

Reinventing mobile computing with differentiated connectivity and network APIs



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Executive summary

Four transformative forces are reshaping mobile computing. Artificial intelligence (AI), cloud computing, contextual computing and immersive media, and communication are creating unprecedented opportunities, when combined with differentiated connectivity and open network APIs.

Since the inception of the smartphone, communications service providers and application developers have relied on a single type of connectivity for all applications, whether on the device or in the cloud. While this distributed model will continue to be useful, the convergence of transformative technologies enables a new paradigm where connectivity-aware

applications and differentiated connectivity and open network APIs deliver capabilities previously not attainable with traditional over-the-top approaches running on universal connectivity.

Differentiated connectivity leverages the best of 5G standalone (5G SA) capabilities through dynamic network slicing, moving beyond static Quality of Service (QoS) to deliver comprehensive Quality of Experience (QoE) for connectivity and applications. Open network APIs expose network capabilities previously available only to service providers, giving developers access to differentiated connectivity and valuable network insights.

This combination creates new mobile computing architectures built on high-performing programmable networks, unlocking 5G innovations for both premium consumer applications and business-critical enterprise solutions.

The result is unprecedented mobile experiences where applications and networks work together to deliver value greater than the sum of their parts. Enjoy this joint thought leadership by Ericsson and neXt Curve to learn how differentiated connectivity and open network APIs transform mobile computing and enable the introduction of advanced mobile experiences.



Reinventing mobile computing

In the past three decades since the emergence of the world wide web, few technologies have had the transformative impact that mobile computing, particularly mobile networks, has had on our lives, enterprises, industries and the future of the telecommunications and computing.

Mobile networks now cover 95 percent of the global population, connecting more than 6 billion devices¹, with network capacity continuing to grow to meet the ever-increasing demand. According to Ericsson's Mobility Report², the growth of data traffic is expected to run around 15 percent per year globally.

Mobile computing remains a strategic technology domain with deep influence on the technological leadership of companies and nations. It has driven the leading edge of technologies for cellular networks, smartphones, semiconductors and artificial intelligence. Mobile computing is poised to be transformed by four fast-accelerating technology trends that will inevitably rewrite the future course of mobile and edge computing.



AI—is expanding from Generative AI via agents/reasoning models to Physical AI, fundamentally changing how applications process and respond to real-world data.



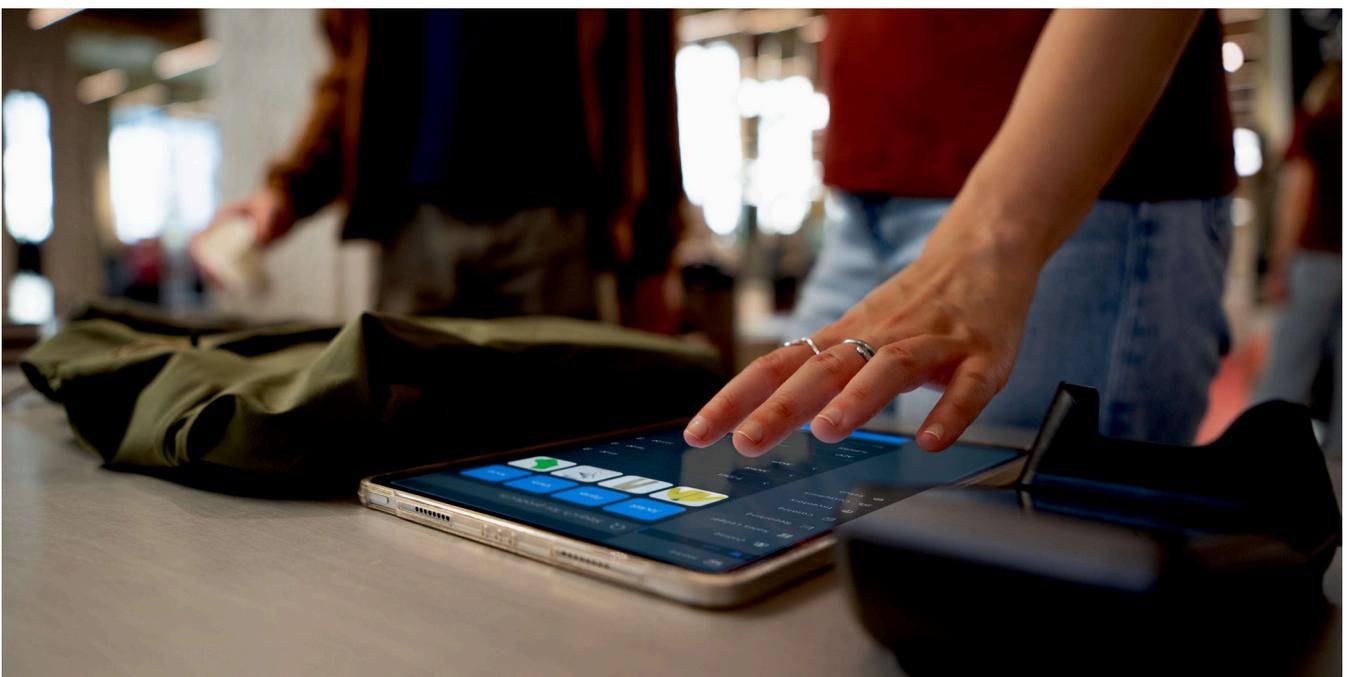
Immersive media and communication—are moving from two- to three-dimensional modes of increased immersion and presence, demanding new levels of network performance and reliability.



Contextual computing—is evolving toward computing models that are aware of the user's location, position, environment and situation, enabling the delivery of timely and relevant data, experiences and outcomes.



Cloud computing—is progressing from centralized hyperscale clouds to hybrid models that are gravitating toward various edges, with both classic and accelerated compute capabilities.



