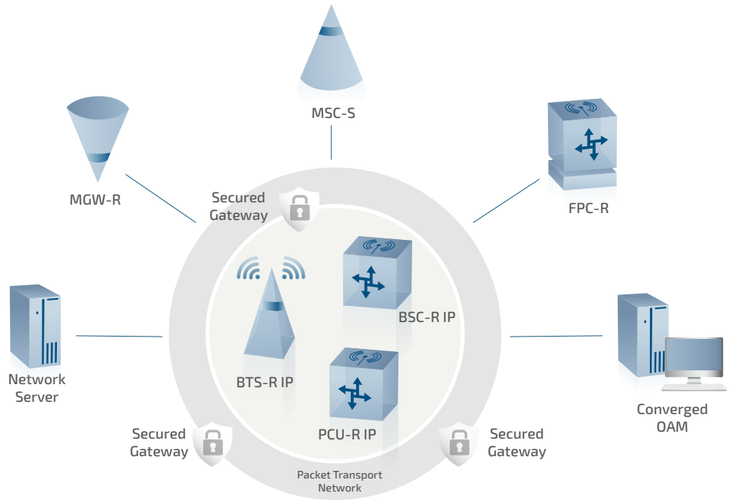
End-to-end solution over packet networks

# GSM-R ACCESS SUB-SYSTEM

- STATE-OF-THE ART TECHNOLOGY
- INCUMBENT INVESTMENTS
- CYBER-SECURITY REQUIREMENTS
- CONTINUITY

POSSIBILITIES START HERE kontron S&T Group

## GSM-R ACCESS SUB-SYSTEM

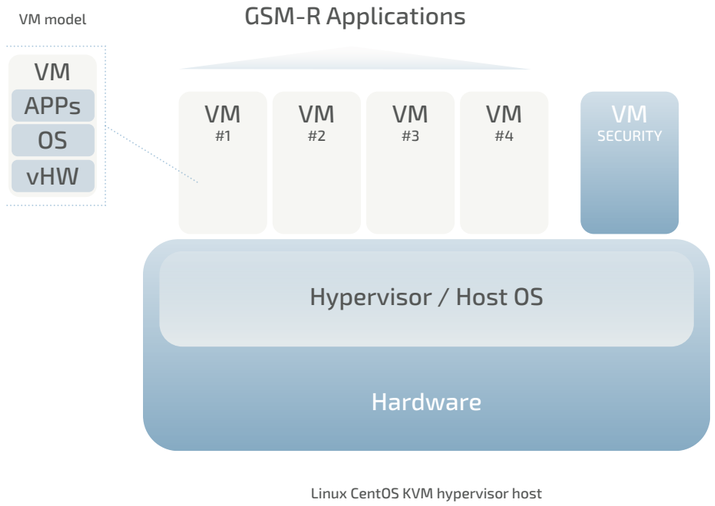



## KONTRONS GSM-R ACCESS SUB SYSTEM

- **HAS STATE-OF-THE ART TECHNOLOGY FOR RAILWAY NETWORKS**
  All access nodes are designed with native IP architecture. The interfaces are transmitted via the packet transport network.
- **PRESERVES INCUMBENT INVESTMENTS**
  Fully compatible with Kontron Transportation GSM-R R4 voice and packet core as well as with legacy Kontron Transportation GSM-R TDM-based BTS portfolio.
- **INCLUDES CYBER-SECURITY REQUIREMENTS**
  IPsec tunnels are used to encrypt flows on all interfaces.
- **ENABLES INTEROPERABILITY WITH ITS OPEN AND 3GPP COMPLIANT A INTERFACE**
- **HAS AN ENHANCED SYSTEM AVAILABILITY**
  This includes native redundancy model for nodes and flexible geographical location distribution.
- **GUARANTEES AN IMPROVED LIFECYCLE MANAGEMENT**
  Made possible by the virtualization of functions and a support on X.86 COTS platforms.

## … TO PREPARE THE SMOOTH EVOLUTION TO FRMCS

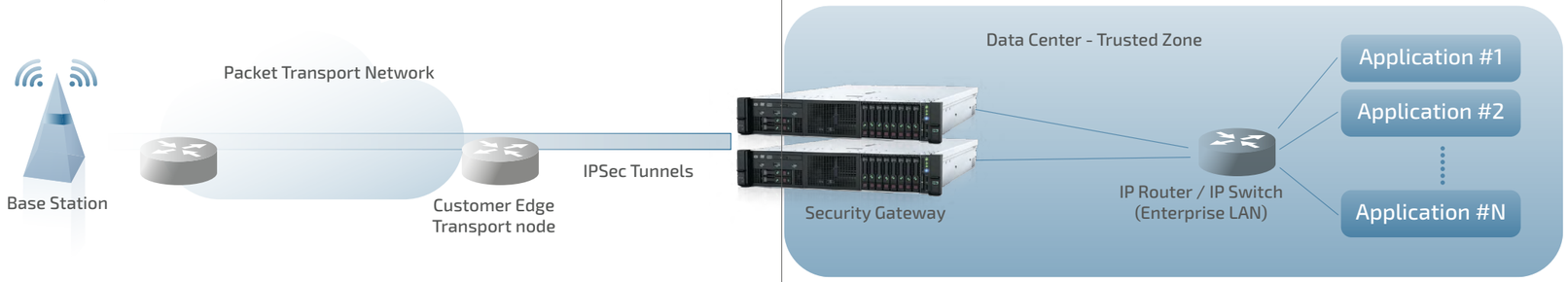
## NODE FLEXIBILITY




The new nodes BSC-R IP and PCU-R IP (including embedded Security Gateway) have functions in the virtualization bare metal model. Resources are shared and distributed, in a scalable and sustainable model.

