





DELIVERING AN INTEGRATED, SECURE, AND RADIO-AWARE 5G TRANSPORT NETWORK


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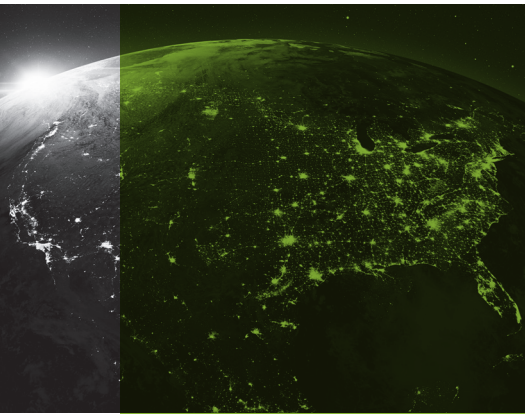
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DELIVERING AN INTEGRATED, SECURE, AND RADIO-AWARE 5G TRANSPORT NETWORK

Complete end-to-end transport solution from Juniper Networks and Ericsson helps to ensure that 5G lives up to its potential

Challenge

Service providers are facing big challenges with the coming massive investment in 5G network buildouts. Alignment between the radio and transport networks has never been more critical to meet the diverse, end-to-end network requirements of 5G.

Solution

The Juniper Networks and Ericsson solution fulfills a pressing industry need for best-in-class 5G radio tightly integrated with best-in-class IP transport and security with single-pane-of-glass management and orchestration—end to end.

Benefits

- Radio-aware, intelligent end-to-end transport
- Open, multivendor architecture
- Integrated, best-of-breed domain solutions

Traditionally, good performance of the mobile transport network could be maintained by simply overprovisioning the network equipment. However, with both the ongoing growth of mobile broadband usage and the new diverse applications enabled with 5G, transport networks of the future will need to become more intelligent, predictive, and agile if they are to keep up with ever-growing network traffic requirements and complexity. Also, transport networks and the radio networks they support must become more tightly integrated and complementary. New transport technologies and new approaches for designing transport networks will be necessary if service providers are going to succeed in building and monetizing end-to-end 5G networks.

The Challenge

Traditional network operators are combating flat revenues, proliferating operational costs due to increasingly complex infrastructure, and an ever-expanding attack surface. Although the 5G standards are still being finalized, 5G is expected to unleash a new wave of revenue-generating applications and services, including gaming, augmented reality/virtual reality (AR/VR), industrial automation, connected vehicles, and 8K streaming video in 3D, to name a few. However, to fulfill very high expectations for both new revenues and operational efficiencies, many diverse network requirements must be met simultaneously, including:

- Intelligent transport networks that are radio-aware
- Higher bandwidth, higher data rates, new radio frequency bands, and massive cell site densification that drive stricter timing requirements, deeper fiber deployments, and major transport network upgrades from the cell site to the mobile core
- Low and ultra-low latency communications and multicloud connectivity
- 99.999% end-to-end carrier-class reliability
- Security to combat expanding threat volumes and attack sophistication, including zero-day attacks and adaptive malware
- Automation to efficiently manage and support the increase in connected devices and diversity of end-user services

The rigid network underlay and overlay mobile architectures of today will not effectively support this new era of 5G and multicloud connectivity requirements.

