGPRS

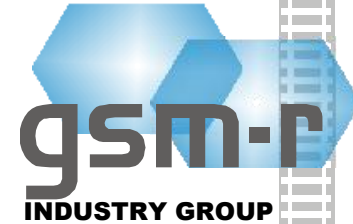


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More efficient ETCS
data transport with
GPRS and eGPRS

Jean Michel Evanghelou
Head of Railways Solution

Kapsch CarrierCom

Context and drivers

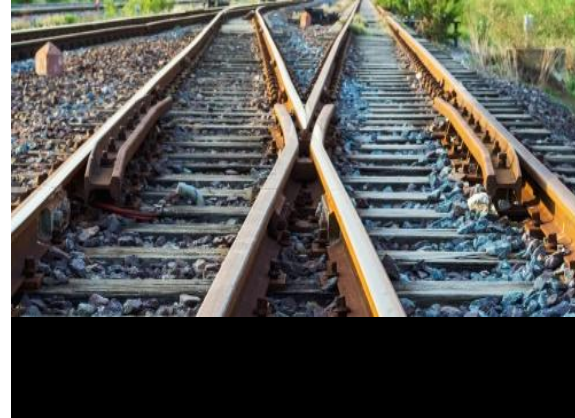
-  Need to provide more capacity for ETCS due to some saturation areas
-  First step towards packet switched technology to prepare future IP evolution of GSM-R
-  TEN-T program to assess, define and validate the end-to-end solution
-  Finalizing standardisation / regulation in ETSI TC-RT, UIC and ERA
-  GSM-R product adaptations and real benefits from GPRS / eGPRS (edge) implementation

GPRS & E-GPRS

An evolution sponsored by ERA & UIC



GPRS as an option of CSD



GPRS as a stepping stone from current circuit switched based technology towards any future proof mobile transmission technology



Today's view within the railway market

The limited capacity of GSM-R circuit technology is a limiting factor for the ERTMS deployment in dense traffic areas and in railway stations.

ETCS over GPRS

European Commission Decision c(2012) 693



The activity aims at **developing** ETCS over GPRS specifications **and demonstrating** the suitability of a packet switching technology, such as GPRS, as a transmission system for ETCS. The **ETCS over GPRS** specifications will be developed **with the aim to achieve a bearer independent system**, and the interface description with the communication system in order **to allow the data transmission over a packet switched technology, such as GPRS, while maintaining the current capabilities (transmission over a circuit switched technology – GSM-R).**”

CR 0741: Packet transmission for ETCS under **ERA CCM** process for inclusion in ETCS
Baseline 3 MR2



