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Keeping viewers happy

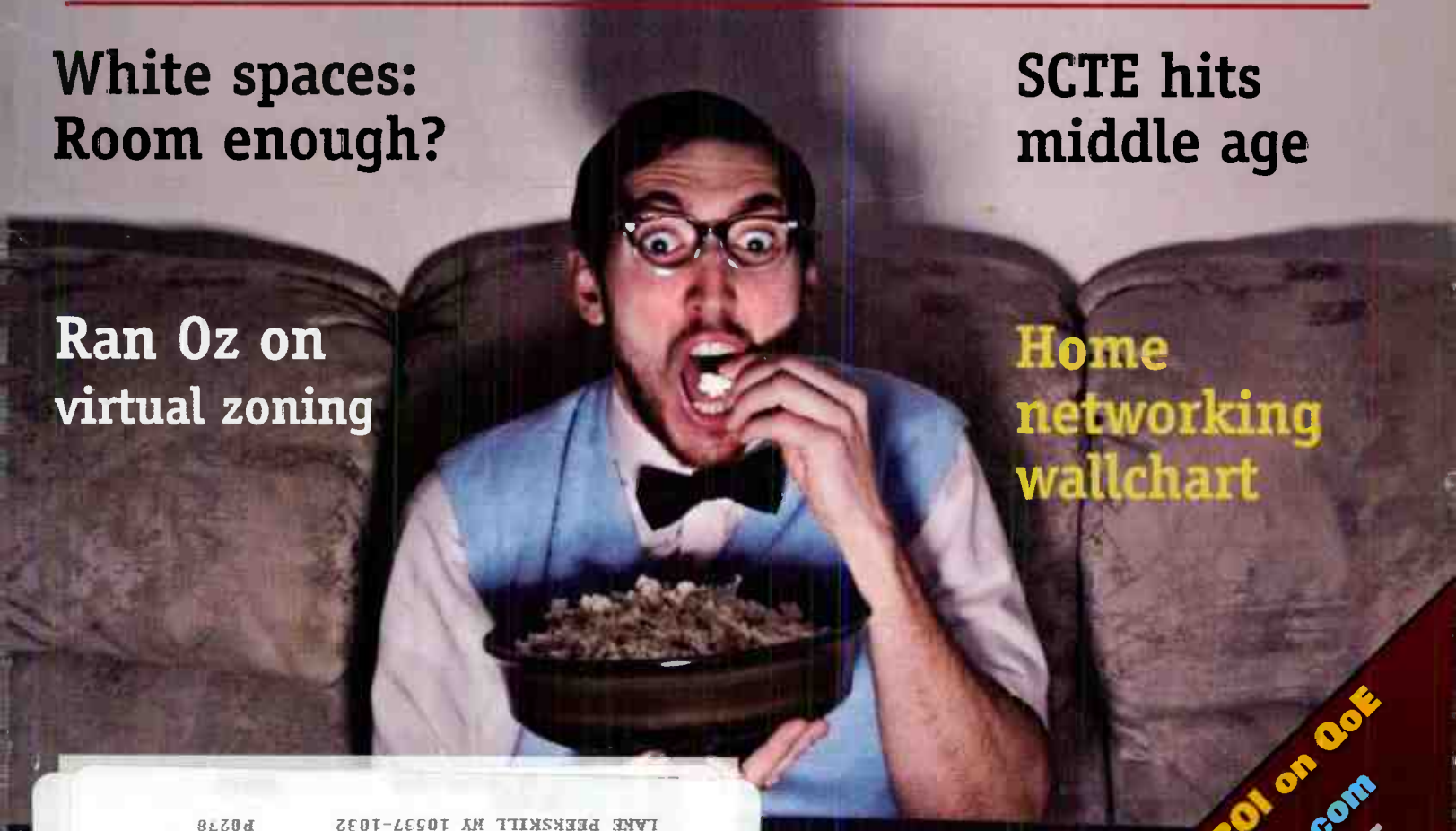
QoE is the key

White spaces: Room enough?

SCTE hits middle age

Ran Oz on virtual zoning

Home networking wallchart



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Neglect in D.C.

By Brian Santo

Editor

The NCTA should be proud for having staged a Cable Show 2009 that was a business, technological and political success.

The SCTE, WICT, NAMIC and Walter Kaitz Foundation got short shrift, however. I heard no complaints about the quality of their events, but they were all compromised by a lack of visibility and accessibility.

The NCTA demanded Cable Connections, so it was incumbent on the NCTA to assist the other organizations. It could have started with the magnanimity to give the other organizations a little space in its show guide. Under "Cable Show Sessions," you might have seen the occasional "Session sponsored by SCTE." Wow. ET who?

Consigning the other organizations to physically remote corners of the conference hall was an indignity that might have been mitigated somewhat by adequate signage, which was lacking. It was the first Cable Connection, and things slip through the cracks.

But what was the reasoning behind cramming the SCTE, NAMIC and Walter Kaitz Foundation into a corner of the schedule – Friday – when many attendees frequently leave early to get home?

What was the reasoning behind cramming the SCTE, NAMIC and Kaitz into Friday?

Hard to imagine how the NCTA could have marginalized the other events more had they been deliberate about it.

Trust me, I understand the strain of proliferating events on travel budgets. Combining events is not inadvisable. But if the NCTA is going to bully its confederates into another Cable Connection next year, those other events – all highly valuable to their constituents – are going to wither further from neglect unless the NCTA is a little more considerate.

In Denver in October, the schedule appears kinder to the SCTE, CTAM, NAMIC and other participants. The SCTE is anticipating a Cable-Tec Expo every bit as successful as The Cable Show was. We'll see you there.

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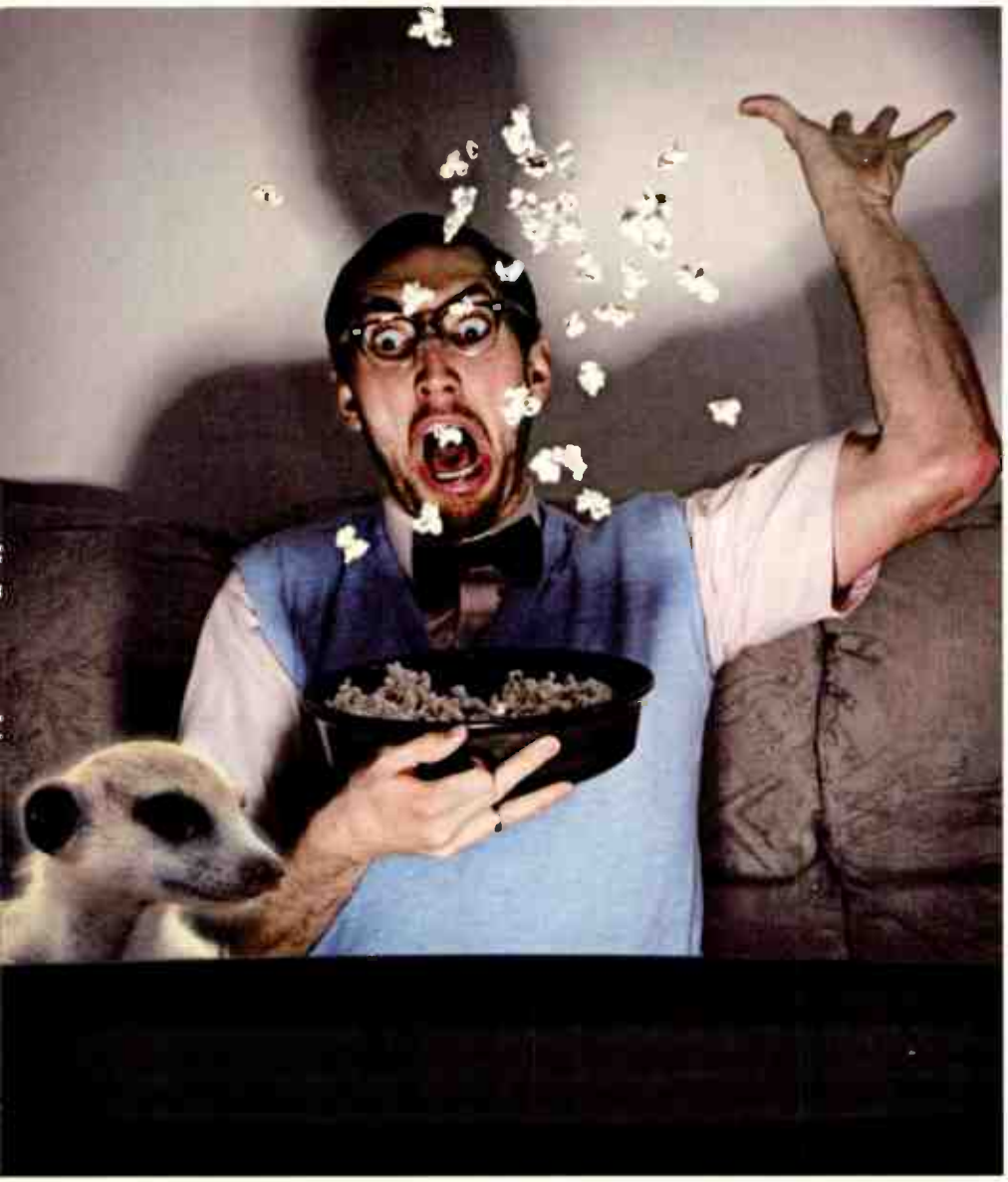
june 09