¹ GSMA, The Mobile Economy 2025

² Ericsson Mobility Report, November 29, 2024

Four transformative forces reshape mobile computing and the evolution of connectivity is a vital piece of the evolution

- AI**
Not only is AI rapidly evolving from “predictive” AI and ML, to current forms of reasoning AI, inference and monetization needs are forcing AI to diffuse across edge environments, scenarios, and on-device for economics, security and privacy.
- Immersive media & communications**
Media and communications continue to become more immersive and interactive fostering novel media and communication experiences and qualities that will require enhanced and new capture, production, and distribution modalities, infrastructure and economics.
- Contextual computing**
Contextual computing fosters new ways for mobile applications to become context, position/posture, and situationally aware. This is essential for current and emerging forms of XR and remote/autonomous applications such as drones.
- Cloud computing**
Cloud computing continues to evolve and over the years has become increasingly diverse and globally distributed thanks to trends in hybrid cloud and edge cloud computing, expanding the frontier of edge computing architectures and economics.

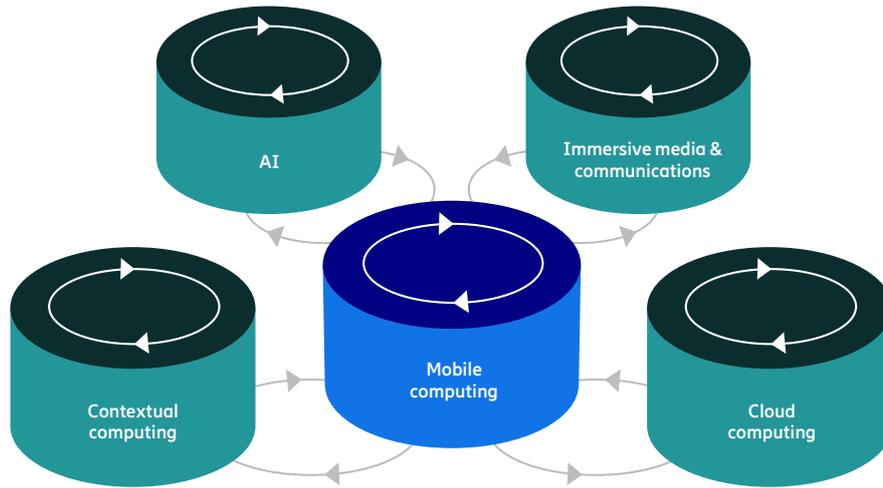


Figure 1. Four technology trends driving the evolution of mobile computing³

The foundational technology underlying the transformation of mobile computing is 5G. 5G was defined to bring transformative improvements in mobile broadband (eMBB), time-sensitive and critical connectivity (URLLC) and the diversification of connected devices at massive scale (mMTC).

The first half of the 5G deployment cycle has seen impressive adoption in North America, primarily centered around mobile broadband to smartphones and fixed wireless access capturing all fixed broadband growth to consumers and small businesses.

The much-anticipated industrial and enterprise 5G application growth is lined up for the second half of 5G. The first release of 5G Advanced, Release 18, is currently being commercialized as service providers make their transition to 5G SA networks. Today, 5G Advanced is introducing features and technologies that compel the industry to rethink the network, rethink the role of mobile wireless infrastructure and fundamentally rethink mobile computing as we have known it in generations past.

Service providers and developers alike must understand the pivotal role mobile connectivity will continue to play in shaping present and future computing models and how computing workloads and data will be distributed from the cloud to the device.

State of mobile globally:

- Mobile networks, based on 3GPP technologies, cover 95 percent of the global population.⁴
- There were 2.9 billion 5G subscriptions at the end of 2025.⁵
- 5G Advanced readiness handset support—first Qualcomm R18 modem, X75 was introduced early 2023.⁶
- Smartphones and Fixed Wireless Terminals stand for 63 percent of all announced 5G devices.⁷

State of US/NA mobile:

- >90 percent of the US population are covered by 5G in mid-band spectrum.⁸
- 5G accounts for 79 percent of all NA mobile subscriptions.⁹
- Fixed Wireless Access (FWA) has captured ALL US fixed broadband net adds¹⁰ in the last 15 quarters.

³ “The Future of Communications”, by Leonard Lee, Akshay Sharma, Dean Freeman, April 2, 2019, neXt Curve

⁴ Ericsson Mobility Visualizer, November 20, 2025

⁵ Ericsson Mobility Visualizer, November 20, 2025

⁶ Qualcomm sparks the next phase of 5G with the world’s 5G Advanced-ready modem-RF system, February 12, 2023

⁷ 5G Market Snapshot, GSA, November 2025

⁸ Ericsson Mobility Report, November 20, 2025

⁹ Ericsson Mobility Visualizer, November 20, 2025

¹⁰ End the Cableopoly, CTIA and 5G Americas, December 8, 2025

Elevating mobile experiences

Today's mobile applications operate with a fundamental limitation: the loose coupling between applications and networks creates a ceiling for experience quality. While this separation has enabled the smartphone revolution, it leaves significant value untapped.

The opportunity for a breakthrough lies in bringing applications and networks closer together through network-aware applications and networks tailored to experience needs. Instead of applications relying on a single, generic connectivity option, they can now tap into the rich capabilities introduced by 5G SA and 5G

Advanced. Simultaneously, automated networks can learn about the applications in real-time and understand network performance needs for the specific applications being used.

This transformation addresses two critical market needs. First, it enables premium variants of existing applications that fully leverage advanced network capabilities, serving underserved segments in both consumer, business, and mission-critical government markets. Second, it opens entirely new categories of applications with demanding network requirements that were previously impossible to deliver reliably.

Mobile networks can expose existing and new capabilities to application developers through differentiated connectivity and network APIs.

By integrating network capabilities directly into applications, developers create value that exceeds what connectivity or applications can deliver independently. By shifting from viewing networks as passive transport layers to leveraging them as active enablers of superior mobile experiences, service providers and developers can transcend traditional limitations and take user experiences to a new level.

