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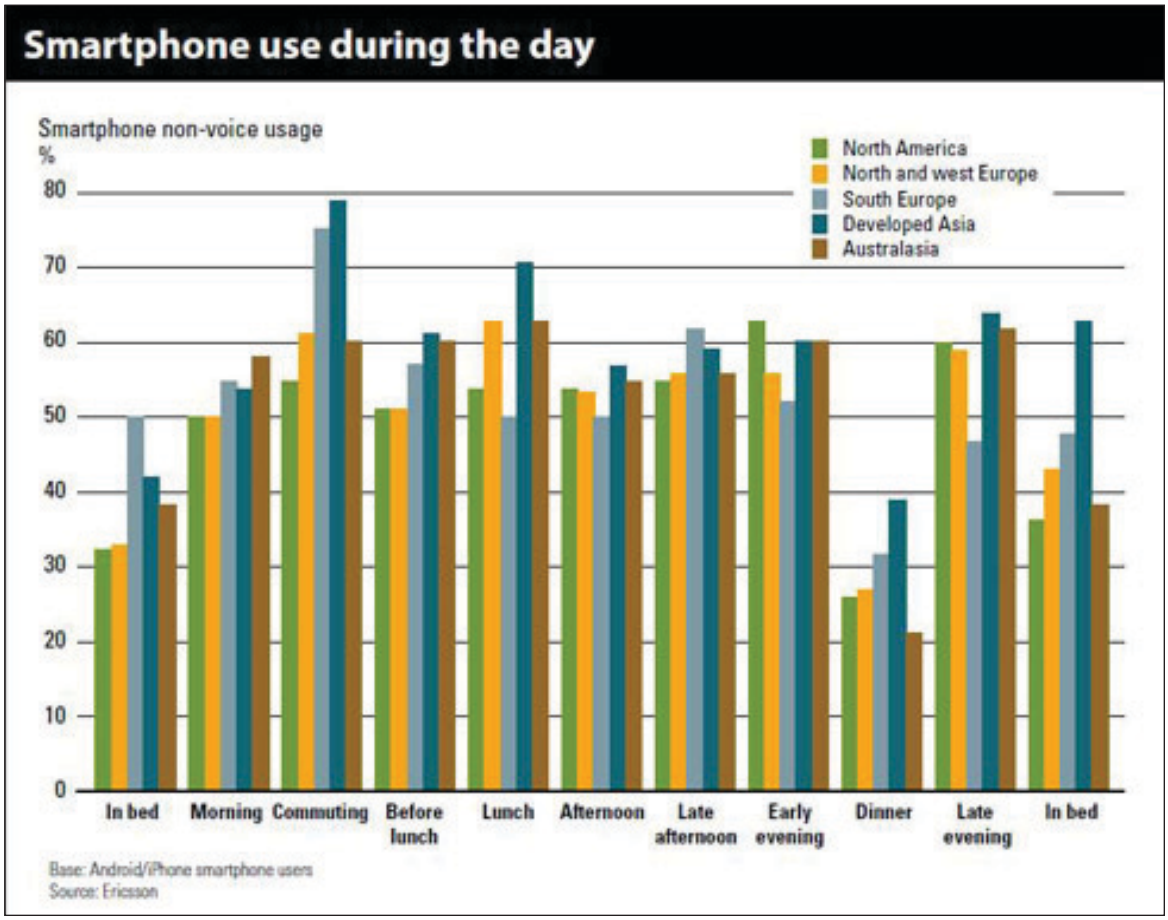
Sculpting the Seamless User Experience

By Jesse Cryderman

Just for fun, I wrote the first paragraph of this story on a collaborative cloud document editor on three different devices, across three different networks. I started on my laptop over Wi-Fi from a terrestrial broadband connection. I then shifted over to my smartphone and onto a 3G wireless network, wrote what I could with Swype input while walking to a nearby cafe, and turned on my tablet as I entered... My tablet connected to the free Wi-Fi inside, and I promptly finished typing this sentence.

I know what you're thinking: what a dork. (Would it have been cooler if I said I was watching *"Reservoir Dogs"* across a network triple-play?)