CED MAGAZINE Volume 35, number 6

Features



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DOCSIS 3.0 picks up some speed

Deployments of DOCSIS 3.0 are beginning to accelerate, with Cablevision, Comcast and Cox Communications applying the most gas.

Cablevision has taken the lead in the race for the fastest speed in North America, introducing in late April a 101 Mbps data service. That was a bit of stunt marketing, as that only barely exceeds the previous fastest by 1 Mbps. Furthermore, those numbers are maximums, not typical speeds.

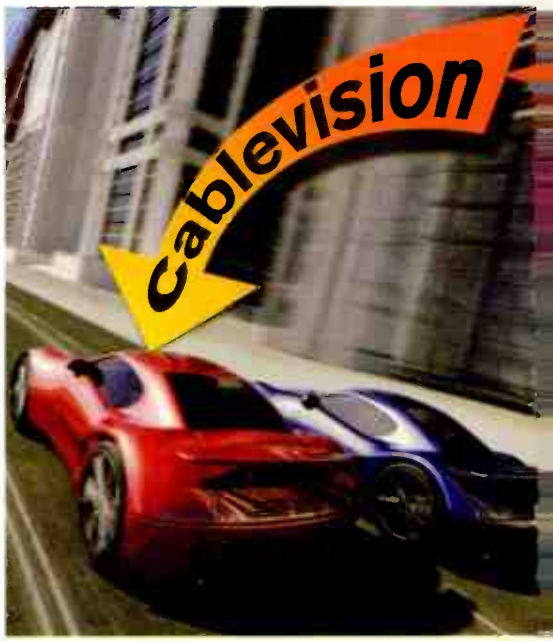
Cablevision's DOCSIS 3.0 tier, which is called Optimum Online Ultra, became available across the company's entire New York metropolitan footprint May 11. A spokesman for Cablevision said the company is using cable modems and CMTSs from Cisco.

While Japanese cable operators have been offering 160 Mbps DOCSIS 3.0 speeds for more than a year, the fastest speed to date in North America was Shaw Communications' 100 Mbps offering, which was launched in February at $269 per month (standalone).

Comcast has been rolling out its DOCSIS 3.0 tier with a top download speed of 50 Mbps and an upstream speed of 10 Mbps for $139.95 per month. Cablevision's Optimum Online Ultra has an upstream speed of 15 Mbps and costs $99.95 per month.

While Comcast has decided to launch DOCSIS 3.0 on a market-by-market basis, Cablevision is the first major North American cable operator to deploy the faster speed across its entire footprint. Cablevision, the nation's fifth-largest cable operator, faces more direct competition from Verizon than most large MSOs.

Comcast recently deployed its DOCSIS 3.0-enabled service in the San Francisco Bay area and in Harrisburg and other portions of central Pennsylvania (business customers will also have access), and its DOCSIS 3.0-enabled wideband speeds are also now available to SMBs in the Boston area.



Comcast's stated goal is to have DOCSIS 3.0-enabled data services in 30 million homes and businesses by the end of the year – 65 percent of its footprint.

Comcast's DOCSIS 3.0 speeds have already begun launching in 12 major markets, including the Twin Cities; the Boston metropolitan region and parts of southern New Hampshire; the Philadelphia metropolitan area; parts of New Jersey; Atlanta; Baltimore; Chicago; Ft. Wayne, Ind.; Portland, Ore.; and Seattle.

Comcast used pre-DOCSIS 3.0 wideband modems from Cisco in its first launch of wideband services in the Twin Cities last year. Comcast is also working with Arris, Motorola and other DOCSIS 3.0 vendors.

And Cox has added Northern Virginia to its list of DOCSIS 3.0-enabled deployments (which includes Lafayette Parish, La.). Cox's "Ultimate Internet" residential service features download speeds of up to 50 Mbps and upstream speeds of up to 5 Mbps. The standard price for the residential service is $139.99 per month.

TWC picks OpenTV's ad management platform

OpenTV added a large feather in its cap with the news that Time Warner Cable has selected its advertising campaign management platform for deployment across all of TWC's regional operating centers in the U.S. TWC will use OpenTV's EclipsePlus in 97 percent of its total subscriber footprint to manage large, multichannel cable advertising campaigns more efficiently.

OpenTV's EclipsePlus Advanced Copy Manager

While Canoe Ventures wasn't specifically mentioned, OpenTV's EclipsePlus hooked up with Arris' ConvergeMedia Ad Decision Manager (ADM) at The Cable Show '09 to demonstrate how the two will enable an operator to identify national ad breaks to do real-time localized ad substitutions based on geographic market data – a critical underpinning for Canoe Ventures' industry-wide advertising initiatives.

The OpenTV news could be an indication that Time Warner Cable, which is the nation's second-largest cable operator, is getting its ducks in a row for a Canoe Ventures rollout.

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First-quarter earnings wrap-up

Cable operator index

RGU growth comes from inducing customers to expand their bundles.

Operator	Total revenue	Net income	Basic video subs added	Digital video subs added	Broadband subs added	Voice subs added	Net RGUs added	Total RGUs
Comcast	$8.8B	$772M	(78,000)	288,000	329,000	298,000	837,000	63.4M
TWC	$4.4B	$164M	36,000	121,000	225,000	174,000	556,000	34.8M
Cablevision	$1.9B	$20M	(6,300)	9,400	29,800	51,400	84,200	10.4M
Charter	$1.7B	($205M)	(22,200)	25,600	71,900	74,300	149,600	12.5M
Mediacom	$360.4M	$22.4M	4,000	17,000	24,000	14,000	59,000	3M
Insight	$236.7M	N/A	16,000	30,700	19,900	24,500	91,200	2M
RCN	$189M	($9.6M)	0	N/A	4,000	(2,000)	3,000	914,000*

Source: Company data

* Excludes digital subs

Cable competition index

AT&T and Verizon win video share, but reports say they're backing off their fiber builds.

Operator	Total revenue	Net income	Video subs added	Broadband subs added	Wireless subs added	Net RGUs added	Total RGUs
AT&T	$30.6B	$3.1B	284,000	372,000	1.2M	N/A	~125M
Verizon	$26.6B	$3.2B	299,000	252,000	1.3M	N/A	~133M
DirecTV	$4.3B	N/A	460,000	N/A	N/A	460,000	18.1M
Qwest	$3.2B	$206M	34,000	42,000	30,000	153,000	12M
Bell Aliant	$2.9B	$313M	(94,000)	N/A	N/A	(94,000)	13.6M
Windstream	$755M	$88M	21,000	31,000	N/A	8,000	4.3M
EarthLink	$60.9M	$2.5M	100	400	N/A	3,400	224,400

Source: Company data

Equipment supplier index

Capex budgets shrink, but vendors are expecting pent-up demand to lift Q2.