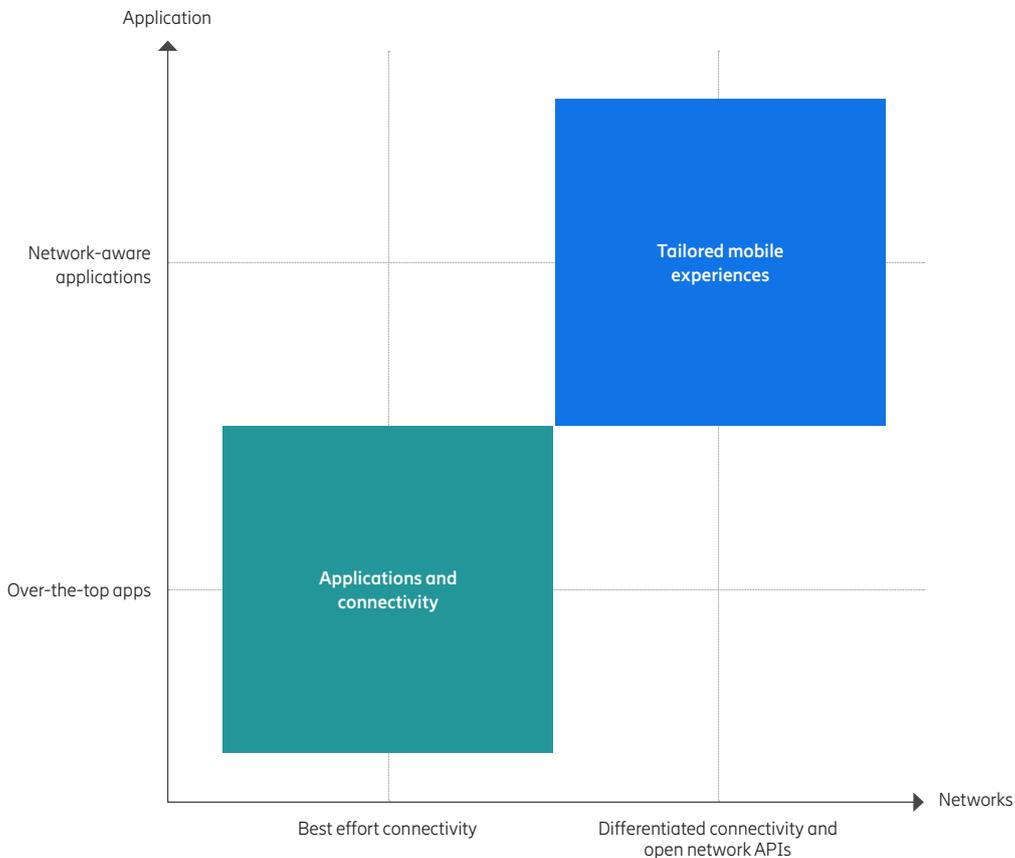


Figure 2. Mobile experiences

Where differentiated connectivity makes a difference

The foundation of mobile computing that delivers differentiated mobile experiences is what Ericsson calls differentiated connectivity. Going beyond early versions of mobile network slicing running on an LTE (EPC) core, differentiated connectivity is uniquely enabled by the more dynamic and

more programmatic network slicing that comes with 5G SA.

Differentiated connectivity extends the mobile value proposition with new capabilities alongside dynamic and adaptive network slicing. From a Quality-of-Service (QoS) mindset that is largely

a network-centric view on connectivity services, we leap to a Quality of Experience (QoE) defined by a connectivity-plus-application-level or system-level perspective of a mobile application.

Differentiated connectivity is more than network slicing. It is an expression of how the nature and purpose of connectivity is evolving as we go from universal connectivity of the 4G era toward the differentiated connectivity of the 5G-Advanced era and beyond.

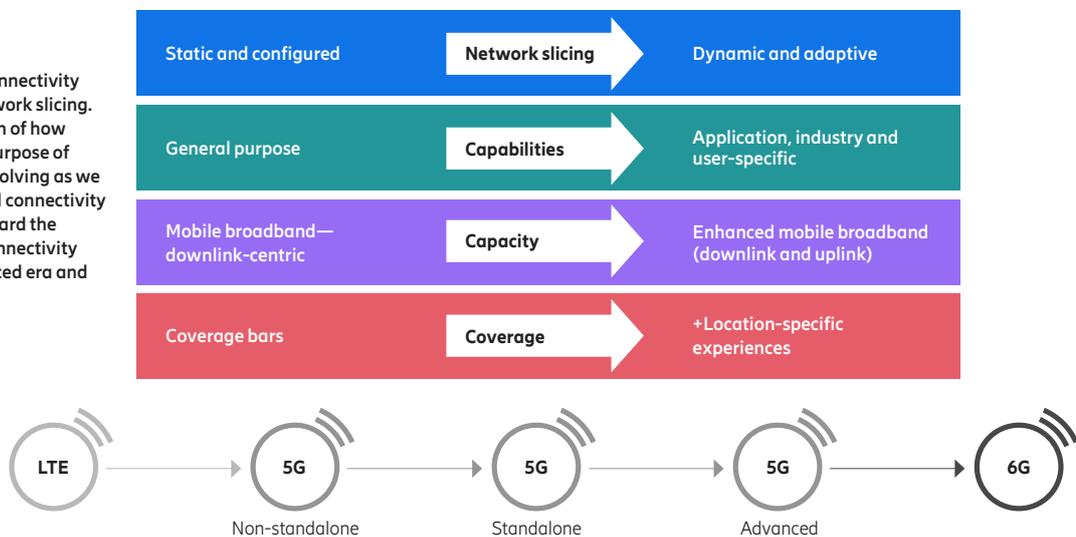


Figure 3. Evolution towards differentiated connectivity¹¹

3.1 Coverage and capacity evolution

Coverage and capacity continue to play a central role in differentiated connectivity, but their definitions are significantly different. Mobile network coverage is evolving from a generic population-coverage model to a model focused on the quality of specific experiences in relevant locations. Rather than simply ensuring broad coverage, service providers can now prioritize delivering exceptional experiences where they matter most.

Capacity growth is similarly maturing, from meeting smartphone demand to onboarding entire networks and industries over 5G. Fixed wireless access has emerged as the first major example of new network adoption at scale over 5G, demonstrating how capacity can be reimagined to serve entirely new use cases and customer segments.

3.2 Advanced capabilities

Differentiated connectivity combines the new capabilities introduced with 5G SA and 5G Advanced with dynamic and adaptive network slicing that is flexible enough to meet future mobile experience demands.

