

Will New Mobile OS Features Hurt Network Performance?

New generation of mobile devices will exponentially increase data usage and challenge traditional network architectures

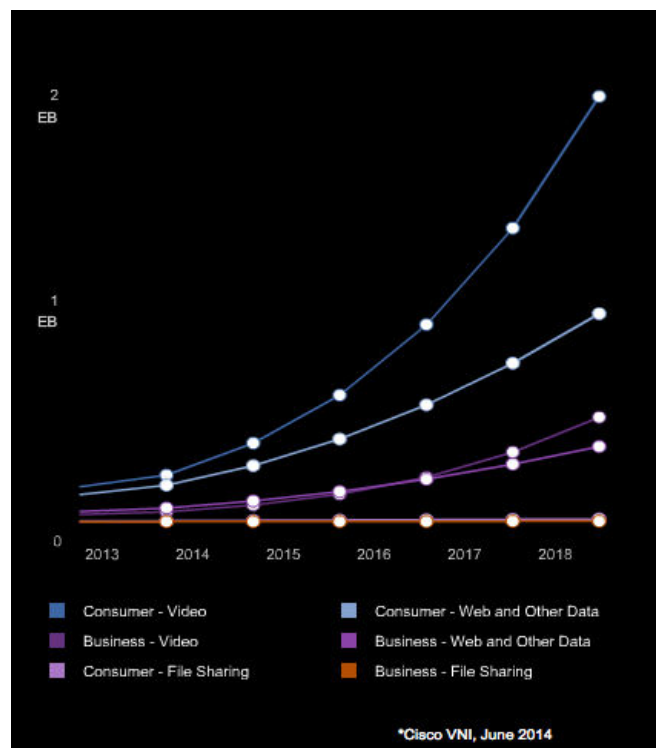
An EdgePaper from EdgeConneX®

Over the past year, industry forecast reports like Cisco's [VNI forecast](#)¹, Mary Meeker's [Internet Trends](#)², [IHS](#)³, [Business Insider](#)⁴, [Infonetics](#)⁵ and others have collectively displayed charts for mobile device/app data usage with more hockey sticks than the NHL playoffs.

Cable & Telco executives who saw similar forecasts fizzle in the 2001 dot-com bust may be skeptical. But based upon announcements from Apple, Google, Microsoft, Amazon and others, the hockey sticks are very real--and may even be understated.

For network providers, delivering this content from a handful of locations will soon be a disadvantage. The growth in data will drive localizing content to maintain a quality customer experience and to manage network expenses / margins.

US Mobile Data Growth



New Software Features

The bandwidth-munching features of new devices span several categories:

1. **Improved voice recognition.** "Hey, Siri," "OK, Google," and similar virtual assistant requests in both handset and automotive applications will drive increased data streams in both directions, as an easier hands-free interface drives more frequent downloads of map, video, music and other high bandwidth content—if the networks can handle the requests.
2. **Multi-device interactions/hotspot applications/plan bundles.**
 - Tethering PCs for Internet access and tethering or sharing data plans with

tablets—and some tablets are free or nearly free (in up-front cost or monthly charges, but probably not both) from [Verizon](#)⁶, [AT&T](#)⁷ and [Sprint](#)⁸ while [T-Mobile’s “un-carrier” approach](#)⁹ takes a different approach and offers 1.2 GB of free data with each tablet

- Linking new smartwatches and fitness monitors to cloud sites for streaming data uploads and reporting downloads
 - Monitoring and sending commands to home security cameras and automation devices
 - Sharing downloaded or streaming content with TV devices like Chromecast or Apple TV
3. **Increased syncing and sharing capabilities.** There is greater ease of sending video or audio messages, family sharing of apps and “Continuity” or “Hand-off” syncing for files and draft e-mails across devices in iOS 8, iCloud Drive/Google Drive/Amazon automatic backups, and many other features.
 4. **Amazon.** Their first phone offers innovations that may create additional data streams in higher volumes than on competing devices.
 - The Firefly scanning/shopping capability allows users to aim their camera at almost any retail item to see if it is available from Amazon. If widely used, it will create a steady image stream back to Amazon’s servers and a return feed of product images, and presents the opportunity to provide sponsored data (an initiative driven by AT&T – the only carrier offering the phone).
 - The Fire has many other high-bandwidth features: free photo backup service to Amazon Cloud, Amazon’s Mayday, an on-demand video customer support service, integration with Fire TV and Prime music.
 5. **Enhanced Gaming.** Processor and software upgrades will enable mobile gaming users to have a more console-like experience, encouraging more use of online multiplayer games and increasing the bandwidth of gaming data requirements.

