High-performing RAN: How to build a competitive edge

ERICSSON

Why do we need high-performing radio access networks?

Network performance impacts customer satisfaction, operational efficiency, competitive positioning, and business growth. Striving for high performance is a strategic imperative for any Communications Service Provider (CSP) looking to thrive in the dynamic telecommunications industry.

The introduction of smartphones has fundamentally changed how people use mobile devices, shifting from phone calls and texting to constant connectivity, app ecosystems, and rich media designed to engage users beyond a simple click.

The rapid adoption of Extended Reality (XR) and Artificial Intelligence (AI) is setting the stage for a new era of use cases that are unlikely to follow the traditional mold of screen-based phones or computers. Together, XR and AI can create computing experiences that are embodied and contextual rather than abstract and screen-mediated.

This shift has the potential to upend the traditional balance between downloading and uploading data. Unlike apps and streaming services, which rely on large data downloads, AI-centric devices will increasingly feed information back into the network. This fundamental change will place unprecedented strain on uplink capacity, requiring networks to evolve.
High-Performing Radio Access Networks (HP-RANs) are becoming essential for deploying mission-critical systems and services, because they provide the low latency, high throughput, deterministic availability, and resilience required to keep communications safe, continuous, and correct under load or during failures. Such networks enable real-time control and synchronization, preserve user experience, and enforce Quality of Service (QoS) so that critical traffic is prioritized over best-effort flows.

The benefits of driving a high-performing network are substantial. An Ericsson Consumer Lab study into the perception of 5G pacesetters revealed several advantages in both customer satisfaction and growth. The resulting report indicated that quality-led service providers strive to deliver both excellent network coverage and performance in their market. They lead on consumer perception and satisfaction and gain in business performance. Leading CSPs are viewed as 5G leaders by upwards of 70% of their own customers. They are 3x more likely to retain customers and have 50% more customers who plan to upgrade their services. Proactive efforts to boost customer satisfaction are rewarded with an uplift in revenues, and with nearly 2x the probability of growing Average Revenue Per User (ARPU) and total revenues year-on-year. Compared to industry averages, these results demonstrate a significant competitive advantage.

These results highlight how network performance creates a reinforcing cycle of business benefits. Superior network quality drives customer satisfaction, which strengthens retention and upgrade rates, which supports revenue growth and provides resources for continued network advancement. For service providers, this represents not just operational improvement but sustainable competitive advantage.

Building a high-performing and high-quality network requires careful planning, strategic investment, and continuous optimization. It is an achievable goal that involves deep understanding of both the physical infrastructure and the software that drives exceptional performance.

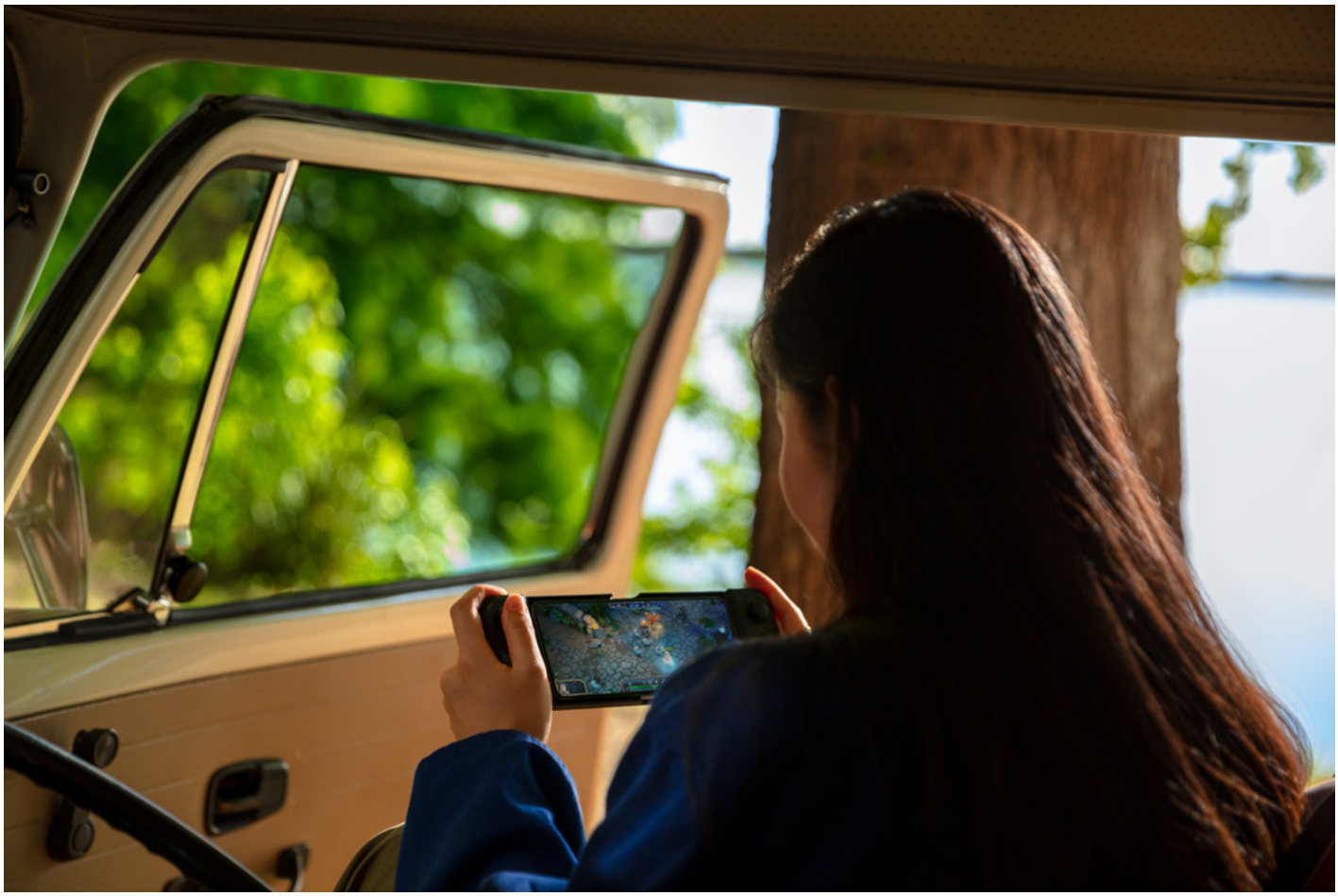
What defines a high-performing network?