The expanding portfolio of 5G Advanced capabilities delivers on the promised potential of Ultra-Reliable Low-Latency Communications (URLLC), and massive Machine Type Communications (mMTC). These capabilities extend beyond consumer broadband to address the critical and time-sensitive connectivity requirements of diverse industries and new device categories. 5G RedCap, introduced with Release 17, exemplifies this improvement by supporting IoT devices with optimized connectivity positioned between NB-IoT and full-blown 5G NR capabilities.

Network capabilities now fall into two complementary categories that applications can access via network APIs. First, we can increase the value of connectivity downlink through traffic prioritization, committed peak rates, increased uplink performance, reduced uplink and downlink latency (L4S), Network-initiated QoS (Ni-QoS) and lowered device cost and power consumption (RedCap). Second, we can take advantage of intelligence on what the network knows about user identity, device identity, the location and application compute resource requests.

These capability categories converge as applications use Quality on Demand APIs to request specific network behaviors dynamically. The total value accrues when coverage, capacity, capabilities and network slicing work together to unlock unprecedented mobile experiences.

¹¹ Ericsson and neXt Curve

3.3 Network slicing

Coverage QoS and network slicing are well-established terms, but they have lagged in adoption at scale in mobile networks. Dynamic resource allocation, using network slicing based on User Equipment Route Selection Policy (URSP) and Quality on Demand (QoD) based on network APIs, are central to differentiated connectivity.

True, service providers can implement static QoS and network slicing over 4G and 5G NSA networks without the capabilities introduced with 5G SA, 5G Advanced and open network APIs. However, dynamic and adaptive network slicing is more resource efficient.

The value creation equation for differentiated connectivity is fundamentally about coverage, capacity AND capabilities allocated dynamically rather than statically. The 5G SA and 5G Advanced adoption

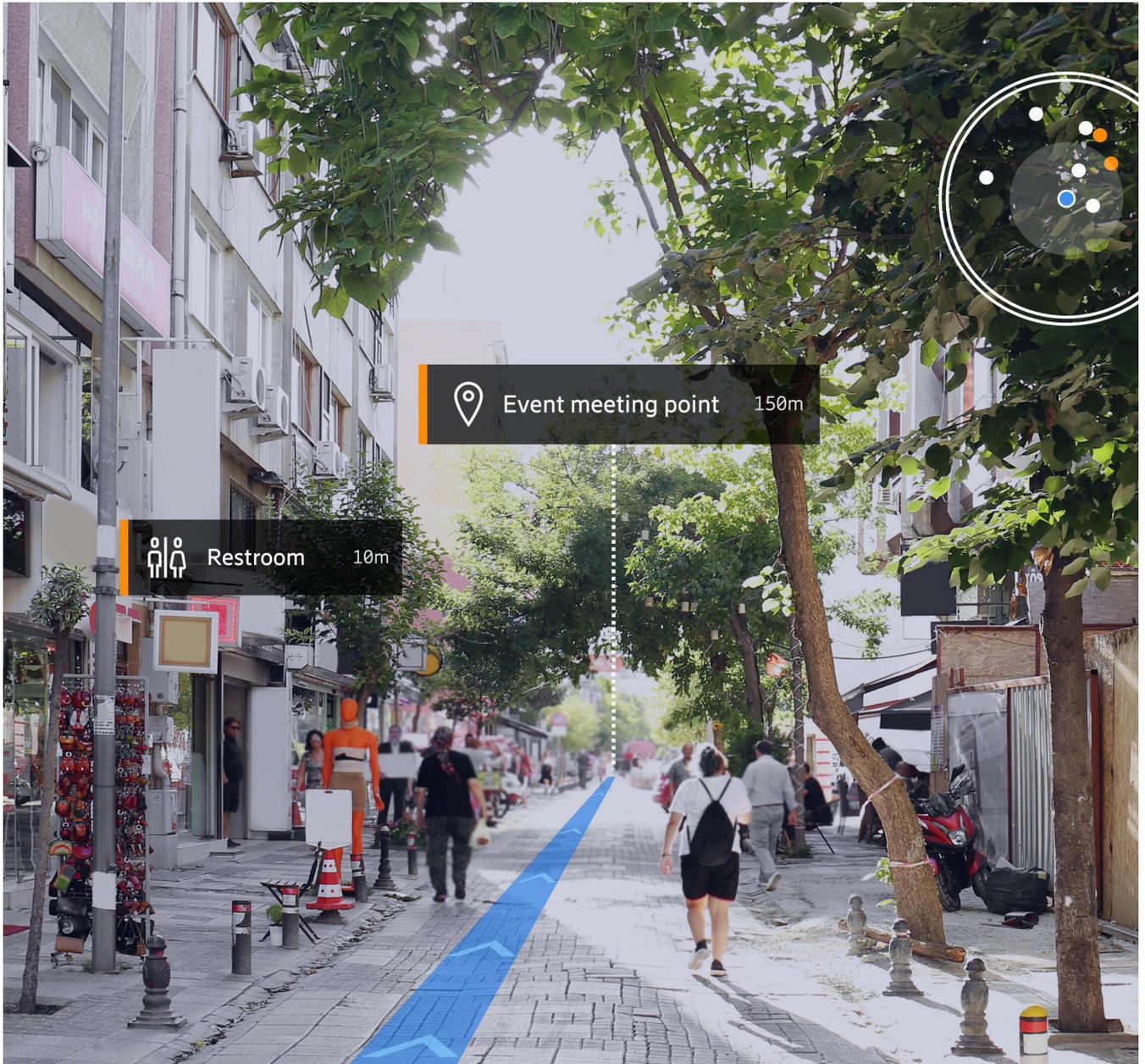
timelines define when differentiated connectivity can start playing a transformative role, positioning it as a strategic approach that takes full advantage of 5G SA, 5G Advanced capabilities.

To understand differentiated connectivity, it is important to recognize the nature of the universal connectivity that has characterized and shaped the business of the service provider and the canvas upon which mobile developers deploy their applications.