Middle school nicknames and definitions of "fun" aside, this kind of seamless experience is increasingly common. Video, voice, gaming, productivity, planning, social networking, shopping; today, all of these activities and more can be delivered over multiple networks with agility. This fact has given rise to the modifiers "anywhere" and "everywhere" being added



to just about anything that can be displayed in pixels. As you can see from the traffic patterns in Figure 1, we use our smartphones all day long, across all locations (even in bed), and that use extends across multiple networks. There are challenges to this model, however, that require additional infrastructure to support.

"As soon as you start to sell content like that, you also have to care for it and cover all of the bases in terms of billing and payments," explained Benz. "Those are things that carriers are pretty well equipped to deliver, but they also need capabilities that build on their existing OSS/BSS infrastructure that are specific to the digital video and digital content world. That brings us back to concepts like portable content in the cloud, what we refer to as a digital locker, which can have a post-paid billing aspect to it in regards to purchase, but also has real-time entitlement requirements on the delivery side."

Regardless, by embracing multiscreen, Comcast is taking a proactive stance in the battle for video. The company is taking its content to the people, wherever and whenever they are viewing it. This is both a competitive advantage and something other video carriers can learn from.

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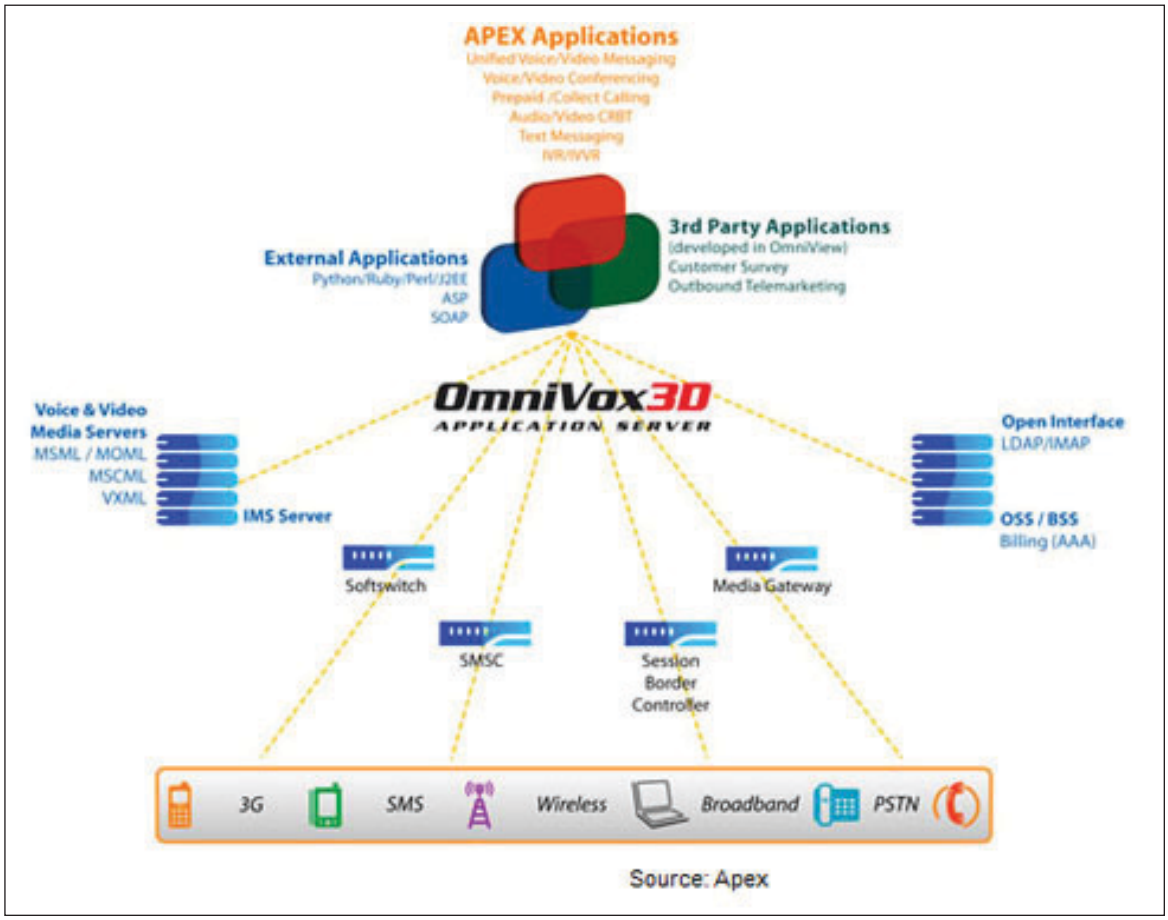
Stefan De Beule sums up the importance of the multiscreen play for operators:

