IP Introduction to Railways

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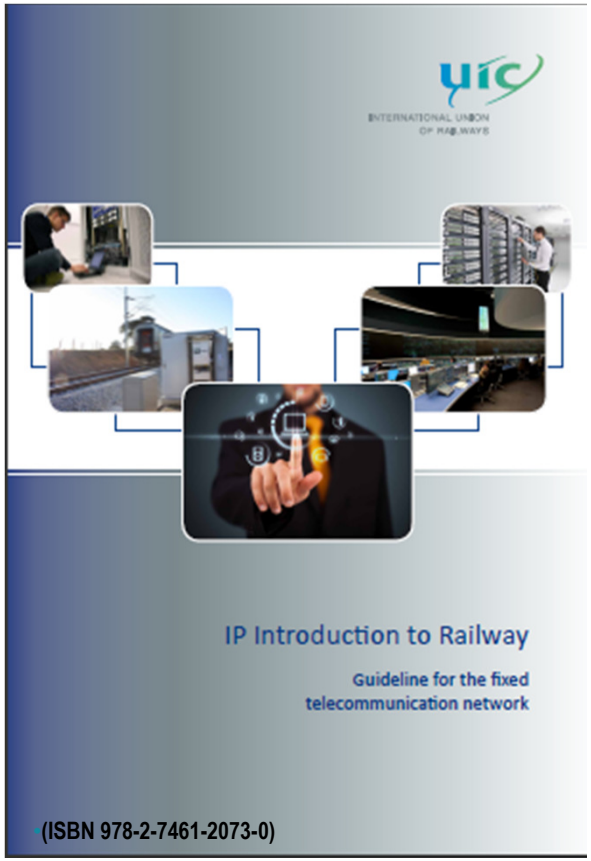
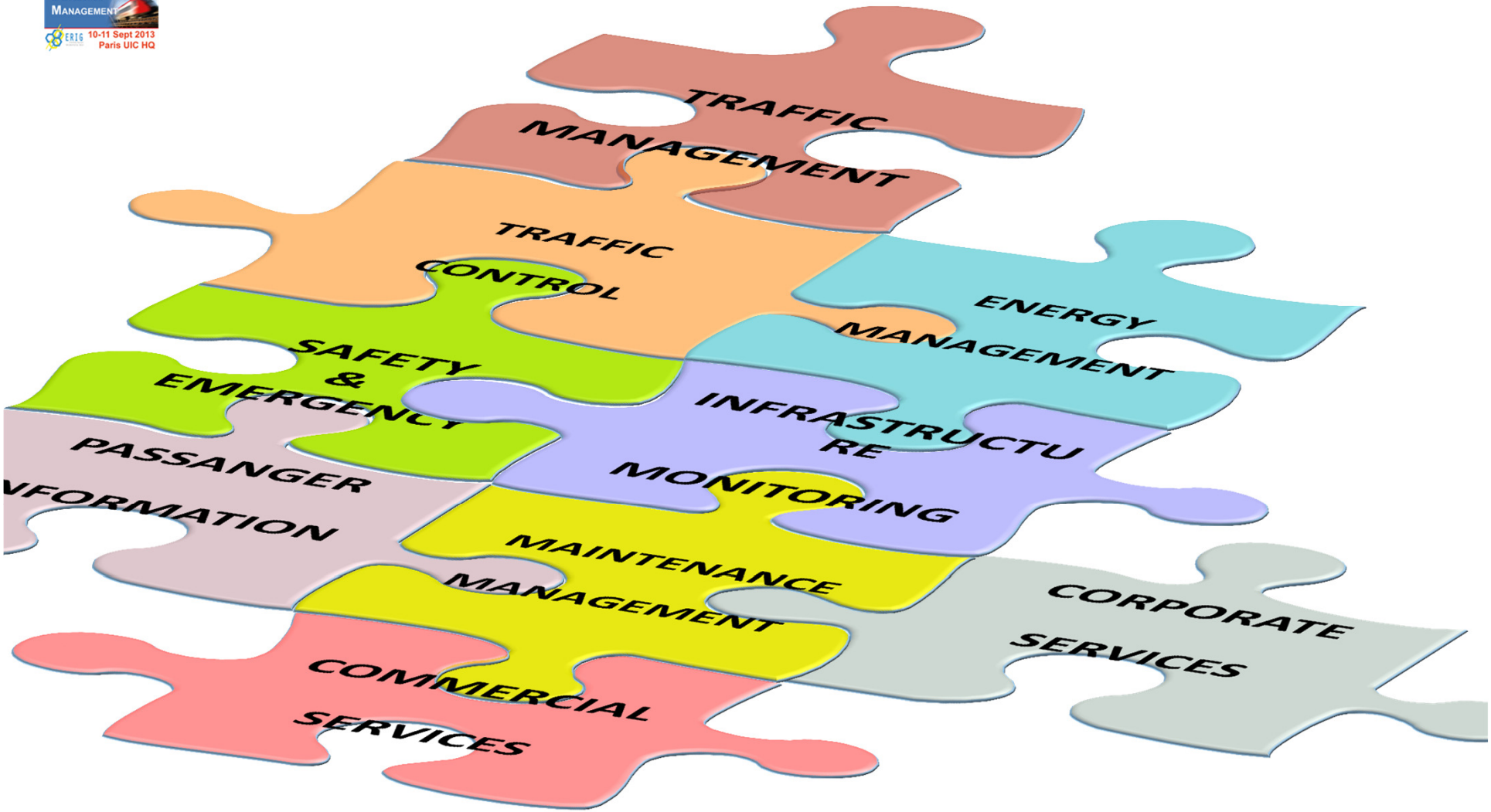
UIC

