

Smart TV, Smart Homes Take Top Billing at CES

At the annual extravaganza known as the International CES, vendors introduced many new bandwidth-gobbling devices and services. These will present opportunities for providers that can offer robust broadband.

A BBC Staff Report

The biggest, baddest trade show of them all – the International Consumer Electronics Show, held in Las Vegas each January – was bigger and badder than ever this year. The 2012 International CES drew a record 153,000 attendees, including 34,000 from overseas. More than 3,100 exhibitors, occupying 1.9 million square feet of exhibit space, introduced an astonishing 20,000 new products.

As usual, the show offered a foretaste of what will drive consumer bandwidth demand: more indispensable gadgets, more video content, more high-resolution formats, more (and easier) connectivity and more services moving to the cloud.

For broadband service providers, two noteworthy trends were over-the-top video – especially delivered to TV sets – and home monitoring and control. Over-the-top video has been gathering steam (and making broadband providers anxious) for several years, but the home monitoring market is just beginning to take off.

More gadgets, more video content, more high-resolution formats, more connectivity, more cloud services.

FIRST, A GRAIN OF SALT

Not all the consumer electronics products and services introduced with great fanfare in earlier years have met expectations. That's no surprise, given the continued weak economy and other challenges. Cisco discontinued the Flip camcorder last year – who needs a Flip when filming videos on a smartphone and uploading them to Facebook is so easy? (However, Toshiba introduced three Flip-like devices at this year's CES, so Cisco may not have had the final word on this subject.) Cisco also discontinued the Umi personal telepresence system, which most observers thought vastly overpriced. Sezmi, which offered an over-the-top video service, exited the business and sold its patents – again, a case of consumers' rejecting expensive

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New consumer electronics devices are affecting bandwidth demand in MDU housing. Find out more at the Broadband Communities Summit.

proprietary hardware. Digital photo frames, though they can still be purchased in any Walmart or Best Buy store, failed to generate excitement at this year's CES; this category may soon be superseded by tablet computers.

Google TV has been slow to catch on despite Google's effort to assemble an ecosystem of device makers, service providers and application developers. Users don't find the interface particularly inviting; more important, Google failed to line up enough content. At present, the software is available on only a few television models. However, as analyst Colin Dixon of The Diffusion Group points out, because Google is "the only company at the table with an ostensibly open platform," Google TV could eventually become as prevalent in the TV world as Android is in the mobile world. (Dixon doesn't expect that to happen any time soon.)

In any case, Google TV should probably be seen as part of a long-term strategy that includes the makeover of YouTube from a destination for cat videos to a home for mainstream but independently produced long-form content – in other words, the TV of tomorrow. Other aspects of the strategy involve building a gigabit network in the two Kansas Cities to test the TV of tomorrow and, perhaps, offering a pay-TV service over the KC networks.

3DTV has also been slow out of the gate. A Parks Associates survey of broadband households conducted just before the 2011 holiday shopping season found 3DTV ownership and

interest in the mid-single digits. Broadcasts in 3D continue; ESPN, despite rumors that it would drop 3D, actually broadcast a boxing match in 3D from CES. However, the scarcity of content and viewers' disappointment with the experience have kept 3D from becoming a force to reckon with – so far.

CONNECTED VIDEO

Despite some failures, online video remains the dominant theme of consumer electronics. Analyst firm NPD In-Stat expects the number of connected devices installed to grow from 257 million units in 2011 to 1.34 billion units in 2016.

Mobile devices such as smartphones and tablets – which are multipurpose but are particularly well suited to video – have been wildly successful, and CES featured plenty of them this year. A new mobile device category called the ultrabook made its debut. Ultrabooks, based on Intel Sandy Bridge processors, are lightweight, powerful laptops that share many of tablet computers' advantages. Some even have touchscreens.

Other successful categories include connected Blu-ray Disc players, hybrid set-top boxes, set-top boxes dedicated to OTT video and connected (aka smart) TVs. Smart TVs, which were shown by every major manufacturer at CES, have proven popular with consumers. The same Parks Associates survey that showed little demand for 3DTVs showed much higher ownership of, and interest in, connected TVs. According to numerous surveys, the great majority of people who buy connected TVs use them to watch online video in addition to standard video services.