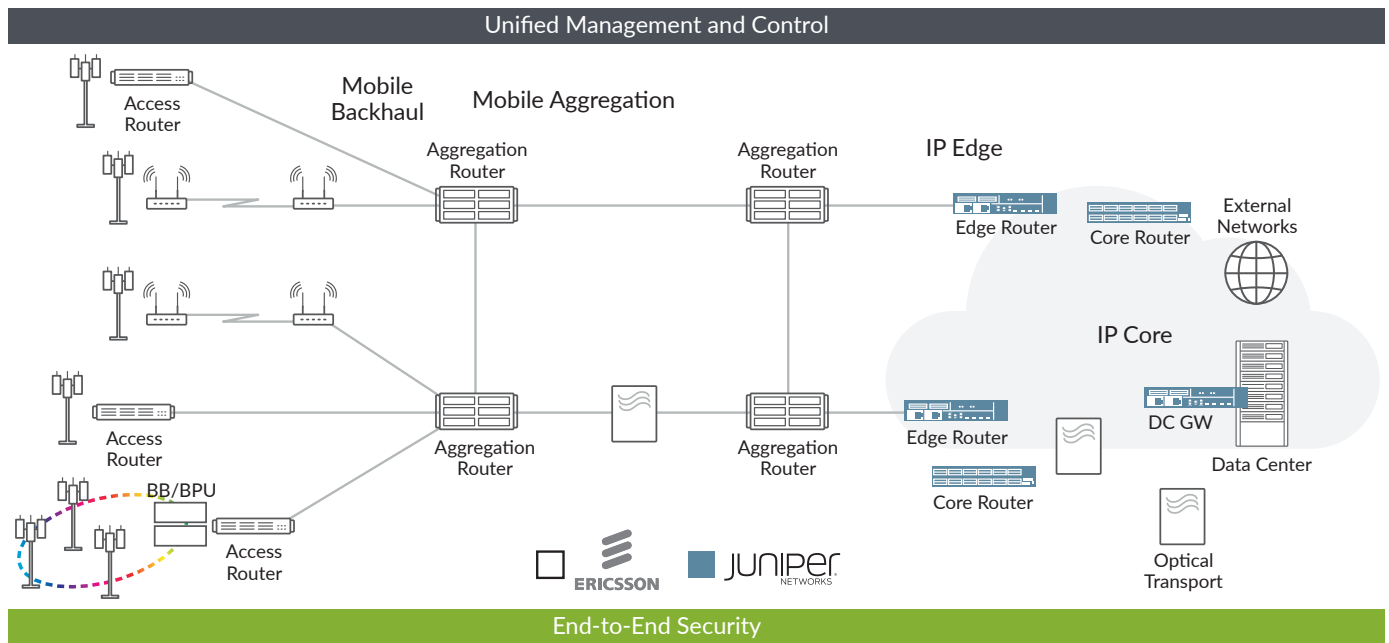


Figure 1: Joint Juniper-Ericsson solution for the end-to-end 5G transport network

The Juniper Networks and Ericsson End-to-End 5G Transport Solution

While some view 5G as the answer to this challenging environment, not all 5G solutions are engineered equally. Juniper has partnered with Ericsson to change the mobile industry by offering network service providers a complete end-to-end solution, from the radio access network (RAN) to the mobile core in order to deliver new services while managing mounting complexity. This joint solution helps to ensure that the promise of 5G will live up to its potential.

The solution features products for fronthaul/backhaul, including microwave radio and aggregation from Ericsson integrated with edge and core IP transport platforms and pervasive security solutions from Juniper. Across the RAN, transport, and core domains of the solution, Ericsson will provide seamless single-pane-of-glass management and orchestration with a high degree of automation to handle increased network complexity and reduce time-to-market for new 5G services. The joint end-to-end transport solution is designed and built from day one to be radio-aware and support exceptional 5G radio performance in a cost-effective way.

Figure 1 provides an overview of the joint 5G transport solution.

Features and Benefits

Radio-Aware, Intelligent End-to-End Transport

The joint solution fulfills a pressing industry need for having best-in-class 5G radio and transport networks tightly integrated. Ericsson is leading in 5G radio and understands the complexity and challenges of how 5G radio is changing the transport domain. Ericsson offers integrated transport for 5G comprised of its solutions for fronthaul and backhaul as part of the Ericsson Radio System, which has been designed with radio in mind. The need to unify RAN and transport has never been greater.

Open, Multivendor Architecture

The joint solution delivers a “best of both worlds” scenario. With Ericsson and Juniper, service providers can deploy a complete end-to-end 5G solution, with pre-integrated, pre-tested, best-of-breed technologies. At the same time, with a shared belief in open, multivendor architectures, both companies remove any concerns about vendor lock-in.

Integrated, Best-of-Breed Domain Solutions

Each company provides a complementary set of market-leading technologies that take advantage of each company’s core strengths. Specifically, the joint solution features best-in-class RAN and backhaul/fronthaul systems from Ericsson integrated with industry-leading IP edge and core transport platforms from Juniper. Additional elements include seamless, domain-spanning management, orchestration, and automation from Ericsson, as well as Juniper’s field-proven, comprehensive security solutions, which are integrated into the network on day one.

