AMD EPYC™ PROCESSORS IN TELECOMMUNICATIONS SECTOR

EXECUTIVE SUMMARY

AMD EPYC™ processors offer the cutting-edge performance and flexibility that the telecommunications industry needs to meet the challenges and exploit the opportunities of 5G:

With its exponential increases in connections and throughput, 5G needs a powerful platform that delivers service speed, integrity and resilience. AMD EPYC processors provide a unique blend of compute performance, I/O throughput and strong architectural affinity to cloud-native software that unlocks fantastic performance in 5G applications, helping 5G to reach **new levels of throughput and reliability.**

The exceptional **I/O performance** of AMD EPYC processors makes them well-suited to 5G workloads by enabling outstanding low latency and high scalability from the core or edge.

The **high efficiency** of AMD EPYC processors addresses the business and regulatory needs of the telecommunications industry to address its heavy power consumption and sustainability goals going forward.

RELEVANT TRENDS

- 5G, the fifth generation of wireless technology, offers significantly faster speeds, lower latency and increased capacity compared to previous generations, enabling a wide range of transformative applications and services. The massive 5G upgrade currently underway has forced telco firms to redesign their infrastructures for traffic volumes exponentially larger than those they've managed before.
- 5G makes it possible to deliver much richer user experiences in both private and public deployments. Its success depends in great part on telcos shifting successfully to more agile cloud-based platforms where they can accommodate a wider variability of service levels, protocols and 5G data types.
- Like all industries, telco is leveraging AI technology and machine learning applications. ML tools can help optimize service operations, forecast retail demand, improve resource allocation and automate manual processes.
- Telcos are under increasing pressure to become more energy efficient. Power consumption is a critical concern as energy costs skyrocket, most notably in Europe, where EU energy inflation rate reached a record 40+ percent following Russia's invasion of Ukraine (although the inflation rate has eased since then).[1]
- Mobile data consumption is growing astonishingly fast. Total global mobile data traffic reached 143 exabytes/month (or 143 million terabytes) in Q3 2023 and is projected to grow by a factor of 3, reaching 403 exabytes/month in 2029.[2]
- Edge computing is growing quickly, bringing compute closer to sources of data on the one hand and end users on the other. With lower demands for latency and network bandwidth, edge computing can bring savings, but it requires low-power, small-form-factor or rugged server designs. Whatever the edge deployment looks like, its servers must be fast, resilient and energy efficient.
- While 6G is still in its initial stages of development, it is definitely on the way, promising more capacity and lower latency to enhance connectivity greater than 5G and improve energy efficiency at the same time. It will require an even faster, more stable, secure and resilient foundation on which to perform.

INITIATIVES TO FOCUS ON IN TELCO

Improvement of data throughput to deal with 5G's massive traffic volumes. Across all industries, telco must provide fast, reliable and secure conduits for the ever-increasing flow of exabytes of data needed to drive richer content or enable the myriad of connectivity needed for smarter, Industry 4.0 Internet of Things-driven industry. The processors that power those data centers must excel not only at raw performance but also at scalability and efficiency.

5G Packet Core. The 5G packet core, also known as the 5G core network or 5GC, is a key component of the fifth generation (5G) mobile network architecture. It serves as the heart of the network and is responsible for enabling the advanced capabilities of 5G networks such as data transmission, network management, and service delivery. Telcos have to create infrastructures that can scale to deal with this challenge.

Data and Network Protection: Security is an all-consuming concern for telcos since data must be protected at rest, in transit and in use. Intrusion detection is just the start of the full security mission telcos must undertake. Telco security systems are low-tolerance, massive-data workloads requiring great density and efficiency for the services they have to support and protect.

Big Data Analytics. Decreasing latency is a key to the success of Industry 4.0 solutions. In security, government and emerging arenas such as autonomous transportation and smart cities, HPC-powered analytics can help telcos enable near-real-time applications.

Video Encoding/Decoding and Content Delivery Networks. Ninety-three percent of American adults access streaming video platforms. Video, including both live-streaming and pre-recorded, now represents the majority of all Internet traffic, and encoding it efficiently in preparation for fast transmission is a must for telcos looking to make their mark in the entertainment content and gaming sectors.