For those who aren't ready to replace their television sets, hybrid set-top boxes remain a less expensive solution. "The next logical iteration is for the set-top box to enhance and expand traditional TV-related services by permitting access to content from the Internet or from Internet-like Web services that provide a 'walled garden' of authorized content," says Gerry Kaufhold, research director of NPD In-Stat. "By combining traditional TV services with 'enhancements' that come in via broadband, content owners and service providers think they can successfully compete with all



The size of a USB flash drive, the Roku Streaming Stick plugs into a TV and delivers streaming online video.

the emerging over-the-top approaches." NPD In-Stat forecasts that more than 23 million hybrid STBs will ship in North America in 2012.

Roku, the manufacturer of a popular dedicated video player, introduced a new device that promises to make its old device obsolete: the Streaming Stick, a Wi-Fi-enabled device about the size of a USB flash drive that plugs directly into a TV to deliver streaming video. The stick, which can be controlled by a TV remote, will not require cables or a separate power source. Like Roku players, it will deliver more than 400 channels and will receive free software updates and channel enhancements.

Of course, the stick can be attached only to televisions that have the necessary receptacle, but Roku designed the device using MHL, a new standard that makes use of HDMI connectors on TVs and that has been adopted by nearly 100 vendors. Best Buy's house brand, Insignia, plans to bring out stick-compatible TVs later this year.

Kurt Scherf, vice president and principal analyst at Parks Associates, calls the Roku Streaming Stick "a game changer for the smart TV market," adding, "It takes the leading streaming platform and integrates into the TV in a way that no one has been able to do before."

Televisions themselves are becoming more versatile. For example, Samsung's smart TVs feature built-in HD cameras and microphones, which enable voice and gestural controls as well as Skyping. The TVs offer more than 1,400 apps, and the number of third-party developers has grown to 25,000. New family-oriented services include photo sharing, syncing of fitness goals and activities, and integration of educational programming with educational progress monitoring.

Like Roku, Samsung appears to have cracked a tough problem that limits adoption of smart TVs – their tendency to become quickly outdated in a fast-changing world. Samsung's new Evolution Kit lets owners upgrade their TVs' "smarts" on a regular basis without having to invest in new televisions.

SHARING CONTENT ACROSS DEVICES

Another boost to online video may come from the UltraViolet standard. In an effort to discourage users from illegally burning DVDs, the industry has struggled to provide a legal, authenticated method for consumers to store purchased video content in online "lockers" and view it from multiple devices.



Samsung's user interface for its smart-TV products features a variety of popular services and content.

CES INSIGHTS FROM PARKS ASSOCIATES

VIDEO SERVICES, PAY TV, AND OTT

Consumer viewership of online video dramatically increased in the past few years, and this trend will continue in 2012.

- Nearly 70 percent of U.S. broadband households viewed online video on their PCs at least monthly in 2011, compared with 38 percent in 2006.
- Netflix recently announced that its members around the world viewed more than 2 billion hours of content in Q4 2011 alone.
- Consumers acquired an increasing number of platforms they can use to watch digital video. Throughout 2012, households will consume more and more video on mobile devices such as tablets and smartphones.

In the past 12 months, 12.7 percent of U.S. pay-TV subscribers downgraded their pay-TV services.

- This trend will impact ARPU and overall revenues and resonate throughout the content ecosystem in 2012.
- Operators will continue to explore new and creative ways to monetize their investments in VOD and multiscreen delivery systems.

Providers rapidly expanded their multiscreen services in 2011 as a deterrent to subscriber and revenue loss due to online video and OTT services.

- By mid-2011, 80 percent of U.S. pay-TV subscribers could receive on-demand content on non-TV screens in their homes through services provided by their pay-TV providers.
- Growth in multiscreen services will continue in 2012 despite implementation costs and unproven business models.
- By the end of 2012, the impact of multiscreen offerings on subscriber churn and business models will be clearer to operators.

PLATFORMS AND NETWORKS

Worldwide sales of “fixed” connected consumer electronics such as smart TVs, connected Blu-ray players, game consoles, and digital video media players will grow from 156 million in 2011 to more than 320 million in 2016.

- Regardless of whether Apple enters the smart TV market with its “iTV” product, gesture recognition and voice control will be defining features of the smart TV experience.
- Trends to watch in the smart TV space include interactive features between the TV and portable devices, automatic content recognition solutions, applications development and the impact to all video delivery channels – pay TV, download, streaming and broadcast.

Broadband households in North America and Europe own an average of 5.4 and 4.8 connectable devices respectively.

