

## FRMCS

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Future Railway Mobile Communication System

Ing. Petr Vitek, Kontron Transportation s.r.o.

# OBSAH PREZENTACE

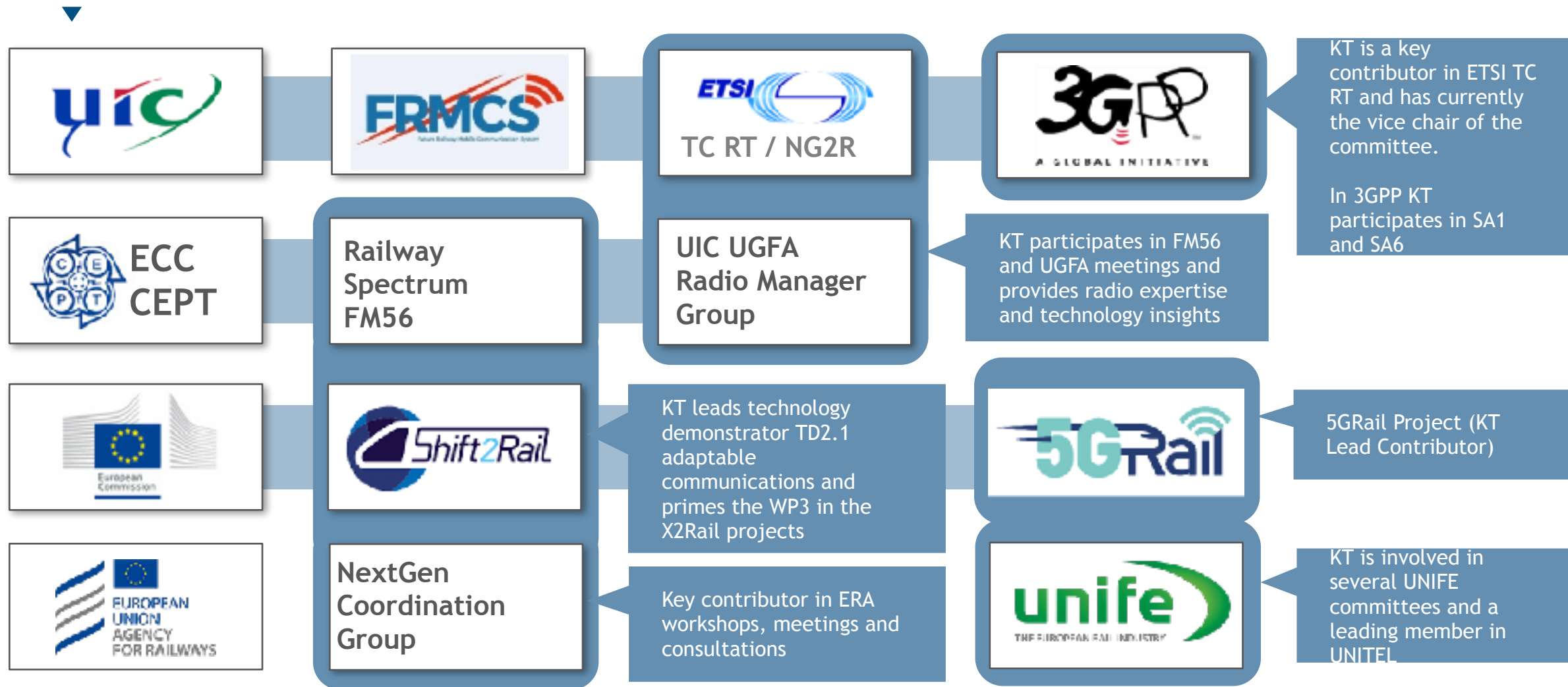
# ZAMĚŘENÍ NA ŽELEZNICI

▼  
 Od GSM-R k FRMCS : plně zapojeni do evoluce drážního systému



Kontron Transportation leading Radio spectrum management and FRMCS definition

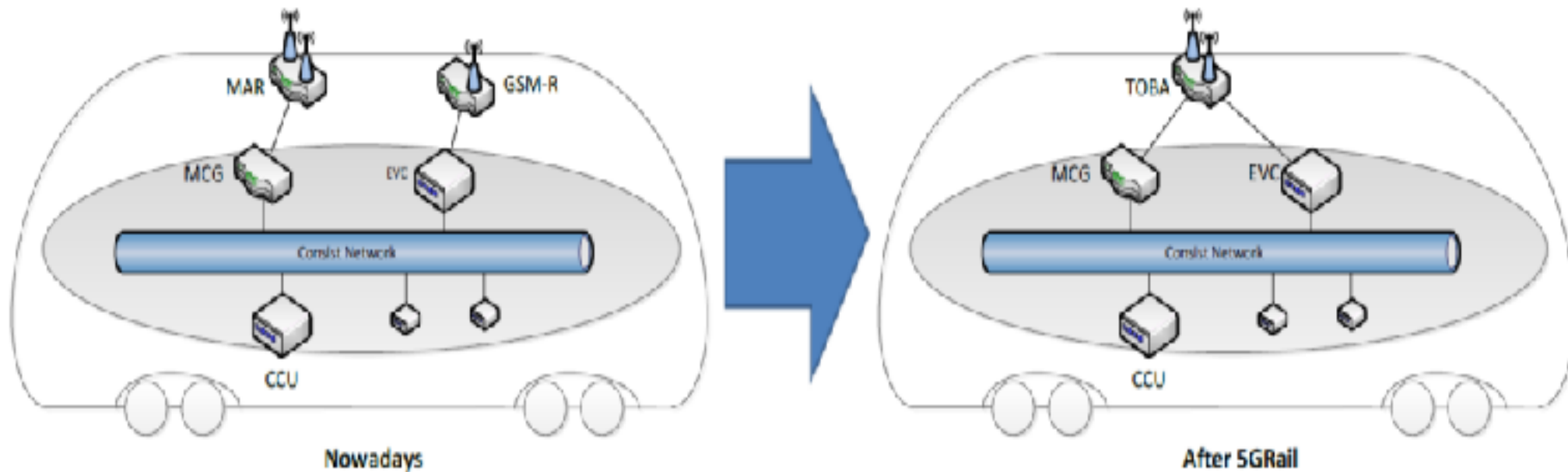
# NAŠE ZAPOJENÍ DO STANDARDIZACE A VÝZKUMNÝCH PROJEKTŮ



# 5GRAIL - 5G FOR FUTURE RAILWAY MOBILE COMMUNICATION SYSTEM

<https://5grail.eu/>

As an example of evolution and innovation potential, the figure provided below depicts the integration between TCMS and TOBA that will be evaluated in the frame of 5GRAIL, with telemetry and file transfer services among others.



