

Connected Homes Will Need More Bandwidth

Get ready for another surge in bandwidth demand as consumers buy the next generation of electronic devices.

By Masha Zager ■ *Broadband Communities*

The International CES always offers a glimpse of the digital home of the future – and a clue to the future of bandwidth demand. This year was no different, as the show featured bandwidth-gobbling devices ranging from the enormous (Ultra-HD TVs) to the minuscule (connected watches).

The gigantic trade show, held in Las Vegas each January by the Consumer Electronics Association, hosts some 3,000 exhibitors, 20,000 product launches and 150,000 attendees.

In reports about CES, caveats are always in order. Many big-name companies don't attend the show or don't reveal their plans. Some products and services rumored to be announced actually aren't. (This year, at the last minute, Intel's "virtual MSO" offering failed to materialize.) Some products introduced with great hoopla never appear in the marketplace; those that make it into stores often vanish quietly within the year. Still others remain on the market but never gain the traction their inventors hope for. Good ideas founder on the shoals of content rights negotiation, technology and marketing challenges, investor hesitancy, intellectual property disputes and sheer consumer orneriness.

It's a wonder any offerings succeed – but some of this year's crop certainly will.

THIS IS THE YEAR OF ... THE PHABLET?

Occupying the middle ground between the largest phones and the smallest tablets is a new type of mobile device: the

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The Huawei Ascend Mate was this year's most talked-about phablet.

phablet. Phablets were introduced at CES 2012 and were back in force this year, with Huawei's Ascend Mate garnering much of the attention. Though phablets' precise niche remains fuzzy and their category name is unfortunate, they appear to be popular with consumers.

Research firm IHS iSuppli forecasts that phablet shipments will reach 60.4

million units in 2013, up 136 percent from 2012. Service providers and building owners should take note because phablets offer "more lifelike viewing experiences" – which encourages consumers to watch yet more video on their mobile devices, both at home and on the go.

To accommodate consumers who want to watch video on all their phablets, phones, tablets, ultrabooks and refrigerators (yes, refrigerators) at once, manufacturers and service providers are collaborating to develop a new generation of set-top boxes or replacements for set-top boxes. For example, Comcast will use ARRIS's new multiscreen video gateway, based on Intel technology, to bring XFINITY TV to multiple screens. Time Warner Cable is taking a different route, teaming up with Roku to bring its video to mobile devices via existing Roku boxes.

ULTRA-HD TVS

Now that consumers have finished replacing their old standard-definition, bulky televisions with high-definition, flat TVs, the industry is ready to move

About the Author

Masha Zager is the editor of **BROADBAND COMMUNITIES**. You can reach her at masha@bbcmag.com.

on to ultra-high-definition, curved TVs. A dozen or more TV manufacturers showed Ultra-HD models (some flat, some curved) at CES. The new 3840 x 2160 standard has roughly four times the pixel count of full high definition; the chipsets support up to 60 frames per second, or double the normal rate. The sound is described as “lush,” and of course, the screens are huge – the largest exceed 100 inches. Some models support 3D video in addition to 2D. Samsung says its curved screen “creates a panorama effect not possible with flat-panel TVs, offering a more immersive viewing experience.”

Overall, watching these televisions is more like being in a movie theater than in a living room.

There are a few drawbacks: a price point designed to appeal only to hedge-fund managers, a complete lack of available Ultra-HD content and an absence of broadcast standards for Ultra-HD (and no guarantee that the TVs shown at CES will meet such standards once they *are* developed). So don't look for many Ultra-HD TVs to be sold this year.

Nevertheless, these hurdles can all be addressed over the next few years, and an industry consensus seems to be forming around Ultra HD as the Next Big Thing. Research firm Strategy Analytics forecasts a global installed base of 10 million Ultra-HD TVs by 2016 and 130 million by 2020.

Ultra-HD televisions were the talk of CES. Offering four times the resolution of full HD, they require 20 Mbps of bandwidth for streaming video.

In addition to garnering support from all the major TV manufacturers, Ultra HD is beginning to generate a larger ecosystem. For example, LG is forging agreements with content providers worldwide. Device maker RED is planning to ship its REDRAY player this spring, which will play Ultra-HD content, both online and local. (Think Blu-ray but better.)