"IP Introduction to Railways"

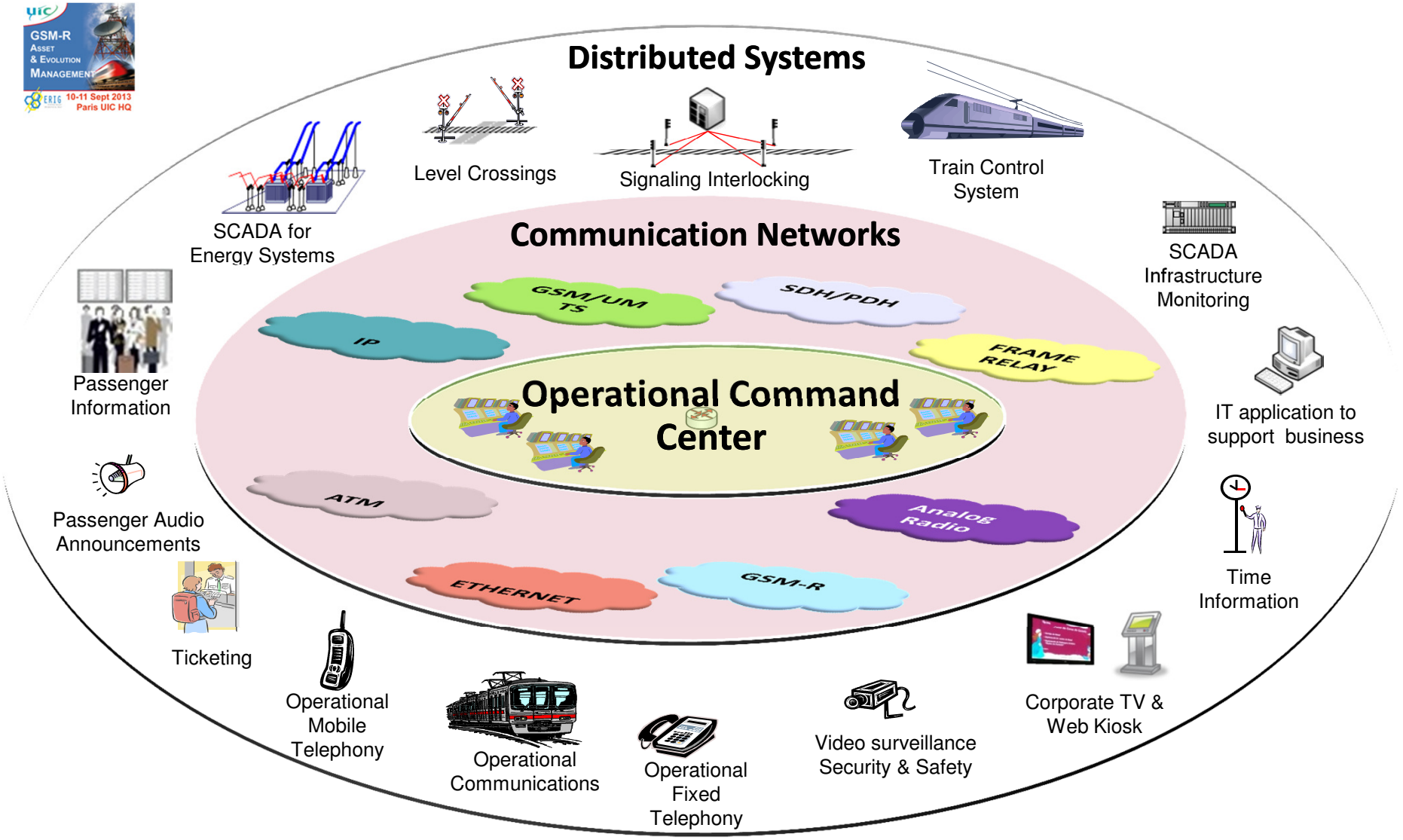


- Based on the **Portuguese railway experience, UIC,** jointly with some other networks, coordinate the development of a **manual of best practices on migration to IP technology.**
- **A first edition** was published in 2012 (ISBN 978-2-7461-2073-0).
- **A second edition** to be published until the end of 2013.