# REFERENCE NA ŽELEZNICI

## Více jak v 25 zemích

- ▶ 51 zákazníků
- ▶ 19 referencí centrálních částí
- ▶ 89,000 km GSM-R sítě
- ▶ ~40 % celosvětového tržního podílu
- ▶ 17 ETCS Level 2 projektů (GSM-R technologie)
- ▶ 12 high-speed lines projektů

 Algeria		 Finland		 Ireland		 Romania	
 Austria		 France		 Italy		 Saudi Arabia	
 Belgium		 Germany		 Lithuania		 Slovakia	
 Bulgaria		 Great Britain		 Luxembourg		 Slovenia	
 Brazil		 Hungary		 Poland		 Spain	
 China		 India		 Portugal		 Turkey	
 Czech Rep.						 UAE	

Market Leader in European Railway Communication



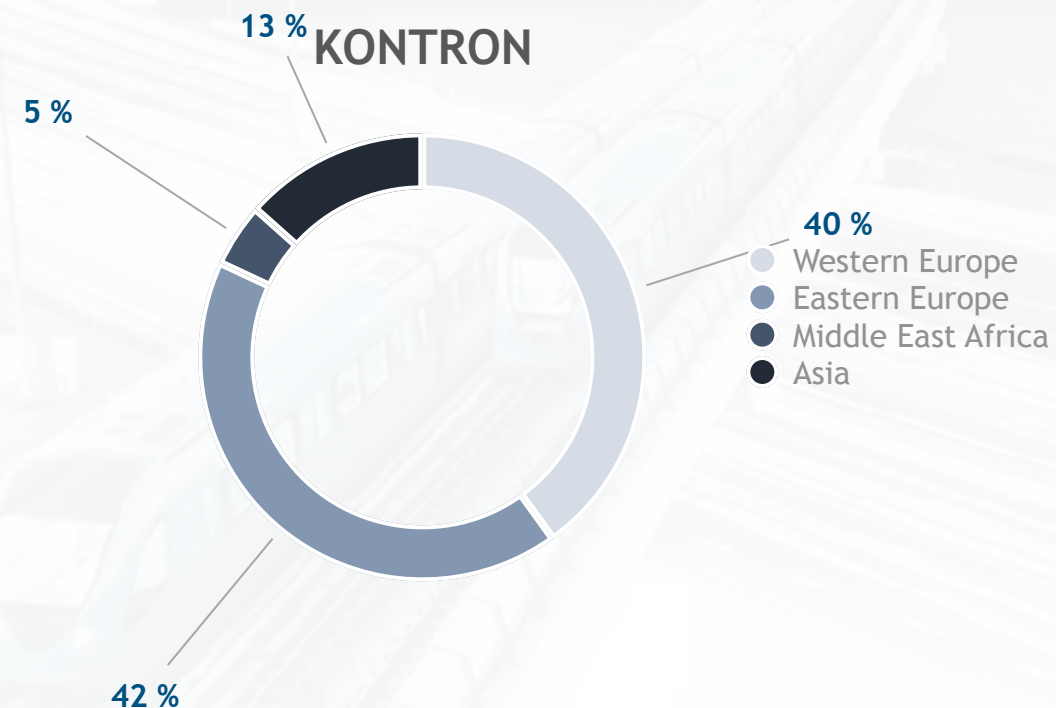
# KONTRON: GSM-R PŘÍSTUPOVÁ SÍŤ

KONTRON supports 89,000 km of railway with GSM-R all around the world

Eastern Europe	37 214 km
Austria	3 500 km
Bulgaria	380 km
Czech Republic	2 620 km
Germany	25 526 km
Hungary	1 055 km
Lithuania	1 563 km
Poland	634 km
Romania	328 km
Slovakia	382 km
Slovenia	1 226 km
Asia	11 930 km
China	10 593 km
India	1 337 km

Source: Kontron, 2021

Western Europe	35 596 km
France	15 797 km
France/UK	52 km
Ireland	1 360 km
Italy	205 km
Luxembourg	271 km
Spain	691 km
United Kingdom	17 220 km
Middle East Africa	4 099 km
Algeria	2 301 km
Saudi Arabia	450 km
Turkey	1 348 km
Total	88 839 km