TECHNOLOGY DECISION MAKERS IN TELCO AND THEIR TYPICAL CHALLENGES

CIO, CTO OR "CTIO"	SOFTWARE ARCHITECTURE/ DEVELOPMENT LEAD	DATA NETWORKING LEAD	ARCHITECTURE LEAD
• Transitioning away from inflexible custom legacy architectures and data centers toward the cloud for the 5G future is complex and expensive. • It is increasingly important to manage capital expenditures through analytics. • Deploying an enterprise-agile operating model is essential in this competitive sector.	• The integration of large, complex data sets across multiple systems presents a programming challenge. • Data protection and integrity is always a top concern, especially as data volumes increase and edge deployments proliferate. • Supporting multiple architectures (cloud, non-cloud, virtualized, non-virtualized, HCI, N-tier) is complex and expensive.	• There is constant downward pressure on the data center's physical space and power consumption. • Rapidly increasing mobile data consumption puts huge stress on cellular networks. • 5G's cloud-native design requires innovative cloud implementations that can be tricky.	• As throughput requirements grow, there is pressure to optimize price/performance per dollar and per watt. Increasing energy costs are a concern. • Increasingly demanding operational workloads are proliferating quickly. • Availability and capacity can never be high enough, and latency can never be low enough.

HOW AMD EPYC™ PROCESSORS HELP TELCOS SUCCEED

AMD EPYC processors are designed to deliver cost-optimized performance across a wide range of telco workloads. They help lay the groundwork for rapid efficiency gains so your customers can get more performance from the same or less data-center power, space or budget and achieve improved performance-to-power ratios.

- AMD EPYC processors offer high core counts, I/O and memory bandwidth which address the specific needs of 5G workloads, create cloud-enabled content delivery networks and manage data processing at the edge of the network.
- Energy-efficient AMD EPYC 8004 processors are purpose-built for edge and telco computing. They enable high productivity, fast and informed decisions and a rapidly responsive business by helping deploy collection, compute and analytics closer to the data source, accelerating the impact of advanced technologies such as IoT, 5G, AI/ML, autonomous systems, content delivery and gaming.
- AMD EPYC 9x84X processors featuring AMD 3D V-Cache™ technology offer triple the L3 cache than our standard EPYC 9004 processors, to bring your applications closer to the core to deliver fast time-to-results for compute-heavy applications such as analytics.
- Ultra-high-density AMD EPYC 97x4 processors deliver the high-throughput, FLOPS-intensive performance and remarkable energy efficiency an enterprise needs on-premises and in the cloud to succeed, making it a smart choice for telco workloads that need more cores and more virtual CPUs while limiting power usage.
- The AMD EPYC processor portfolio helps to run a virtualized network, with high core counts and performance enabling less server equipment required thus having a positive impact on TCO. AMD has wide ecosystem support for virtualization and containerization with partners like Red Hat and VMware®.
- State-of-the-art AMD Infinity Guard features, including Secure Encrypted Virtualization (SEV), Secure Nested Paging (SEV-SNP) and Secure Memory Encryption (SME), are built into AMD EPYC processors to add extra layers of protection for proprietary data and IP.
- AMD is consistently delivering on its long-term processor roadmap, giving your customers confidence that they can confidently navigate their data center risks, complexities and requirements.

HELPFUL ISSUES TO RAISE WITH TELCO CUSTOMERS

- What does your 5G transition/transformation roadmap look like? How will you expand your infrastructure with new flexibility and deploy systems in a 5G world that can accommodate up to one million devices per square kilometer?
- Given today's rising energy costs, how can you build out an optimal telco infrastructure while simultaneously improving energy efficiency?
- How do you plan to manage vastly increasing mobile data traffic while also maintaining performance levels, optimizing security and regulatory response and reducing your power consumption?
- How can you bring your compute power closer to the data and your users to reduce latency and improve service quality?

LOOKING FOR MORE GUIDANCE? HAVE QUESTIONS?

CONTACT AN AMD SERVER EXPERT OR VISIT explore.amd.com/server-request/request

WWW.AMD.COM/NETWORKING-AND-TELCO

TOGETHER WE ADVANCE_TELCO COMPUTING

1 Euronews.next, "Energy Crisis in Europe," April 5, 2023, https://www.euronews.com/next/2023/03/29/energy-crisis-in-europe-which-countries-have-the-cheapest-and-most-expensive-electricity-a
2 Ericsson, Mobile Data Traffic Outlook 2002, https://www.ericsson.com/en/reports-and-papers/mobility-report/dataforecasts/mobile-traffic-forecast
3 CordCutting, "2023 Annual Streaming Media Report: The Year of Churn," March 15, 2023, https://cordcutting.com/research/state-of-streaming-report/
4 AMD Infinity Guard features vary by EPYC processor generations. Infinity Guard security features must be enabled by server OEMs and/or cloud service providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard. GD-183.