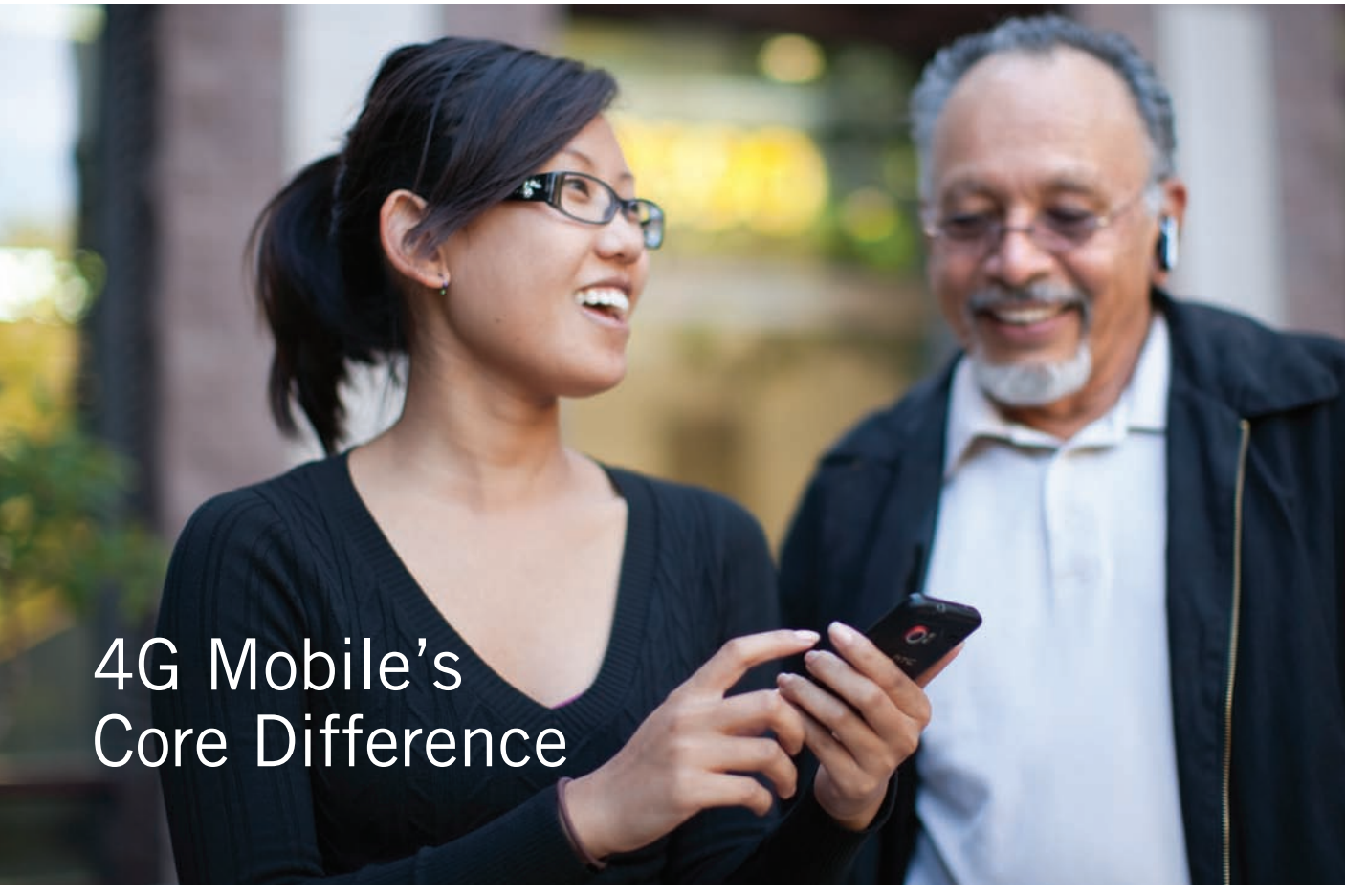

4G Mobile's Core Difference

For LTE and WiMAX, router-based platforms adapted from 3G are a bad fit. A purpose-built platform is a smarter move.

By Kevin Fitchard

A year ago, the words "mobile core" and "Tellabs" wouldn't have been mentioned in the same sentence. As far as wireless networks went, Tellabs was focused almost entirely on backhaul.

But that all changed for two reasons. First, Tellabs bought WiChorus, an upstart vendor that made a big mark in 2009 with several key WiMAX core contracts. Second, the 4G core's distributed architecture breaks down the distinctions between the core and backhaul network, enabling Tellabs to expand beyond its backhaul niche.

In a recent interview with Kevin Fitchard, wireless infrastructure editor at *Connected Planet*, Tellabs CTO Vikram Saksena explained why his company chose to enter the core market, how its platform fits into its portfolio and overall wireless strategy and how it plans to compete in the larger 4G core market.