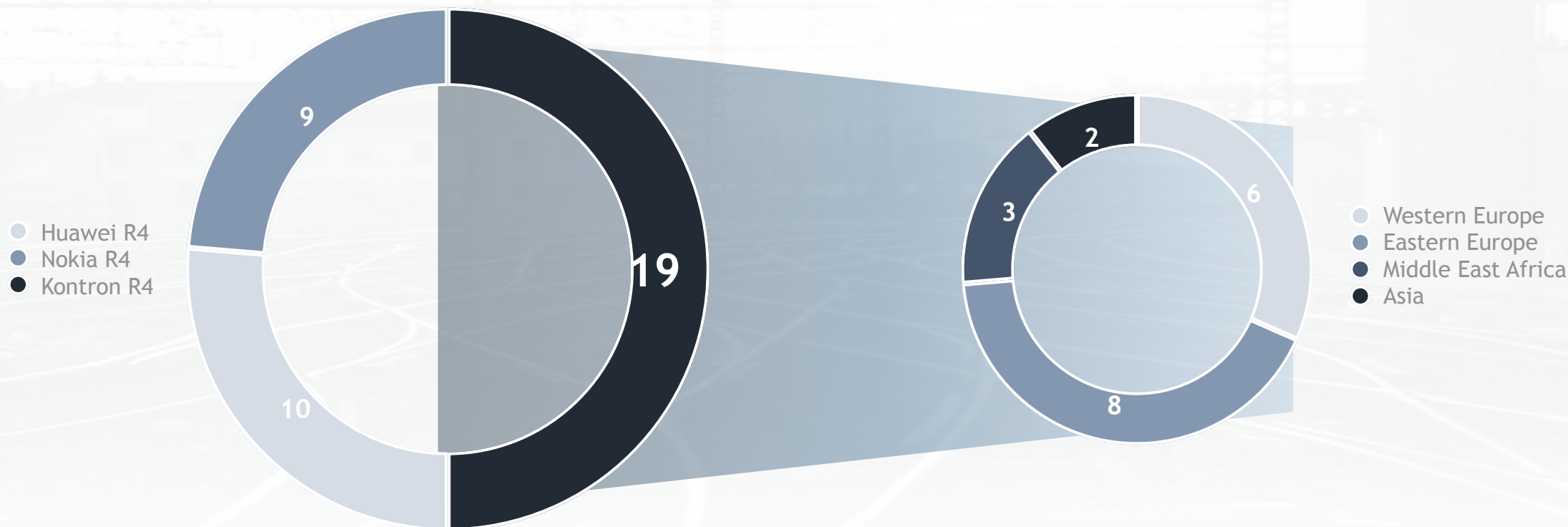


Worldwide GSM-R presence, mainly in Europe

# KONTRON: GSM-R CORE



KONTRON is GSM-R R4 market leader , covering 50% of the market share worldwide with 19 R4 core networks deployed



Source: Kontron, 2021

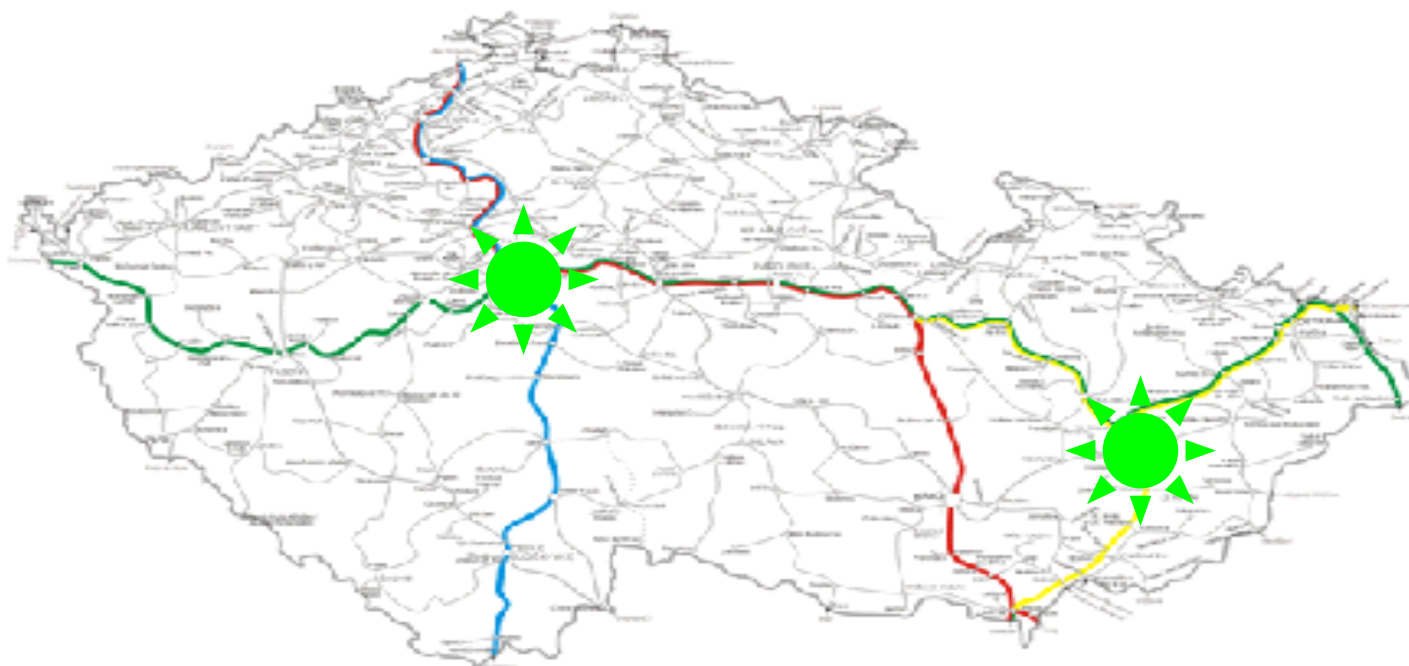
KONTRON is n° 1 in new generation R4 core with the most developed installed base