The network infrastructure landscape is at an inflection point. While 5G promises have captured headlines, the reality for many CSPs is that most deployments barely scratch the surface of what's possible. HP-RANs bridge this gap, delivering superior performance and energy efficiency without spiraling expenditure.

A HP-RAN is crucial for today's service providers for many reasons. It has the potential to become a fundamental pillar of business success, giving the ability to compete effectively in the demanding consumer landscape. Moving from best effort to performance-based subscriptions will help set the foundation for programmable networks and the differentiated services that require reliable service in both downlinks and uplinks. HP-RANs provide superior performance and energy efficiency at the lowest total cost of ownership (TCO) while ensuring network resilience.

Existing 5G deployments are far from complete. Wide deployment of mid-band spectrum is essential. Network densification is critical. CSPs must improve overall efficiency and aggregate deployed bands to meet evolving demands on 5G Standalone (5G SA), which uses its own core network infrastructure. Doing so will fully scale up HP-RANs to empower next-level programmability, enable novel use cases, and help realize exciting new business models.

Achieving high performance also means developing and dimensioning networks to deliver the right coverage, speed, and reliability that tomorrow's consumers, enterprises, and industries demand. As part of ongoing modernization strategies, the deployment of compact, efficient, and future-proof network solutions that leverage continuous software updates will play a key role in enhancing and improving user experience while lowering TCO.



Network evolution: where to start

Building a HP-RAN successfully requires CSPs to allow more network bandwidth and move spectrum assets to 5G networks. Bandwidth from several spectrum layers will provide both the coverage and the capacity needed to achieve great 5G network performance. 5G inherently reduces energy consumption, and the path to 5G SA becomes easier the more spectrum layers run on 5G. When 5G SA is deployed, the full business potential of new use cases powered by service differentiation can be harvested.

1. **Re-farm spectrum:** Sunset 2G and 3G services as soon as device penetration and market dynamics allow. Consider ways to promote 4G- and 5G-enabled devices beyond smartphones to speed up device fleet modernization and re-farming. This way, more low- and mid-band spectrum is made available for re-farming to 5G. The overall network becomes simpler and more cost-efficient to manage and operate.
2. **Establish a plan for 5G SA:** This requires support in both the Core network and the RAN, and can be achieved both directly upgrading from Long-Term Evolution (LTE) and via 5G non-SA as a steppingstone. By identifying which frequency bands have the best potential to provide coverage and performance in the RAN, and upgrading to a cloud-native 5G Core, you can make key steps toward a successful SA launch.
3. **Explore new use-cases:** 5G SA unlocks countless possibilities on top of best-effort mobile broadband and Fixed Wireless Access (FWA), thanks to innovations like Differentiated Connectivity, Reduced Capability (RedCap), and Positioning.

Find the low-hanging fruit: Investigate which services have the highest potential for uptake. Explore areas like mission-critical services, performance-based subscriptions, and live broadcasting. These are all major trends that leverage the potential of network innovations.

The network blueprint

Designing and implementing a robust HP-RAN requires a comprehensive approach that addresses spectrum utilization, infrastructure efficiency, and operational resilience. The cornerstones that form the foundation of this network are superior performance and reduced TCO.

Superior performance

Superior performance means the network can deliver consistently high levels of user experience. Consider that providing low network performance with basic mobile broadband means consumers sit and wait for their smartphones or laptops to load every time they use them, or that an important video conference call can't handle the audio and video feed due to poor uplink speed. Consumers expect their connectivity to be seamless—without delays or dips in quality. Network performance influences customer satisfaction, affects revenue levels, and alters brand image.

There are three crucial elements to maintain to achieve superior network performance: spectral efficiency, compute efficiency, and resilience.

Spectral efficiency -- more bits per Hertz
Spectral efficiency is about utilizing purchased network spectrum assets to the fullest. This requires maximizing data transmission over a given bandwidth. It is enhanced through technologies like multiple transmit and receive branches, Massive Multiple Input, Multiple Output (MIMO), beamforming, and carrier aggregation schemes. These technologies allow 5G to provide higher data rates, improved network capacity, and deliver new use cases.

Enhance antenna and radio efficiency
Remote radios and antennas are optimized to support low- and mid-band spectrum, predominantly on Frequency Division Duplex (FDD) across all RAN generations. Remote radio solutions offer a wide-area coverage foundation for 5G.

Enhancing RAN sites with radios and antennas to support multiple bands combined in one hardware unit has become an industry standard, as has upgrading the low bands from 2 transmit and receive antenna branches (2T2R) to 4T4R. This gives a coverage boost and improved cell-edge reception.

With the low bands efficiently deployed from a radio perspective, mid-bands on FDD can evolve further. There is often a hidden opportunity in deployed passive antennas that can be seized for further spectrum efficiency on mid-bands.

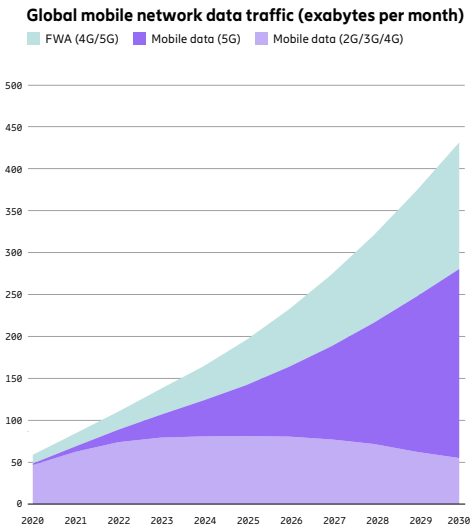
Maximize uplink with unchanged footprint
Radios with 4 transmit and 8 receive branches (4T8R) can double the uplink performance on mid-band FDD spectrum, improving cell-edge throughput without touching the antenna. This is possible because many antennas have spare (receive) branch ports.