RED is also partnering with Ode-max on an Ultra-HD movie distribution platform that includes built-in tools for digital rights management, sales, marketing and analytics. This platform, ODEMAX.COM, will give filmmakers, production companies and independent distributors direct channel access to the new cloud-enabled REDRAY players.

Service providers and building owners beware: Even with the use of new data compression technologies, RED files require 20 Mbps downstream capability (and the same amount upstream if consumers want to watch movies away from home using devices such as Slingboxes). Ultra-HD movie files will also be enormous (15 gigabytes on average).

As this technology is adopted, providers are likely to hear more complaints from customers about speed limitations and bandwidth caps.

These new TVs also promise to increase bandwidth demand in other ways. For example, Samsung's F9500 OLED TV allows two people to watch different HD content at the same time, on the same screen. Samsung's 3D glasses, which come with personal speakers built in, provide separate stereo soundtracks for each viewer. In addition, Stream TV Networks demonstrated technology that enables 3D content to be viewed comfortably without special glasses – long considered the holy grail of the 3D industry.

HOME MONITORING AND CONTROL

Home monitoring and control products, after hovering on the verge for years, seem to have broken through in the last year. Prices have fallen, major service providers and retailers have committed to the technology, and consumers (as well as small businesses) are showing plenty of interest. A few examples of the products and services shown at CES:

- Global Caché's iTach Flex, a smart endpoint that adds electrical devices to Wi-Fi or other networks. Information about temperature, power, security alarms and more can be sent over the Internet to inform a user about an event. For example, a text message can be sent in response to an open garage door or a water leak.
- GreenWave Reality's Connected Lighting Solution, which offers control over residential lighting with dimmable, wireless LED and CFL bulbs through an IP-enabled home lighting network, controllable from PCs, smartphones or handheld remotes.



Samsung unveiled Ultra-HD TVs at CES.

- Lowe's Iris home monitoring system, which was launched in 2012 and now has a raft of new products and partners. Product demos ranged from connected thermostats and wa-

ter heaters, sprinkler systems, window blinds and network-connected light bulbs to a pet door that tracks the comings and goings of five different pets and a moisture sensor

that reminds homeowners to water their plants. Will connected homeowners be utterly lost when the wireline broadband goes down? Iris has that eventuality covered, too, with a

WHO YOU GONNA CALL? GEEK SQUAD!

More gadgets mean more tech problems. More gadgets that talk to one another create more confusion about whose tech support line to call. According to research firm Parks Associates, a quarter of consumers who experience problems related to networking call their broadband providers for assistance – even if the faulty gadget came from some other source entirely. That's why providers such as Comcast and CenturyLink have expanded their support services to include premium services that were once out of scope. Parks Associates estimates U.S. tech support revenues will exceed \$8 billion in 2017.

"Consumers want a solution that covers their support needs for all of their gadgets – computers, tablets and smartphones; 72 percent of consumers interested in technical support feel the service should be able to fix every technical problem they experience," says Patrice Samuels, a research analyst at Parks Associates. "As the boundaries separating digital devices blur, support services likewise will have to expand in order to effectively resolve consumers' support needs."