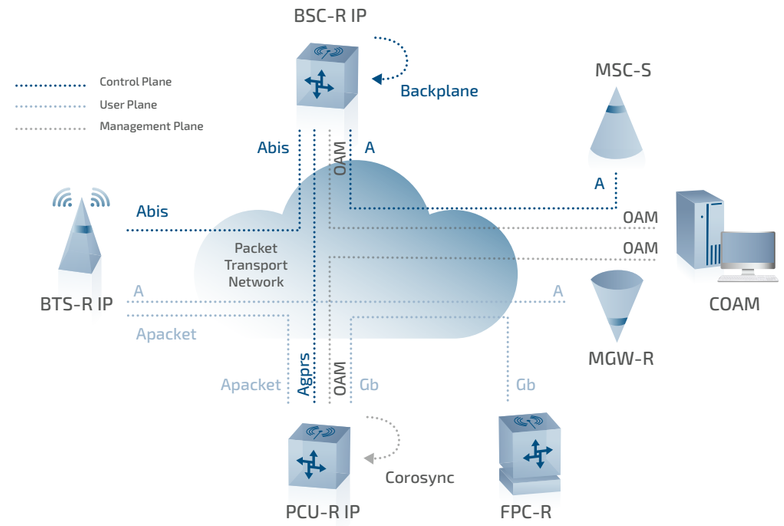
## EMBEDDED SECURITY WITH SLA COMMITMENT

All interfaces are encrypted by IPSec Encapsulating Security Payload (ESP). They are native at BTS-R IP level, within VM in BSC-R IP and PCU-R IP. To protect the data center, the stand-alone Security Gateway is fully integrated in the Kontron Transportation portfolio and has SLA commitment with save delivery in case of threats.



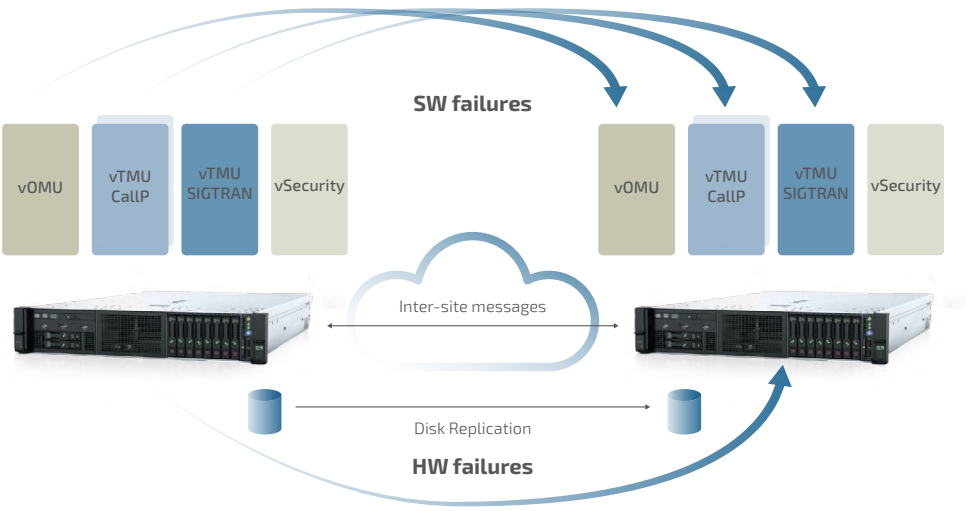

## TRANSPORT PERFORMANCES

All interfaces have a separation between control plane, user plane and management plane in dedicated data flows. They are VLAN based, for flow segregation flexibility in the packet transport network and improve end-to-end routing performances with dedicated class of service per flow.



## HIGH RESILIENCE

Node is organized over 2 IT servers with virtualized applications. The servers can be co-located or remote geo-located. It is Software fail-safe in hot stand-by mode for BSC-R IP and has a quick hardware failure mechanism for switching, with data integrity management.




## SMOOTH MIGRATION PATHS

BTS-R TDM-based is ready to be connected to a packet transport network.

LEGACY BTS Portfolio can be connected through a TDM transmission network up to an IP converter. This IP converter is integrated within the GSM-R Access sub-system over packet transport network.

## About Kontron – Member of the S&T Group

Kontron is a global leader in IoT/Embedded Computing Technology (ECT). As part of the S&T technology group, Kontron offers individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

For more information, please visit: **www.kontron.com**

## About Kontron Transportation – Member of the S&T Group

Kontron Transportation is a leading global supplier of end-to-end communications solutions for mission-critical and carrier networks. Its portfolio includes GSM-Railways, FRMCS (future railway mobile communication system), TETRA, DMR, LTE solutions for mission critical networks as well as mobility solutions for the public transport sector and is enabled with the entire service value chain, from planning, developing and producing to deploying, integrating, maintaining and operating. A further mission is to provide a critical E2E IIoT solution dedicated for railway operators to support data collection, transport, monitoring and analysis.
Kontron Transportation invests in research and development and is driving the evolution into the next generation of broadband solutions for mission-critical networks, for instance as an associated member of the European research initiative Shift2Rail.
Kontron Transportation is part of S&T group and headquartered in Vienna (Kontron Transportation GmbH) with main subsidiaries in Belgium, France, Germany, Portugal, Spain, the Czech Republic and United Kingdom.

For more information, please visit: **www.kontron.com/ktrdn**

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