Vendor	Total revenue	Year-over-year percent change	Net income	Year-over-year percent change
Cisco*	$8.2B	(17 percent)	$1.3B	(24 percent)
Motorola	$5.4B	(28 percent)	($231M)	(19 percent)
Juniper	$764.2M	(7 percent)	($4.5M)	(N/A)
JDSU*	$280.6M	(27 percent)	($85.2M)	(N/A)
Arris	$253.5M	(7 percent)	$12.9M	N/A
Harmonic	$67.8M	(22 percent)	($18.8M)	(N/A)
BigBand	$43.9M	10 percent	($2.3M)	(19 percent)
Silicon Image	$40.5M	(40 percent)	($33.3M)	(N/A)
OpenTV	$29.4M	(13 percent)	$1.2M	(81 percent)
Vecima*	$20.1M	(34 percent)	$1.2M	(63 percent)
Concurrent*	$19.2M	(1 percent)	($15.3M)	(N/A)

Source: Company data

*Financials reported are for Q3 2009

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SCTE rides engineering renaissance

The Society of Cable Telecommunications Engineers has built up a mountain of accomplishments during its previous 40 years of existence, and now that mountaintop is providing a good perch for where the association needs to go in the future.

Roughly 100 days into his term as president and CEO of the SCTE, Mark Dzuban has a pretty good idea of where the SCTE is headed in both the near and long term. Dzuban said focus groups composed of cable operator chief technology officers and other members of senior leadership teams are currently being formed to define where the industry as a whole is headed and how the SCTE can help the MSOs reach their goals.

"There is a renaissance – and I use the term renaissance because it's for the appreciation of basic engineering skills – underway as the Society has moved from traditional cable technology to a much broader stroke of telecommunication interests," Dzuban said. "The renaissance of basic engineering skills isn't just about the last mile of the cable plant. It's the whole network and how we develop our partnerships and skills."

Yvette Kanouff, a past chairwoman of the SCTE's board and SeaChange International's chief strategy officer, said the SCTE is working on both broadening and deepening its scope in order to stay nimble and relevant in an industry that has changed considerably since the SCTE's inception.

"While it's super important to keep the chapter support and the support in the field, there has been so much consolidation that the SCTE has to focus on the main issues engineering-wise that we are facing operationally today," she said.

As part of his overall plan, Dzuban said he has already spoken with CableLabs President and CEO Richard Green, Bill Check, senior vice president

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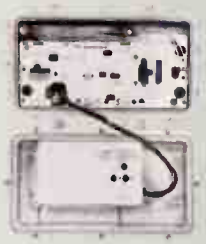

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of science and technology for the National Cable & Telecommunications Association, and NCTA President and CEO Kyle McSlarrow to "minimize redundancy and to optimize the clarity of our missions."

One example of the SCTE and NCTA working in tandem was the announcement in May that the SCTE was taking over responsibility for the ongoing maintenance and publication of the NCTA Recommended Practices for Measurements on Cable Television Systems.

"I went out and met with Dick Green and the gang at CableLabs last year to talk about the best practices and how we have to get that jumpstarted," said Tom Gorman, the SCTE's at-large director and chairman of the board, and Charter's vice president of field operations. "We're all working on defining those roles to make them clearer because they weren't always evident to a lot of people."

While the SCTE is working on drawing up its plan of attack to address the needs of an ever-evolving industry, there are several areas that Dzuban and company have already identified and started work on, including energy management, disaster recovery, more certification, network operations and developing IT/IP expertise.

"Clearly, one of the areas we need to focus on is energy management," Dzuban said. "There are tools that we're working on today that will drive down the idle time of trucks from 3 hours a day to 30 minutes, which from an operational perspective is pretty significant.

"We're also looking at the consumption of energy in our facilities."

Along with more advanced certification courses, the SCTE will also need to look at new standards and committees to keep up with emerging technologies.

"There are some clear trends that we're seeing," SeaChange's Gordon said. "We're seeing a lot of centralization of functions, especially as we really start to look at the three-screen environment and start to share video across one to the other, and sharing bookmarking among content. If you're really looking toward tomorrow, you have to look at IT infrastructures and the standards across those in a very serious way."

Dzuban said he is working with various entities, cable operator employees and vendors on fine-tuning a three-year plan, but he expects to be continually tweaking the plan as the industry changes.

"We have certification programs that are now being revisited by the CTO and senior folks, who are saying we need to get ahead of the ball instead of behind the ball and build a workforce for the new technologies that we see on the horizon," he said. "They're saying, 'Let's build the foundation and the tools these folks will need to operate these systems in a forward-looking view.'"

Ops launch remote DVR services

Motorola's DCX3400-M

Remote digital video recorder management services are gaining speed as of late, with recent announcements by Time Warner Cable, Verizon and Dish Network.

Time Warner Cable, which is developing a multi-room DVR solution using Motorola's tru2way set-top software, is also bringing its subscribers the ability to program their DVRs from a remote device.

The only thing TWC has said about the timing of the introduction of the service is that it will be "later this year."

Meanwhile, Verizon has added more wireless handsets that work with its remote DVR management service for its FiOS video subscribers. Verizon is now offering the remote DVR management service to all of its FiOS TV DVR users.

The service allows customers to remotely review, change or add recording requests, delete recorded programs, and browse and search TV and video-on-demand listings, as well as set parental controls.

In January, Verizon first introduced its free remote DVR management service to FiOS TV Media Manager subscribers, who accessed the capability via a Web site or through select Verizon Wireless handsets.

The company is also providing a new wireless application to FiOS TV Home Media DVR customers that will allow them to use any cell phone to remotely access their DVRs. To access this application, customers have to subscribe to a data plan from Verizon Wireless or any other wireless service provider.

"We've had a tremendous, positive customer response to the freedom, flexibility and control that our remote DVR management service provides," said Shawn Strickland, vice president of FiOS products for Verizon.

And Dish Network recently announced the availability of its free Remote Access service that allows its customers across the nation to program their DVRs with any Internet-connected device. Remote Access does require that customers have a broadband-connected ViP Series DVR for the service.

Dish Remote Access also includes a search functionality that looks for content throughout a nine-day programming guide. It uses keywords and filters set by the user, such as genre, channel, sports, content rating and language. Once they find the programming event they want to record, customers can click the record button next to the event description, selecting to record the one event, all events, or only new events.

In addition, Dish customers who lease or purchase the ViP 922 HD DVR, which will be available later this year, will have the ability to view both their live and recorded DVR content via integrated Slingbox technology. The same integration is also available to customers who have a Slingbox connected to a Dish ViP Series DVR.

CableLabs unveils ETV test suite

CableLabs has launched an alpha version of its ETV Test Suite to support user agent development.

Based on the CableLabs EBIF specification, the test suite features a set of test EBIF applications, a test plan and test controller software, including source code for the latter.

The test suite provides preliminary test coverage for developers of ETV user agents. CableLabs said it would continue to expand test coverage and provide updates to the suite in the coming months.

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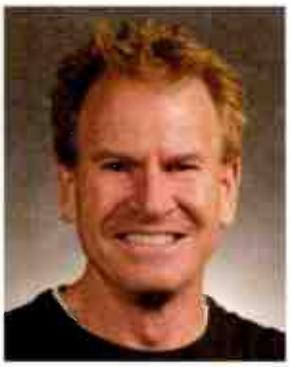
Who's calling?



By Stewart Schley

Media & technology writer, Denver, Colo.

stewart@stewartschley.com

In 1968, the year Martin Luther King Jr. was shot, the first patent relating to a telephone Caller ID system was issued

This is a tough one for young people to fathom, but there was a time when you didn't know who was calling on the telephone until you lifted the receiver and said, "Hello?" Phones rang and people answered, and only then was revealed the identity of the caller – friend, spouse, seller of encyclopedias or carpet-cleaning services.