Differentiated connectivity serves as a complement to universal connectivity rather than a replacement. Both universal and differentiated connectivity will coexist in mobile networks in the future, with differentiated connectivity addressing specific use cases and applications that can benefit from enhanced capabilities and better performance.

Universal connectivity:

- Best-effort connectivity—same generic connectivity for all applications
- Over-the-top applications—with no visibility into networks
- Consumer-focused—driven by smartphone needs and adoption
- Downstream-centric network evolution—from cloud to users
- Wireless duality—mobile and Wi-Fi treated as two equal options
- Proxy measures for QoE—coverage bars and speed tests
- Traffic volume-based business models—buckets or unlimited



Leveraging network APIs

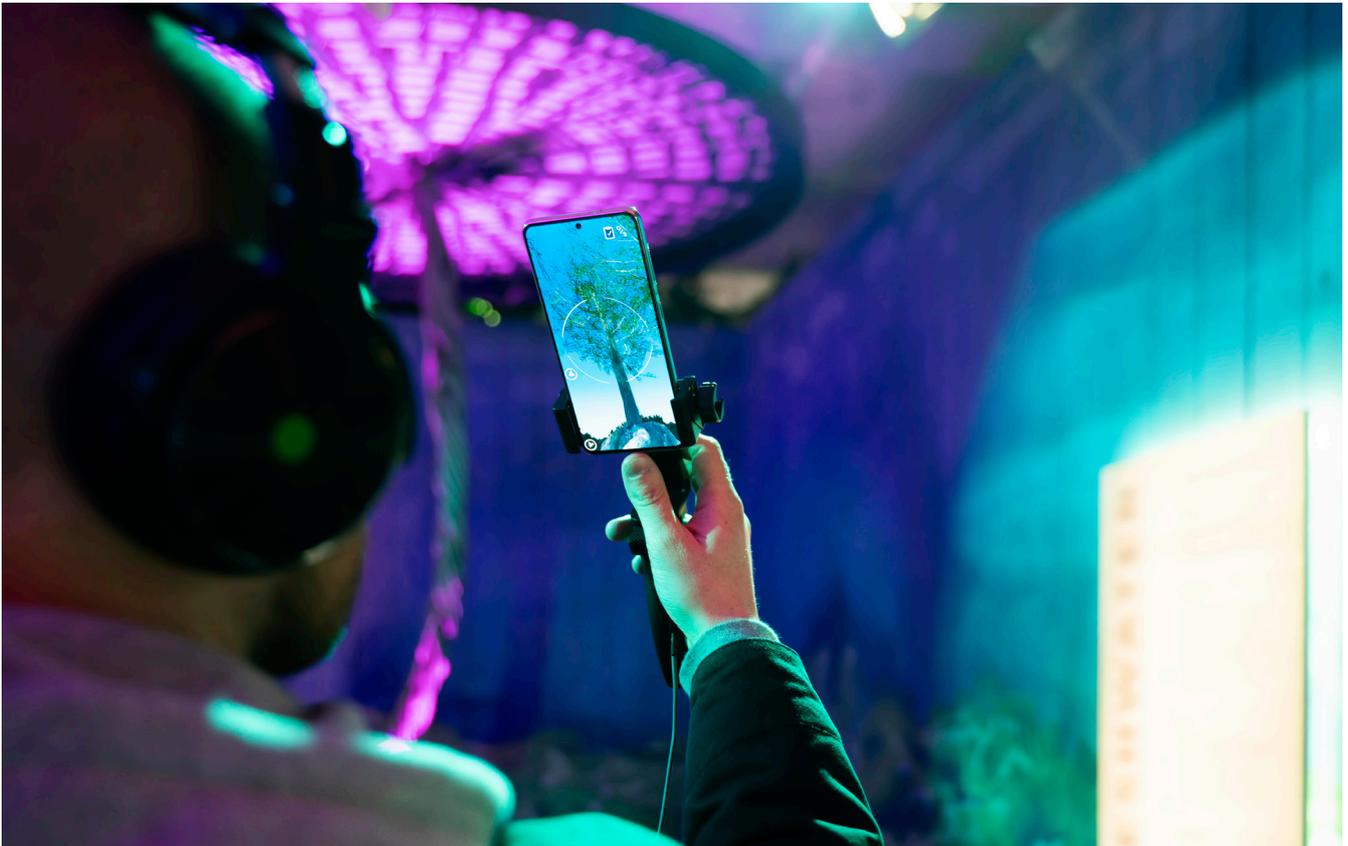
Combining differentiated connectivity with network APIs lets us realize differentiated experiences and capabilities over a high-performing and programmable 5G SA network. 5G and 5G Advanced continue to expand network capabilities and connectivity modalities that support new device categories, improve the economics of densification, and are changing the nature of mobile wireless infrastructure.

Differentiated connectivity + network APIs = **Tailored 5G mobile experiences**

Network APIs have been around for years but are reaching a tipping point with the advent of the Open Gateway Initiative. The Open Gateway Initiative builds on the ongoing legacy of TM Forum's Open API, the earnest efforts by service providers and intermediaries to expose existing network capabilities to developers and the Linux Foundation's CAMARA Project. These collaborative efforts are creating standardized approaches to network API development and deployment that can scale globally.

Over the past couple of years, the introduction of network API exchanges such as Aduna has begun to catalyze the scaling of a platform of network APIs at a global level. By ensuring that exposed network capabilities of participating service providers are transacted in a regulatory-compliant, consensual and secure way, the exchanges foster the trust necessary for widespread adoption of network APIs.¹²

Network APIs on a 5G SA network enable a new frontier for mobile and fixed wireless applications. This point is important to understand. Exposing the capabilities of a 5G network and making them accessible will enable novel mobile and fixed wireless computing models not feasible before on cellular networks. Network-aware mobile applications together with differentiated connectivity and open network APIs can and will work in conjunction to realize new levels of reliability, assurance and latency. This dynamic represents the significant difference between network APIs and the mobile computing paradigms and approaches we have seen based on best-effort, universal connectivity.