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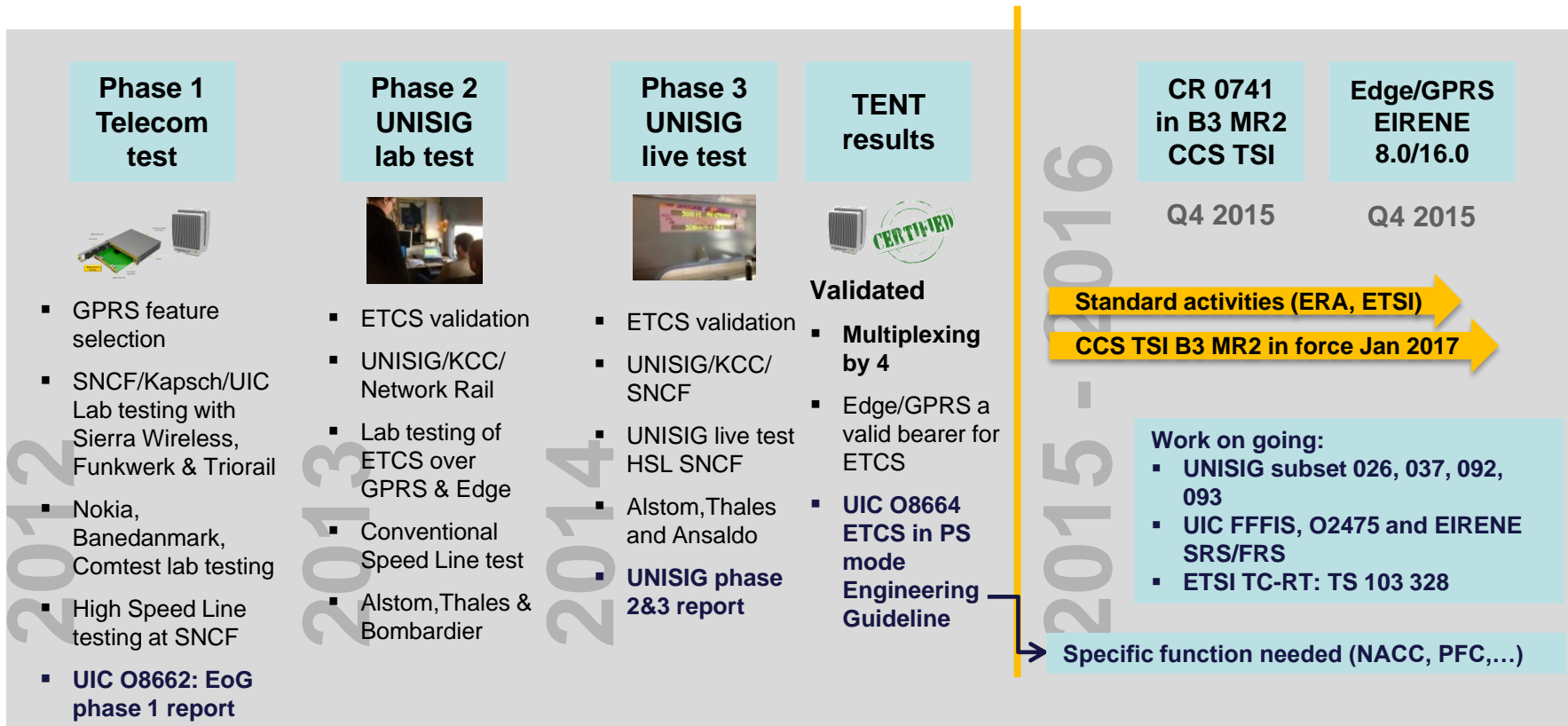
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TEN-T program

ETCS over PS - A long process



Tested, Demonstrated and Standardized

Our involvement in standardisation



Driving standardisation to inforce GPRS readiness

- Active driver in all area: TEN-T (ERTMS UG), ERA, ETSI TC-RT, UIC
- CEF call participant for Activity 3: ETCS over GPRS/EDGE capacity study in station environment

Main outcomes to date

▼
ETSI TC RT update
TS 103 328: GPRS/EGPRS
requirements for ETCS (final draft)



▼
ERA
CR 0741 - Packet Data
transmission for ETCS



▶ **EIRENE update**
FRS-SRS 8/16 (CR9225)



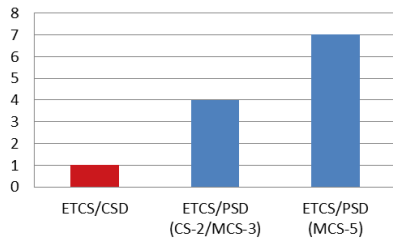
Driving standardisation towards Next Generation

- Active driver in major program: **ERA Next Generation, ETSI NG2R, Shift2Rail**

ETCS over GPRS study

Key findings

ETCS Users per Radio TS



Direct benefits

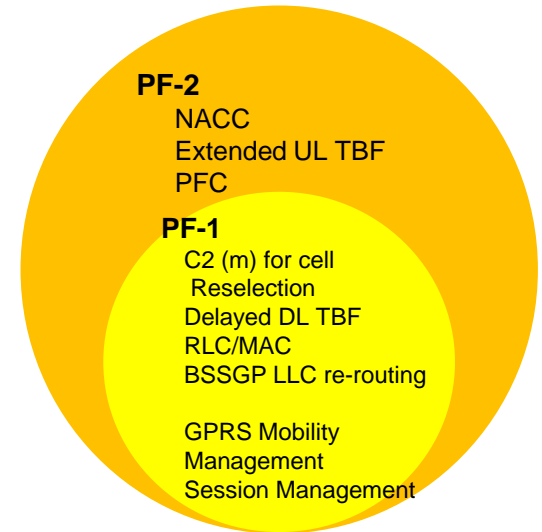
- Support for high traffic density areas (multiplexing)
- Flexible resource usage (sporadic connections, traffic spikes handling)
- Relaxation of constraints on frequency planning

