Ericsson Router 6000

Purpose-built for superior RAN performance

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Purpose-built routers for radio networks

The transport infrastructure is key to securing the best performance for all 200+ foreseen use cases enabled by 5G. Adding on Cloud RAN, the evolution of radios, interfaces, and deployment architectures - all of that drives the need for increased capacity and connectivity, lower latency, and support of increased traffic volumes in 5G transport networks. These requirements have to be accomplished using less energy, thus supporting service providers' Net Zero ambitions.

Time and phase synchronization are crucial for high-performing radio traffic. At the same time, capabilities such as security, advanced quality of service (QoS), and segment routing are key technologies to enable new functionality such as network slicing. Agility, programmability, and software-defined networking (SDN) enable a high degree of automation across the transport domain, reducing overall complexity and operational expenses. As mobile networks move toward cloud and centralization, it brings new benefits and challenges in the transport domain. More operators see the need to build packet-based fronthaul networks. Packet Fronthaul uses standard technologies that lower transport deployment and maintenance costs and is a pre-requisite when adding Ericsson Cloud RAN.

Combined with RAN, our extensive transport portfolio and pre-verified solutions let you design, build, upgrade, and maintain a transport network that supports the evolution of your mobile network and the potential introduction of Cloud RAN in a cost-efficient way with minimal risk.

High density of high-capacity, radio-near interfaces

Densification of radio sites and new radio interfaces drives the need for higher port density in backhaul routers to handle the new connections. The increased radio capacity in 5G, along with the RAN coordination functions, will require higher speed for these router ports. No one-size fits-all. Routers and configurations must be tailored to the individual sites. Some sites may only demand a few high-capacity interfaces (like 10GE). Other sites may need a much higher density of 25GE or even 100GE interfaces. To match all these requirements, the Router 6000 portfolio includes a variety of products.

Advanced synchronization

Seamless synchronization is fundamental to unlocking the full potential of 5G. 5G time division duplexing (TDD) requires tight time and phase synchronization. GNSS receivers are sensitive to disturbances, which can result in degraded 5G performance or even an outage. Synchronization support in the transport network enables a more fault tolerant architecture and, eventually, higher radio performance at a lower cost. The Router 6000 series offers cost-optimized and complete time, phase, and frequency synchronization support. By providing more freedom for Grandmaster placement and requiring fewer GNSS receivers, the 5G network becomes more robust, fault tolerant, and cost-efficient. The Router 6000 synchronization solution also provides excellent monitoring tools to simplify operations and ensure the highest network performance.

Distributed security

We foresee a threefold increase in the number of radio sites. The main driver of this change is network densification caused by small-cell deployments. However, that exposes the network to more points of attack. A security-hardened design makes the Router 6000 products ideal in untrusted domains, while its hardware-accelerated distributed security gateway function offers IPSec-based connectivity with no compromise in network performance. End to-end security enforcement across the entire network is crucial for isolating and securing network slices.

Simplified underlay and overlay

The ability to run one physical network with performance and flexibility for every use case with a policy-based overlay and a service-aware underlay unlocks business potential. Automated end-to-end provisioning of traffic-engineered paths, seamlessly spanning multiple SDN domains, translates into end-to-end optimization to avoid constraints and guarantee KPIs and SLAs. For example, automated provisioning enables end-to-end VPNs where endpoints can be dynamically provisioned from the access to the core and datacenters without setting up a VPN for each domain. Segment routing (SR-MPLS and SRv6) has attributes that facilitate making the network more programmable. That enables efficient network slicing and makes adjusting to the evolving demands of 5G networks easier.

Automation to reduce complexity and costs

5G networks require increased connectivity, virtualization, and disaggregation. There is a need to adapt to the dynamic nature of service handling as well as to provide a greater number of connection points. The Router 6000 portfolio is fully integrated with the Ericsson Network Management (ENM) platform and supports auto-integration with a seamless setup for the RAN transport network. That enables the automatic discovery of the Router 6000 nodes and the automatic download of their predefined configuration. Each configuration is kept in sync with ENM for fast and simple operation and maintenance. Advanced SDN functionality enables automatic traffic engineering, network optimization, and advanced network-connectivity management end-to-end.

Efficient fronthaul networks utilize packet technologies

The transport infrastructure is also vital to mitigate the otherwise explosive bandwidth requirements on the digital fronthaul interface in centralized RAN deployments (C-RAN). And here, packet based technologies come into play. Evolved CPRI (eCPRI) uses packet technology that enables the fronthaul network to carry other types of traffic, such as enterprise.