¹² Aduna: The cornerstone of an API-enabled telco future, Leonard Lee, January 17, 2025, neXt Curve

New mobile computing architecture and edge paradigms

The conventional model of mobile computing today occurs between a subscriber’s device, typically a smartphone or feature phone, and the various forms of cloud infrastructure over largely universal connectivity.

As a result, mobile applications have evolved on device from simple WAP (Wireless Application Protocol)-based, near-zero client applications connected to cloud-based services to today’s robust mobile apps running on increasingly capable devices. In modern mobile application architectures, data and application workloads are distributed between the device and the server-side cloud resources.

Differentiated connectivity and network APIs change the conversation about mobile computing and edge computing architectures, especially as service providers

make their transition to 5G SA and as networks become more cloud-native and composable. With increasing industry interest in AI and the network and network APIs in conjunction with cloud and Edge Computing, APIs open new possibilities in mobile computing that have been imagined but weren’t as feasible or viable in the past.

Interestingly, the CAMARA library contains “network APIs” that make edge computing resources discoverable and their services exposable and consumable in a similar fashion to network capabilities. Mobile applications will therefore have the ability to manage and orchestrate both connectivity and edge and cloud compute resources in a fine-grained and active way.¹³

In-proximity edge computing, resources and high-reliability, low-latency differentiated connectivity can be

instantiated by Quality on Demand and Edge Computing APIs. The innovative mobile computing architectures enabled will foster a new breed of network-aware mobile applications.

This multi-tier mobile computing architecture transforms 5G SA networks into a “global platform of innovation.” As enterprises and service providers explore edge AI and distributed AI computing models, they can leverage differentiated connectivity orchestrated through network APIs to support entirely new categories of intelligent applications.

The implications for pioneering mobile developers are equally profound. Mobile developers will need to make the evolutionary leap to dynamic, network-aware application designs and embrace applications that actively collaborate with the network.¹⁴

As service providers advance along their 5G modernization journeys, mobile computing will benefit and evolve as global network APIs and differentiated connectivity foster a rethinking of mobile computing.

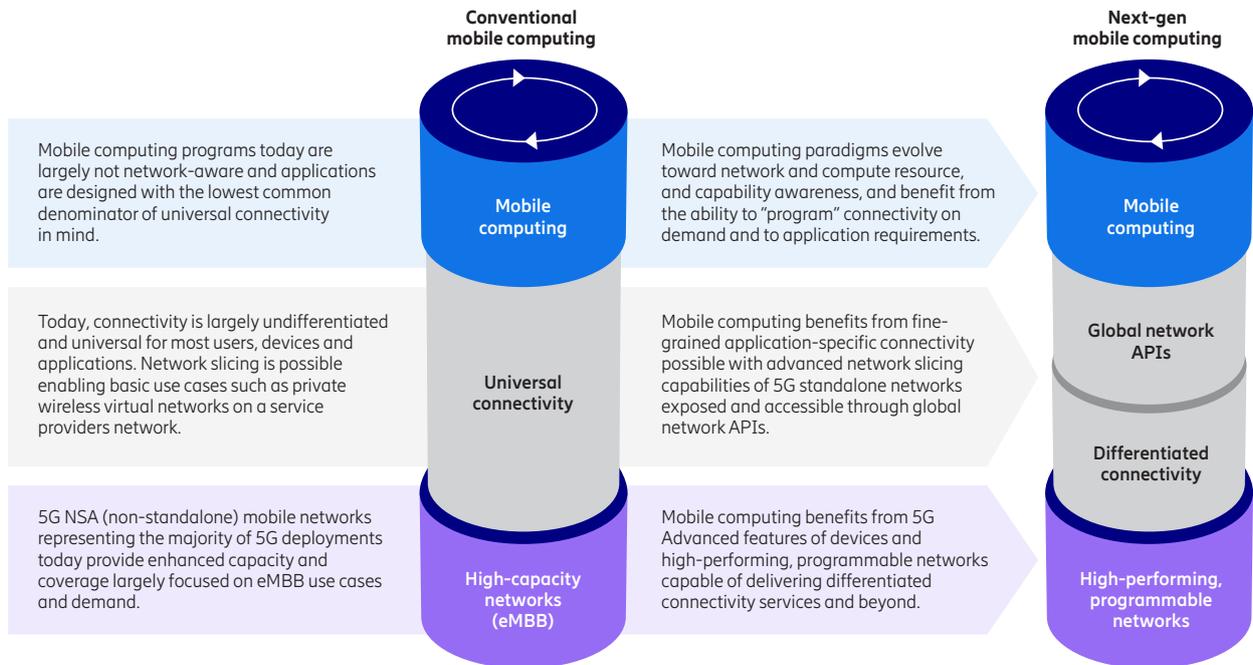


Figure 4. From undifferentiated connectivity to API-driven networks¹⁵

¹³ “A Framework for Global Network API Innovation” by Leonard Lee, February 27, 2025, neXt Curve
¹⁴ Aduna: The cornerstone of an API-enabled telco future,” Leonard Lee, January 17, 2025, neXt Curve
¹⁵ “The Network Capability Value Chain/Stack” by Leonard Lee, February 22, 2025, neXt Curve

Driving 5G innovation with differentiated connectivity and open network APIs

Differentiated connectivity and network APIs can drive 5G innovations targeting both subscribers and developers. Understanding how the technology expresses itself and creates meaningful impact is key.

The technology expresses itself by improving existing applications and services or fostering entirely new categories of applications and experiences. Imagining what lies beyond conventional mobile computing requires that we advance how we think about and approach mobile computing application design and supporting system architectures.

We need to transcend thinking that focuses solely on connectivity and the network and instead, open our minds to what differentiated connectivity and network APIs make possible today and will enable in the future.

Let's look at the notion of 5G innovation from the perspective of the service provider and the mobile application developer. Network APIs represent new tools for developing richer mobile experiences. Applications can now utilize APIs that extend beyond traditional cloud resources

such as compute, memory and storage to include access to network resources through differentiated connectivity and exposed network capabilities, as well as AI capabilities. These three powerful tools open new possibilities for enhancing user experiences.