Holistic Railway Operational Model



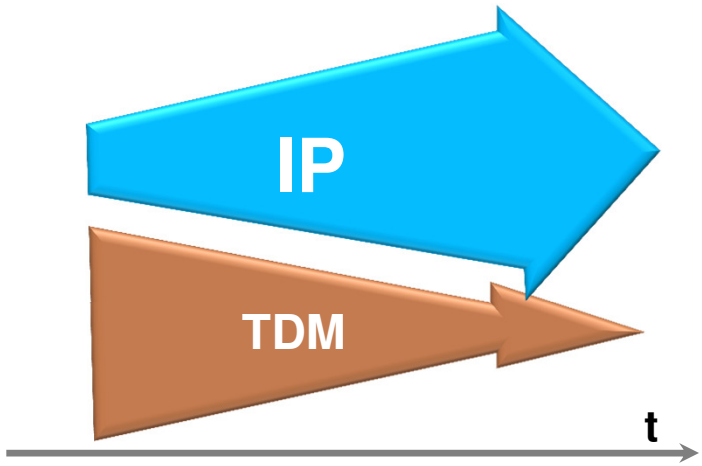
Towards Unified IP Network



Towards Unified IP Network

General telecommunications traffic trends:

- Network traffic has been and will continue to evolve from TDM to packet IP.
- However, the need to support legacy TDM services still be required.



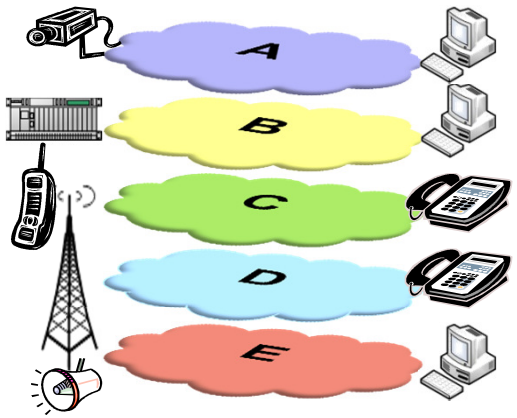
Towards an unified IP Network

The approach was:

- Converge interfaces and protocols towards IP
- Redesign the network as a unified IP network

Separate Networks

Communication topologies specific to each railway system



Convergence:

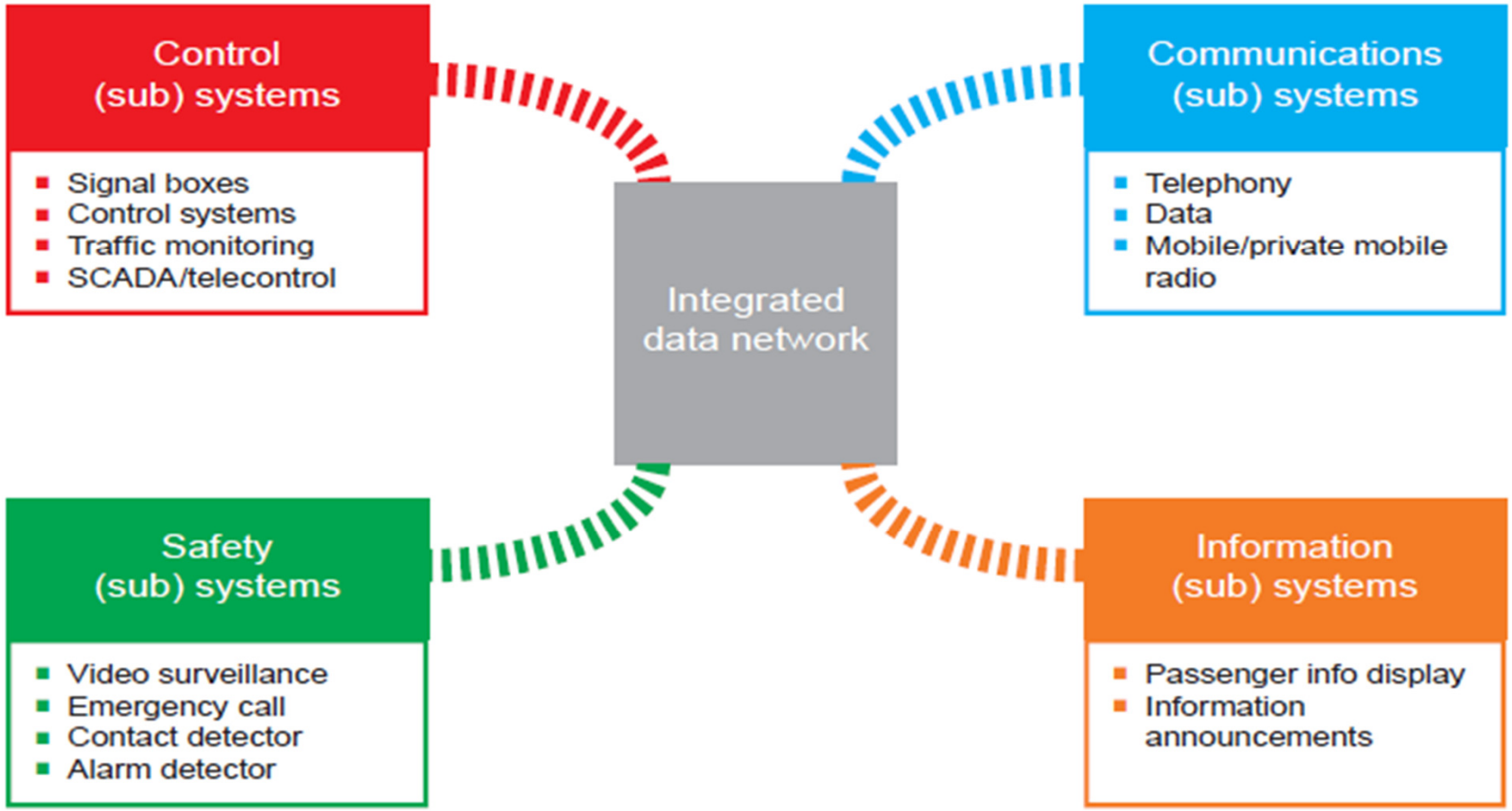
- Operational Optimization
- Project Simplification
- Higher Flexibility
- Higher Resource Allocation
- Optimized Costs Cx/Ox