# STÁVAJÍCÍ GSM-R TECHNOLOGIE



# TECHNOLOGIE GSM-R - ATCA

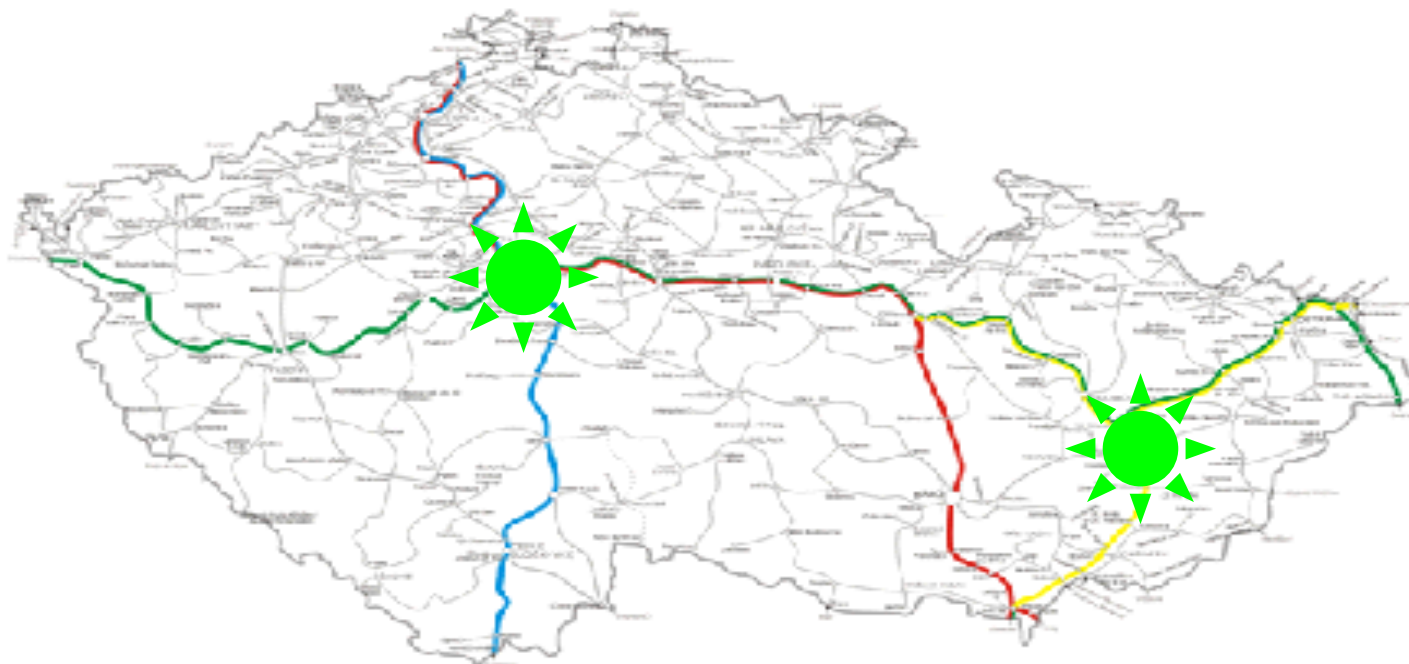


100 %


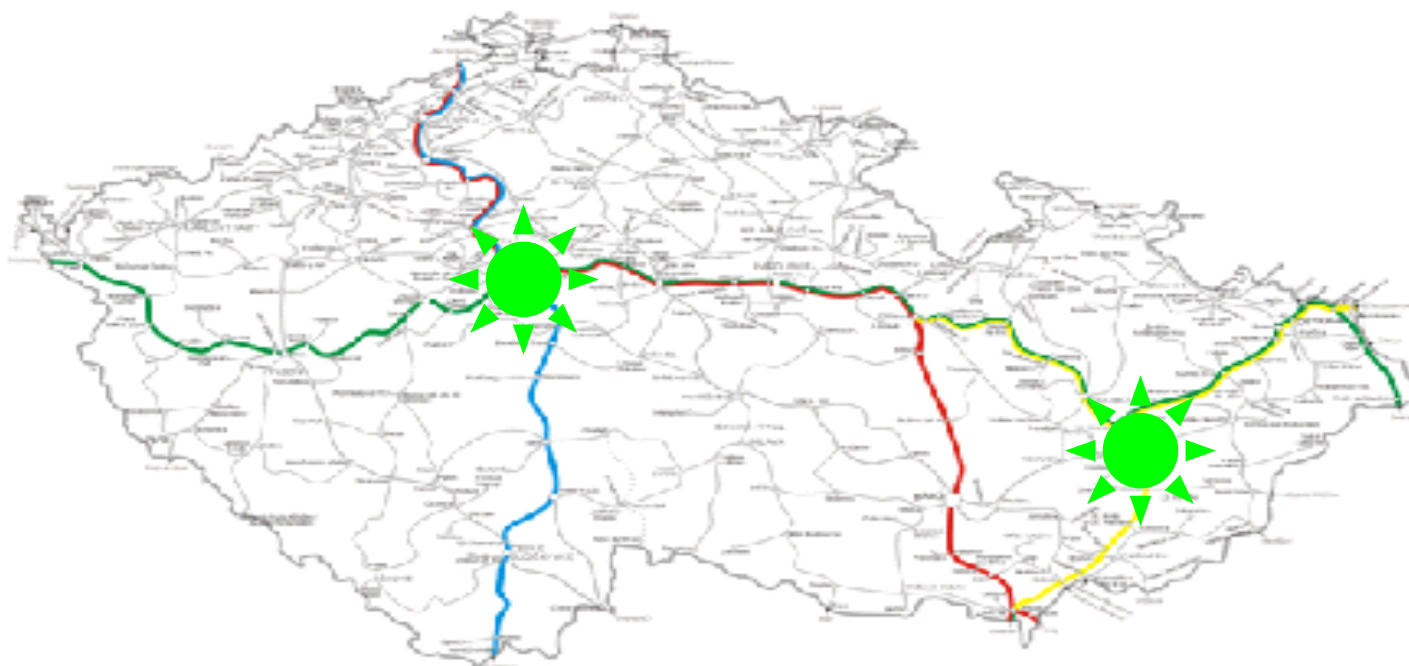
# TECHNOLOGIE GSM-R - SCP/IN

SCP/IN v České republice:

- **Plánováno:** 2 redundantní uzly + georedundance
- **Postaveno:** 2 uzly včetně georedundance, 100 % hotovo



# TECHNOLOGIE GSM-R - BSC



100 %



# PROČ FRMCS ?

## GSM-R: VHODNÁ TECHNOLOGIE - „IT SIMPLY WORKS“



Railways embraced GSM-R for the long run  
GSM-R is a Proven Technology with Proven Services  
There is no GSM-R technology obsolescence, but  
future rail requirements represent a challenge for GSM-R

**„GSM-R - It simply works ...”**



Industry confirmed the GSM-R Lifecycle until 2030  
Kontron Transportation committed at least until 2035  
Coexistence and Migration expected from 2025  
until 2040 or later