New Hardware Features

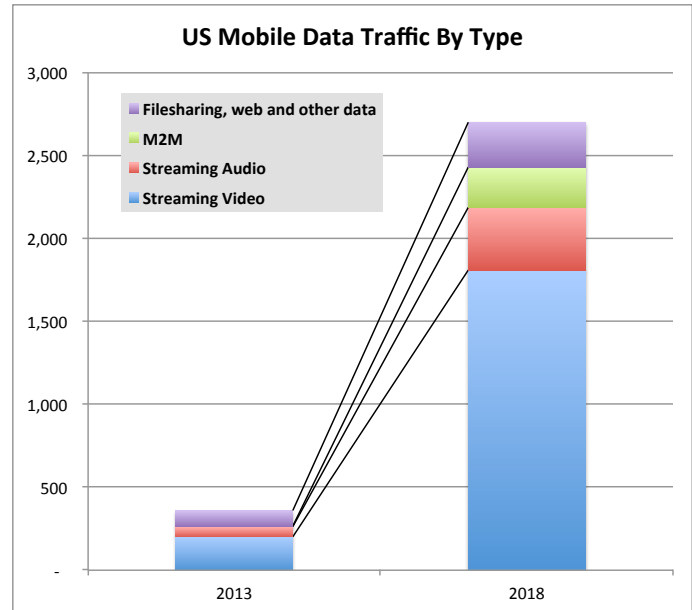
The releases of the latest iPhone, Android L devices, Amazon’s Fire and Windows Phone devices with a [full-fledged virtual personal assistant](#) should have a similar impact, with hardware driving data usage.

- **Size Matters.** The 4 GB original iPhone was discontinued within 3 months of launch. The iPhone flagship models have launched with 16 to 64 GB options since the iPhone 4S. The Samsung Galaxy S5 starts at 16 GB, while the Amazon Fire starts at 32 GB. Bigger storage means users can shoot and upload more video, download more content, auto sync more podcasts, and buy more apps that generate their own data flows and periodically update—all things that drive data network usage.
- **More Display Pixels and Camera Megapixels.** Devices with [large HD screens](#) will stream and store higher resolution content. Ever-higher megapixel camera sensors create larger photo images and dramatically larger video streams to be

uploaded and shared. The next wave will include phones capable of shooting 4K video.

Are Mobile Devices the Source of Your Internet Performance Issues?

When mobile device owners turn off the “Use Cellular Data” option for apps that download, stream and/or upload videos, music, files, apps, operating system downloads, etc., these devices hop on Wi-Fi connections to do their heaviest data transmissions. The underlying home cable/Internet providers, workplace ISP networks, or the Internet service providers at public hotspot locations like coffee shops, hotels, airports and libraries get hammered with high data volumes. Many of these transactions, like updating podcasts, syncing e-mails and messages, etc. happen in the background with no user prompting. Network providers who want to deliver a best-in-class customer experience need to factor in the growth in mobile device data consumption and the number of mobile devices per residence or business in capacity planning for all aspects of their networks.



Based on Kleiner Perkins Caufield & Byers Internet Trends

The Impact

Nothing highlights the impact of new usage models better than a good summer vacation traffic jam. The ecosystem of smart phones, cell networks, long-haul data networks and application servers is ill-suited to handle the crush when the masses head to the beach and get stuck in the same traffic jams. Voice recognition systems like Siri can stall, unable

to process requests, and map applications can have delays calculating alternate routes for thousands of users looking for detour options at the same time. Meanwhile, the kids in the back seat play games, stream TV shows and video clips and otherwise do their part to overload networks. And in coming years, the data demands will be exponentially higher.