"When comparing telcos/cable operators with OTT players, telcos and cable operators have a major competitive advantage: their existing customer base. If they can satisfy the multiscreen requirements of their existing customers at the right price (by offering rich, high-quality content across various screens), these customers are typically not going to look for alternatives."

Michael Bjorn, head of research at Ericsson ConsumerLab commented on consumers'



"everywhere" mobile data use writing, "We are entering an era in which it makes no sense whatsoever to talk about online versus offline for the simple reason that we are constantly switching between the two. And we scarcely even think about it."

Beyond simply enabling the same video stream or chat capability across multiple screens however, there is a larger task of enabling the same Quality of Experience (QoE) across numerous device platforms and networks. The intersection between ubiquitous delivery and quality is where the concept of a seamless user experience develops. As Iyad Tarazi, VP of Network Development and Engineering, Sprint explained, "The ideal end-state is one where changes in the network access are completely transparent to the users."

By leveraging their strengths, CSPs are uniquely positioned to monetize the seamless user experience, provided they take the right steps. However, if a seamless user experience is the end goal, neither services nor the transports they are delivered over can exist in silos. In order to deliver a compelling, seamless user experience, service providers must utilize a platform-, access-, and device-agnostic application server, support multiple radio access technologies (RATs), and build a robust content and network partner ecosystem.

Next Generation Application Server

As we reported last month, multi-screen offerings are table stakes for service providers these days. The strategy is to deliver content to where the customers are, not expect them to find you. In a recent report, Michael Bjorn, Ericsson, wrote that,

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"tablet users clearly show how app usage migrates between devices while the underlying app-related behavior remains unchanged." However, if there isn't significant openness and interoperability, multi-device play doesn't work well. A next generation application server can deliver consistent service offerings over phone, TV, mobile, tablet or computer, and is equally competent regardless of access or platform.

According to an Analysys Mason report, "Competition between CSPs and with companies in adjacent industries, such as Google, Yahoo!, Microsoft and Apple, is driving investment in telecoms application servers to enhance existing services and combine them with new offerings, such as presence, location, IPTV and other new capabilities."

here are numerous examples of next-gen application servers in the market from Ericsson, Alcatel-Lucent, OmniVox, Genband, OpenCloud (a recipient of significant funding from NSN), and others. They promise to accelerate the creation and delivery of new services, improve partner service enablement, provide a conduit for multi-device/platform data analytics, and leverage pre-paid scenarios that require real-time charging. As you can see in this vendor example in Figure 2, a next-gen application

server is a And it's not just consumer-market offerings that benefit from the next generation application server, it enables advanced enterprise service convergence as well. In Canada, Telus deployed the Genband's A2 Converged Application Server earlier this year, specifically for business customers. This single deployment enabled fixed/mobile convergence, unified communications, web-portal self management, integrated multimedia collaborations, and a PC-based soft client and call control capability.

Join Hands to Smooth Seams

As we all know, service providers' coverage maps include coverage provided by numerous partner networks. Since visual footprints are such a key component of marketing, this is one area where service providers have been quite active. However, the opportunity to leverage partnerships to deliver a seamless user experience extends far beyond roaming agreements.

Sometimes this means joining up with a partner to deliver the full gamut of access and service. Vodaphone recently partnered with Kordia to provide mobile voice and broadband (Vodaphone) along with fixed internet, WAN, and fixed-lined telephony (Kordia) in New Zealand.