To support the need for an all-packet network, we introduced a unique packet fronthaul gateway that enables:

- Utilization of an existing installed base of CPRI radios
- Bandwidth savings totaling 60–80%, achieved using conversion
- Both C-RAN deployments and distributed RAN (D-RAN)
- Cloud RAN deployments, serving as Cloud RAN gateways.

Energy efficiency
Reducing power consumption is high on everyone's agenda. Our Router 6000 products are designed with low power consumption as a key design requirement, resulting in four times better energy efficiency across three product generations. No effort is too small - even intelligent FAN algorithms help reduce power consumption.

Router 6673 is a powerful fronthaul gateway and a multi-service router with embedded RAN Compute functionality leveraging the unique Ericsson Silicon. The router enables efficient conversion to eCPRI for our NR-ready CPRI radios but can also be used in RoE mode (Radio over Ethernet). In the C-RAN hub, Router 6678 is a perfect match to aggregate 100GE from the macro sites.

Transport for Cloud RAN
Ericsson Cloud RAN supports both D- and C-RAN architectures and uses generic hardware instead of purpose-built. It does it by using virtualization for parts of L1 and all L2 radio processing. With the introduction of Cloud RAN, establishing a superior transport network is fundamental, and it requires a Cloud/Fronthaul Gateway to convert CPRI from existing CPRI radios to eCPRI. Router 6673 with Cloud RAN and ERS basebands allows for seamless transport of existing 4G and 5G traffic, as well as future Cloud RAN deployments. That gives the flexibility to deploy, manage, and migrate to future RAN technologies while efficiently transporting existing traffic.

1. Access for 4G/5G

- Mid-band and mmWave drive 10/25GE deployment
- Local radio co-ordination traffic on 10/25GE
- Time and phase synchronization

2. IPoDWDM

- Combined applications with Fronthaul 6000 (colored optics and filters)
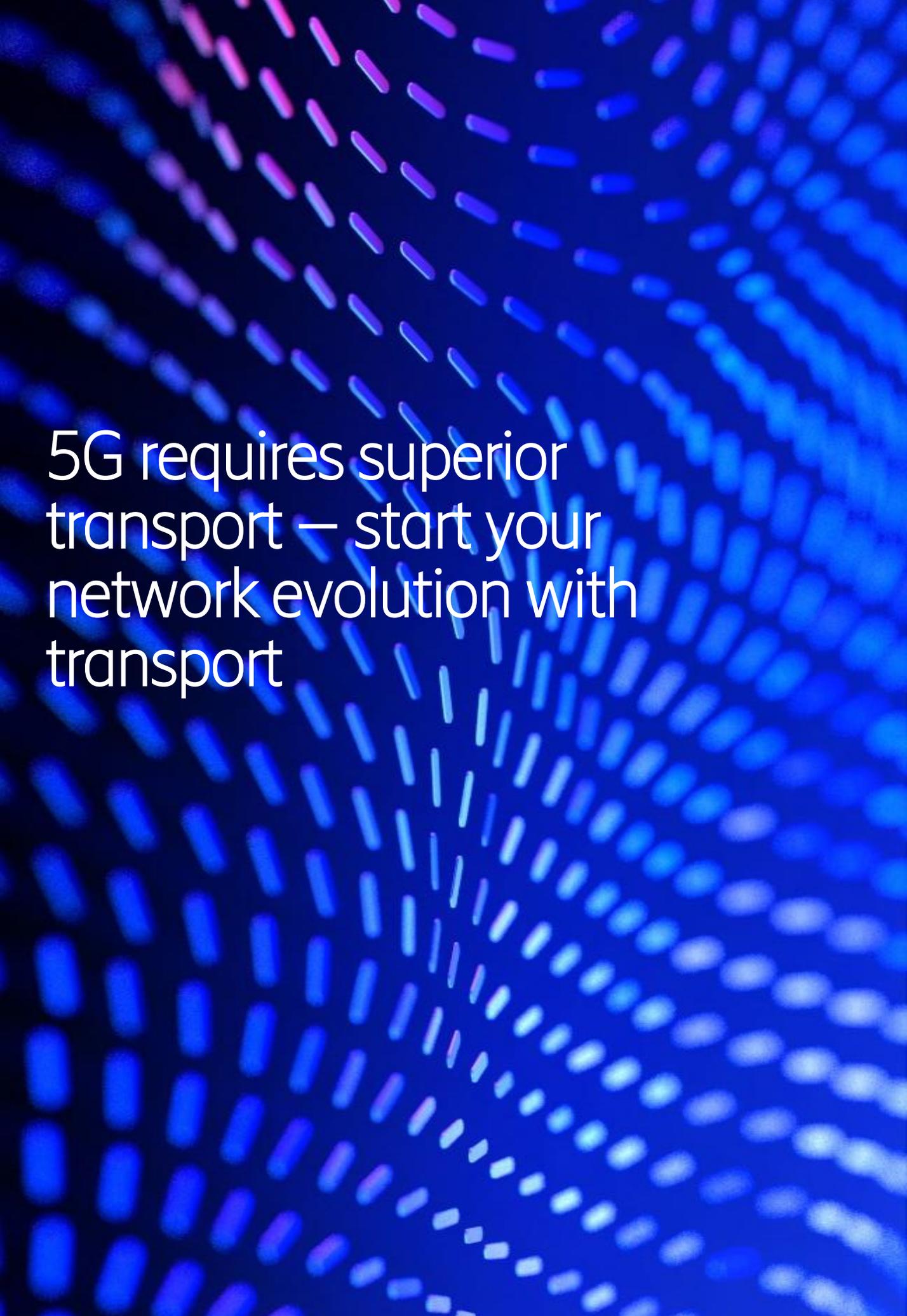- Nx10/25G over a single fiber strand