That experience seems a long way off from today's telephone world, where digital photographs, custom ringtones and caller identities announce themselves before users ever deign to take the call. But mass adoption of Caller ID services is a relatively recent phenomenon, at least compared with the long pathway the technology took to get there.

In 1968, the year Martin Luther King Jr. was shot and the film "2001: A Space Odyssey" was released, the first patent relating to a telephone Caller ID system was issued. A Greek communications engineer, Theodore George Paraskevakos, had filed for a patent describing a device that would decode and display the identity of calling telephones within a receiving device. The Greek Patent Office issued patent 40176 in May 1968. It was the first of 20 patents Paraskevakos would receive from Greece, the U.S. and several other nations over the next seven years.

Yet by the mid-1970s, "Caller ID" systems remained obscure. A small, independent phone company in Leesburg, Ala., tried out Paraskevakos' boxy decoder with good success, but the technology remained all but invisible to mainstream telephone users. One interested observer who did take note was the Japanese inventor Kazuo Hashimoto, who had developed one of the first commercially popular phone answering machines. Hashimoto in 1976 filed for a patent on a prototype device that would display caller information. Although not the first to explore Caller ID technology, Hashimoto would have sweeping influence over the category. The early patents he received were ultimately upheld by the U.S. Patent and Trademark Office after Hashimoto charged that AT&T had infringed them. (AT&T agreed to settle the case, paying an undisclosed amount of royalties to Hashimoto.)

Even so, it would take years after Hashimoto's first patent filing before a major U.S. phone company would stage a market test of Caller ID technology. In 1984, in Harrisburg, Penn., Bell Atlantic tested an approach that piggybacked on the automatic number identification system used for internal call-billing purposes to distribute Caller ID information. Later that year, BellSouth followed with a similar test in Orlando, adopting the brand name "Caller ID." Both companies seemed convinced that Caller ID not only would work reliably, but that consumers would be willing to pay a monthly surcharge for a service that promised to solve a pesky telephone problem: getting stuck on a call people would have preferred not to take.

BellSouth became the first company to deploy Caller ID commercially, starting in Memphis and rolling the service out across its entire nine-state territory by 1992. Bell Atlantic and U S West followed with deployments in the late 1980s. Like BellSouth, they made use of the telephone industry's SS7 standard for handling call data to transmit Caller ID information.

Caller ID survived early challenges and complaints from privacy advocates (and from telemarketing companies proclaiming to be privacy advocates), who argued that divulging a caller's identity unmasked the caller's presumption of anonymity. A compromise of sorts was established in 1994, when the FCC adopted standards requiring that a caller's number be routed through a switched network and that telephone companies had to offer free call blocking on a per-call basis.

Caller ID began to gain strong consumer traction in the U.S. in the mid-1990s. Penetration shot from 16 percent of phone users to 40 percent from 1995 through 1999, the research firm Arbitron found. People from all strata, economically and demographically, were embracing Caller ID – a trend Arbitron researchers chalked up to ease of use, low costs and an ability to enhance a familiar home appliance.

Those same traits appear to be working in favor of the latest wrinkle to touch Caller ID: sending caller information to the television set. Caller ID to the TV applications are fast becoming requisites of the interconnected telecommunications era, with major cable companies, telco video providers and satellite TV broadcasters offering the novel feature. It's a convergence play that couldn't have been imagined when inventors first began thinking up ideas for caller-identification systems 40 years ago. But because it takes a good idea and makes it incrementally better, chances are they'd agree: It's got a good ring to it.

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The Early Television Museum

By Walt S. Ciciora

Expert on cable and consumer electronics issues

wciciora@ieee.org

I just returned from the 2009 Early Television Convention in Hilliard, Ohio. It was an enjoyable and informative event. I would encourage spending some time on the museum's Web site. But do it when you have time to browse because you could end up spending several hours without even realizing it.

Older readers of this column will recognize the name of the president of the Early Television Museum, Steve McVoy. He is an innovator in cable television technology and has a number of patents in the field. His passion now is the history of television, much of which predates the history of cable. This is a subject that should be of interest to anyone in cable. Our roots lie here.

There's an interesting term used when trying to decide whether something is a patentable invention. That term is "long-felt need." This term certainly applies to television. Innovators have been dreaming about and experimenting with various concepts of sending moving pictures from one place to another for more than 125 years.

We in the cable industry owe a lot to those who preceded us

Television is older than electronics. The first televisions were mechanical with no transistors, no vacuum tube amplifiers or picture tubes – nothing electronic. In 1883, Paul Nipkow invented a scanning method consisting of a rotating mechanical disk with appropriately located holes arranged in a spiral. As the disk rotates, only one hole is located on the image to be transmitted. As one of the holes completes a left-to-right scan, another hole commences scanning from the left slightly below the path of the previous hole. When the bottom hole completes its scan, the scanning disk will have made a full revolution, and the top of the image is again scanned. Nipkow was granted a German patent (patent No. 30105, applied for Jan. 6, 1884) on this invention but did not actually build the system. In 1923, John Logie Baird built a crude system based on the Nipkow scanning disk. A wide variety of enhancements were added to this basic system.

Amazingly, you can see several versions of the mechanical television system, some even in operation, at the Early Television Museum. A number of these come from other countries – many from Britain.

For me, the highlight of this year's conference was a display of several field-sequential color television displays. Television history buffs will remember that the FCC approved the CBS system before it approved the current compatible analog color television system, usually called the RCA system. The first implementations of the field-sequential color television system used a black-and-white display synchronized to a rotating disk with color filters on it. While the red filter was in front of the display, red picture information was transmitted, and similarly for the blue and green filters. The museum has several of the old displays, and they were in operation during the convention.

Additionally, Cliff Benham, an enthusiast and experimenter, has built several of these displays and brought them to show to us. Picture quality was very good. Of special interest, he showed a two-color display, which looked surprisingly good. If the three-color display was not there for easy comparison, many ordinary viewers would not see much to complain about. Even more importantly, Cliff showed a modern shadow mask picture tube driven with the sequential color signal. This dispels the myth that the CBS system required a noisy color wheel in its receiver.

Several interesting lectures were provided in the afternoon. An engineer, Stan Lebar, who worked on the development of the color television camera that was used in the Apollo moon project, talked about its design and why a field-sequential system was used.

When the idea of taking a television camera to the moon was first proposed, some of the purists opposed the idea as having entertainment value only and making no scientific contribution, and said that every pound taken to the moon was precious. Forceful arguments were then made that the television camera would bring participation to the taxpayers who financed the effort. That argument won the day. Lebar described, in very human terms, the tension and anxiety he felt as he waited for the camera on the moon to show its first pictures. What if it didn't work? Fortunately for all, he didn't suffer that embarrassment, and we got to see history being made.

Other interesting presentations concerning television's early history filled out the afternoon.

Of course, museums of this sort have limited appeal and support. We in the cable television industry owe a lot to those who preceded us and made television possible. Without television, there would be no cable television. As a minimum, visit the museum's Web site: http://www.earlytelevision.org. The site is comprehensive and includes links to other sites of interest. Better yet, visit the museum in person, especially during its next convention. DVDs from earlier conventions are available, which will give you solid motivation to be there next year. Consider becoming a supporting member of the museum. The cost is minimal but is very important to the cause.

To read past columns, visit www.CEDmagazine.com

Path to addressable ads goes through virtual zones

By Ran Oz

CTO, executive vice president and co-founder of BigBand Networks

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Virtual zoning makes sense in the march toward personalized advertising

Cable operators continue to look for ways to enhance TV advertising, which has remained a valuable source of income with an annual growth rate of around 5 percent. Today's economic climate requires any new initiatives, advertising-related or otherwise, to keep capital and operational expenditures to a minimum while offering shorter payback periods.

The migration path from today's zone-based advertising to the end goal of TV advertising – one-to-one addressable advertising, which entails interactivity, accurate measurement and national coverage – has a necessary intermediate step: virtual zoning. Virtual zoning leverages infrastructure already in place to give operators the ability to deliver increased granularity with a scalable and migratory path to implementing fully addressable advertising in the future.

