Packet Core Gateway

Cloud native user plane with best in class throughput providing business continuity and enabling innovation
Ericsson Packet Core Gateway is a cloud native user plane traffic processing and gateway function in Ericsson’s dual-mode 5G Cloud Core offering.

One of the major trends in the mobile networks is explosive growth of customer traffic, including video traffic (see picture 1). With the introduction of “all-you-can-eat” packages the ARPU is destined to remain flat, so the operators must reduce cost per bit dramatically to stay competitive.

The introduction of CUPS and NFV allows operators to have more choices to cost effectively design the network distributing user plane including Gi-LAN services. This causes increasing integration and operational costs as number of user plane sites grows. To control the escalating costs, operator user plane needs to be simplified while offering the best and a differentiated quality of experience.

The introduction of the new capabilities in 5G Radio networks (higher throughput, lower latency, higher density, precise positioning) and in 5G Core networks (network slicing, edge computing, cloud native automation, advanced network exposure, service-based architecture) enable operators to expand the addressable market.

Operators are not expected to quickly swap the existing EPC networks with the new 5GC architecture therefore the two architectures are expected to co-exist in the coming years.

![Regional mobile data traffic (EB per month)](image)

*Picture 1. Regional mobile traffic growth*
Ericsson value proposition for cloud native user plane

Packet Core Gateway is built to address operator challenges in the user plane area.

Packet Core Gateway helps reducing cost per bit with best-in-class throughput per CPU and host on standard Intel processors. It also provides single packet pipeline processing all payload traffic from Radio to Internet including Gi-LAN services in a single hop without consuming Cloud Infrastructure resources. We call this capability Integrated Service Chain and it saves more than 30% footprint. Flow centric architecture provides high peak throughput per user with normal dimensioning.

Increasing integration and operational costs as number of user plane sites grows are addressed through fully automated operations using standard Kubernetes and common O&M with the rest of 5GC so that the cost to manage additional user plane site is marginal. PCG architecture provides flexible scalability so that different microservice scales according to the needs of different use cases. This way, deployment costs are minimized as user plane will quickly adapt to the needs on the use case.

Another operator challenge is to keep business continuity while deploying the new Packet Core architecture, 5GC. Packet Core Gateway solves this by supporting Ericsson dual-mode 5G Cloud Core solution. Ericsson’s dual-mode 5G Cloud Core solution delivers cloud native applications that support simultaneously EPC and 5GC 3GPP architectures. PCG also supports single development track for both EPC and 5GC and it is full 3GPP-compliant with no proprietary interfaces and vendor lock-in.

Packet Core Gateway unique design provides the needed latency, jitter, footprint and security capabilities required by the verticals. It also includes unique blueprint to integrate 3rd party logic and scripting capabilities enabling faster innovation cycles.
Packet Core Gateway characteristics

Ericsson Packet Core Gateway is ahead of competition when addressing operator challenges in the user plane area.

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<th>Challenge</th>
<th>Ericsson’s Value</th>
<th>Ericsson’s Solution – Packet Core Gateway</th>
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<tr>
<td>Cost per bit</td>
<td>Best in class throughput per CPU and host</td>
<td>— 200 Gbps per host without DPI, 75 Gbps per host with DPI, including SRVCC and High Peak Rate Support</td>
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<tr>
<td>Integration and operational cost</td>
<td>Cloud native user plane</td>
<td>— Ahead of the competition in stateless design providing cloud native properties</td>
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<td>Business continuity while deploying 5GC</td>
<td>Dual-mode 5G Cloud Core Gi LAN consolidation</td>
<td>— Cloud native independent LCM per microservice and 96% saving in SW upgrade speed with ISSU</td>
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<td>Video growth while keeping good QoE</td>
<td>Traffic and video optimization</td>
<td>— Common QoE with the rest of 5G, savings increase by a number of distributed sites</td>
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<td>Trial and launch of new services in an agile way</td>
<td>Support for new 5G use cases</td>
<td>— Flexible scalability depending on the use case (e.g., centralized and distributed deployments)</td>
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Optimized TCO

Revenue growth

Cost per bit is further reduced by low energy footprint of 27% lower energy consumption compared to 2nd best vendor.

Integration and operational cost reduction is further addressed by industry alignment with Automation, VNF packaging and VNF LCM adhering to ETSI MANO, ONAP and coming extensions for containers.

Business continuity while deploying 5GC is achieved with dual-mode 5G Cloud Core Solution which re-uses millions of lines of industry hardened code for and SGW-U/PGW-U/UPF/MSP functionality, a major investment into a new software architecture with full support for 4G and 5G.

Existing Gi LAN services include:

Traffic optimization:
- Fully integrated in the gateway & linked to policy use cases
- Providing better QoE, faster time to content and decreasing video stalling
- Best at P3 benchmarking
- Applicable for TCP and QUIC
- Including DNS acceleration.

Video optimization:
- Fully integrated in the gateway
- Across video providers: HTTP, HTTPS (TLS or QUIC).

End user will experience minimized Video Stalling and minimized Video Quality Fluctuation.
- Linked into Policy use cases,
- Congestion based (Radio aware)
- Radio friendly pacing.

SW probe:
- SW probe addresses all 3GPP interfaces in EPC and 5G
- Common, open and vendor agnostic data exposure following industry standards across PCG VNFs.
- Provides vTap flexible packet mirroring with metadata enrichment at any point in Service chain
- Provides SW Probe: subscriber events and KPI reporting at various levels (including traffic and video KPI)
- Support for multiple consumers and output formats and flexible filtering criteria: ready to be integrated with major probe vendors
- No extra DPI required.

and NAT & Firewall capabilities:
- Best in class CGNAT and Firewall reusing a major vendor
- Fully integrated and TCO efficient solution (Single VNF, no additional NFVi investments to manage East-West traffic)
- Same Cloud Native capabilities: ISSU, scalability, auto healing.
Contact us
For more technical and commercial information please reach out to us.

Further reading
Ericsson Packet Core Gateway
Ericsson’s dual-mode 5G Core can help manage TCO during migration to 5G
Ericsson 5G Core (5GC)