3. Centralized RAN hubs

- High port density 10GE / 25GE /100GE
- Low latency (µs range)
- Precise synchronization

4. Aggregation

- 10GE / 25GE / 100GE density
- Latency (ms range)
- Form factor
- QoS and buffer size

5. Packet fronthaul

- Conversion and RoE-modes
- Class C-sync
- Support Cloud RAN

5G requires superior transport — start your network evolution with transport

Products and offering

Our Router 6000 family is designed to cater to the diverse, challenging demands of modern backhaul and fronthaul networks, all of them with energy efficiency as a high priority. The series holds the industry's highest-performance 5G routers, each designed as part of our radio system to enable best possible RAN performance with 5G features not found in any other router today. The Router 6000 portfolio can be used in backhaul, fronthaul, and Cloud RAN, to build superior transport networks that connect 5G services everywhere.

Router 6000 family

Cost-efficient RAN routing
The Router 6000 series responds directly to the 5G challenges concerning IP backhaul/ packet fronthaul/aggregation. It supports the exponential traffic growth, increased network connectivity, and the need for synchronization and security with a complete, scalable, and cost-efficient router portfolio. This product family contains purpose-built routers with optimized throughputs and high 10/25/100G port densities to meet the requirements of the evolving 5G transport networks.

Router 6000 products

Router 6471
• Compact access router for suburban sites, emerging markets, and small cells
• Advanced synchronization and IPSec support
• Distributed security GW (SeGW) support for small cells
• Pay as you grow TDM support with TDM 1001

Router 6672
• Advanced 4G/5G access router and pre-aggregation router with 100Gbps forwarding capacity
• Advanced synchronization and IPSec support
• Sealed design preventing dust from contacting the PCB, removing the need

Router 6675
• 5G-combined access and E5 switch with 100GE interfaces and 320Gbps forwarding capacity
• Advanced synchronization and IPSec support
• Programmability and SDN support

Router 6671
• Energy efficient cell site- and backhaul router with 100 Gbps forwarding capacity
• High density of 10 and 25GE ports in 1 RU
• Advanced synchronization
• Native SRv6

Router 6676
• 1 RU cell site- and backhaul transport router with 360 Gbps forwarding capacity
• High density of 25GE and 100GE ports
• Advanced synchronization
• Native SRv6

Router 6673
• 1.5 RU 800 Gbps Fronthaul gateway and multiservice node with native SRv6
• RoE and Ericsson CPRI to eCPRI conversion using Ericsson Silicon.
• Advanced synchronization

Router 6678
• Optimized for aggregating 100GE in aggregation- and central hub-sites with 4.8Tbps forwarding capacity
• Built for high reliability with redundant PSU and FAN
• Native SRv6

Router 6273
• Modular pre-aggregation, and aggregation router
• High 10/25/100G port density with 800Gbps full-duplex forwarding capacity in only 3U height
• Designed to lower CAPEX and OPEX

Router 6274
• Modular and redundant aggregation router with high 10/25/100G port density
• 2.7Tb full-duplex forwarding capacity
• Integrated 100Gbps IPoWDM optical solution for longer reach

Management, orchestration, and transport

Building a superior transport network also requires efficient management and orchestration of its services. With the introduction of Cloud RAN, edge compute, container-based architectures, and network slicing, the management and orchestration systems have become vital components to capture the booming market potential of 5G.