In taking the next logical step beyond the coarse targeting that today's ad zones provide, MSOs need to be able to match a specific ad version with a greatly reduced number of households. This ability to match a small number of versions needs to offer a greater level of household granularity – also known as virtual zoning. The main advantage of virtual zoning is its ability to provide operators with additional addressability and revenues with modest capital expenditure requirements.

One approach to implementing virtual zoning is to leverage existing narrowcast infrastructure already in place for video-on-demand and switched digital video and apply it to linear advertising. Virtual zoning allows MSOs to send each narrowcast group of households (service group) a dedicated feed from the splicer. This gives MSOs the ability to match ad versions to a level of 500 to 1,000 households, instead of the 50,000 households provided by today's ad zones. The key advantage here is that within a service group, there is still only one copy of the channel, and therefore there is no additional spectrum required for increasing the targeting granularity, nor are there changes required on the set-top box side.

Virtual zoning is also flexible. It is not dependent on the deployment of SDV and can be applied to systems with or without it. Virtual zoning can perform both SCTE 30 and SCTE 130 insertions within the same channel, allowing operators to gradually migrate inventory from zoned to more virtual zoned – or more granular – delivery while protecting current revenue streams.

While virtual zoning does not provide the full addressability potential for cable, it is a good intermediary step that allows for a gradual migration to what many consider the end goal for cable advertising – linear unicast, or full one-to-one addressability.

Full addressability means being able to match ad versions to subscribers on a household or tuner level. In order to provide complete one-to-one addressability without complex integrations in the set-top box, MSOs will need to transition to a unicast stream delivery model. Delivering a dedicated stream to a subscriber allows for placement of specific ad versions, or even customized ad versions, per subscriber. Linear unicast also allows for other video personalization enhancements, such as personalized overlays, mosaics, messages and tickers.

Linear unicast is based on SDV technology. When a subscriber switches to a channel, the set-top box requests the tuning information for that channel from the SDV server. The SDV server, in conjunction with an Edge Resource Manager, decides whether that request should be fulfilled using a shared stream (multicast) or a dedicated stream. For a dedicated unicast stream, the process is similar in nature to the creation of a VOD session from a VOD server through an edge QAM.

Linear unicast changes the bandwidth allocation model for cable from the traditional supply model, based on the number of channels offered, to a demand model that is based on the number of active tuners. This allows MSOs to gradually migrate their channels from multicast to unicast over time, selecting specific channels, or even specific tuners, for unicast while keeping the remainder in multicast.

As operators advance their advertising offering and approach full ad addressability, they must gradually migrate from their existing zone-based infrastructure to a full unicast delivery model while maintaining revenue streams and minimizing their capital and operational expenditures.

Virtual zoning allows the industry to take advertising forward, while at the same time offering increased addressability with low capital expenditure requirements and with no need for additional spectrum. It is a natural next step on the path to linear unicast. SDV was originally deployed by MSOs to reclaim spectrum and allow for the introduction of new services, but it has now evolved to become a powerful tool for reporting and a vehicle for migrating from multicast to unicast – otherwise known as personalized television.

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Next month, SCTE Board Chairman Tom Gorman, vice president of field operations for Charter, will write about the benefits of belonging to an SCTE chapter.

ARE YOU

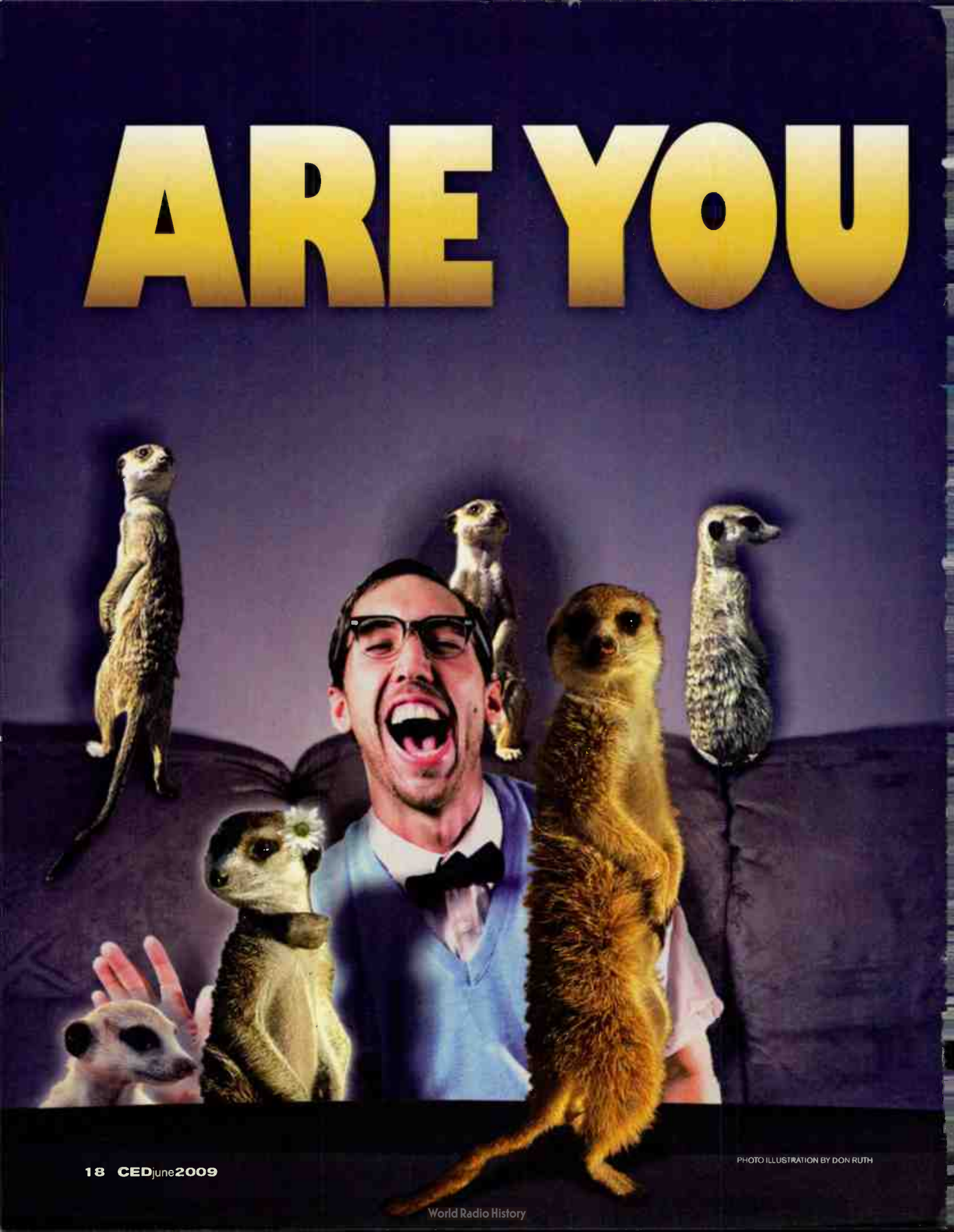


PHOTO ILLUSTRATION BY DON RUTH

EXPERIENCED?

Subscribers merely want to feel like they're there. QoE is the way to get them there.

By Brian Santo, Editor

There's been a lot of talk, talk, talk about quality of experience in the last few years, but now the industry is beginning to walk the walk. Operators have been educating themselves about, and are beginning to implement, technologies and processes to provide QoE, and that is encouraging more vendors to support those efforts.

The traditional standard for video quality has been making sure video signals reliably get to customers, making sure packets get from Point A to Point Z – a process that came to be called quality of service, or QoS.

The shortcoming of that approach is that picture quality, what customers actually see on their screens, is beyond the purview of QoS. Picture quality has always been a value, but until recently, service providers could get away with adequate picture quality, which meant QoS was adequate for the job.