Unified Network

All railway systems supported in a multiservice network

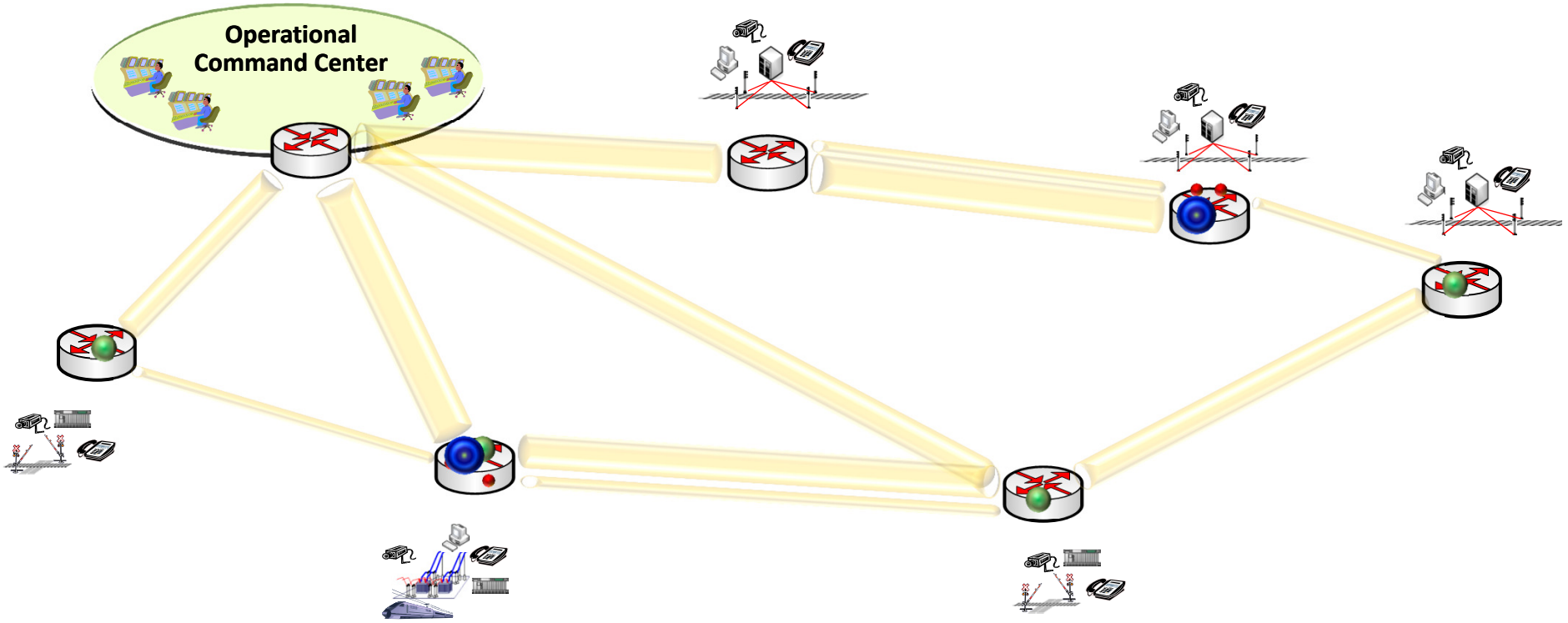
Towards Unified IP Network

Railway Operational Model



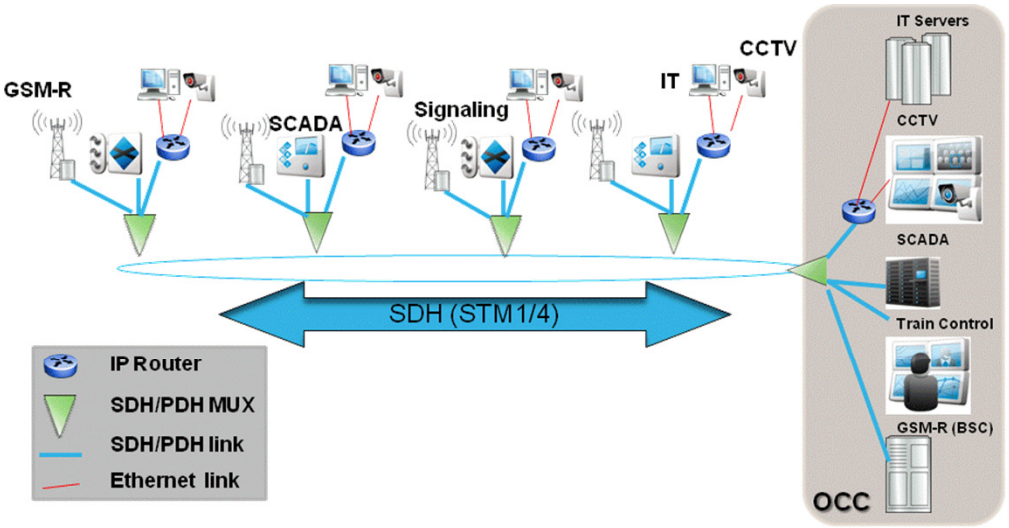
MPLS as a Step Forward on IP

MPLS implements virtual circuits on top of packet networks



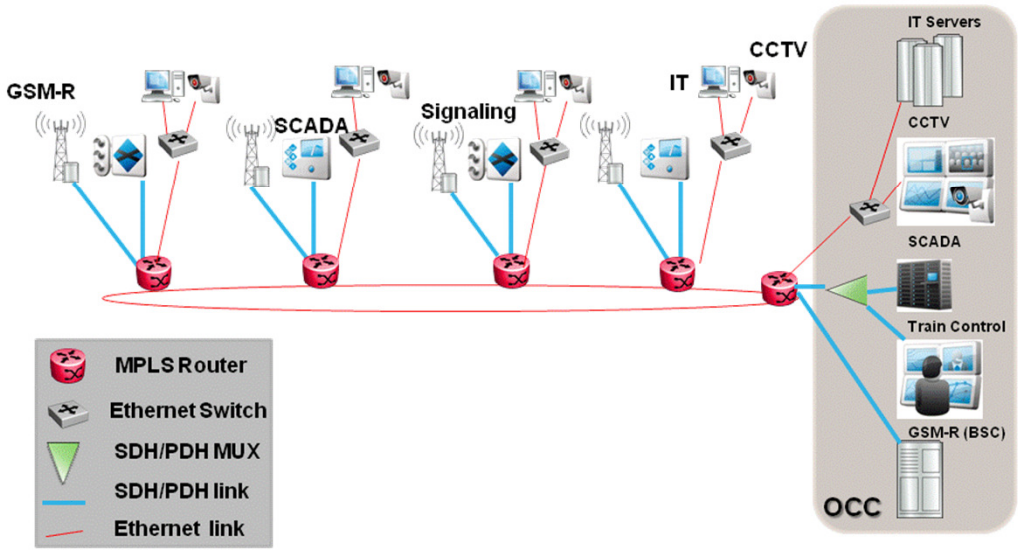
Reliability / Traffic Engineering / Traffic Isolation / Multiprotocol / Synchronization