Advanced management of transport services

The Router 6000 products are part of Ericsson Radio System and utilize the common management system, Ericsson Network Manager.
With Ericsson Network Manager, all network technologies can be handled in a single management platform. The solution provides a single interface for managing the complete mobile network. It reduces the cost of operations by automating tasks such as monitoring, service provisioning, software management, and initial deployment.

ENM allows for SDN-based management with open and standard interfaces, a framework for policy-driven automation, and end-to-end orchestration to support the efficient roll-out of 5G services.

Ericsson Orchestrator (EO) connects RAN, Core, and Transport to enable endto-end network slicing. Service Orchestrator in EO is the glue between the transport and the cloud domains for both intra- and inter-datacenter connectivity.

Ericsson Transport Automation Controller is an intelligent, cloud-native transport controller that uses AI and ML to analyze and automate microwave, IP and optical networks. It allows easy and cost-effective management of IP transport network allowing:
• service assurance, monitoring of performance against user-defined SLA-objectives and reporting
• synchronization health monitoring
• fast troubleshooting of service issues by pinpointing links on service route with suboptimal performance

Evolve your network to support 5G and beyond

Future-proof the IP network to support the RAN evolution.

Digital services of the future will demand new capabilities in 5G and beyond. That includes an appropriate end-to-end QoS in throughput, latency, device density, availability, and reliability. The key to success is the best-performing transport network. As the first wave of 5G deployments has begun, the race to secure 5G-ready transport infrastructures is on.

Future-proof network products require high capacity, a compact and modular building practice, advanced packet functionality, and aligned and backward compatible features across different network nodes. Flexibility and modularity are essential, and the utilization of software upgrades to existing hardware makes the rollout of new RAN services faster and more cost-efficient.

Modularity and flexibility for any medium and deployment scenario
Our diverse router portfolio offers a variety of products that can be used in all RAN use cases. The portfolio's modularity and flexibility support any network size, from small sites to significant aggregation, even when the network scale grows. It also supports any installation need, both indoors and outdoors. And the mix and match approach allows your network to grow organically, also when it grows in scale and complexity. Our transport products support the network evolution from 5G and beyond. Investing when and where necessary prevents from excessive spending and high up-front costs without over-dimensioning.

Network slicing
Network slicing is a key component in a 5G network architecture. By splitting the physical network into multiple virtual ones, it's possible to separate and handle different 5G use cases according to their specific requirements. Our components are designed for efficient network slicing to enable traffic engineering for optimal transport path selections based on bandwidth and latency. QoS is tailored to support different types of customers and services by allocating speed, coverage, and capacity into logical slices.

SRv6 for scale and simplicity
Using standard summarization, SRv6 router advertisement dramatically reduces both host and service routes in the network. It enables an any-to-any capability without requiring the routers' control plane to grow to an uneconomic scale. At the same time, this allows the network to be segmented into smaller routing domains to protect against failures that would otherwise affect large areas in the network.
SRv6 requires only IPv6 connectivity for operation. Legacy protocols like LDP and RSVP can be phased out of the network, thus significantly decreasing complexity.

For traffic engineering, standardized extensions to IS-IS and OSPF are needed. Interoperation between SRv6 and MPLS is also well understood and supported, both on service and transport levels.
Network slicing, SLA enforcement, and sub-50ms path restoration in any topology (TI-LFA) are all native capabilities of SRv6, making it the protocol of choice for backhaul networks for 5G and beyond. Traffic engineering will be easier with SRv6.

Datacenter gateway
Router 6274 can be used as Datacenter Gateway and is a part of Ericsson NFVI solution. Ericsson NFVI enables operators to deploy virtual network functions (VNFs) or cloud-native functions (CNFs) from multiple vendors, as well as OSS and BSS applications, with high speed while keeping the total cost of ownership low. Router 6274 has the capacity, scalability, and redundancy protocols, required for performance and stability. The solution is system-verified, which significantly simplifies deployment, operations, and upgrades.

About Ericsson

Ericsson enables communications service providers to capture the full value of connectivity. The company's portfolio spans Networks, Digital Services, Managed Services, and Emerging Business and is designed to help our customers go digital, increase efficiency, and find new revenue streams. Ericsson's investments in innovation have delivered the benefits of telephony and mobile broadband to billions of people around the world. The Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.