The advent of high-definition video is forcing the issue higher up the list of priorities, however. For customers who have dropped a couple grand on a plasma widescreen and are shelling out a C-note or more per month for HD, just getting a signal is no longer anywhere near good enough. Those folks are *investing* in video and are unlikely to put up with anything but the most fleeting of problems in picture quality.

Competition is also a factor that is rendering QoS less than adequate. Ten years ago, dissatisfied customers might churn, but if an operator so desired, it could offer those former customers inducements to churn back. Now with the market approaching saturation, coupled with the advent of sticky bundles, losing a customer is a more final, and therefore less tolerable, proposition.

And the competitors know it and show it. Several cable companies tout their quality, and Verizon and DirecTV both do marketing based on uptime and quality.

"I can't say it's a large problem," said Gregg McEntee, director of network services for Comcast California. "But even if a problem affects only 1 percent of customers, that's a million phone calls."

Marketing quality video is one thing. Delivering it is another. Monitoring equipment companies like IneoQuest, Mixed Signals and Symmetricom anticipated the concern, have been talking up QoE and report that most major MSOs are beginning to embrace the new ethic.

"MSOs are only beginning to get their arms around what QoE means," said Mixed Signals CEO Eric Conley, an observation echoed by most sources for this article. "Look at the top-six major MSOs in the U.S. I'd say two of them have a handle on it. On average, the rest don't. Everyone is still relying on suppliers to tell them what the deal is."

Comcast is one of the two, Conley said.

Comcast's McEntee has been working with several QoE vendors. One challenge of assuring QoE is extracting usable information from a consternating surfeit of data from the network. "We can detect a lot of things," he explained. "But what's meaningful? We're still in the infancy of this."

Evaluating volumes of data and mapping the results to what viewers can actually perceive is an exhausting process that is far, far from complete. It's a critical need, and multiple vendors are doing it. That's two steps forward, but there is no standard means for the process or for presenting the results (scores or grades), which is one step back.

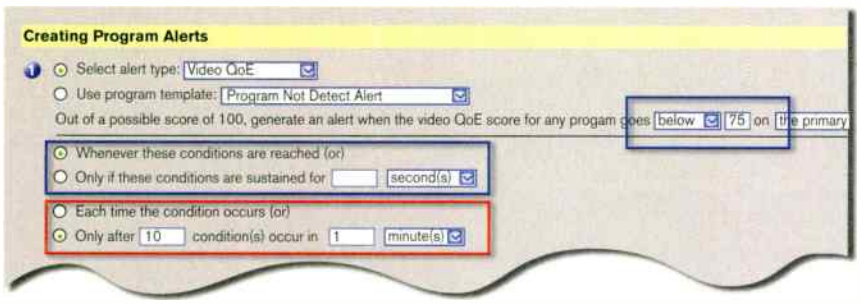
RGB Networks uses monitoring systems to evaluate the performance of its own products, not only to make sure that its bandwidth optimization, grooming, ad insertion and other equipment works, but also to ensure that the company isn't becoming a source of video degradation itself.

Tools from different vendors "can come up with different variables. It can all be valuable information," said Ramin Farassat, RGB's vice president of product marketing.

"Yes, the tools are helpful," Farassat said, "but at the end of the day you still want to do side-by-side comparisons, done objectively, with a bunch of guys in a semi-dark room."

Mixed Signals, for example, said it can look at video streams and identify errors

ARE YOU EXPERIENCED?



A key element of assuring quality of experience (QoE) is mapping network performance data to degradations in video quality that are actually detectable by customers. The next step is creating a scale for the severity of the degradation, which in turn can be used to set triggers for alerts when video quality deteriorates below a threshold that can be set by the service provider. Source: Mixed Signals.

that will result in specific problems, such as frozen video, tiling, black screen and audio level disruptions. The company has developed a Perceptual Video and Audio Scoring System, which provides a score that reflects subscribers' TV-viewing experience. An operator can set a threshold for quality, and can set alerts if video quality degrades below that level.

"The key is thresholds," McEntee said, "setting them to where you consider it an impairment."

Comcast is taking its metrics and turning around and sharing them with its network equipment suppliers – "the BigBands and Terayons," McEntee said – so that they have actual network data they can use to tweak their systems to perform better.

Implementing QoE is starting to catch on with vendors of encoders and multiplexers, and it is likely to move to QAMs. Most other network systems simply transport video, though, so adding QoE support there might be unjustifiable.

Imagine Communications has been talking in terms of video quality from its inception. It recognized early on that video quality would become a competitive differentiator, explained President and CEO Jamie Howard.

Video quality is "very complicated for service providers to manage," Howard said. "The vendor community has responded with better encoding, leveraging human visual models, mezzanine encoding," – encoders at content providers' sites – "and bandwidth efficiency across the plant, as well as monitors and remote probes."

(Source encoding is a critical concern. One of the first things Comcast realized is that it can't improve quality, so it's been turning to its video sources and making sure they conform to minimum video quality standards, McEntee observed.)

Imagine has taken a systemic approach to video, anticipating that service providers will have to serve video to multiple devices – TVs, laptops, cell phones – at different quality levels appropriate for each, while considering bandwidth available for each.

Because of the complexity of managing video through different paths, the company developed a quality manager utility that allows Imagine systems to measure both inputs and outputs for quality consistency.

Howard also revealed a glimpse at where all can go next: healing. Howard said Imagine is not doing forward error correction, but instead is doing something in the MPEG layer that is analogous to FEC. He declined to offer details but promised Imagine will debut the development early next year.

Harmonic, in April, jumped into the fray with its Iris video quality monitoring and optimization software. Although the company couches Iris' capabilities in terms of QoS, that Iris can monitor source quality, examine individual channels, evaluate signal degradations and – significantly – provide an optimization score is an argument that Iris has as much to do with QoE as it does with QoS.

The other half of the challenge of having enormous volumes of data to sift through is having a paucity of data from the last mile – specifically in customers' homes.

The problem in subscribers' homes is often noise. The source might be something intermittent, or might be something that the consumer introduced, perhaps even unwittingly.

"There are aspects of our network where the customer is our canary. We're changing that. If we can get information out of the set-top, that's that many more canaries singing."

– McEntee

The data required is often there, just sitting in the set-top box, but it's too often inaccessible from a remote location. New set-tops with DOCSIS or DOCSIS set-top gateway (DSG) signaling or OCAP can be polled for data. McEntee said his operation is now rigging a system to poll the Motorola boxes used in Comcast's California markets. "We're on the precipice of change," he said.

McEntee also said that SNMP (the Simple Network Management Protocol) is becoming a prerequisite for the equipment Comcast buys.

Another element of QoE, not involving engineering but absolutely critical, is getting the information to call centers. It's all about customer service, McEntee said. If the network operations center detects a problem in video quality, "we get that info to the call center, so if a customer calls we can say, 'Yep, we know about it; we're working on it.' Whether you can get the problem corrected before you get too many calls – that's the $64 million question."

QoE is heavily skewed toward video, but what about the data channel – Internet access and VoIP? There seems to be a difference of opinion on whether QoE is needed there or not, and the differences seem to hinge on perceptions of consumer behavior and expectation.

McEntee said modems and E-MTAs can be polled for plenty of data, and noted that the data channel already has error correction built in. Besides, he said, customers still have a tolerance for service degradations in broadband: "The average consumer might not even recognize it as deterioration of service, where with video, it's smack-dab in front of you."

"The telephone has been around for 100 years, and people have expectations of how that's supposed to work," said Jonathon Gordon, Allot's director of marketing. "They've been watching TV, and they have expectations for how that's supposed to work. For them, it doesn't matter if they turn on the TV or the PC – the expectations are similar. That puts the onus on the infrastructure providers to provide that quality."

Providing quality will depend on identifying the application or service being offered and identifying what equipment the consumer has, and perhaps also on the tier of service the consumer has subscribed to. That argues for putting a lot more intelligence in the network than is currently there, Gordon said. Everyone is going to have to either manage or support things like Skype.