Challenges of Introducing IP/MPLS

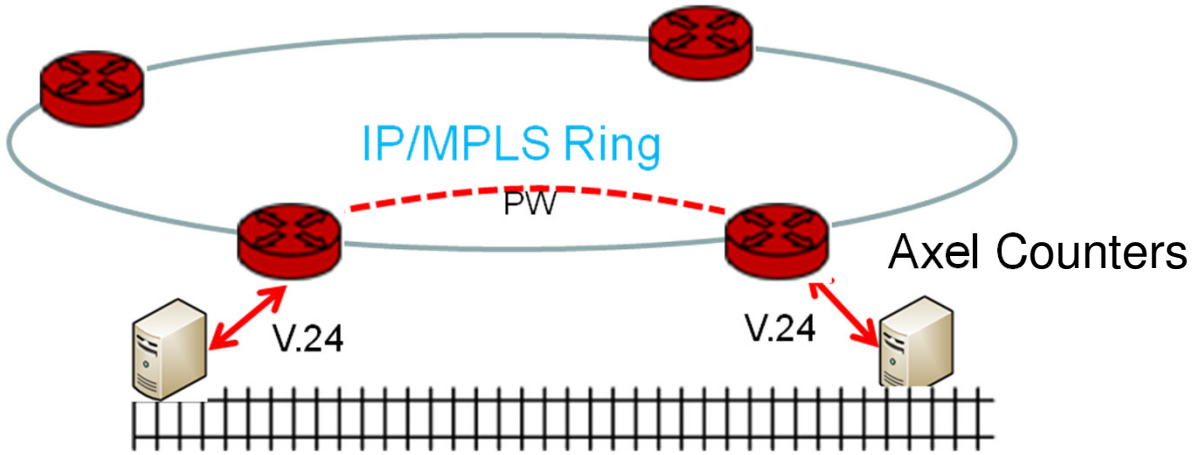


Railway services over TDM technoogy

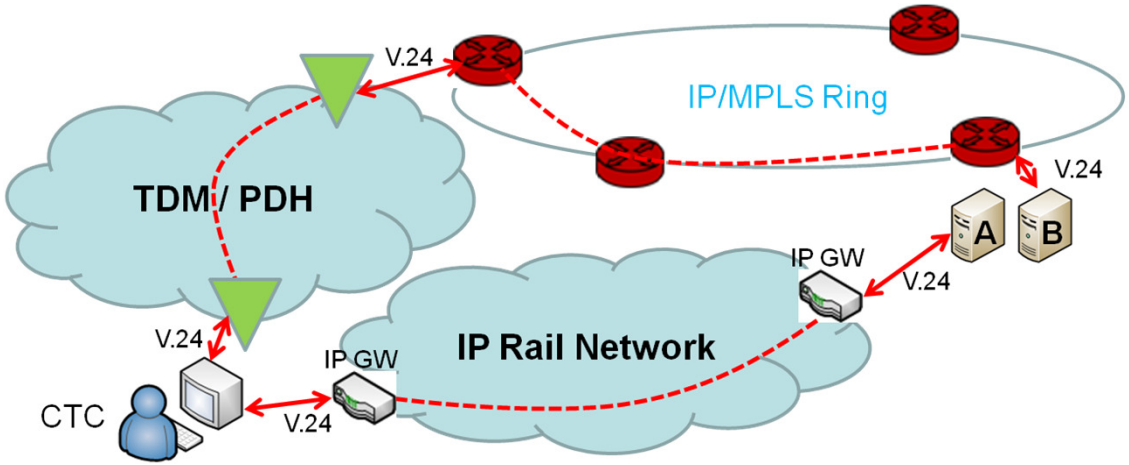
Railway services over IP/MPLS technoogy



Challenges of Introducing IP/MPLS