**Kontron Long-Term Support**

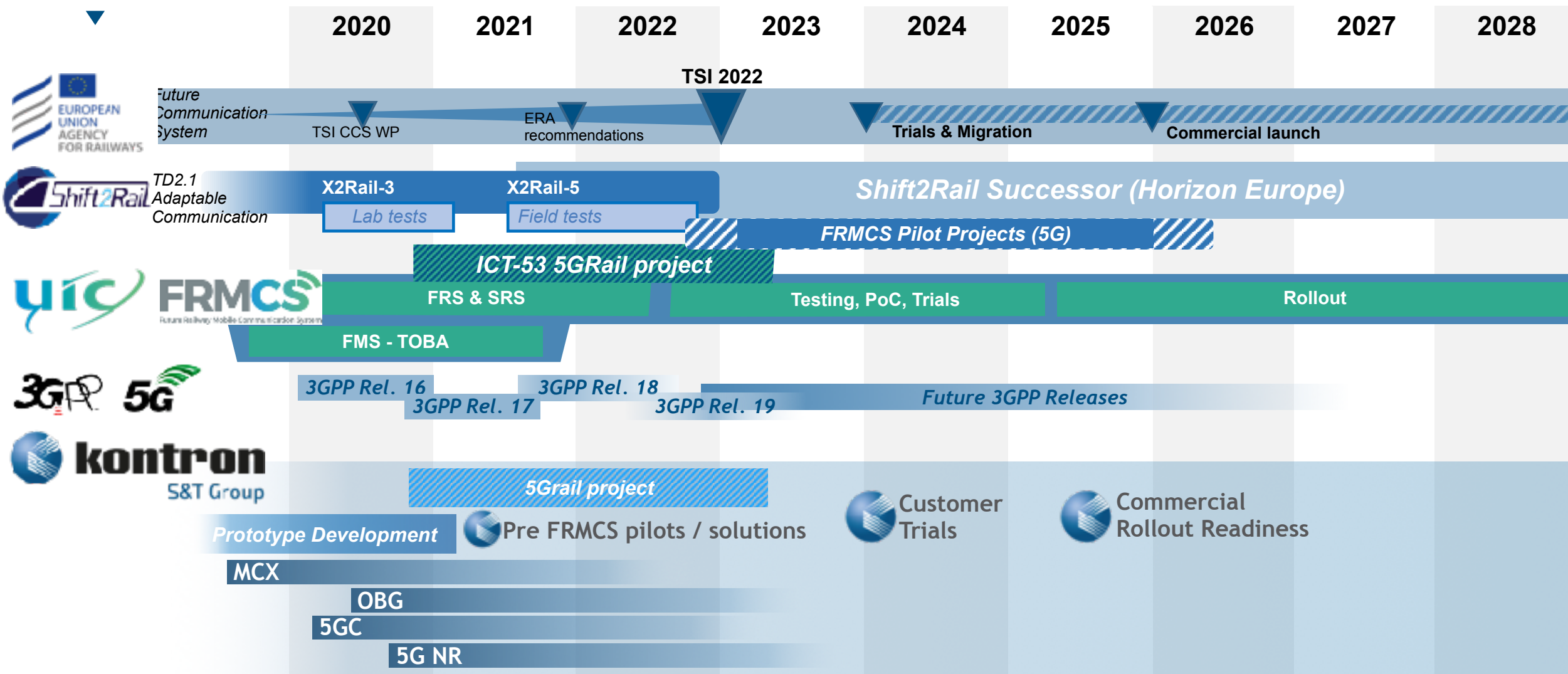


Active work and dedication on a Next Generation standard required by all stakeholders  
Interworking and functional migration from GSM-R to FRMCS remains a major challenge

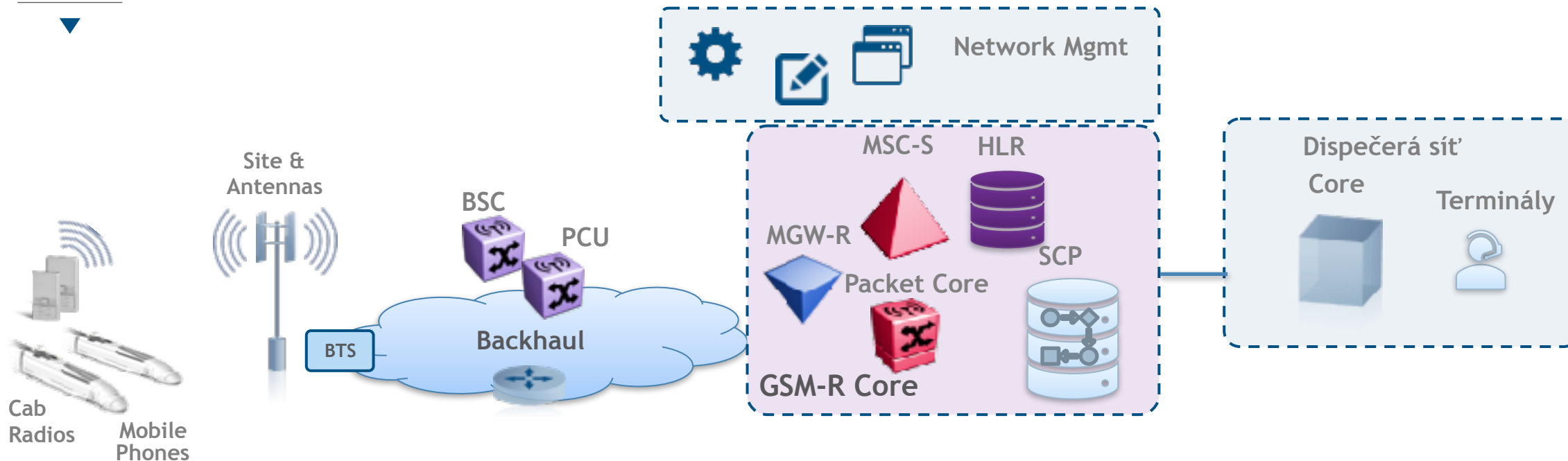
**We are committed to support our GSM-R customer base and help them in the transition towards FRMCS**