By deploying a 4T8R radio, uplink capacity for FDD bands is doubled while site footprint remains unchanged. By also combining 4T8R in a multi-band radio and antenna sector, wide-area coverage sites provide higher cell-edge throughput over multiple FDD mid-bands with zero added site footprint.

There are also radios with 8 transmit and receive branches. Note that 8T8R radios require a swap of the passive antenna, since classic multi-band antennas typically do not house 8 transmitter ports. An 8T8R FDD antenna is physically smaller to fit the same site space while also supporting beamforming in downlink. The 8 transmitters in downlink provide benefits, but at reduced uplink capacity compared to using the legacy multi-band antenna with 8 receivers.

Boosting urban capacity
While most service providers have harmonized their low-band spectrum to multi-band solutions, many have also rolled out Massive MIMO on their mid-band Time Division Duplex (TDD) spectrum, bringing a much-needed capacity boost to urban and suburban sites. Massive MIMO has served CSPs well and has become synonymous with 5G downlink speed, with 10x more downlink capacity versus legacy solutions and better support for new use cases.

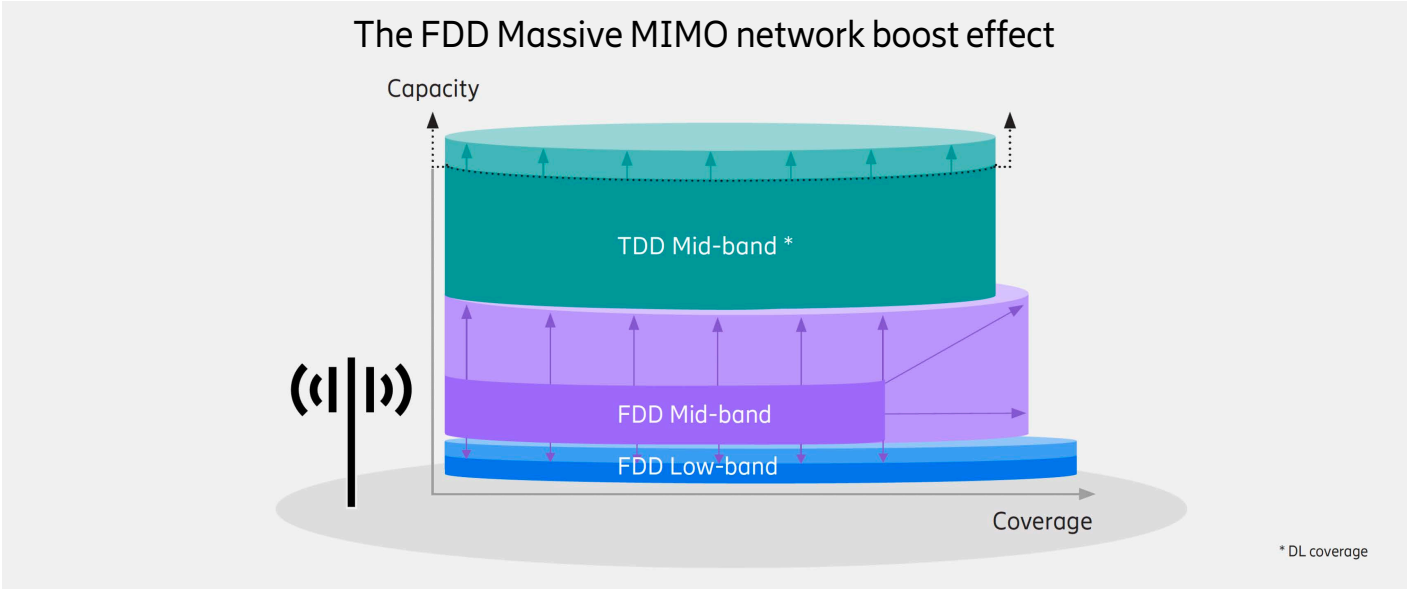
However, with traffic projected to increase 2.5x by 2030 according to the latest Ericsson Mobility Report, many busy sites are already experiencing congestion, particularly in the uplink. This presents a need for CSPs to scale capacity with traffic and creates an opportunity to advance the network with performance-based subscriptions that provide ubiquitous service in both downlink and uplink.



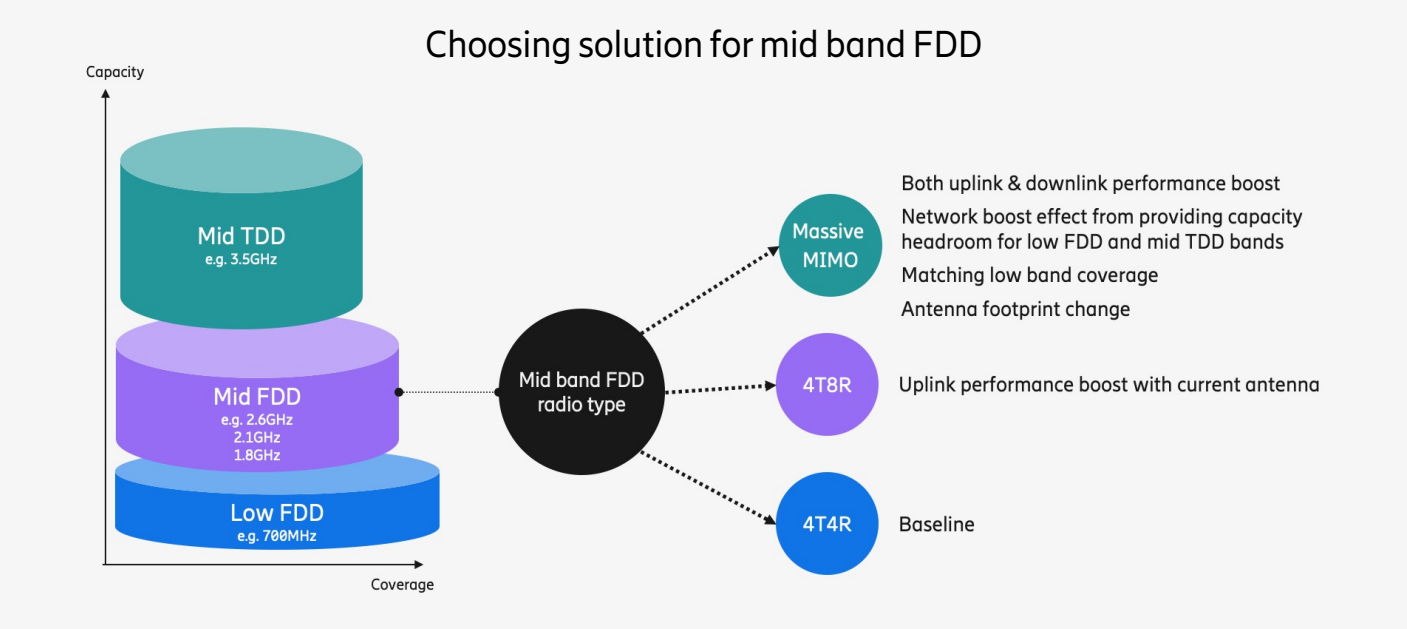
Get Massive MIMO for FDD
Massive MIMO for TDD provides superior downlink speeds, but a great downlink relies on a strong uplink. In contrast, Massive MIMO for mid-band FDD changes the uplink game and is field-proven to improve performance across all spectrum layers:

- Low-band FDD provides continuous 5G coverage and session continuity but is limited in capacity
- Massive MIMO for FDD improves capacity and offloads both low-band FDD and Massive MIMO mid-band TDD layers
- FDD mid-band capacity multiplies by more than 3x in the uplink and 2x in the downlink
- It extends the coverage and cell-edge speeds of FDD mid-bands

Massive MIMO for FDD presents a strong technology base for reframing from 4G to 5G. Many CSPs struggle to manage 4G demand while wishing to shift more spectrum to 5G to increase performance and decrease energy consumption. With Massive MIMO in a sector, 4G traffic can be moved to a smaller amount of spectrum and free up more spectrum for 5G.



Choose FDD 4T8R over Massive MIMO
FDD Massive MIMO provides a clear capacity boost to busy sites with high and growing demand for uplink throughput. In these sites, Massive MIMO for FDD can deliver high capacity in both downlink and uplink, particularly when combined with TDD mid-band support. In areas and on sites with lower capacity demand, the 4T8R solution can ensure proper downlink-uplink balance and help extend the availability of TDD mid-band to the network edge, even in suburban and semi-rural areas.



Upgrade scenarios

Highly loaded sites: Some networks have hotspots or event sites that are highly loaded and require more capacity than TDD mid-band can provide. For long-term planning, FDD Massive MIMO can be deployed today to meet future needs at many sites.

Sites with coverage constraints: In suburban or rural areas where demand exceeds the capacity of 4T4R FDD solutions, uplink capacity can suffer from longer inter-site distances (~1,500 m or more), meaning TDD mid-band may not contribute enough. A 4T8R radio or FDD Massive MIMO can better meet higher capacity demands.

Lack of TDD spectrum: The most common spectrum allocation on TDD mid-band is a bandwidth of 100 MHz. Combined with advanced beamforming capabilities and highly downlink-biased traffic patterns, this makes TDD mid-band the most suitable first choice for capacity expansion. However, with narrower spectrum allocation below ~50 MHz, an FDD Massive MIMO upgrade could be a better investment.

Local areas with high uplink demand: Certain areas in the network—e.g., industrial or specialist business areas—can be targeted for uplink-centric services such as video conferencing, broadcasting, or other upload-intensive use cases. Similarly, event areas like concert halls can generate recurring high levels of uplink traffic demands, which are significantly better met with a Massive MIMO for FDD solution.

RAN Compute efficiency
All radios, remote and Massive MIMO, rely on a RAN Compute board. This baseband is the processing unit responsible for handling the digital signal processing tasks for transmitting and receiving data over the radios and antennas for all technology generations.

As they enable the handling of massive amounts of diverse data types, solutions with efficient and future-proof RAN Compute capabilities will prove critical going forward. As networks become more complex and accountable to critical use cases, and the demand for data and low-latency services continues to rise, the importance of compute power will intensify.

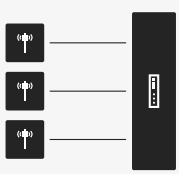
Efficient RAN Compute solutions enhance network performance and capacity by optimizing signal processing and supporting several radio access technologies simultaneously, e.g., running 4G, 5G, and Massive MIMO in tandem.

RAN Compute also facilitates the interworking between radio frequency bands to aggregate multiple bands and combine them in such a way as to maximize performance in both downlink and uplink to achieve both the needed data rates and also best coverage at cell edge.

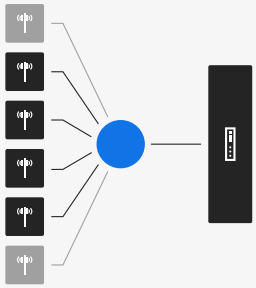
RAN Connect for open fronthaul efficiency
The RAN evolution is going to change the network fronthaul and create new opportunities for CSPs. The fronthaul interface is moving from Time Division Multiplexing (TDM)-based Common Public Radio Interface (CPRI) and becoming packetized. Instead of vendor-specific protocols, an open fronthaul is introduced.