Edge/Core IP Transport

This is the industry’s only WAN edge services solution to deliver near infinite programmability, cost efficiency, and versatility with performance at scale for the evolving technological and business demands of next-generation mobile services delivery. It has been purpose-built to optimize IP/MPLS transport for backbone, peering, and converged metro core applications.

Security

This joint solution has been built around field-proven mobile security solutions, including security gateways, Gi, and roaming firewalls. It includes integrated security and threat life cycle protections, including threat detection, the orchestration of policy-based threat mitigation, and real-time threat stoppage. Firewalls use common software for both physical and virtual deployments, and are integrated with Ericsson Radio Systems.

Backhaul IP Transport

Designed for 5G

- Optimized for 10G/100G connectivity
- High-throughput, low-latency, and best-in-class buffering
- Hardware accelerated IPsec and high-accuracy internal clock for best 5G performance

Purpose-built for Ericsson Radio System

- Indoor and outdoor variants with Ericsson Radio System building practices for flexibility and simplified rollout
- Common management with radio
- Fan-less and filter-less design to minimize maintenance costs

Automated connectivity

- Zero Touch Provisioning (ZTP)
- SDN-based and policy-driven for automated service provisioning and creation
- Segment routing and high-scale quality of service (QoS) for network slicing, simplicity, scalability, and infrastructure utilization

Active/Passive Fiber Fronthaul

- Flexible topologies: Highest flexibility to build C-RAN and support all topologies; uses active/passive fiber wavelength-division multiplexing (WDM) transmission
- Flexible building practices: Indoor and outdoor variants with Ericsson Radio System building practices supporting rail-mount
- High performance: High fiber density and capacity at extremely low latency, offering best radio performance at an efficient cost

Microwave Radio

- Market-leading switch and link capacity; 1G-10G interfaces
- All building practices: Indoor, outdoor, and split
- All frequencies: From 6 to 80 GHz

Network Management

- Consolidation: Control and visibility of any technology (5G, 4G, 3G, and 2G) or multidomain, whether it is a physical network function (PNF) or a virtualized network function (VNF).
- Always Online: Real-time access to data gives immediate access to all configuration data and changes in the network. Leads to improved service quality and performance.
- Automation: Incident-driven management, automation rules, remote diagnostics, VNF management, and self-organizing network (SON) optimization

Solution Components

MX Series and PTX Series Routers

Juniper Networks® MX Series 5G Universal Routing Platforms and PTX Series Packet Transport Routers provide a high degree of versatility to support edge and core IP transport for simplified 10G/100G/400G operations. These powerful platforms offer Juniper's unique universal chassis design and advanced Juniper Networks Junos® operating system software functionality, which includes Junos Node Slicing, Junos Telemetry Interface (JTI), and an open, standards-based hardware-accelerated user plane in a 5G Control and User Plane Separation

(CUPS) solution. Also, Juniper's transport routers offer integrated dense wavelength-division multiplexing (DWDM) interfaces with interoperability between the MX Series, PTX Series, and Ericsson's Router 6000 family.

SRX Series

Mobile transport must be secured at all potential attack interfaces. This is ensured with Juniper's field-proven mobile security solutions, including security gateways, Gi and roaming firewalls, and virtual and containerized firewalls that can protect new network interfaces. Ericsson Radio Base Stations are already integrated with the Juniper Networks SRX Series Services Gateways, a high-performance and highly scalable next-gen firewall platform, providing both Gi firewall and security gateway solutions for end-to-end 5G offerings. Juniper will continue to enhance its security solutions to work efficiently with Ericsson's RAN solutions as they evolve to 5G.

Ericsson Router 6000

Ericsson Router 6000 series is a radio-integrated, service provider SDN-enabled IP transport portfolio. It delivers high-performance connectivity for LTE, LTE-advanced, and 5G applications. The Router 6000 series comprises a set of versatile routers offering the right capacity, resilience, and form factors for diverse and challenging demands of modern backhaul networks; and it provides an unprecedented experience.

Ericsson Fronthaul 6000

Ericsson Fronthaul 6000 builds centralized RAN architectures in dense urban areas where both capacity and equipment footprint are critical. Fronthaul 6000 is a flexible and cost-efficient, active and passive fiber fronthaul solution for (e)CPRI transmission, and offers to outperform fiber density, capacity, and latency characteristics to reach cutting-edge 5G radio performance, even in the most critical deployment areas.