# ČASOVÝ PLÁN

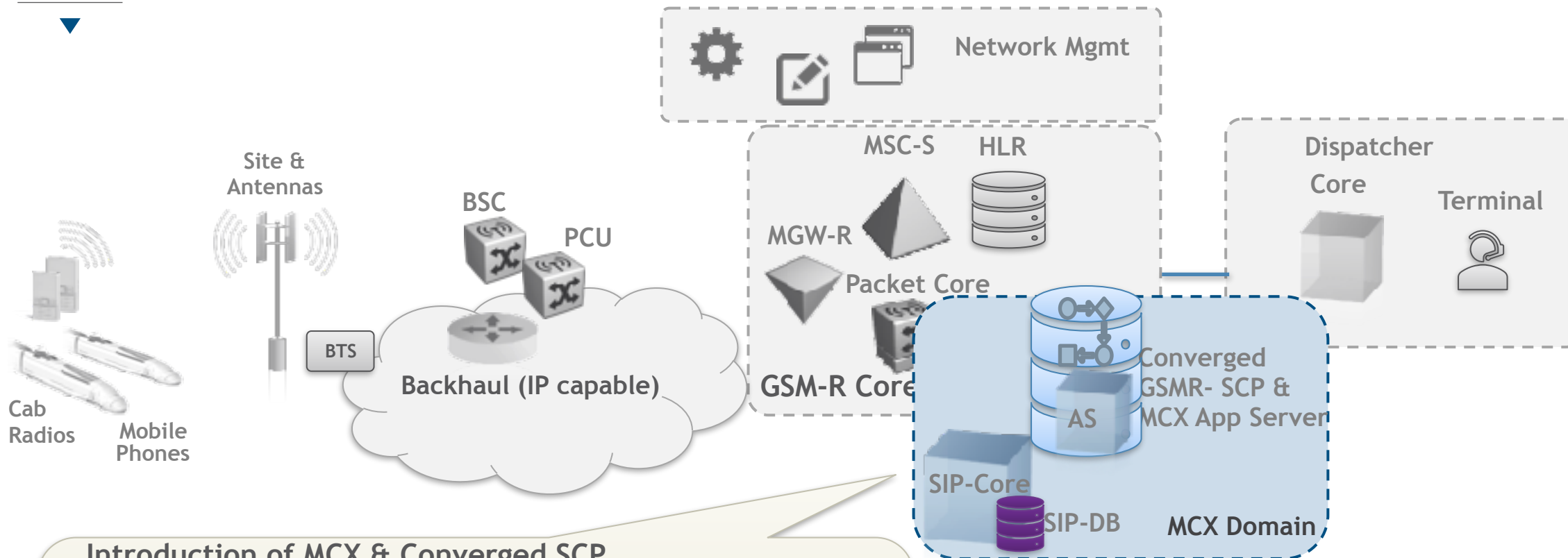


# EVOLUCE VAŠÍ SÍTĚ GSM-R



**Starting Point GSM-R:**  
 GSM-R sít' založená na R4-Core/GPRS Core, GSM/GPRS Access, Dispečerská sít', Network Management ...

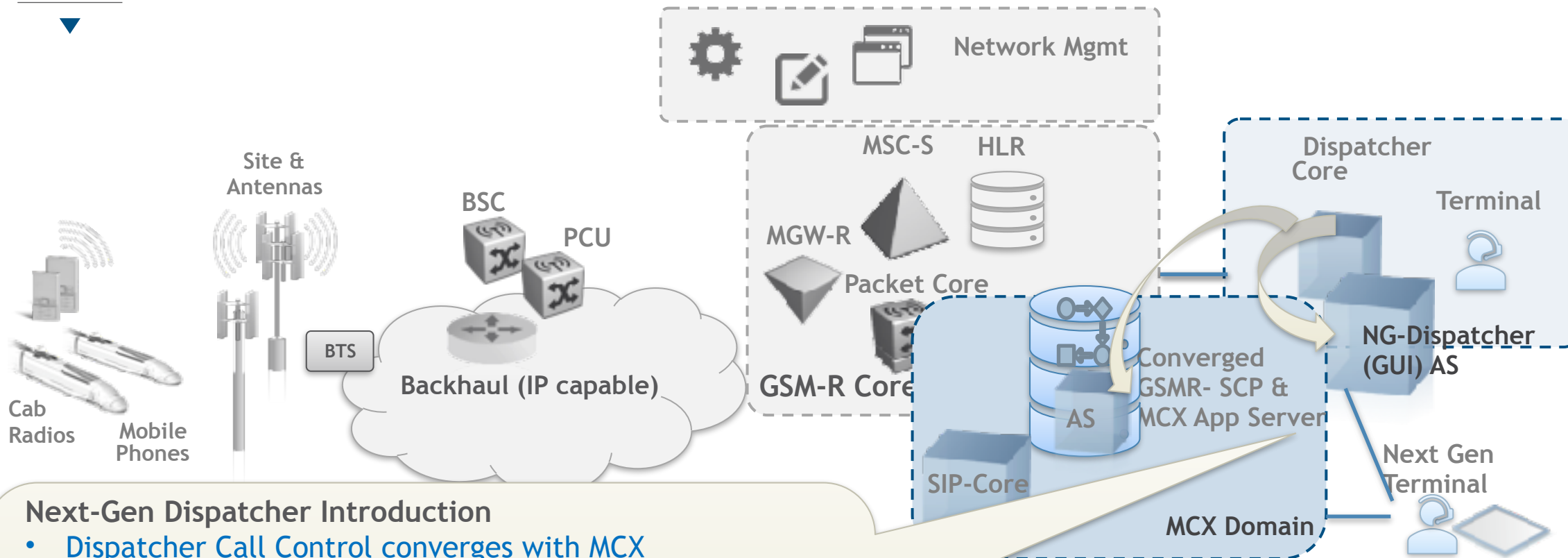
# EVOLUCE VAŠÍ SÍTĚ GSM-R - MCX



## Introduction of MCX & Converged SCP

- New MCX Domain
- GSM-R SCP will be upgraded to support MCX service allowing service transfer (interaction) between MCX and GSM-R services
- Anticipating GSM-R to FRMCS Interworking Function