- By 2016, ownership of these devices will almost double to 9.8 in North America and 9 in Europe.
- Increasing adoption of connected platforms capable of accessing this content online will fuel growth in digital media distribution in 2012. These devices include desktop computers, smart TVs, Blu-ray Disc players, game consoles, laptops, netbooks, tablets and smartphones.
- Each device category is at a different stage of maturity, and penetration will follow a different growth rate. Overall, connected devices will more than double their presence among broadband households.

MOBILE CE AND SERVICES

Global smartphone shipments exceeded 460 million units in 2011 and will reach 1.3 billion units in 2016.

Smartphones drive mobile data adoption, putting more pressure on mobile operators’ network capacity management and data plan pricing models. Smartphone user growth translates into skyrocketing mobile data usage, which will test network capacity as well as pricing power of the operators. Operators have several solutions to manage this data traffic, including the following:

1. Intelligent network policy protocols to prioritize network traffic by type through solutions from companies such as Tekelec
2. Traffic optimization tools for data-intensive applications such as video, using solutions from companies such as Bytemobile
3. Offloading solutions such as Wi-Fi and small cell technologies from companies such as Kineto Wireless and IP Access
4. Expanding capacity by acquiring spectrum and moving traffic to efficient networks such as LTE.

Only 58 percent of U.S. mobile data users are very satisfied with their monthly data quotas, and only 41 percent are satisfied with the prices of their current data plans. How mobile operators address consumer data needs and dissatisfaction with costs will be critical issues in 2012.

Robust tablet sales point to a dramatic shift in content consumption behaviors in the next few years.

- Worldwide, 56 million media tablets (excluding e-book readers) were sold in 2011, and sales will top 280 million units in 2016, making tablets a major computing and Internet media platform.

- Tablets will overtake PCs as the top Internet traffic driver by platform in 2016, when U.S. household penetration will exceed 67 percent.

ADVERTISING AND SECOND-SCREEN ACTIVITIES

Second-screen content and ad integration will take off in 2012.

- Almost 20 percent of U.S. smartphone and tablet owners currently search for TV program information on these devices while they watch TV, despite the limited availability of synced applications. Creating and enhancing second-screen synergies offer new revenue streams and ad inventory opportunities.

Consumers are becoming more comfortable with personalized TV and Internet advertising.

- More than one-third of TV and Internet users are comfortable with personalized TV and Internet ad targeting techniques (38 percent and 34 percent respectively).
- Generally speaking, consumers are more comfortable being targeted by advertisers (involuntarily) than with providing personal information to receive ads for products or services of interest.

CONNECTED-HOME SYSTEMS AND SERVICES

Energy management is moving into mainstream markets.

- Smart-meter deployments will reach 56 million by 2015, at which time 45 percent of U.S. households will have smart meters. Smart meters and the data they generate will enable utilities to add services to improve their relationships with consumers. Energy

management systems can mine customers' smart-meter data and provide meaningful comparisons, individualized recommendations and real-time feedback about usage anomalies.

- Broadband and security providers are starting to offer energy management and home controls. Offerings from early entrants ADT and Verizon will be followed by offerings from Time Warner Cable, Comcast and AT&T.
- Among U.S. broadband households, "energy monitoring has the highest appeal among possible value-added services, followed by energy management services. However, the revenue potential from these services may be limited, as no single payment plan gets the majority of support. As a result, there are several different paths to market – for example, bundling energy management with remote control and monitoring, offering an energy monitoring service for a nominal fee and packaging energy management with security and remote control.
- Big-box retailers are also entering the market. Lowe's is offering energy management products with the launch of its Iris platform.

Enhanced capabilities offered by IP-based security will expand the percentage of U.S. households with professionally monitored services to 30 percent by 2020.

- Of the 30 percent of U.S. households with security in 2020, more than half will have IP-based services.
- Broadband ISPs will capture 80 percent of the IP-based security market.

The new UltraViolet standard, which dozens of technology companies support, promises to do just that. Though usability problems have prevented the standard from gaining traction, Amazon announced that it will begin selling movies in UltraViolet format from a major studio. Neustar, a company that provides basic telecommunications infrastructure services such as phone number portability, will manage the online locker.