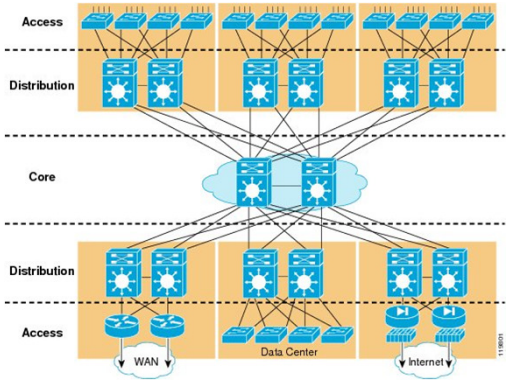
Railway services over IP/MPLS technoogy



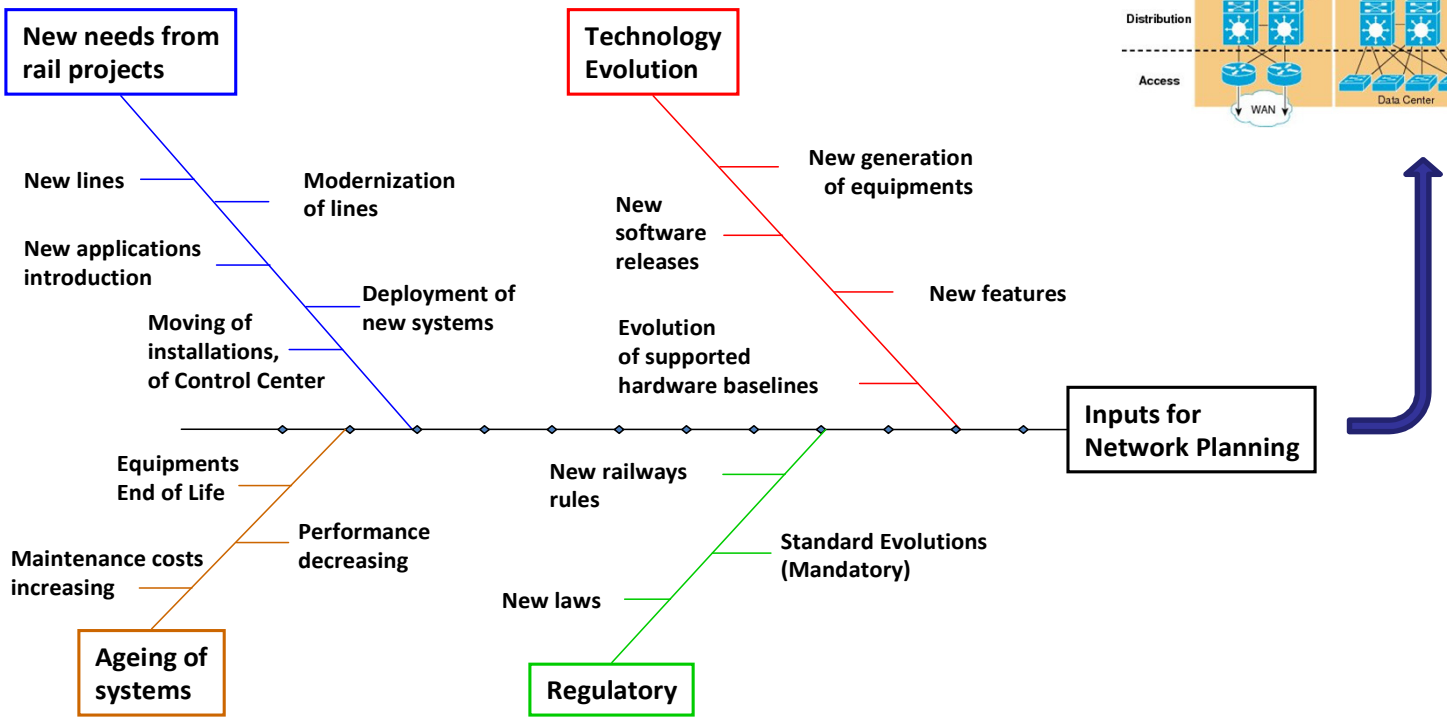
Requirement	ESTW	PIPC	Axel Counter
Network Recovery in case of link failure	< 500 ms	< 5s	< 500 ms
Interface	V.24 / RS232	V.24 / RS232	V.24 / RS232