Other times, it means linking in order to reach into areas where a carrier doesn't have spectrum licenses, or can't offer high-speed access. In India, Airtel, Idea, and Vodaphone entered into an agreement to, "provide 3G services to our customers in the circles where we have not built our own 3G network, in order to bring a pan-India experience of 3G services to our customers."

Swisscom and Verizon Business partnered in order to target seamless service convergence specifically for business customers. The resultant offering includes, "integrated networks, convergent services, seamless processes and comprehensive customer services."

AT&T has made partnering part of its DNA, since global, ubiquitous connectivity is one of the company's goals. AT&T underlines this in their marketing, explaining they offer, "the largest alliance of international voice and data network partners of any U.S. Carrier."

Partnering doesn't mean handing over network control to an outside operator. What it does mean is striking agreements to share unique services and network quality data.. It means entering into revenue

A popular service effectively deployed across multiple devices is probably a bigger deal than a priority QoS button.

sharing partnerships with OTT and other carriers to ensure quality across unmanaged networks. While there have been significant developments in access partnerships and high-end converged business service offerings, there is still much work to be done on the consumer level. Additionally, service partnerships—wherein carriers partner with other service provides (operators or OTT) to offer improved QoE services at a premium—are just beginning to take off.

Multi-Mode Mobile

It's no secret that even with all of the fanfare surrounding LTE and 4G, legacy mobile networks are going to be around for a long time, and so will the devices that operate on the various RATs currently in use. However, deploying and supporting numerous separate mobile topologies is an expensive endeavor. This is where network consolidation and multi-mode mobile comes into play.

Iyad Tarazi, vice president of network development and engineering for Sprint, outlined the problem. "Carriers also need to consolidate architecture to be able to successfully support multiple technologies such as EVDO, LTE, HSPA, etc. that will be part of the network for many years to come." Tarazi went on to say that "deploying completely independent infrastructure to support each technology is not viable from an economic and operational standpoint."

Network consolidation will be a deciding factor in who can profitably deliver the seamless user experience. "The ability of a carrier to charge its subscribers more for consuming more is not linear and demand is projected to increase at a significantly higher rate than revenue." Tarazi explained. For this reason, network equipment vendors are betting heavily on multi-mode. Everyone from NSN to Ericsson to Huawei offers a device that inherently supports multiple RATs from a single unit.

Until we crack the multi-mode code, consumers will be stuck with devices that only work on select networks. For instance, Apple does offer an unlocked

iPhone 4s, but it only works on GSM networks. If your carrier is CDMA, you're out of luck.

What about manufacturing devices that are multi-mode, not just multi-band? This is occurring already, albeit at a very slow rate. Currently, there are inherent incompatibilities between RAT standards, some of which are being ironed out by hardware manufacturers. Perhaps in the future we will see the emergence of ubiquitous interoperability standards that will allow any device to function on any network, similar to plugging any landline phone into a POTS network. Until then, multi-mode network consolidation is still evolving, and an important link in the enablement of a seamless user experience.

Erasing Seams Improves Customer Experience

In advocating for the development, delivery, and management of a seamless service convergence, the importance of the customer experience cannot be overstated. The industry, as a whole, is beginning a slow but very necessary perceptual shift toward a experience- and customer-centric business perspective. Ultimately, since usage patterns extend across every direction and device, the seamless user experience is a crucial component of next-gen telecommunications.

I asked Carol Borghesi, senior vice president of Customers First Culture at Telus, to list some top drivers for a positive customer experience. "Reliability, ease-of-use, innovation, quality and functionality of the handset, and pricing and transparency," she said. How do you control these factors once the user steps out of your walled garden? Carriers spend a lot of time figuring out how to control quality across the managed network, but what about the unmanaged network?

Creating seamless user experience requires service providers to: implement a next-generation application server that is device-, platform-, and access agnostic; be able to partner with other carriers and service providers to launch innovative services and monitor them across multiple networks; and invest in multi-mode technology that supports legacy devices as well as new technology for years to come.