UltraViolet-compatible offerings at CES included Technicolor M-GO, a cross-platform, cloud-based search and discovery engine that offers seamless access to content across all connected devices. M-GO can also be used with smartphones or tablets as a "second-screen experience" – that is, a consumer

can use a mobile device to find content and then "throw" that content to a TV to watch it. Initially, M-GO will be available on ultrabooks; on Samsung Smart TVs, Blu-ray Disc players and Galaxy tablets; and on VIZIO televisions, tablets, Blu-ray Disc players and stream players in the VIZIO Internet Apps Plus ecosystem. TDG's Dixon comments, "If you purchase an UltraViolet movie through the Amazon store, you should be able to play it through M-GO... That will be a good test, when M-GO is released, to see if the UltraViolet standard is truly a standard."

Dixon also notes that consumers who use UltraViolet will have to upload their own movies to the online locker. "The drawback is that to upload few hundred DVDs will take much longer than up-

loading CDs," he says. "Upstream bandwidth could be a big barrier."

TV Everywhere also remained an important theme. For example, Cisco added TV Everywhere capabilities to its Videoscape hybrid TV platform. Videoscape, which has been deployed by such providers as Canada's Rogers Communications, YES of Israel and Numéricable of France, will now offer a consistent look and feel across devices. Service providers can use Videoscape to deliver live and on-demand video to as many as six devices in a home, including personal computers and mobile devices.

HOME MONITORING AND CONTROL

Home monitoring and control is shaping up as the next revenue opportunity



Pella's SmartSync technology, integrated with Lowe's Iris system, allows shades and blinds to be controlled through Web-enabled computers and smartphones. (Courtesy of Pella Windows and Doors)

an energy control kit, features a thermostat control, appliance controls and a circuit box sensor to measure electricity usage throughout the house. Add-on devices include remote door locks, pan-tilt-zoom outdoor cameras and window and door sensors that turn lights on when a door or window is opened. The monthly charge is the same no matter which package a customer chooses or how many devices are added. Verizon says nearly 60 percent of users access the service via mobile devices.

Another service provider that offers home automation services is Deutsche Telekom, which will implement Smart Connect platforms from Sumitomo Electric Networks beginning in mid-2012. Subscribers will be able to use a remote computer, smartphone or tablet to lock or unlock doors, control lights and appliances, and manage heating and air-conditioning equipment.

for broadband service providers. Even though home-automation systems typically operate over ZigBee or Z-Wave networks inside homes, residents need reliable broadband connections to use the systems remotely (for example, to let a repair person into a home or turn on the home air conditioner before leaving the office). For systems that include networked video cameras, upstream bandwidth is critically important.

Dedicated do-it-yourselfers buy and install these systems themselves, but many consumers prefer buying them from telecom providers that can set up the systems and bundle the service into a regular monthly bill. Verizon, which last year launched a home monitoring service based on the Motorola Mobility/4Home platform, recently selected InstallerNet as its professional installer of choice. Customers can either install the equipment on their own or use InstallerNet, a nationwide referral network, to schedule a professional installation with a local installer at a discounted rate.

Verizon offers two packages. The more popular package, a home monitoring kit, lets customers turn lights on and off remotely and peer through networked cameras. The second package,

VENDOR SPOTLIGHT

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AlertMe	www.alertme.com
Amazon	www.amazon.com
Broadcom	www.broadcom.com
Cisco Systems.....	www.cisco.com
D-Link	www.dlink.com
Evolve Guest Controls.....	www.eguestcontrols.com
Haier	www.haier.com
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Ingersoll Rand	www.ingersollrand.com
Insignia.....	www.insigniaproducts.com
InstallerNet.....	www.installernet.com
Intel	www.intel.com
LG	www.lg.com/us
Lowe's.....	www.lowes.com
Lutron.....	www.lutron.com
Mindspeed	www.mindspeed.com
Motorola Mobility/4Home	www.motorola.com
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Service providers won't have the smart-home market all to themselves. Lowe's, the world's second-largest home improvement retailer, entered the market with a cloud-based home management system, Iris, which will be available in mid-2012. AlertMe, a British company, provides the software and hub device for Iris.

Iris, which Lowe's says "will offer simple, scalable solutions at price points attractive to the mass market," will allow customers to control thermostats, locks, lighting and appliances from any mobile device. Customers will also be able to monitor and protect their homes with video cameras and door, motion and fire sensors.

"This is an exciting development in the connected home space," comments

Stuart Sikes, president of Parks Associates. "While there have been various simple applications such as remote management of HVAC systems that have delivered significant savings, until now there have been few comprehensive offerings aimed at the mass market. Lowe's new Iris product and service platform has the attributes needed to break down these barriers and reach the consumer with a scalable solution at an affordable price, and it should position the company as a formidable leader in this space."