***Kevin Fitchard:* Why get into the packet core space?**

Vikram Saksena: We historically have been strong in the backhaul space, and what we were trying to do was find adjacencies to see where we could expand beyond just doing backhaul. When we looked at 4G, because of the way the networks are being flattened to be more data-centric, the obvious play beyond backhaul was the packet core.

There are synergies between backhaul and the packet core when you look at how 4G networks are built. We felt that having both those pieces would offer our customers an advantage. We feel we can leverage our backhaul presence and innovate for customers in ways that would be hard to do with a stand-alone packet core.

In 3G and before, the RNC was the demarcation point between backhaul and the packet core. When you go to 4G, there is no RNC. There is the radio part, and then there's an IP network behind it. Artificially you can break it up into packet core and backhaul, but it's really all one IP network.

***KF:* Tellabs isn't just entering a core market; it's doing so with a different strategy than the established core vendors. Explain how your purpose-built platform is different from the router-based approaches of your competitors.**

VS: In broad terms, what the router vendors are doing is to take an existing router platform and then graft a packet core onto it. This creates some architectural issues in terms of scalability and performance.

A router is a Layer 3 platform, while a packet core is more of a Layer 4 through Layer 7 platform. When your initial product wasn't designed to be a gateway product, it creates fundamental limitations when you try to add gateway functionality to it.

However, when you start with a packet core platform and try to add routing and switching — which is the approach we are taking — you get a completely different product with significantly better scale and performance characteristics.

In some ways, both approaches combine routing and packet core functions in one product, but the resulting architectures and designs are very different. We're starting at the gateway layer and moving down the stack rather than starting at the routing layer and moving up the stack.

"You want to make the user experience consistent."

— Vikram Saksena, CTO, Tellabs

The router vendors are building their packet core on top of their existing operating system, which is built around routing and switching. In that model, when you add packet core you're adding a server blade: an application layer blade in the router. You're taking traffic in from a line card, hair-pinning it into a server blade and then bringing it out through another card.

That is very inefficient because traffic has to traverse the switch multiple times. What we do is perform all the processing functions when traffic enters the line card.

We have a very distributed architecture, in which we've built the packet core into our platform operating system itself, as opposed to adding it as an application on an existing operating system. When the packets enter the line card, they get processed, not only at Layer 2 and Layer 3 but also at Layers 4 through 7. This reduces latency and increases the effective throughput of the platform.

Compared with stand-alone packet core platforms, we paid special attention to the multi-dimensional aspects of packet core performance. Our architecture supports independent scaling of control plane, data plane and application plane performance.

The stand-alone packet core platforms from other vendors were designed originally for 2G and early 3G networks. This was well before the advent of smartphones. Back then, data traffic demands were not as stringent, and only the data plane throughput was of primary concern. We recognized that with the plethora of smart devices coming on to the 3G and 4G networks, dealing with control plane and application plane performance was equally important.

Therefore we dedicate processing resources to scale every dimension of performance. We've done things that we would consider more 4G-centric, rather than trying to reuse older platforms originally designed for 2G and 3G networks of the pre-smartphone era.

KF: What do you think the competitive landscape will be like? Many analysts have projected that a few radio access vendors will dominate the 4G radio market. Will the same be true — or even more so — for the 4G core market?

VS: The closer you go to the edge, there is more opportunity for more players. As you get to the core, it condenses down to fewer players.

I think most operators are drawing the line between the radio and the core. Radios are very cost-sensitive components, and that's where most of the CapEx lies. It's good to drive the cost down by having more competition in that space.

The packet core is a little different because it's the control point for the users' experience. There are very few operators who will deploy multiple different packet cores. Each aligned with a different radio vendor, because when you move from base station to base station and end up on a different packet core, service layer consistency may be lost.

In that situation, it's not clear that you'll get the same user experience because of the different ways these packet cores deal with traffic and user sessions. Many operators are trying to create more of a single- or dual-vendor packet core, along with a multiple-vendor radio access network. You want to make the user experience consistent, and you want to make your charging and billing functions consistent, so you won't see as much diversity in the packet core as you will in the radio network.

KF: Are you saying operators are willing to pay a premium for a packet core that they wouldn't necessarily pay for the radio network?

VS: In our industry, generally speaking, pricing is value-driven. The packet core is the "brain" of the wireless network; it is where the service logic and policies are enforced, which enables the operators to differentiate their offerings.

This is quite different from the radio layer, which provides commoditized access. The pricing models are consistent with the value delivered by these segments in the operator's network. ■

2G: Second Generation
3G: Third Generation
4G: Fourth Generation
CapEx: Capital Expenses
RNC: Radio Network Controller