GPRS/EDGE
Efficient Resource Usage

GPRS/EDGE
More Flexible Network Engineering

Recipes for an efficient and highly available network

- Geo-redundancy and high-availability features (Gb-Flex)
- EDGE offers Incremental Redundancy for robust communications in non-ideal radio conditions
- A careful radio planning still required to get the best performance



TEN-T Parameter Feature Set

PF-2 required for best performance

GSMR-IG has the expertise to deliver an efficient network in support of the growth of the railway traffic.

GPRS benefits

An enabler for ERTMS deployment



Capacity.

Multiplexing capability demonstrated using GPRS/EDGE.

- Will allow deployment of ETCS L2 in dense traffic areas, border areas and railway stations
- Will increase as such the track capacity and ERTMS deployment



Performance.

QoS Management.
Adaptative bearer selection.

- Will enhance the ground to train transmission and shorten time delay in case of disconnection
- Will increase track capacity and open the way towards ETCS L3, ATO



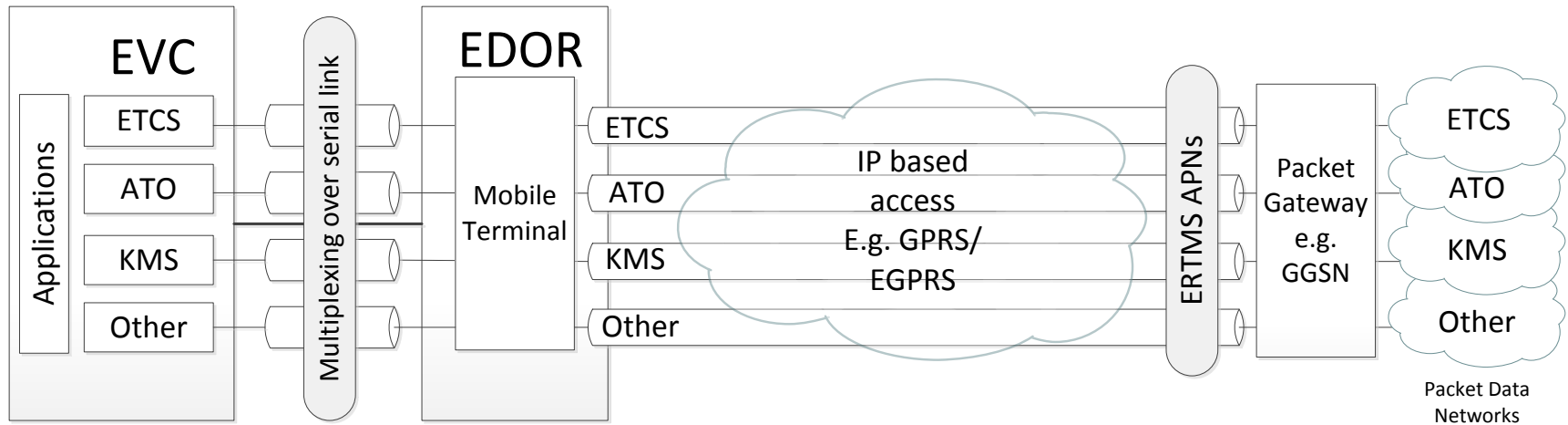
Maximize investment.

Mixed Traffic Operation
Open the gate for other applications.

- Removal of trackside signal equipments
- GPRS and EDGE pave the path towards an all IP evolution and will allow the deployment of other applications such as ATO, On line KMS, train diagnostic,...



ETCS over GPRS : solution enablers



GPRS and Edge already answering the need of tomorrow

CONCLUSION



Proven optimization of spectrum => ETCS operational benefits



Packet switched technology => Preparing Next Gen & Anticipating new Apps



Standardization and Tests done => Ready to Go

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