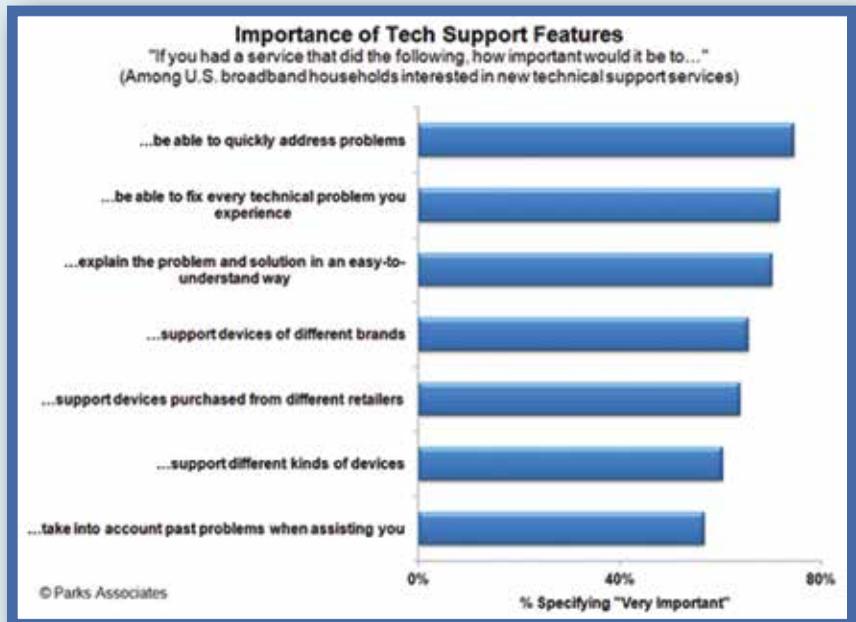
One of the most popular consumer tech support companies is Geek Squad, which launched in 1994 with one geek, \$200 and a bicycle and is now a 20,000-person division of Best Buy. In addition to offering remote and on-site services directly to consumers, Geek Squad partners with service providers, retailers, utility companies and others.

Based on firsthand experience, Geek Squad agrees with Parks Associates that the complexity of the digital home increases the need for tech support. Albert Afflitto, the manager of strategic partnerships for Geek Squad, says, "We're seeing a lot of manufacturers that built products they initially promoted as 'grab and go' and are now showing interest in Geek Squad doing the installs. We've also worked with several VoIP providers for consumers and small and mid-sized businesses who drop-ship equipment to their customers and then find they need to support them more than they planned

on. There's more need for remote support as more devices are added and more connectivity among devices is added."

In the last year, Geek Squad has turned its attention to multifamily housing communities, where its marketing channels include both service providers and property owners. Typically, a channel partner either buys Geek Squad services at wholesale and resells them or operates under a revenue-sharing agreement. Standard bundles include support for up to five devices per household. Bundles generally include PCs, tablets, smartphones, printers and game consoles, though anything with an IP address could be eligible. Though resellers can set the pricing, in at least some cases consumers receive discounted prices. Some channel partners even provide tech support as a bulk service included in the rent. Either way, it's a valued amenity and a differentiator for property owners.

Afflitto says that prime candidates for Geek Squad services include student housing, senior living communities and urban developments. "Even kids who are tech savvy may be gathering more viruses and have more devices," Afflitto explains, adding, "Senior housing may see more activity because seniors are often reluctant to troubleshoot their own PCs."



Verizon USB modem for backup.

- Allure Energy's EverSense 2.0, a home environment and energy management platform that uses the owner's smartphone location sensor to manage energy usage. When a resident leaves the house, EverSense turns down the heating or cooling. When the resident is on the way home, EverSense automatically turns climate control back to the desired setting.
- LG Electronics' new line of appliances (refrigerator, washing machine, vacuum cleaner and oven) that consumers can manage by talking to their smartphones or clicking TV remote controls. An LG spokesperson explained, "They can start a load of laundry while driving home from work, tell their robotic cleaner to vacuum the floor before company arrives or view the refrigerator's inventory of food items [before going shopping]." The refrigerator can even be programmed to order food automatically from a supermarket when supplies are running low. The refrigerator has an LCD display so its owner can watch a movie (or the Food Channel) while cooking.

HOME NETWORKING

Bandwidth delivered to a home or business is useless unless it can be distributed to user devices. Distributing bandwidth and managing connected devices is the job of a home network, and home networking technologies continue to improve, becoming faster, more reliable and more energy efficient with each succeeding generation.

This year at CES, four industry alliances shared a booth to demonstrate the complementarity of power line, wireless and coax home networking standards with one another and with DLNA (the protocol that lets devices on a network discover one another easily). Wi-Fi networking technology is most visible to consumers, and home control sensors generally use low-power wireless standards such as ZigBee and Z-Wave. However, in-home wireless still has its limitations, and stationary devices are usually best connected with wires. Because home construction varies, sev-

One new home management platform turns on the heat or air conditioning automatically when the owner's smartphone is headed home.

eral physical media (power line, coax, twisted pair, Ethernet cable and even fiber) will continue to be used for home networks, along with such standards as HomePlug, MoCA and HomePNA.

