The Core of the Mobile Broadband Experience

Most mobile operators want a common core network for 2G, 3G and 4G. Here's why.

By Gabriel Brown

Gabriel Brown is a senior analyst who covers wireless at Heavy Reading. For more information, visit www.heavyreading.com.

The mobile data services market is on fire. With advanced devices and rapid application innovation, the quality and range of services offered to end-users are phenomenal and improving every day.

Underlying this service experience are tremendous advances in the performance of data-centric mobile broadband networks. The mobile packet core is at the center of this transformation. Its vital mobility, session management and security functions are what make a wireless network a truly mobile network. And because it's the conduit through which mobile users connect to applications, attention is starting to gravitate to this critical — if historically low-profile — part of the mobile network infrastructure.

Broadly, there are 3 focus areas in the mobile packet core domain where progress will enable operators to continue to improve the subscriber experience and gain a competitive commercial advantage: subscriber and traffic growth, network monetization and architecture transition.

Subscriber and Traffic Growth

With demand for capacity exploding, the mobile packet core must scale in both the throughput and compute dimensions.

It's well understood that more users, each generating more and more traffic, increase demands on user-plane capacity. But unlike the wireline world, in a mobile broadband network, user mobility, security and a sessions-based connectivity model place a far greater emphasis on control-plane scalability.

Increasingly, the "transaction rate" at which packet core equipment can communicate with devices and surrounding network elements is emerging as an important scalability metric. As a result, new requirements on vendor's hardware and software platforms are necessary.

Network Monetization

By virtue of its place in the network, its policy, charging and control functions and its traffic management capabilities, the mobile packet core is strategic to operator initiatives to monetize investments in RAN and backhaul.

Whether related to charging and billing, congestion management, quality of service or value-added services such as parental control, core network equipment must support traffic-processing capabilities. Operators can use these capabilities to layer services on to what is otherwise just a smart piece of connectivity infrastructure.

Increasingly, as third-party applications and service become more important, there's also a need to expose these advanced service capabilities to partner organizations and developers via network APIs.

Architecture Transition

The all-IP evolved packet core architecture defined for 4G/LTE networks represents a major change relative to the 2G/3G network. With the circuit-switch domain eliminated, voice service must now be carried over the packet core alongside best-effort data traffic, increasing latency and reliability requirements on network equipment very significantly.

Then the nature of the flatter network architecture itself drives other changes. For example, the direct interface between packet core and base station increases control-plane load on packet gateways, pooling concepts change design assumptions and "fan-in" requirements increase dramatically.

One further point is that these 3 aspects of mobile packet core evolution apply across the technology generations. Recent Heavy Reading research has confirmed, without ambiguity, that the majority of operators around the world are targeting a common core network capable of simultaneous support for 2G, 3G and LTE radio access.

This finding re-states the strategic importance of mobile packet core and highlights the importance operators place on consistent yet flexible service sets and roaming/interworking between generations of technology as a way to serve as broad a range of customers as possible. ■

API: Application Programming Interface
2G: Second Generation
3G: Third Generation
4G: Fourth Generation
IP: Internet Protocol
LTE: Long-Term Evolution
RAN: Radio Access Network

Smartphones eating up your bandwidth?

Learn how one large mobile provider prepared to meet the demands of 4G.

In this case study, you'll learn how a large mobile provider:

- Gained instant bandwidth relief with high quality of service
- Bridged the divide between 2G and 3G
- Secured seamless ability to migrate to LTE/4G
- Simplified operations with a single network manager

Download Tellabs' free case study, *Bandwidth Today, 4G Tomorrow,* at tellabs.com/backhaul.

tellabs®