Network capacity, power requirements, space needs and proximity to end users all need to grow at rapid rates each year to maintain and improve performance. The table below takes Cisco’s VNI forecast for mobile content for 2018 and compares it to what larger metro area or region used in 2013, and the comparisons and implications for network and backbone architecture are staggering.

Mobile Content Hosting Implications of 50% CAGR, 7.5X Growth by 2018

Market/MSA	2013 Population	2018 Mobile Data Demand in 2013 Pop. Equivalents	
		2013 Pop. Equiv	Comparison to 2013 Usage
US Population	316,128,839		
New York-Newark-Jersey City, NY-NJ-PA MSA	19,949,502	149,621,265	47% of 2013 USA Demand
Los Angeles-Long Beach-Anaheim, CA MSA	13,131,431	98,485,733	31% of 2013 USA Demand
Miami-Ft. Lauderdale- W. Palm MSA	5,828,191	43,711,433	219% of 2013 NYC Demand
Denver-Aurora-Lakewood, CO MSA	2,697,476	20,231,070	101% of 2013 NYC Demand
Kansas City, MO-KS MSA	2,054,473	15,408,548	117% of 2013 LA Demand
Salt Lake City, UT MSA	1,140,483	8,553,623	147% of 2013 Miami Demand
Dayton, OH	802,489	6,018,668	103% of 2013 Miami Demand
Reno, NV MSA	437,673	3,282,548	122% of 2013 Denver Demand
Clarksville, TN-KY MSA	272,579	2,044,343	100% of 2013 Kansas City Demand
Napa, CA MSA	140,326	1,052,445	92% of 2013 Salt Lake Demand

Based on Cisco VNI Forecast

Believe in the hockey stick for mobile data. Markets as small as Reno or even Napa will soon justify their own dedicated data centers for content.

Conclusion: Localize or Else...

For network providers, the content increase highlights the transport/peering cost of supporting millions of simultaneous HD and 4K content streams to and from mobile devices across long distances.

The legacy content and application hosting architecture consisted of massive cloud data centers built near peering points and cheap power. It relied on the assumption that achieving large scale at peering points would deliver an acceptable user experience. This model works great for global e-commerce, text-driven sites (news, blogs, etc.), or e-mail – applications sending data intermittently to a wide variety of localities around the globe. However, this architecture cannot support a high-quality, data-rich user experience. With the bandwidth explosion, [Edge Data Centers](#)[®] serving a metro area or small region will have enough content demand to achieve scale.

For today's content, a new paradigm is needed. By shifting to localized hosting at the edge of the network, content providers and network providers can remove backbone delays and peering congestion from the performance equation. For end users, this will improve latency and availability, but more importantly deliver the type of user experience that customers demand!

¹ www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/index.html - ~Country

² www.slideshare.net/kleinerperkins/internet-trends-2014-05-28-14-pdf

³ technology.ihs.com/api/binary/448315?attachment=true

⁴ www.businessinsider.com/growth-in-the-internet-of-things-2013-10

⁵ www.infonetics.com/pr/2014/m2m-connected-car-connections-svcs-market-Highlights.asp

⁶ www.fiercewireless.com/story/verizons-comprehensive-tablet-strategy-leading-way/2014-07-23

⁷ <http://gigaom.com/2014/08/04/want-an-lg-g3-smartphone-att-will-sweeten-the-deal-with-a-1-tablet-but-theres-a-catch/>

⁸ www.gottabemobile.com/2014/03/22/samsung-galaxy-s5-deals-continue-with-free-galaxy-tab-3/

⁹ <http://gigaom.com/2014/04/10/t-mobile-boosts-its-free-tablet-data-offer-to-1-2-gbs-starts-selling-discounted-slates/>