Ingersoll Rand, whose Trane and Schlage devices are used both in Verizon's offering and in Lowe's, also showcased its own system, Nexia Home Intelligence, at CES. Nexia, which won design and engineering awards at the show, is included in many of the new houses built by Len-

nar Homes. It lets consumers remotely manage door locks, heating and cooling, video surveillance, lights, shades and energy usage via Web-enabled computers and most smartphones and tablet computers. Users can also receive text alerts notifying them of when people arrive at and depart from their homes.

Ingersoll-Rand showed several new features at CES, including the ability to record live home video, trigger recording based on specified parameters, and activate window and door sensors during nighttime hours only. Later this year, the company plans to add whole-home energy monitoring at the circuit level and an astronomical clock that enables homeowners to adjust lighting and shades based on sunrise and sunset times.

CES INSIGHTS FROM ERICSSON CONSUMERLAB

Ericsson researchers identified the hottest consumer trends for 2012 and beyond, based on annual interviews with 100,000 individuals in more than 40 countries and more than 10 megacities. They found

- Connectivity has become as essential as roads and electricity.
- Social media are redefining news reporting.
- Anyone can now be a service provider.

Michael Björn, head of research at ConsumerLab, says, "Consumers have taken to smartphone apps like fish to water. Touch and direct access via icons hide the complexity of Internet services, and people are now willing to explore many new areas of everyday life – anything from recipes to receipts – that benefit from connectivity. We just concluded a study in emerging markets and found that even first-time mobile-phone users very quickly become Internet users. Connectivity is becoming an increasing part of their daily activities."

Some of the findings include the following:

1. **Connectivity is king.** Connectivity has become as essential as air. Once they are connected, consumers say the Internet is one of the last things they would give up if they had to reduce their expenses.
2. **Everyone can be a service provider.** There is a huge demand for new services. The Internet makes it possible for both companies and consumers to invent new solutions, such as apps.
3. **Social media redefine news reporting.** Social media drive consumption of pictures, video clips and music, and now they also help consumers judge

the relevance of news by providing necessary social commentary.

4. **Mobile phones play a significant role in everyday life.** Consumers show most interest in mobile services that are directly related to nearby places or local services. Although 90 percent of all smartphone owners always carry their phones with them, only 80 percent of them mention carrying money.
5. **Transparency is more important than privacy.** People are getting used to living transparent lives, and they expect companies and other organizations to act transparently as well.
6. **The cloud makes things easy to use.** Sharing information and having several devices connected at all times is becoming the norm for consumers, resulting in the introduction of more cloud-based services. The main driver is ease of use.
7. **Everything connects.** Mobile data surpassed voice in the fourth quarter of 2009 and doubled voice in the first quarter of 2011. Consumers are increasingly connecting to the Internet and to things around them, such as cars, vending machines and ticket gates.
8. **In uncertain times, consumers strive for control.** In times of economic instability or when disasters such as earthquakes occur, we see renewed interest among consumers in services related to utilities such as water and electricity. Likewise, a change in disposable income is driving demand for consumers to be in control of service consumption.

CES INSIGHTS FROM ZYXEL: IMPLICATIONS FOR SERVICE PROVIDERS

Following are excerpts from a Broadband Communities interview with David Thompson, director of product management at ZyXEL Communications, which manufactures broadband customer-premises equipment.

What do new consumer devices mean for service providers?

Over-the-top video is growing by leaps and bounds. The Boxee Box, Roku 2 and Google TV all lead to an increased need for getting higher speeds into the home. Some providers are putting in usage caps, but quite a few more are trying to meet the growing customer needs for increased speeds and content. Many telcos are pushing DSL to its highest limits – 45 Mbps to 50 Mbps for ADSL with pair bonding or even higher speeds for VDSL, both constrained by the length [of copper loops]. We've seen more trials of bonded DSL in the last six months than we've seen in a while. Most homes already have at least two pairs running to the house.

We're also involved in vectoring trials now. Vectoring [elimination of DSL cross talk] has to be supported on both sides, so it may require new customer-premises equipment, but virtually all the equipment we've announced in the last year can be upgraded to support vectoring. Vectoring does amazing things for DSL's reliability and overall speed. It's a very useful technology for telcos to roll out, especially if they don't have to upgrade their customer-premises equipment.