Don Bowman, Sandvine's CTO, believes consumers still have a greater tolerance for compromises in quality with PC-based services. Problems, he said, "may be compensated by the convenience." That said, consumer expectation of quality is a moving target, he noted.

The difficulty in the U.S., said both Gordon and Bowman, is that the network neutrality debate is forcing service providers to beg off using deep packet inspection (DPI) tools, which elsewhere are being used successfully for traffic management, and literally profitably to aid in service creation.

The concept of scoring or grading video quality is migrating to the data channel. Sandvine is working on developing a mean opinion score. "It's still eluding us, but we're working toward it," Bowman said.

Imagine's Howard noted that MSOs

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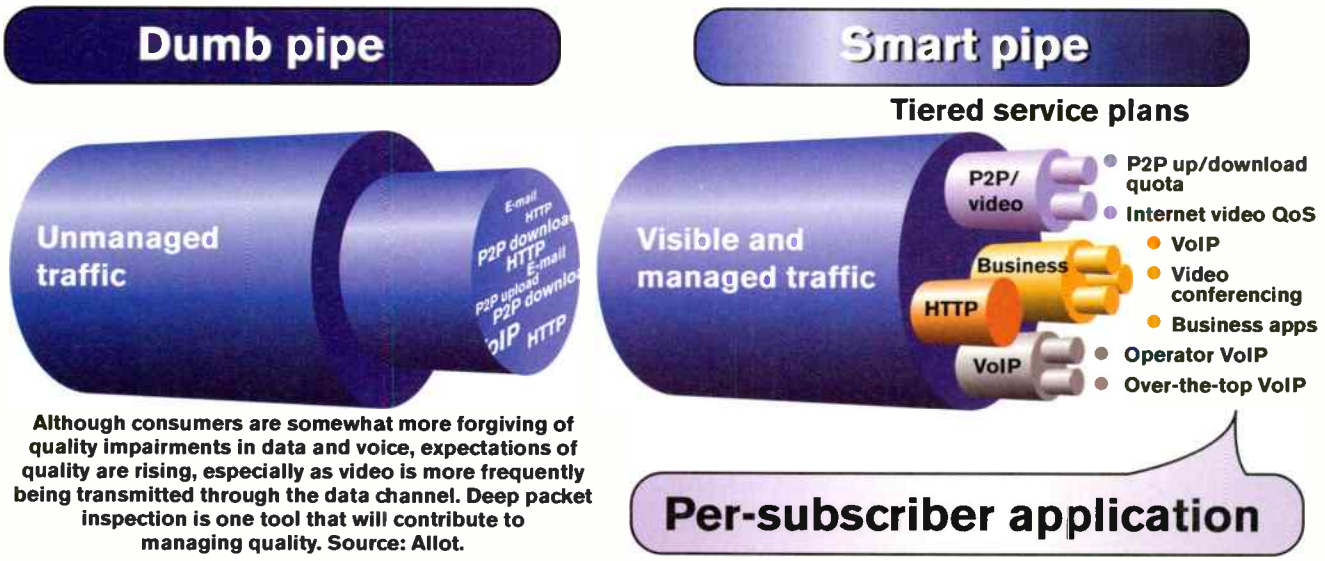

Although consumers are somewhat more forgiving of quality impairments in data and voice, expectations of quality are rising, especially as video is more frequently being transmitted through the data channel. Deep packet inspection is one tool that will contribute to managing quality. Source: Allot.

are experimenting with offering cable content to cable subscribers through the DOCSIS channel. As far as customers are concerned, they'll be paying for that content. "If you're working on the buffer model, and the flow of bits into playout is faster than the flow into the buffer, you get a pause, and that's disruptive. People are going to complain if they're paying for that."

Providing video through the traditional MPEG channel, through the DOCSIS channel, plus transporting video from third parties – Hulu, YouTube, etc. – will be "challenging," Howard said. ■

WHITE SPACE

Not everyone appreciates free air

White space broadcasting could be a broadband boon or a catastrophe for cable

By Jim Barthold,
Contributing Editor

Even gas stations don't give out free air anymore, so it's little wonder that the federal government's offer of free air – unpaid access to the wireless radio spectrum known as white space – is meeting a mixture of skepticism, confusion, and even some resistance throughout the telecom space.

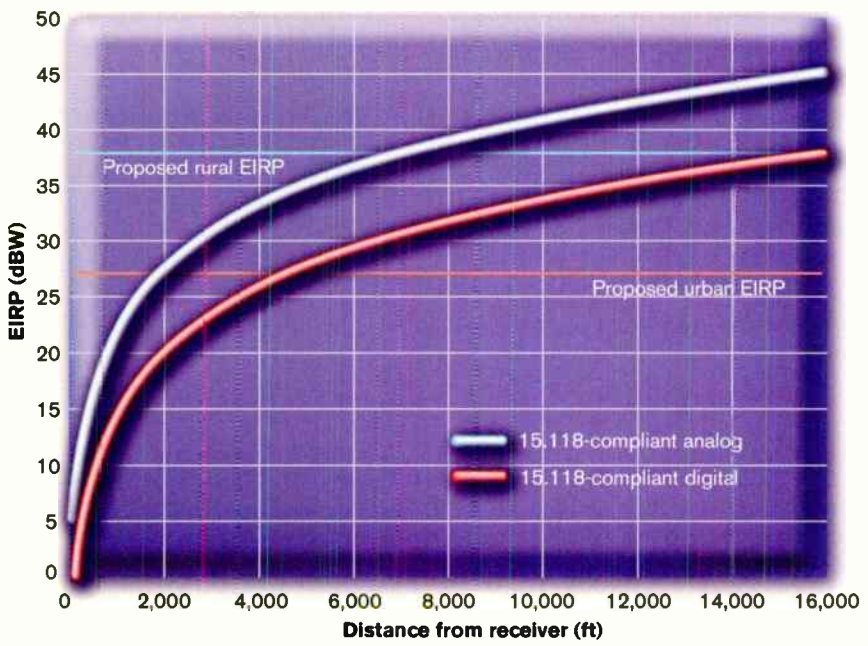

Figure 1: Transmit power (dBW EIRP toward receiver) vs. distance to receiver for maximum tolerable. DPU reception interference with one intervening wall.

After raffling off a great percentage of the 700 MHz spectrum used for analog TV broadcasts that is in the process of being vacated, the FCC in November designated anything left over, including the buffer zone between channels (the white spaces), as restrictively free for use by wireless players.

The government's position was that the valuable spectrum would be useful for innovative broadband connectivity schemes, and all the better if used in rural areas. That spectrum has potential for becoming a more potent Wi-Fi in-home networking play.

Of course, the feds attached more strings than the violin section of The Philadelphia Orchestra to the deal. The tightest of them is a requirement that a working white space database be set up and deployed for consumer devices to access in order to determine available channels in the vicinity before sending or receiving signals – an additional precaution against interference.

While major wireless vendors such as Motorola believe this is not only a reasonable request, but also one that can easily be achieved, others, like the cable industry, don't think it goes far enough. The NCTA made that clear by filing a Petition for Reconsideration with the FCC, claiming the Commission had not done enough to protect cable subscribers from interference and asking that the power levels for portable devices be lowered, while seeking greater separations between fixed devices and cable households. On a second point, the NCTA also asked the FCC to provide more protection from interference for cable headends.

The NCTA commissioned Carl T. Jones Corp. (CTJ) to look at spectrum interference issues and, based on CTJ's report, concluded that "the 100 mW power output level adopted for personal/portable devices will interfere with cable television viewing … and could adversely impact cable modem Internet access and other cable services in the home." The filing added that the FCC's "cable headend protections are inadequate, and some provisions need further clarification."

Cable's quick-draw attack on white space might be a little shortsighted, argued Miguel Myhrer, senior executive and lead of the North America Wireless Network practice at Accenture, because the spectrum might actually prove useful to cable operators.

"The first significant jumpstart will be the security applications, which will have more money behind them and have solutions that the cable guys are already providing for commercial customers," Myhrer said. "I think this will be a natural fit for them to look at white space in that context."