The move is from very static connections—from a radio to a specific baseband interface—to being both dynamic in nature and a true network with any-to-any (A2A) connectivity. In addition, the compute power in the basebands has increased substantially, enabling increased support for more radios and cells per baseband. This drives the need for a new portfolio area that caters to new opportunities within open fronthaul that will play a significant role in delivering HP-RAN with the lowest possible TCO. This will help achieve the following:

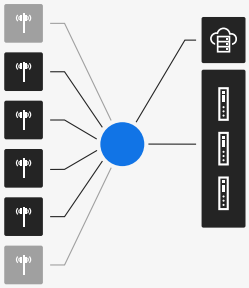
- Radio-site scalability and performance that fully leverages the potential of RAN Compute
- Utilization of the bandwidth efficiencies and operational opportunities that come with packetization in fronthaul
- Increased observability and manageability for open fronthaul



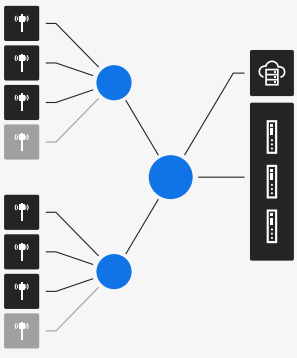
Radio to specific baseband interface



Aggregate radios to common fronthaul interface



Simple evolution to Cloud RAN



Simple evolution to Centralized RAN

Site resilience

Site infrastructure is the backbone of every RAN site. It consists of enclosures, power supply, network management, and climate solutions. The main responsibilities of site infrastructure are upholding network performance, offering redundancy and resilience, and optimizing efficient use of energy.

Site resilience has become increasingly important as networks become more advanced, capable, and bear national-security responsibilities. Securing resilience in HP-RAN requires continuous service—despite challenges such as power outages, environmental conditions and sudden weather changes, equipment failures, or cyber threats. A less resilient network is unable to face these risks, which can lead to more frequent network downtime and increased customer dissatisfaction.

Consider five key improvement areas for site clusters that are part of a network upgrade. Combining resilience upgrades with capacity or footprint hardware improvements during a site visit will save precious operating expenses. Here is the checklist for a resilient site build:

1. Outdoor enclosures with heat-exchangers:
Introducing outdoor enclosures at select sites can reduce energy consumption and increase resilience. By using heat exchangers instead of air conditioning, the site is protected from both dust and moisture. For best performance of the housed equipment, digitized temperature monitoring and adjustment based on real-time conditions help improve resilience.

2. Battery backup:
When the main power grid fails unexpectedly, the network needs an alternative power source to keep running, especially for critical services related to national security. At least four hours of backup is needed to build a resilient network. Moving from acid to lithium-ion batteries simplifies management, as lithium variants have built-in electronics that allow real-time monitoring of the network's backup capacity.

3. Connected secure sites:
Internet of Things (IoT) capabilities can connect the enclosure and power systems to the network management system, offering site visibility, intelligence, and security. This enables remote monitoring of voltage and charge levels, alarms, and the inner temperatures. Combined, the connected site prevents disturbances that could impact network performance and revenue loss.

4. Site material with verified designs:
Using verified site equipment and accessories including brackets and cabling will tackle anything from strong winds to animal contact and seismic movements.

5. Zero footprint resilience:
An elevated power system can maintain the supply where a traditional cabinet might fail during, for example, flooding. This way, the site also becomes less prone to theft and vandalism. As no fans or filters are used, and cooling is managed through convection, zero footprint also means zero maintenance.

Improving site resilience with RAN Connect
The Ericsson RAN Connect portfolio is designed to significantly enhance network resiliency by introducing a flexible, packetized fronthaul architecture and leveraging open standards. It was created to maintain continuous and robust connectivity between radios and RAN Compute, even under adverse conditions. Its tight integration with the RAN, combined with end-to-end network automation, can enable rapid fault detection and speedy recovery.

RAN sites normally use satellite systems like GPS to maintain precise time synchronization. However, if a site experiences GPS jamming, it loses radio synchronization and eventually shuts down the entire radio unit to prevent network interference. RAN Connect not only detects GPS spoofing and jamming attacks but also mitigates these risks by leveraging time synchronization from the transport network itself. This delivers highly accurate and stable timing to the radios on-site, maintaining network performance even when satellite signals are compromised.

RAN Connect enables the automatic rehoming and reconfiguration of radios/cells to backup RAN Compute resources without the need for site visits in the event of a failure. This further strengthens service continuity and helps CSPs maintain high levels of service and maximize network uptime.

Lowest total cost of ownership

The second cornerstone of a HP-RAN is achieving the lowest TCO. This is paramount for several key reasons. Here are three primary strategies that CSPs can employ to reduce network expenditure: reduced energy consumption
and site footprint plus improved efficiency.

Reduced energy consumption
Enabling energy savings is fundamental as most service providers in recent years have had to spend as much on electricity as they spend on new equipment. Estimates show that the RAN can consume more than 80% of the total energy use in mobile networks, indicating the importance of selecting products that contribute to overall energy efficiency.

The site footprint relates to more than just radios and antennas. Legacy sites typically host large container-based shelters with air conditioning systems consuming vast amounts of energy. As energy prices increase, a shift from a fully sheltered site to an outdoor enclosure, or even a rail-based zero-footprint site infrastructure, is expected to reduce site energy consumption by up to 25%.

New software functionalities provide CSPs the ability to efficiently scale up or down network capacity according to the traffic load—without impacting key performance indicators (KPIs). High-performing, energy-efficient radio network equipment can dynamically adapt with the finest granularity to prevent any energy waste. By upgrading to the latest software subscriptions, improvements can be leveraged on a quarterly basis, enabling better sleep modes and increased processing capabilities.

Reduce site footprint
Another key strategy for minimizing TCO involves selecting hardware solutions that reduce site footprint to lower recurring rental costs. When choosing the right radio and antenna solutions, products that balance high output power with low weight will reduce both the cost of rollout and the on-site footprint while preserving overall performance. Reducing hardware footprint also contributes to lowering the embodied carbon footprint of each site, as less weight equals reduced aluminum use.

TCO also benefits significantly from compact, future-proof solutions that extend the product lifecycle, such as radios designed to support multiple access technologies, manage multiple bands or combinations on multiple antenna sectors and bands.

As 5G traffic increases, legacy bands can then easily be re-farmed to 5G without the need for site visits or product replacements. In addition, choosing products with an open fronthaul interface adds future flexibility at the site, keeping the option to introduce an Open RAN-based network.

Improved site flexibility and efficiency
Improved site flexibility and efficiency are crucial elements that contribute toward better performance, lower costs, and faster deployments. The introduction of new radio solutions such as Massive MIMO benefits from the RAN Connect product line to lower TCO through remote radio rehoming and reconfiguration—again without the need for unnecessary site visits. Furthermore, RAN Connect enhances compute efficiency by enabling a 33% increase in the number of radios supported per RAN Compute.