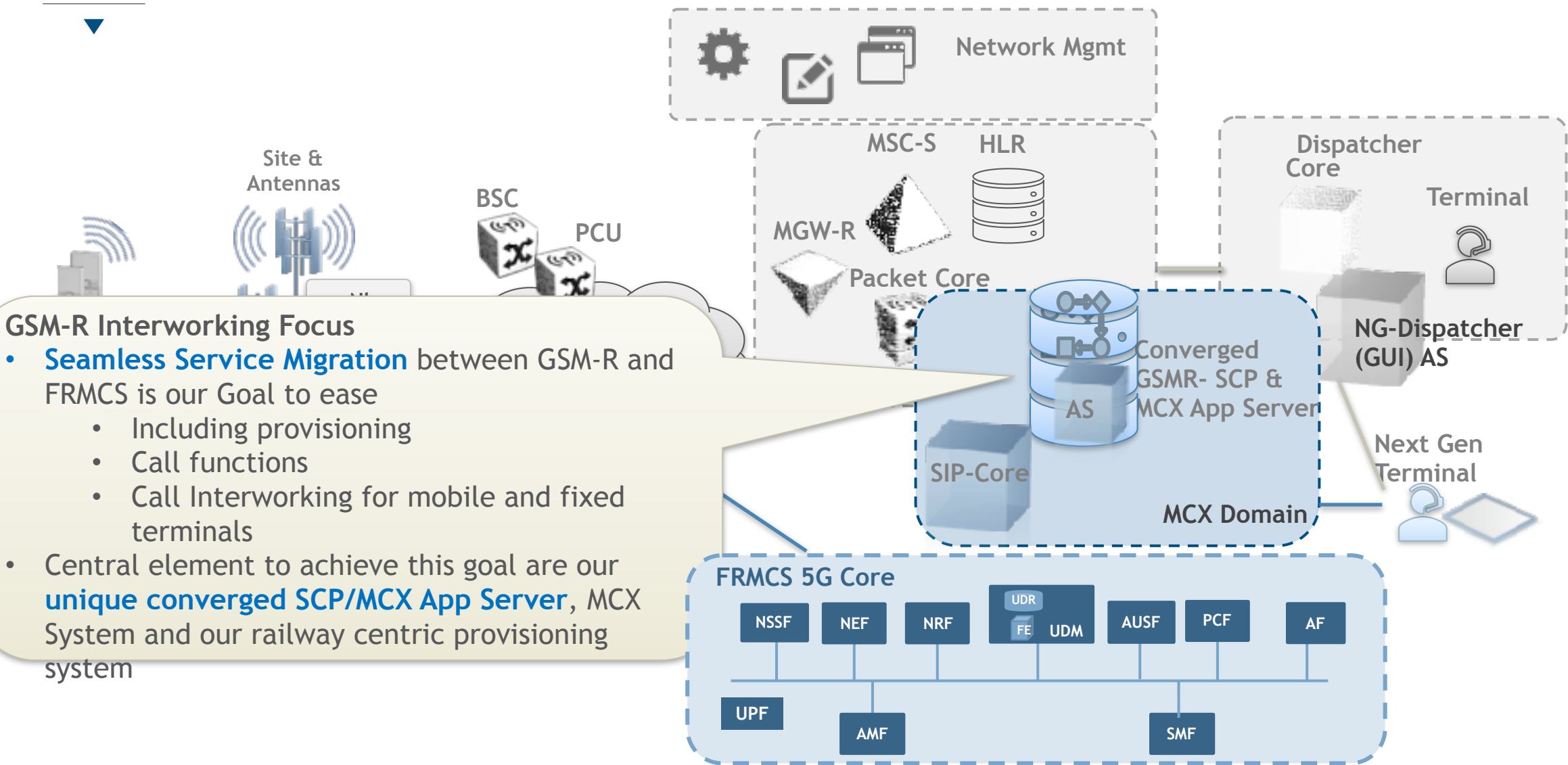
# EVOLUCE VAŠÍ SÍTĚ GSM-R - DISPEČER



## Next-Gen Dispatcher Introduction

- [Dispatcher Call Control converges with MCX](#)
- MCX Interconnectivity, Conferencing are handled by the 5GC and SIP core.
- Other Dispatcher system functionality will be transferred to an [Dispatcher Application Server \(AS\)](#) which provides mainly Dispatcher Role Management and GUI Control feature, and other capabilities.