[Another option for telcos is to bring fiber all the way to the home.] Most fiber ONTs have no home networking or even Wi-Fi built in; a provider either gives a customer an Ethernet connection into the home or puts a second gateway inside the house. With our universal gateway device, when a customer migrates from copper to fiber, the provider puts an ONT on the side of house and connects it to the Gigabit Ethernet port in the gateway inside. The customer doesn't see any change, just higher speeds.

What's the advantage of using a residential gateway with fiber to the home?

Gateways can support services such as device management through the TR-069 protocol. There's nothing keeping telcos from continuing to manage [customer devices] through TR-069 when they switch to fiber. Full manageability, quality of service, help with Wi-Fi settings and so forth – everything is still available.

Does broadband video increase bandwidth requirements inside the home?

Yes. If you're watching online video on your computer or smart TV and the speed of the network within the home isn't fast enough, you'll have buffering.

Inside a home, technologies for connectivity include high-power wireless for TV use, power line networking and HPNA. Wired networks that use HomePlug and HPNA can support higher-bandwidth applications such as OTT video and IPTV without running any new wires. Existing power lines and coax lines can be used for home networks.

The HomePlug Powerline Alliance just announced the availability of the HomePlug AV2 specification, which will allow 500 Mbps home networking equipment and support higher transfer rates within the home. Our new Homeplug adapter looks like a power adapter – you plug it into a wall and plug the Ethernet cable into the box. That lets you get Internet into a room where you otherwise wouldn't have coverage.

Didn't power line networking have problems in the past?

Newer versions of power line networking are much more reliable and easier to use. If the three little lights are all green, you're OK; if they're yellow or red, you're not. We did a large-scale trial with a North American provider, and it worked in 96 percent of the homes. Earlier versions were reliable up to 30 Mbps of bandwidth, and now with the new adapters it's even better than that.

Why don't telcos use wireless connections?

Consumers are starting to overload their wireless connections. With all the devices now connected – iPhones, tablets, TVs, laptops, game consoles, Blu-ray Disc players – everything begins to slow down. There can easily be 10 or 12 Wi-Fi-enabled devices in a home, all on 2.4 GHz, so wireless congestion is becoming a bigger problem.

Also, no standard Wi-Fi router handles video well, and no service providers are trying to deliver IPTV over wireless without dedicated boxes. We make a wireless streaming adapter (the WAP5605) that's optimized for video and uses a different frequency, 5.8 GHz, to avoid congestion. Telcos are using it as an upsell or when they don't want to run new cabling through a home – if there are no existing cables where the customer wants to put the TV and they don't want to run Ethernet connections. We're looking at getting to the point where streaming video wirelessly is less expensive [than using a wired network], but we're not quite there yet, except in a few cases where there's a particularly difficult cable run.

We also have a 60 GHz short-range product. It carries video signals via HDMI from a transmitter to a receiver. It lets consumers get rid of the cables hanging down from their wall-mounted TVs, so it's a good upsell product for IPTV providers. Telcos didn't even realize they had this problem till we showed them the solution! Customers

are willing to spend money to keep their living rooms looking nice. Each transmitter handles four devices, so you can attach a set-top box, a game console and more. It keeps the cables nice and short.

Any new opportunities for service providers?

The biggest one is home automation and monitoring, together with energy-monitoring applications such as controlling a thermostat with an iPhone or seeing how much power you're using. ZyXEL is making an OSGI-enabled gateway that connects to in-home appliances

and talks back to the cloud. We put one or more USB ports on the gateway and get an adapter to Z-Wave or ZigBee. The service provider enables applications on the gateway that use the adapter to talk to Z-Wave or ZigBee devices in a home.

There is a market for people who want to know how much power any given device is using. If they find out a TV is using a lot of power, they can plug it into a power strip and turn it off. Then there are applications such as turning appliances on and off remotely – those are real applications that consumers want now.