Which portfolios are needed to build high-performing radio access networks?

Building a robust HP-RAN requires carefully selecting suitable products, strategic planning and investment, and continuously optimizing spectrum, footprint, and resilience.

Passive antennas
At the network edge, new antennas created using Ericsson's Trio-Net philosophy maximize network impact through three interconnected dimensions: antenna design, pattern, and system integration. Thanks to better FDD mid-band utilization, improved carrier aggregation, and higher modulation and MIMO schemes, this combination encourages around 15% higher uplink throughput, 29% reduced radio output power, and 35% lower mobile energy consumption.

Each design choice is carefully evaluated to balance these trade-offs and to maximize the overall network impact. The precisely engineered antennas are tailored to enable high-performing, energy-efficient networks by providing:

- **High performance and energy efficiency**, thanks to up to 85% antenna and beam efficiency and ultra-stable PIM
- **Low TCO and seamless deployment**, with 37% lighter weight, industry-leading wind load, and safe & smart brackets
- **Sustainability in every detail**, enabled by superior energy efficiency and 42% lower embodied carbon footprint

The passive antenna portfolio breadth supports all site types and traffic scenarios. To satisfy all network requirements, it covers a wide range of applications thanks to the extended range of ports (from 2-ports to 24-ports), a wide frequency spectrum (from 600MHz to 6GHz), and support for multiple technologies (TDD and FDD, multi-beam and beamforming). The portfolio also includes special antennas for railways, public safety, and small cells.

Massive MIMO radios
The Ericsson Massive MIMO portfolio has evolved into a leading combination of ultralight weight, wideband capabilities, and further enhanced energy efficiency. Ericsson is driving the innovation of Massive MIMO for an optimal balance between performance, energy efficiency, and easy deployments, providing customer-centric solutions for new business possibilities.

In 2025, Ericsson expanded its Massive MIMO portfolio with four new energy-efficient, high-performing radios for both TDD and FDD. All are powered by Ericsson Silicon and support open fronthaul. Including the new radios, Ericsson's open fronthaul portfolio spans over 130 radio products, giving service providers the possibility to integrate with other vendors to support specific scenarios.

The innovations will reduce energy consumption by up to 30%, lower operational costs, and cut weight by up to 50 percent, supporting more efficient, flexible, and more sustainable network deployments.

FDD Massive MIMO
The FDD Massive MIMO portfolio is complemented into a global portfolio, adding the AIR 3285: a dual-band FDD Massive MIMO radio supporting 1800 and 2100 MHz bands, and weighing only 30kg. This FDD Massive MIMO radio is the lightest in its class, resulting in easier and less time-consuming installation. It reduces energy consumption by 30 percent and has a 40 percent smaller embodied carbon footprint compared to the previous product, AIR 3283.

TDD Massive MIMO
When it comes to Massive MIMO for TDD, Ericsson introduces three new radios supporting global scenarios: AIR 6494, AIR 3266, and AIR 3265:

AIR 6494 addresses the footprint challenge when additional mid-band TDD spectrum becomes available. A single AIR 6494 replaces two single-band Massive MIMO radios through its 64-branch wideband transceivers and 480W output power. The total energy consumption is still reduced by 30%, and increased site rent is avoided.

AIR 3266, the ultra-slim wideband radio, addresses network sharing with improved capabilities. This radio leverages the same compact building practice as the world's smallest Massive MIMO, the AIR 3255, but with 400W output power and 192 antenna elements. The higher output power and the larger bandwidth of up to 390MHz creates even better opportunities for RAN sharing.

AIR 3265, the next-generation ultra-light, ultra-slim 32-branch radio, offers a higher Effective Isotropic Radiated Power (EIRP), improving the coverage further on the mid-band TDD spectrum in single-operator deployment scenarios. Energy consumption is still reduced with 25 percent energy savings, and the embodied carbon footprint is reduced by 30 percent.

AIR 3285
Dual-band FDD Massive MIMO in 30kg

AIR 6494
Replacing two single-band radios TDD Massive MIMO

AIR 3266
Ultra slim, with improved network sharing capabilities.

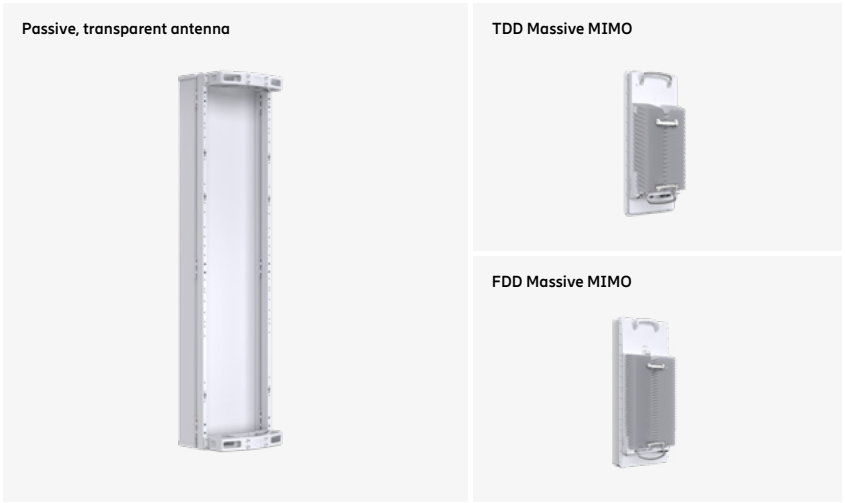
AIR 3265
Improving coverage on mid-band TDD in single-operator scenarios

Interleaved antennas
Sometimes sites need additional Massive MIMO performance, but increasing the footprint is problematic. Site expansions may be restricted, increase rental costs, or require lengthy access negotiations. The common denominator here is increased OPEX. This can often be avoided with a single-antenna solution. Interleaved antennas solve this challenge, as the Massive MIMO radios are installed behind the passive antenna.