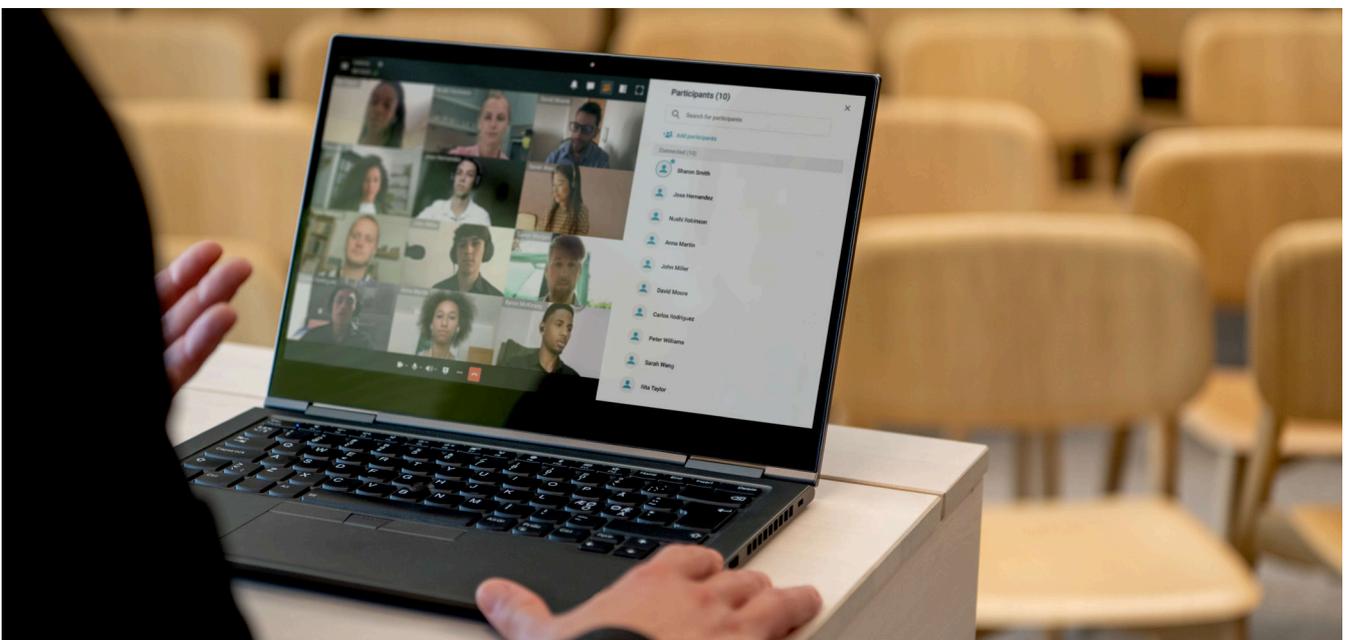
Communications service providers can target 5G innovations with a scope that extends far beyond connectivity innovations. Differentiated connectivity combined with open network APIs opens up new frontiers for innovations. These advances can evolve from existing applications, emerge as new smartphone applications, or manifest as novel device and application combinations that leverage the unique capabilities of advanced mobile networks.¹⁶

Application developers can target mobile experiences with tighter integration between applications and networks without necessarily exposing differentiated connectivity to users. These innovations enable developers to explore next-generation mobile computing models that surpass current possibilities.

Advances leveraging differentiated connectivity and open network APIs typically bridge network and application boundaries, signaling a demarcation shift from over-the-top applications decoupled from universal connectivity. Typical characteristics of innovations to expect include:

- a focus on **delivering experiences** where the sum of the value is greater than connectivity/decoupled from applications
- addressing **unserved and underserved parts** of premium consumer segments and business-critical enterprise segments
- taking advantage of the elevated **capabilities introduced with 5G Advanced**

Differentiated connectivity and network APIs enable richer experiences by bringing applications and networks closer together. The potential for business model innovations is an essential part of the equation to ensure that services providers can capture sufficient value created to justify the required network investments. (The details in these innovations are beyond the scope of this paper.)



¹⁶ The Global API Exchange Proposition for Operators by Leonard Lee, February 17, 2025, neXt Curve

Summary and conclusions

As 5G enters the second half of its evolutionary journey, the industry must evolve with it. Differentiated connectivity and network APIs are central to bringing about network-aware mobile computing applications supported by differentiated connectivity and open network APIs. The implications are both profound and inevitable as outcomes of the ongoing evolution of mobile wireless technology going into 5G Advanced and into 6G.

The evolution of the network will bring about a rethinking of mobile computing and mobile computing architectures. Ultimately, it will spark a fresh generation of network-optimized and network-aware mobile applications across new categories of devices beyond the smartphone.

In order for this transformative step in mobile computing to spur revolutions across industries, the mobile industry and ecosystem will need to undergo a dramatic mindset shift away from conventional thinking about mobile computing. Service providers, application developers, original equipment manufacturers (OEMs), cloud

service providers and enterprise and consumer users all need to think differently. Going beyond broadband and data traffic, they must embrace the new convergence of differentiated connectivity and network APIs.

By dynamically exposing and activating network capabilities to precisely meet application demand and requirements, we are unlocking potential that even the most forward-thinking developers have yet to envision and explore. The challenge now is awareness across the ecosystem.

Service providers, transcending conventional business models, must recognize differentiated connectivity and network APIs as more than a technical feature. The combined technologies will be transformative business catalysts that enable entirely new premium services, creating new monetization opportunities and business models for service providers and developers alike.

The transition to 5G SA equips service providers with sophisticated network slicing capabilities while preparing networks for

the expanded possibilities offered by 5G Advanced features. Differentiated connectivity services can then be intelligently composed through network APIs to support next-generation mobile computing architectures and applications that deliver great value to users.

For developers, network APIs offer unprecedented control over network resources, transforming the network from a static transport layer into a dynamic, programmable resource that adapts to application needs in real-time. Applications can then deliver consistent, high-quality experiences with full awareness of network conditions in a user's location.

This is 5G's true promise fulfilled—not merely delivering increased speed but creating an intelligent platform of innovation where network-aware applications and application-aware networks harmonize to deliver seamless, intelligent and adaptive mobile experiences that respond to user needs in real-time.