Guidelines for Introducing IP

Network Design



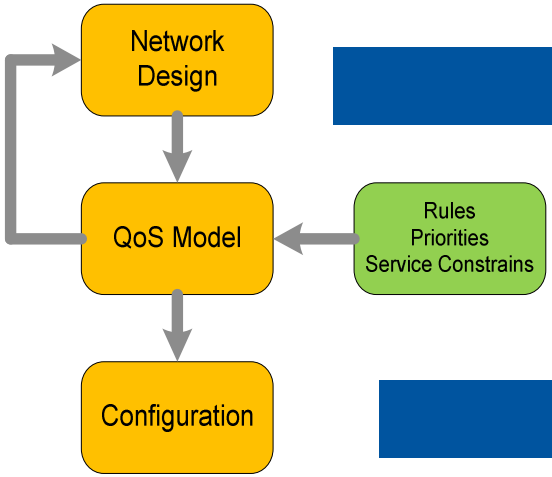
Network Planning



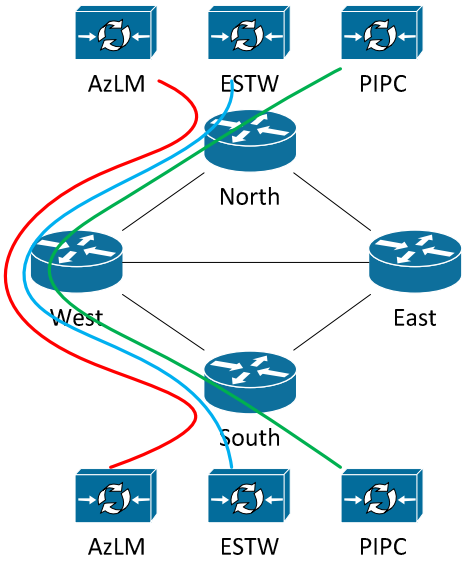
Guidelines for Introducing IP

Security

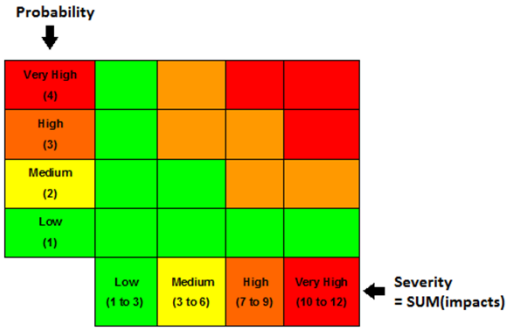
QoS



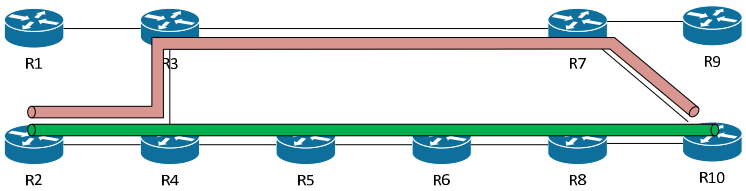
Testing



Risk Analysis



Traffic Engineering



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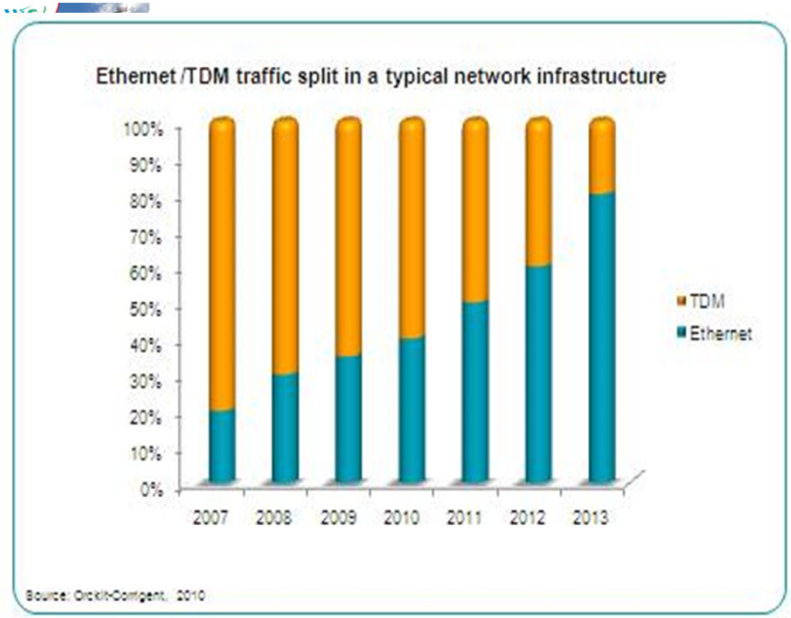
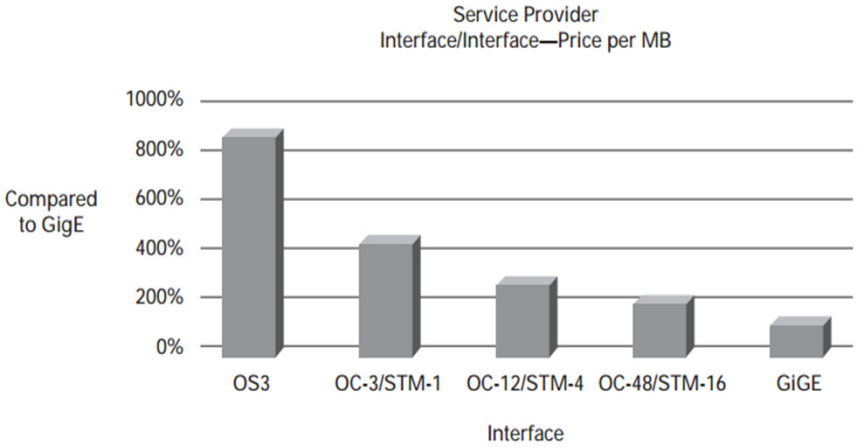
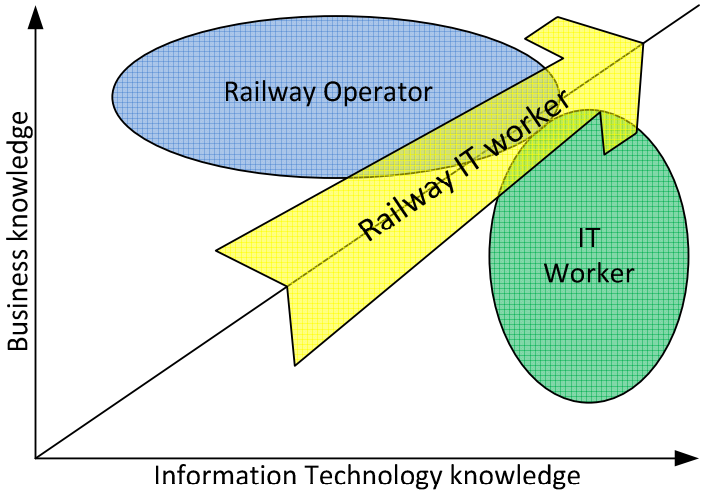


Economical Indicators



Human Resources



Vision on Railway Communications

- Modern railway demands a set of new challenges on telecoms:
  - International border-crossing interoperability, higher rail track capacity, higher capacity of command and control systems, higher safety and security and novel passenger services, among others