The new Interleaved Antenna 8000 series are the next generation interleaved solutions and have a fully transparent and modular design. These innovations are complemented by advancements in antenna technology that further optimize network performance. Beamforming capabilities and modular configurations are being refined, allowing operators to customize deployments based on their unique requirements.

The portfolio has two beam-through windows in the passive antenna. This means having one TDD Massive MIMO section behind the top of the antenna, with the addition of FDD or other TDD Massive MIMO capabilities through the lower part of the antenna. In total, the solution can host up to five frequency bands with Massive MIMO. Over time, the modular design enables field replacement of individual radios without dismantling the entire setup.

Modular and replaceable



Remote radios
For low and mid FDD bands, Ericsson provides a flexible, comprehensive portfolio with a radio solution for any situation. The portfolio spans from 2T2R, as well as 3-sector radios, to 4T8R capabilities and more if needed. The portfolio entails footprint and performance-optimized single-band and multi-band options, where tailor-made silicon puts Ericsson radios in the lead to reduce tower load, weight, and energy consumption while minimizing interference and extending coverage. The radios are designed for easy rail mounting as well as antenna-near mounting.

The 4T8R range of radios supports both dual and triple band in one unit, with **Radio 4823** bringing flagship capabilities. Supporting 1800, 2100, and 2600MHz in only 33 kg, bringing 2x improved uplink performance, but also a unique separate remote electrical tilt on the 2600MHz frequency band to extend coverage or network capacity based on the service provider's deployment choice. And as for all remote radios, it is designed with passive cooling—no fans, less maintenance.

5G Advanced in high-performing RANs
With Ericsson, network performance is a cornerstone from both a hardware and software perspective. CSPs can leverage solutions that optimize the radio access network across the crucial mid and low band spectrum. But optimizing performance without a purpose is not enough. With Ericsson's new 5G Advanced subscriptions CSPs can deploy premium network performance, unlock new revenue opportunities while driving operational savings across the RAN. These subscriptions are strategic enablers for programmable, high-performing networks that meet evolving business needs.

Performance and service differentiation
The new subscription Premium Network Performance provides performance gains at high load, and for uplink-centric use-cases like video conferencing and AI-powered glasses, and the Device Battery Performance software optimizes energy performance for new devices.

Revenue generation & new services
Mission Critical Services, and RAN Differentiated Connectivity enable consistent performance, reliable, and bounded latency—ideal for uplink-heavy use cases, localization-based services, and priority-based connectivity. These capabilities allow service providers to offer tailored connectivity that meets the demands of high-value enterprise and consumer applications.

The new Outdoor Positioning, Critical IoT, and RedCap subscriptions open new business models by enabling services such as asset tracking, mid-tier device connectivity, and industrial automation.

Driving energy and operational efficiency

Ericsson solutions offer continuous improved energy efficiency end-to-end, from antenna, radio and software to site and backhaul. 5G is however the most energy efficient RAN technology with up to 10x better energy efficiency per delivered gigabyte. As a starting point, 5G RAN has Micro Sleep Tx always on, bringing 15-25% daily radio unit energy savings compared to 4G, without impacting network KPIs. Further energy-savings are possible by applying a combination of sleep modes that switch off surplus hardware when traffic is low and switch back on capacities in the RAN domain when traffic is high, always preserving network performance and user experience.

Ericsson's energy saving strategy is about not only reducing energy expenses but also setting network performance according to the CSPs desire. With 5G Advanced, a new Energy Efficiency and Management subscription optimizes energy consumption while securing quality of service target through intents. It enables dynamic configuration and orchestration of various energy-saving RAN features in real-time, while observing the full impact on traffic in the specific node.

The new Real-Time AI-Powered Automation subscription additionally reduce manual configurations through distributed automation that allows real-time optimization. This leads to lower operational costs at scale, especially in dense urban deployments where efficiency is critical.

Matching RAN Compute with radio capacity

The latest Ericsson RAN Compute basebands are tailor-made for launching advanced 5G use-cases. The competitive ingredient that Ericsson RAN Compute leverages is Ericsson Silicon, which together with the Ericsson many-core architecture manages a massive amount of parallel execution, meeting the stringent timing requirements of 5G.

Ericsson RAN Compute is additionally designed with a low footprint at the heart, cutting energy consumption by up to 50% compared to the previous generation. These aspects as the inherent design make RAN Compute equipped to support 4G and 5G with several technologies concurrently on one 19-inch unit, also referred to as mixed mode.

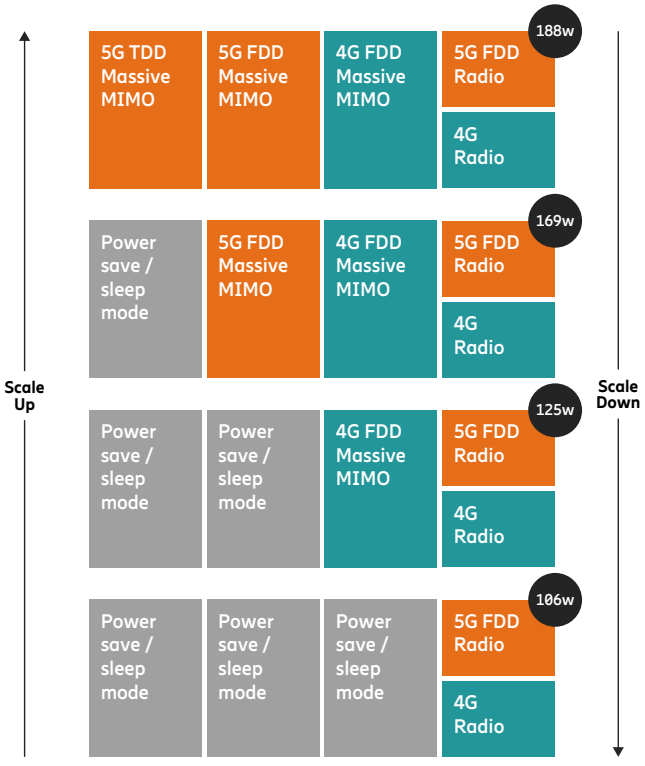
The latest generation of RAN Compute offers up to 4 times the capacity compared to previous generation and can support up to five different 4G and 5G mixed modes, including both TDD and FDD Massive MIMO together with low band radios, in a single unit.