Relentless innovation and invention in mobile wireless technologies shaping 5G and upcoming 6G continue to expand the capabilities, coverage economics, and capacity of mobile networks.

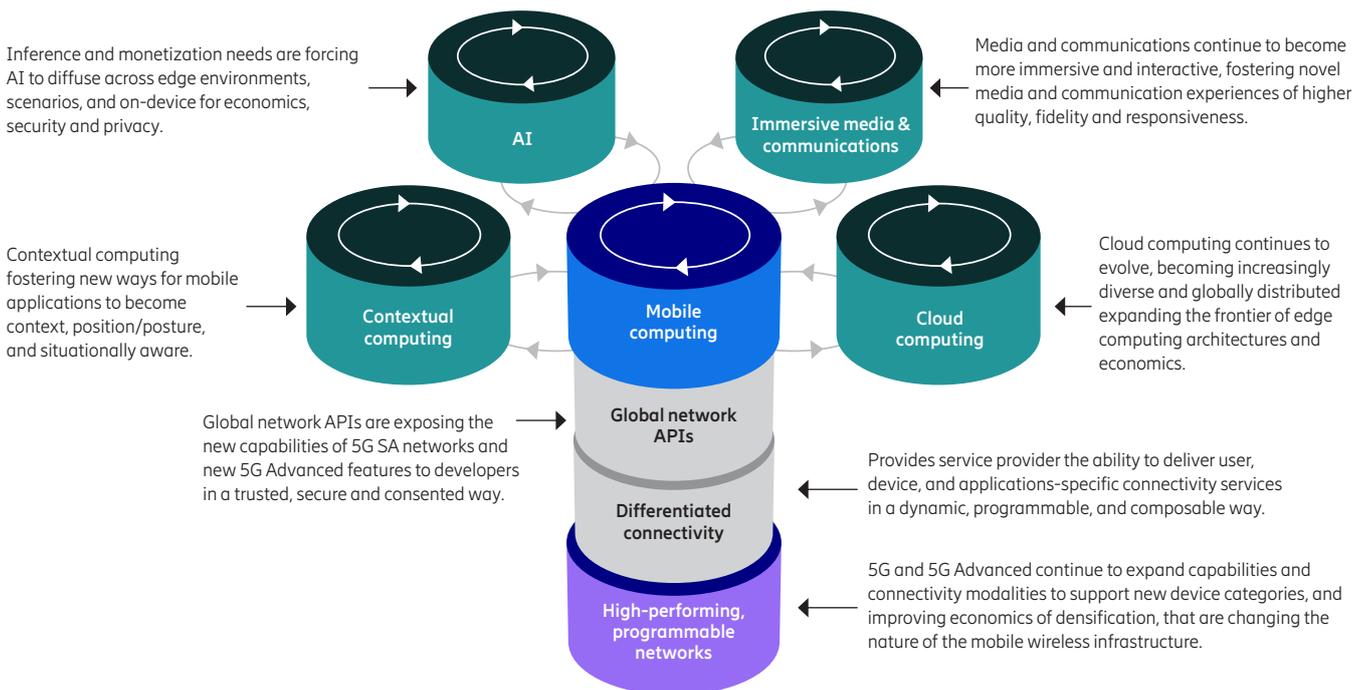


Figure 5. The role of differentiated connectivity and global network APIs¹⁷

¹⁷ Ericsson based on neXt Curve research

About the authors

Leonard Lee

Founder and Managing Director of neXt Curve



Leonard Lee is the Founder and Managing Director of neXt Curve, an independent research advisory firm based in San Diego, CA, with the mission of helping TMT (Technology, Media & Telecommunications) industry pioneers explore and pursue opportunities forming at the intersection of transformative technology and industry trends.

With over 30 years of experience as a management/technology consultant and industry analyst, Leonard has advised Fortune 500 organizations across various industries on emerging and transformative technologies, business and product strategy, and innovation.

Leonard's cross-domain research covers mobile computing and wireless infrastructure, enterprise computing and networking, AI infrastructure and data center, media and broadcast technologies, enterprise software and analytics, consumer and industrial IoT, cybersecurity and trust, and semiconductor technology.

He is a former managing partner with Gartner Inc. and partner/principal at IBM, PwC, and EY.

Peter Linder

Head of Thought Leadership for Ericsson in the Americas



Peter Linder is Head of Thought Leadership for Ericsson in the Americas. In this role, he drives region-specific thought leadership initiatives, contributes to major global Ericsson initiatives, and is active in developing the thought leadership profession.

He has held a variety of leadership positions at Ericsson in the product, portfolio, solution, commercial, business development, and marketing areas of the business, with half of his career based in Sweden and half in North America.

He is a versatile speaker, fluent in English, Spanish, and Swedish, and skilled in both theatrical and cinematic deliveries. His signum is a profound understanding of fixed and mobile networks, with curiosity for the difference they can make in society.

He joined Ericsson in 1991 after graduating from Chalmers University of Technology in Gothenburg, Sweden, with a master's degree in Electrical Engineering and a master's degree in International Business Management. Outside work, he is a passionate motor racing fan, a world traveller, an aspiring videographer, and enjoys golfing and skiing.

About Ericsson

Ericsson enables communications service providers and enterprises to capture the full value of connectivity. The company's portfolio spans the following business areas: Networks, Cloud Software and Services, Enterprise Wireless Solutions, Global Communications Platform, and Technologies and New Businesses. It is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's innovation investments have delivered the benefits of mobility and mobile broadband to billions of people globally. Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.

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About neXt Curve

neXt Curve is an independent research advisory firm based in San Diego, CA, with a broad agenda covering technology, media, and telecommunications (TMT) sectors with the objective of exploring and clarifying frontier markets and associated opportunities forming at the nexus of emerging and transformative technology trends. Its coverage areas include mobile wireless technologies and infrastructure, artificial intelligence, data center and supercomputing infrastructure, semiconductor technologies, security and trust, and cloud and edge computing. Since its founding in 2017, neXt Curve has and continues to advise leading companies across TMT sectors on their top strategic priorities.

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