Additional home monitoring and control news from CES included the following:

- **IBM ecosystem:** Though it did not make any product announcements and had no booth, IBM showcased a smart-home ecosystem it is developing along with several partners, including Lutron and EnBW. The system features a cloud remote platform, a residential gateway and wireless home control sensors.
- **Rockethome platform:** Rocket-home demonstrated its platform for intelligent metering and home management, powered by Mindspeed processors, which lets consumers optimize their home environments for comfort and efficiency. Users link home appliances and multimedia equipment inside the home and over the Internet, then control them and automate functions while measuring usage and efficiency. A home security management suite is also included.
- **Tri Cascade thermostat:** Tri Cascade announced an energy gateway thermostat with a management application that will allow homeowners to reduce energy consumption by up to 35 percent. Two-way communications with utility companies help the utilities balance demand and supply by shedding load during times of critical peak demand.
- **D-Link Cloud Camera:** This camera has remote pan/tilt capabilities and automatic day/night viewing of live HD video feeds from any desktop or with an iPhone, iPad or Android device. The camera sends e-

mail alerts when intrusions or disturbances occur and can trigger recording from integrated external devices, including doorbells, alarms, lighting and motion sensors. Another new camera, the Enhanced Wireless N Day/Night Home Network Camera, comes equipped with enhanced motion detection and night vision to see up to 15 feet in pitch black. The camera also has a built-in microphone.

- **ZyXEL Web cameras:** ZyXEL Communications launched the CloudEnabled series of Web cameras, featuring cloud-based technology that eliminates traditional installation processes. Video feeds are accessible via Internet-connected personal computers, iPhones or Android devices. The cameras incorporate 802.11n wireless technology to enable uninterrupted surveillance, and an array of Infrared LEDs automatically illuminate dark areas, pro-

viding visibility up to 15 feet. Pan-tilt-zoom functionality allows a user to pan a camera up to 340 degrees and tilt it up to 100 degrees.

- **Haier "cloud-living" TV:** Whitegoods manufacturer Haier is placing televisions at the center of connected homes. Its "cloud living" TV is the hub of a smart home, relaying information to cellphones and computers and serving as a remote control for washing machines and other appliances. (If that's not impressive enough, Haier also showcased mind-wave technology that allows users to change TV channels and volume levels with their thoughts. Unfortunately, Broadband Communities reporters missed that demonstration.)
- **Samsung connected washing machine:** Samsung took laundry-room technology to a new level with its connected washing machine, the Wi-Fi-enabled WF457 washer. Via



The Digital Health Summit at CES focused on a fast-growing market where health, wellness and technology converge.

CES INSIGHTS FROM BROADCOM: CONNECTING EVERYTHING

"Connecting everything" is an apt tagline for Broadcom, whose system-on-chip solutions and embedded software products deliver voice, video, data and multimedia connectivity in home, office and mobile environments. Because its solutions power so many devices, the company is well-positioned to discern trends throughout the entire consumer electronics industry.

At CES, Broadcom introduced six new set-top box and hybrid gateway platforms based on the MoCA 2.0 standard. This new version of MoCA (short for Multimedia over Coax Alliance) – a home networking protocol for sending broadband data over coaxial cable – more than doubles its predecessor's performance and enhances broadband video quality. It enables more energy efficiency, supports higher levels of security and has the support of operators that include Comcast, Cox Communications, DIRECTV, DISH Network, Time Warner Cable and Verizon.

Steve Palm, Broadcom's senior technical director, says the need for MoCA – and for faster home networks generally – is driven by TV Everywhere. "It has a lot of names, but it's really about getting commercial content onto all kinds of devices in the home," he says. "Tablets, mobile phones, smart TV – these are all important pieces to getting the infrastructure out there." The challenge for service providers, Palm adds, is finding a backbone on which to move data in the home. He believes coax is the obvious choice in most homes. "Cable and satellite have been using coax for a long time, and MoCA is still the technology of choice for wired needs."

In response to concerns about network power management, MoCA 2.0 was designed to put network devices into low-power mode when they are not being used and wake them only to perform a task. Palm offers an example: "Suppose you have your main set-top box in the living room, not doing anything, but you're in the bedroom and you want to schedule a recording to watch later. The set-top box in the living room has gone to sleep, but the set-top box in the bedroom says, 'Hey, wake up and schedule something.' It gets it all organized, and when it's done, they both go back into low-power mode." Device manufacturers, service providers or users can set the parameters for putting devices into sleep or wake modes.

WHY SET-TOP BOXES ARE KEY

Broadcom doesn't restrict its efforts to MoCA, however. It supports many other standards – including DLNA, Wi-Fi, Wi-Fi Display, NFC, HomePlug and Ethernet – with the aim of turning any of the almost 2 billion nonconnected digital TVs in the world into Internet-connected smart TVs and delivering video content to mobile de-

vices as well. Palm sees set-top boxes as key to this effort. Though some device manufacturers focus on Blu-ray Disc players as connectivity hubs, Palm asks, "Do you even need that disc player anymore? People are getting their video from the network, so we're focusing on connectivity and features for the set-top box – that's where the sweet spot is."

