Prepare for the Next Wave of Traffic: How GenAI Will Impact Mobile Networks

By: Ericsson

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Generative AI (GenAI) is everywhere, it seems. It's powering the personal assistants on our phones, augmenting customer service, supporting health care providers, driving autonomous vehicles and even creating art, poetry, and movies.

As regional carriers continue to roll out 5G networks and enhance their existing infrastructure, this new technology is poised to reshape mobile network traffic patterns in ways that demand careful planning and strategy.

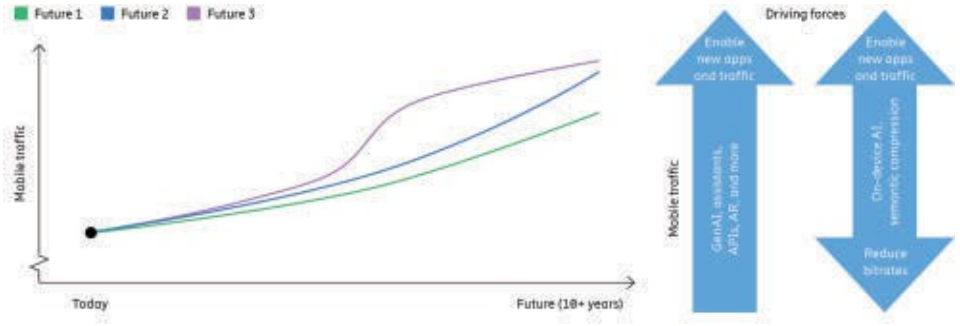
The Rise of AI-powered Mobile Experiences

While we're mostly familiar with text-based AI chatbots, video-based AI assistants and immersive experiences are emerging as the next frontier, promising to transform how consumers interact with their devices and environment. Initially, such interactions will mostly be consumer-initiated, but as the decade progresses, we'll likely see AI-based assistance acting independently on behalf of consumers.

This next generation of GenAI applications will be far more demanding on mobile networks in three key ways.

First, consumers will spend more time with hyper-personalized content on their smartphones, such as AI-generated educational materials tailored to their learning style or entertainment content customized to their preferences.

Second, they'll use their smartphone cameras to interact with AI systems that can analyze their surroundings. Imagine pointing your phone at a broken appliance and receiving on-the-spot repair instructions.



A conceptual illustration of different mobile traffic growth impacts due to GenAI.

Third, as smart glasses and extended reality (XR) devices become more common, consumers will engage with always-on AI assistants providing real-time information about their environment, like calculating the nutritional value of the food on their plate.

Impact on Network Traffic

Ericsson research suggests three potential scenarios for how GenAI could impact mobile network traffic over the next decade:

1. **Sustained growth:** Even in developed markets, where traffic growth has shown signs of slowing, widespread adoption of GenAI applications could drive continued traffic increases.
2. **Accelerated growth:** Strong consumer uptake of GenAI services could push traffic growth significantly beyond baseline predictions.
3. **Explosive growth with eventual stabilization:** Widespread adoption of (augmented reality) AR glasses and AI assistants could cause a dramatic surge in traffic, potentially spurring the adoption of new compression technologies and eventual stabilization.

What Regional Carriers Need to Know

The impact of GenAI on networks will evolve throughout the decade. Initially, most GenAI workloads will run in the cloud, either in real-time or pre-rendered for hyper-personalized content. While some medium-complexity GenAI tasks may eventually move to smartphones through simplified AI models, complex real-time interactions will require a federated approach: simple tasks on smartphones, privacy-sensitive tasks in private clouds or at the edge and highly complex processing in the cloud.

This evolution will likely change the traditional balance between uplink and downlink traffic. While emerging technologies like semantic compression (which uses AI to encode the essential features of content rather than transmitting every pixel of data) might help offset some growth, these capabilities would require significant advances in device hardware and embedded AI software. However, these same technologies will likely enable entirely new applications and improve existing ones that will once again drive traffic higher.

Planning for the Future

Regional carriers should prepare by planning for increased uplink capacity, evaluating edge computing solutions, monitoring XR device adoption in their markets, and preparing for accelerated traffic growth beyond current projections. By understanding these trends and planning accordingly, carriers can position themselves to support the next generation of AI-powered mobile experiences while maintaining the high-quality service their customers expect.

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