Ericsson MINI-LINK

Microwave networks are built on the market-leading MINI-LINK—a powerful and cost-efficient microwave node fulfilling the requirements of mobile broadband evolution. It offers market-leading capacity both for the link as well as the switch. It is flexible enough to support any frequency, any site type, switching and routing, and any type of sync. With MINI-LINK, the installed base can be evolved in a cost-efficient way.

Ericsson Network Management (ENM)

Networks are changing and so is the way we manage them. Ericsson's strategy for managing information and technology in telecom operators' converged Information and Communications Technology (ICT) networks is realized with a new generation of management system. Built and designed to improve operational productivity, they also deliver the best user experience in networks where content delivery, IoT, M2M, and enterprise services underpin a new business reality.

Network Management is the offering domain name for end-to-end management for monitoring, trouble shooting, configuration, and optimization of networks through automation rules.

Figure 2 provides an overview of the components of the Juniper-Ericsson joint solution.

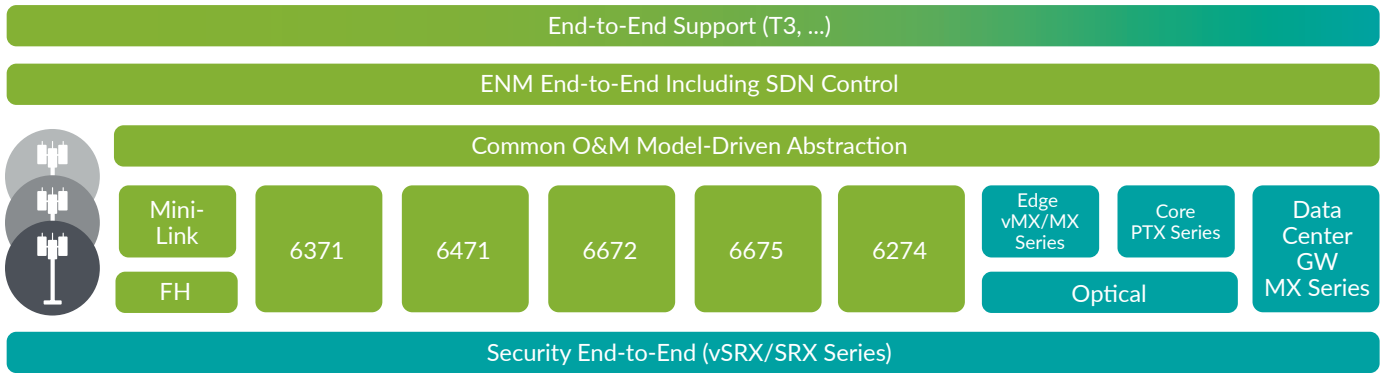


Figure 2: Complete 5G transport solution with Ericsson and Juniper products

Summary—Juniper Networks and Ericsson Deliver a Complete End-to-End Transport Solution to Ensure that 5G Lives Up to Its Potential

5G will be a game changer for mobile transport. New diverse services and exponential traffic growth will create new challenges on the mobile transport network, many known today and many not. In order to enable service providers to take full advantage of the 5G promise and to address the many challenges associated with 5G, an integrated and optimized end-to-end 5G transport solution is needed to connect 5G radio and core systems. The joint Juniper Networks and Ericsson solution offers best-in-class 5G transport and comprehensive security, all integrated as part of the Ericsson Radio System to guarantee superior 5G performance. 5G places new demands on networks and this is an exciting time for both companies to help service providers through their 5G transformations.

Next Steps

For more information about how your organization can benefit from the Juniper Networks and Ericsson integrated, secure, and radio-aware 5G transport network solution, please contact your Juniper Networks or Ericsson sales representative. To learn more about all of Juniper's 5G network solutions, please visit www.juniper.net/us/en/solutions/mobile-provider/.

About Ericsson

Ericsson is one of the leading providers of Information and Communication Technology (ICT) to service providers, with about 40% of the world's mobile traffic carried through our networks. We enable the full value of connectivity by creating game-changing technology and services that are easy to use, adopt, and scale, making our customers successful in a fully connected world. For more than 140 years, our ideas, technology, and people have changed the world: real turning points that have transformed lives, industries, and society as a whole.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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