In fact, even a smart TV might need help from a smart set-top box by the time it's a year or two old. Palm explains, "When people buy a TV, they don't want to replace it soon, but they do want new features and functions. So we see a need for an over-the-top set-top box – a small-form-factor device with a lot of functionality. People don't feel so bad about replacing that."

He adds, "In order to get a TV cost-competitive, it can't have much memory, CPU, or 3D graphics. That all costs money. If you were to build a TV that could run the kinds of applications that will be available five years from now, you couldn't sell the TV."

THE QUEST FOR A UNIVERSAL DEVICE

Though most of Broadcom's reference designs are incorporated into set-top boxes made for service providers, it also released designs at CES for OTT devices that consumers could purchase from electronics stores.

The company also makes chipsets for hybrid boxes that offer access to both broadcast TV and over-the-top content from a single device. These include hardware hybrids with TV tuners and software hybrids with built-in access to pay-TV content. However, there is still no universal device that supports access to any service.

"Today, if you don't have the right connector on a tablet, you can't get cable service. There's one box per service," Palm says. "The end game is that consumers should be able to get any content and any service on any device."

Sling Media, whose devices "sling" live TV programming to other screens inside or outside a home, offers another approach to distributing video. (Sling can be considered the original TV Everywhere.) Broadcom has now built Sling software into one of its MoCA gateway chipsets. This gives service providers the option of allowing subscribers to watch premium broadcast content on any wireless Internet-connected device.

Palm explains, "Sling's software is really good at figuring out how to get behind firewalls and also figuring out how good the Internet connection is and adjusting the bit rate accordingly. That built-in transcoding lets us support variable bit rates on the fly in a set-top box, without having a separate box."

Broadcom also announced support for Myriad Alien Vue, a new TV platform that allows Android apps to run alongside existing television functions. Alien Vue lets

CES COVERAGE

service providers add thousands of applications and entertainment services to their set-top boxes without completely overhauling their operating systems.

Palm says, "People are accustomed to putting cool software, games and so forth on their phones and tablets, and now they'll be able to put Android apps on set-top boxes. Typically Android is the operating system [for

the set-top box], but sometimes service providers have their own middleware. Alien Vue allows Android games to work with their operating systems – the best of both worlds."

Palm's summation of 2012 CES: "Good, healthy competition spurs great innovation. We're seeing some really cool things."

a smartphone and a wireless router, a consumer can monitor cycle selections, remaining time and finishing alerts and remotely start or pause the washer. Samsung's Smart Care system diagnoses washer issues and sends alerts to consumers' smartphones. The WF457, the first smart grid-ready Samsung washer, was a 2012 CES Innovations Award honoree.

- **Samsung grocery app:** Samsung also introduced a grocery manager app for refrigerators that will allow consumers to track the locations and

expiration times of perishables.

- **LG and Whirlpool also showed smart appliances.**
- **ADT interactive smart home solution:** ADT Pulse now makes up almost a quarter of ADT's new residential sales. This home monitoring and control solution helps provide 24/7 monitoring of intrusion, fire and carbon monoxide along with video of events, lighting, climate control, appliances and more. New additions include an indoor, low-light wireless camera, a wireless touch screen that can be used any-

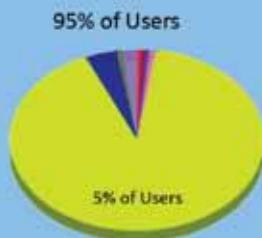
where in the home, an outdoor wireless IR camera and a Wi-Fi repeater.

- **Poly-Control door lock:** This new Z-Wave controlled lock can be mounted on almost any existing door lock.
- **Evolve Guest Controls thermostats:** Evolve debuted thermostats and infrared motion sensors for the hospitality industry.
- **Somfy Systems:** Somfy, which manufactures motors for window coverings, introduced technologies for controlling window coverings along with lights and thermostats. ❖

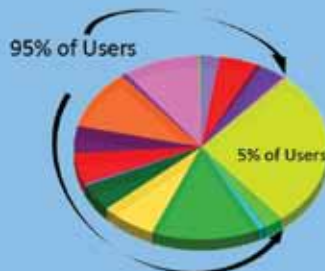
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