Advanced 5G markets typically utilize three to four modes in basebands at present. The additional modes allow CSPs to run additional technologies simultaneously on one and the same RAN Compute board.

The new RAN Compute portfolio offers 20x more storage for AI model management and 3x more dynamic AI memory.

The real-time AI support enables faster data processing, decision making, and automation across the radio access technologies and mixed-mode combinations. The AI boost is already proven to enhance Link adaptation with 20% in downlink speed in public networks.

Ericsson RAN Compute is a platform for continuous innovation that evolves with new capabilities through software upgrades over many years.



RAN Processor 6672

Deploy Ericsson RAN Connect
The evolution of RAN is transforming the fronthaul network while enhanced RAN Compute products support more radios and cells per unit, necessitating a new portfolio: Ericsson RAN Connect.

This solution empowers CSPs to aggregate radio traffic to a high-capacity fronthaul interface, unlocking the full potential of RAN Compute. In addition, RAN Connect enables increased site flexibility, network observability, and remote configurations.

The portfolio consists of both outdoor and indoor solutions, with capacities ranging from 600 Gbps to 1.2 Tbps and offers high-performing radio synchronization. This contributes to achieving HP-RANs with increased capacity and ultimately improving the overall 5G user experience.

Transport network
The transport network forms the fabric of RAN and provides the foundation for meeting higher demands with much greater data volumes and a range of new requirements.

What makes Ericsson's 5G Transport offering unique is the breadth of solutions that help service providers meet increasing traffic as the industry rapidly moves to 5G and beyond. It encompasses microwave, routing, and optical solutions, coupled with AI-driven analytics and software-defined network automation for advanced RAN transport.

Our 5G Transport portfolio delivers the capacity, latency, and reliability needed to build and evolve 5G networks everywhere.

Site energy orchestration
Ericsson's Site Energy Orchestration empowers customers to tackle the challenges of rising and fluctuating energy costs through smart energy management, energy storage, and renewable energy sources at the site level.

Applying AI-powered RAN applications (rApps are intelligent applications that run on the RAN), this innovative solution enables service providers to manage hundreds or even thousands of sites as a cohesive virtual power plant.

By seamlessly integrating global networks with energy grids, Site Energy Orchestration provides unparalleled cost visibility and control. This allows CSPs to significantly reduce energy operating costs without compromising user experience. Beyond cost savings, the solution also opens new revenue opportunities through grid services and demand response programs.

New business growth opportunities
High-performing, resilient, and cost-efficient networks are essential for driving business growth, serving as a unified platform to support every use case. Performance-optimized 5G networks can help unlock multiple revenue streams:

Consumer and enterprise services
5G Advanced capabilities including Differentiated connectivity support premium tier offerings with guaranteed performance levels, enabling service providers to go beyond unlimited data plans, and create opportunities for tailored connectivity packages across sports and culture events, enterprise connectivity in sectors like media broadcasting, logistics and healthcare among others.

Public sector applications
Advanced network capabilities enable CSPs to partner with government agencies on mission critical, defense and public safety communications—all requiring the reliability and performance only 5G networks can deliver.

With the capacity and agility to adapt swiftly to changing demands, these networks position service providers to capitalize on emerging opportunities. Ericsson is committed to delivering cutting-edge solutions that empower sustainable growth and unlock new revenue streams.

The Ericsson Advantage: Proven Leadership

Ericsson's track record demonstrates the tangible impact of our network solutions on CSP success:

Industry recognition
Rated leader among telco vendors in the Gartner Magic Quadrant for Communications Service Provider Network Infrastructure for five consecutive years, validating our comprehensive approach to network evolution.

Proven performance
Ericsson customers won 74% of public benchmark reports, demonstrating real-world network superiority that translates directly to improved customer satisfaction and competitive advantage.

Global scale
Of all 5G global traffic outside of China, 50 percent traverses Ericsson networks—proof that our solutions deliver at the scale and reliability required for the world's most demanding operators. These achievements reflect our deep understanding of CSP challenges and our ability to deliver solutions that drive measurable business outcomes.

Strategic questions and next steps

As you evaluate your network evolution strategy, consider these critical questions:

Business value assessment
- Which delivers the highest immediate value for your use cases: superior performance or lower TCO?
- What new revenue opportunities could performance-optimized networks enable in your specific market?
- What's your optimal implementation timeline for maximum ROI? (Typical deployments show positive returns within 18-24 months)
- Technical readiness
- How does your current network performance benchmark against high-performing network standards?
- How will FDD Massive MIMO and RAN Connect fit into your network evolution roadmap?

AI integration
Ericsson is embedding AI into radio access network capabilities to drive energy savings, reduce operational costs, and enhance performance. Which use cases will benefit most from AI in your network—energy optimization, traffic prediction, or automated network operations?
Contact your Ericsson account team to conduct a network readiness assessment and develop a customized roadmap for your market.

The time to act is now

Building performance-optimized, programmable networks is no longer optional—it's essential for remaining competitive and supporting current and emerging services as 5G adoption accelerates.

The primary drivers for network evolution are rooted in the need to address explosive traffic growth while delivering a ubiquitous 5G experience and deploying profitable use cases across consumer, enterprise, and public sectors. Service providers must accomplish this while maintaining competitiveness in an increasingly dynamic telecommunications landscape.

To seize these opportunities, CSPs must focus on several core objectives: maximizing spectral efficiency and compute capabilities, optimizing energy usage, boosting network resilience, and adopting software capabilities for service differentiation.

The integration of AI into mobile networks represents a pivotal step forward, enabling smarter energy management, automating complex operations, and delivering seamless performance enhancements at scale. Strategic investments in technologies like FDD Massive MIMO and advanced RAN solutions based on open interfaces provide the flexibility and capacity required for sustained growth.

Next-generation networks are essential for meeting the challenges of modern connectivity. They enable not only technical excellence but also creating tangible business value through enhanced customer satisfaction, operational efficiency, and new revenue opportunities.

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