# EVOLUCE VAŠÍ SÍTĚ GSM-R - SPOLUPRÁCE S GSM-R

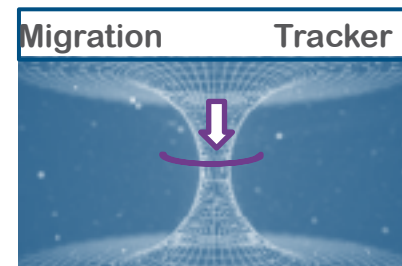
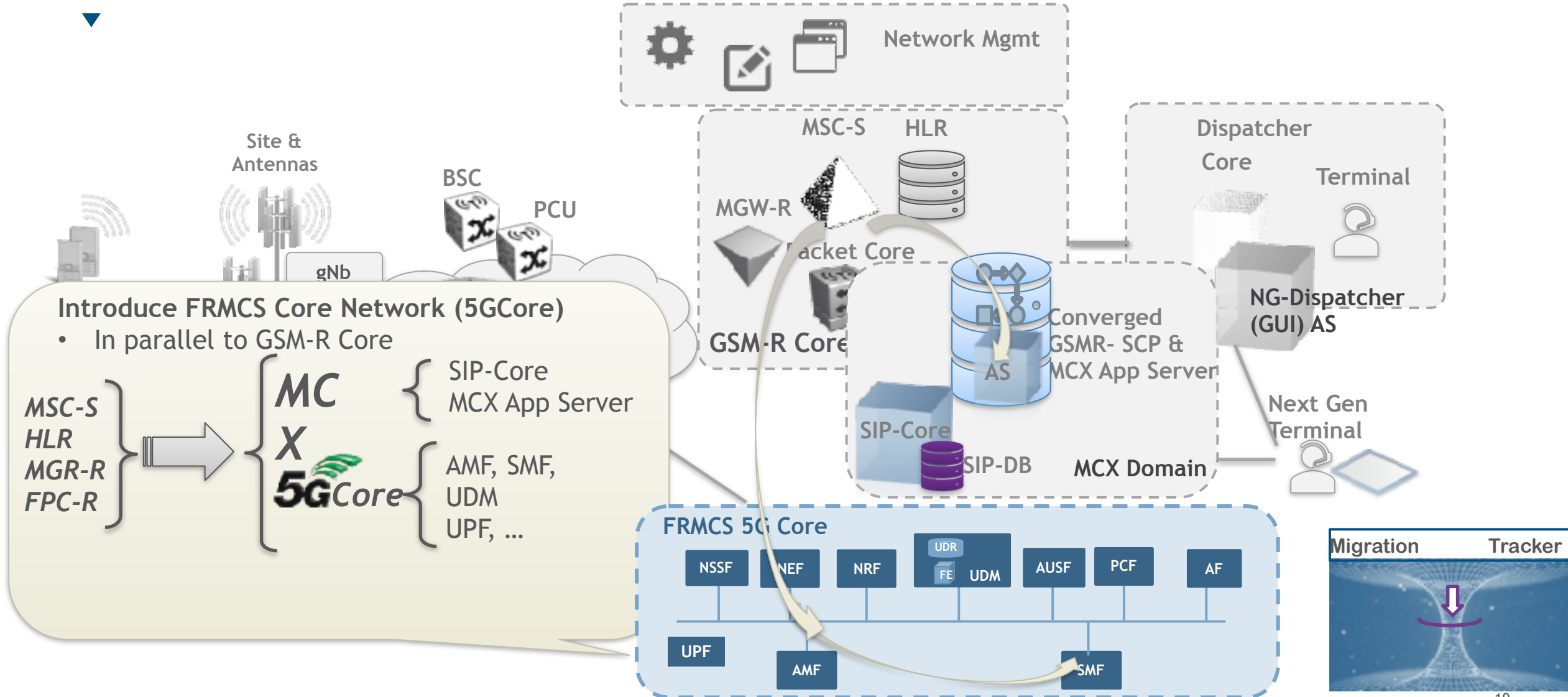


## GSM-R Interworking Focus

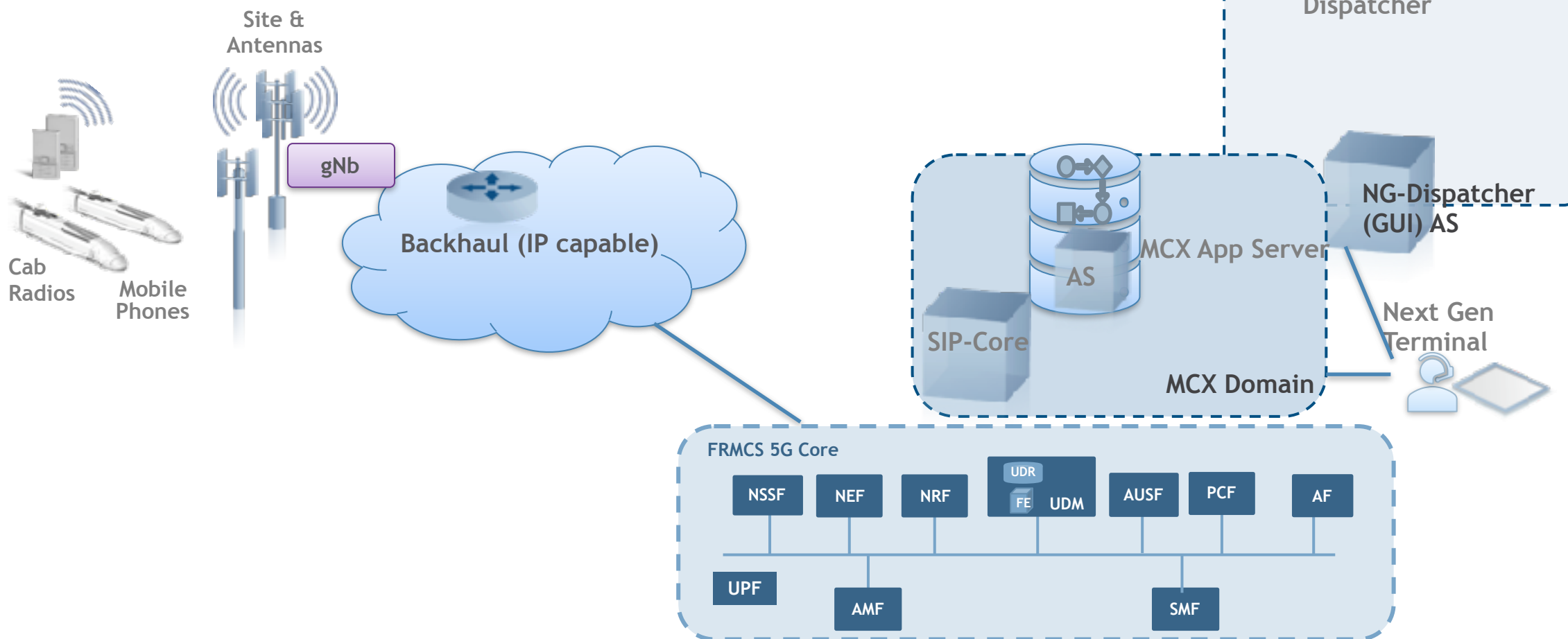
- **Seamless Service Migration** between GSM-R and FRMCS is our Goal to ease
  - Including provisioning
  - Call functions
  - Call Interworking for mobile and fixed terminals
- Central element to achieve this goal are our **unique converged SCP/MCX App Server**, MCX System and our railway centric provisioning system



# EVOLUCE VAŠÍ SÍTĚ GSM-R - FRMCS/5G(6G) CORE



# EVOLUCE VAŠÍ SÍTĚ GSM-R - MIGRACE DOKONČENA



# ZÁVĚR

# DĚKUJI ZA VAŠÍ POZORNOST



ING.  
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CEO

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