A new, more advanced home networking standard, G.hn, which can be used for power line, coax, copper and plastic optical fiber networks, is still at an early stage of development. Although G.hn chipsets have been certified and were shown at CES, no devices are yet commercially available.

Managing bandwidth in home networks has also become critical. When a home network consisted of two PCs surfing the Web, management was simple. Today, consumers use many devices and run many applications from a single Internet connection. Avoiding contention and optimizing performance (for example, streaming a YouTube video without being interrupted by the video game being played in the next room) requires intelligence in home routers.

One new intelligent router solution is Qualcomm's StreamBoost technology, which enables broadband routers to manage and shape traffic by giving each connected device and application the priority and bandwidth it requires for optimal performance. At CES, Alienware and D-Link demonstrated StreamBoost routers based on Qualcomm's VIVE 802.11ac technology for gigabit-class Wi-Fi. These routers will be available this spring.

... AND MORE

LTE for fixed broadband: Wireless providers building LTE mobile networks have promised that LTE will serve as a lower-cost, higher-performance substitute for DSL in rural areas where "true broadband" is economically challenging. Because the LTE rollout began in urban areas, where consumers don't need it for

home broadband, this claim has been unproven. However, the appearance at CES of LTE gateways suggest that LTE will indeed become the standard for low-end broadband. For example, Zyxel's LTE5121 delivers 4G fixed broadband Internet with home network connectivity options that include Wi-Fi, Gigabit Ethernet, VoIP ports and support for smart home services such as home automation and monitoring.

T-Mobile USA announced 4G Connect, a program designed to make 4G connectivity a standard, integrated and free feature on select notebooks, tablets and ultrabooks. Consumers who purchase 4G Connect devices will be able to access the Internet via T-Mobile's 4G network with no extra equipment, annual contracts or commitments.

Cloud media storage: Collectors of digital media struggle with storage of movies and music. If they store content locally, they must consume it locally. (If you've bought a movie, you might want to watch it at a friend's house or in a hotel room). Storing media in the cloud poses other sorts of problems. At CES, manufacturer Dane-Elec showed a product called my-Ditto that offers a hybrid local *and* cloud storage solution – the best of both worlds, the company says.

Connected gadgets: As a famous philosopher would have said if he had known about Facebook, the unrecorded life is not worth living. Certainly, the unrecorded snowboard run is not worth snowboarding. Resort owners will have to beef up their broadband connections to accommodate the latest generation of snow goggles, such as Liquid Image's APEX HD+, which has full HD recording, built-in Wi-Fi and a rotating camera lens. Wireless capabilities include live streaming to an iOS or Android device, file playback, remote control and adjustment of camera settings.



ARCTIC WHITE

JET BLACK

CHERRY RED

The Pebble Watch has customizable watchfaces and connects to the Internet through smartphones.

If you thought cellphones had made watches unnecessary, wait till you see the Pebble Watch, which was crowd-financed through Kickstarter in 2012 and made its debut at CES 2013. The watch is infinitely customizable and has downloadable watchfaces, Internet-con-

nected applications and notifications. Pebble connects to iPhone and Android smartphones using Bluetooth, alerting wearers with a silent vibration to incoming calls, emails and messages.

DISH Hopper with Sling: DISH combined two favorite products – a

whole-home DVR and a gadget for uploading content via the Internet to a remote device. The new Hopper with Sling lets customers watch live and recorded television anywhere on Internet-connected tablets, smartphones and PCs as well as move recorded television to an iPad for viewing without an Internet connection. The new offering was reportedly slated to receive CNET’s “Best of CES” award until CNET’s parent company, CBS, which is in litigation with DISH over the Hopper’s commercial-skipping abilities, put the kibosh on that plan.

HealthSpot: The new telemedicine service HealthSpot generated excitement at CES. The HealthSpot Station is a private, walk-in kiosk that offers live access to board-certified doctors via high-definition videoconferencing and interactive digital medical devices. When located in pharmacies, office buildings, schools and other public spaces, the kiosks promise to make possible doctor visits that are convenient, quick and devoid of downtime and hassle. ❖

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