- Wired and wireless communication technology shall be able to provide seamless communications to all railway applications;
- New railway applications based on virtualized IT platform and cloud computing will arise as a standard solution;
- Network security and flow control will play an important role in the network operation;
- Novel in-train and in-station passenger oriented applications will benefit from a broadband and harmonized network;
- The network design to support safety and mission critical communications based on IP requires a deep and mature experience.

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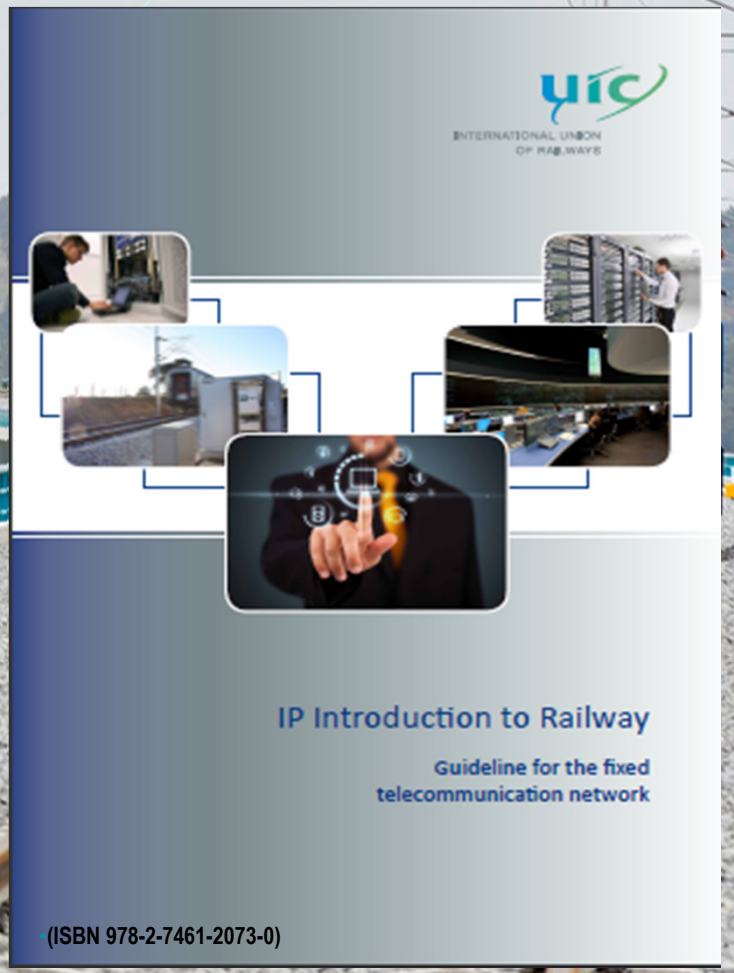

Thank You