In the long term, cable's opposition is probably just a speed bump compared with all of the other issues surrounding the path to making white space a broadband reality. Those issues should all eventually be smoothed – either through revisions within the FCC or by compromise with opposing parties – because the spectrum is too valuable to be ignored, said Steve Sharkey, senior director of regulatory and spectrum policy for Motorola.

"The basic approach is still sound," Sharkey said. "NCTA has raised concerns about some of the

specific implementation."

Cable isn't the only one questioning how the FCC has gone about this thing, but none of the bellyaching is in the realm of an outright uprising.

"Opposition may be a bit strong of a word," said Jake Ward, a spokesman for the Wireless Innovation Alliance, a coalition of companies like Microsoft, Google and others. "There are industry-wide policies by the wireless carriers of not taking a position, [and] cable has said various things, mostly focusing on the idea of interference rather than having an issue of who's going to deliver what."

White space, added Sharkey, was, from the start, a "very complicated proceeding with a lot of different interests involved, a lot of different aspects, a lot of things that you needed to protect and work around. As the FCC did its analysis and put all of that together, it's not surprising that you ended up with something that is not perfect for everyone, and we need to make some adjustments."

Filtered down to its essence, white space appears to have two very real deployment possibilities. First, broadband solutions making use of white space spectrum could be especially practical in rural spaces where there's no broadband of any kind now, and where in many cases there were no television stations to begin with.

"If you envision the blue and red part of the U.S. political map, the red tends to be the rural states and the heartland states [where] there are substantially fewer existing television stations," said Marc Berejka, senior director of technology policy and strategy for Microsoft. "The amount of spectrum available in rural America would be phenomenal."

The fact that the spectrum is in the potent 700 MHz range is another boost, because that means it can go long distances, leap tall buildings and penetrate short ones. Developing this spectrum is "about lowering the collective cost of extending the network out to people who currently are not on the network. White space offers the opportunity to extend coverage into areas where there is none – at a low cost – and the opportunity to make a low-cost offer available to people who might not be able to afford 50 bucks a month," Berejka continued.

Maybe. Then again, maybe that's not going to happen, either – at least as Microsoft envisions it.

	Field strengths (dBμV/m) required to produce a -72 dBm desired signal at the processing equipment and maximum allowable interfering signal level to guarantee at least 23 dB D/U	
Channel	14	51
Desired DTV field strength	+41.8	+45.1
Maximum undesired field strength (on-axis)	+18.8	+22.1
Maximum undesired field strength (off-axis)	+43.8	+47.1

Figure 2: Maximum tolerable undesired field strengths at headend-receiving location.

"Spectrum licenses cost a lot of money, so when unlicensed spectrum hits the market, it does leave some opportunities that don't cost quite as much; but still, to do a quality build-out, you have to have a fair number of capital funds, and the markets have not been too good lately for new companies to access capital," said Chris Pearson, president of 3G Americas, a mobile advocacy group whose members may or may not be interested in taking advantage of white space and, conversely, may or may not see those bidding to use the space as competitors. "It's a difficult scenario to say how white space or unlicensed spectrum might go into the rural areas. It's just a little bit too early until we understand exactly everything."

Barry West, president and chief architect of WiMAX provider Clearwire, understands two sides of the equation: financing and spectrum. Clearwire is building its business in a tough economy with funding it's getting from partners like Comcast, Time Warner Cable, Bright House Networks, Google and Intel, so he knows how much it costs to build a new wireless network. He also knows what the market thinks about this kind of thing since all of his partners are taking varying degrees of financial hits from the financial markets for their participation.

West, who has experience in the mobile wireless space, also knows the competitive advantage of owning the spectrum when going into a new market. Besides eliminating interference possibilities, it also eliminates competitive possibilities in many instances.

"I'm not a big advocate of the whole unlicensed part in terms of driving a mass market. You have to have a spectrum policeman, which is usually an operator that's looking at the quality of service and tuning it," West said.

Because the 700 MHz band "goes a long way," white space technology becomes attractive as a means for providing fixed wireless broadband, West said. The caveat about establishing a commercial service using unlicensed white space spectrum, West added, is that "it's not regulated, so you're into the world of Wi-Fi."

That world is the second, albeit potentially first-to-market, opportunity for white space spectrum.

"To the extent that Wi-Fi is an 802.11 family of standards, you could certainly implement the technology in this spectrum," Motorola's Sharkey said.

And existing Wi-Fi devices could coexist with white space-based devices, added Ward, who believes "there's a business plan

there that says the further your range, the better, and that's how you convince somebody to carry a higher volume center – by making it desirable to have better range and higher fidelity."

Things aren't quite that easy or compatible, argued Edgar Figueroa, executive director of the Wi-Fi Alliance.

"At a high level, maybe some of the operating modes could be very similar to the way that Wi-Fi works now; but under the hood, we could be doing some very different things that would be needed to operate in this mode: the power, the frequency, the transmission," he said.

Wi-Fi is a developed space that's moving along quite nicely without any intrusions.

"In terms of the synergies that exist with what's been defined, the requirements are for some adaptive radio and dual-location types of mechanisms. You can do that with Wi-Fi now; in fact, a lot of solutions do those kinds of things," Figueroa said. "There are a lot of things that are not yet defined, and that's why, from the members of the Wi-Fi Alliance, we're just monitoring at this time."

Perhaps, then, Wi-Fi is too restricted a space for white space spectrum that might be better suited for something like WiMAX, which, coincidentally, has been working to set interoperability standards for 700 MHz equipment.

"It's an excellent band because it has a long reach," said Mohammad Shakouri, vice president of the WiMAX Forum. "We believe 700 MHz would be a band that we eventually can build WiMAX technology. The question has to do with regulation – how much power you can have. The biggest question on the white space is more regulation and policy to be defined so that a different ecosystem as an industry could leverage it."

While everyone sees different potential for the spectrum, there is one area of across-the-board agreement: White space use and deployment isn't going to happen overnight.

"Ultimately, down the line, five or 10 years out, it provides a great spectrum, but it still needs development and an ecosystem behind it," said Accenture's Myhrer. "I don't think there will be a business model day one, or even a couple years out. It will be a couple years. It provides an interesting area of opportunity, especially for cable clients looking to provide security solutions, [and] provides a very strong spectrum to take advantage of for certain applications."

Those applications might be for cable; they might be an adjunct to wireless plays like 3G and evolving 4G already in the market, such as the Clearwire WiMAX deployment; or they might be new plays altogether. ■

Preparing for the quad play

The 4G mobile broadband road is paved by Mobile Device Management

By David Ginsburg, vice president of marketing at InnoPath Software

The road to 4G has two branches: WiMAX and Long Term Evolution. For a number of years now, operators – mostly in emerging regions – have been trialing WiMAX. There have already been a few commercial deployments, notable among them the launch of Clearwire's Clear WiMAX service in Baltimore and Portland, Ore., and this month in Atlanta. Comcast plans to resell Clear in Portland, and Time Warner Cable has plans to do likewise in an unidentified market later this year. With Verizon, AT&T, Cox Communications and other major providers choosing to pursue LTE, the imminent expansion of 4G is assured. The question is: How will operators transition their users to the new networks?

Growing subscriber expectations

With the growth of smartphones and other advanced mobile devices, mobile operators, both new and established, are looking to provide a premium customer experience across their mobile broadband offerings, while at the same time reducing operating expenses. Subscribers expect their services to work as advertised, and when they don't, customers expect to have any problems resolved in short order. The burden placed on the mobile operator will come even more to the forefront with 4G adoption, when many previously tethered subscribers will cut the cord. They will depend on wireless connectivity for their very livelihood and will expect reliability and technical support responses equal to – or exceeding – those of their former landline offerings. They will run more applications on their devices, and these will change more rapidly. They will have more complex security and business relationships, with an assumption that the single device is used for both business and pleasure, and that the device must support protected applications such as banking. This is where Mobile Device Management (MDM) enters the picture.

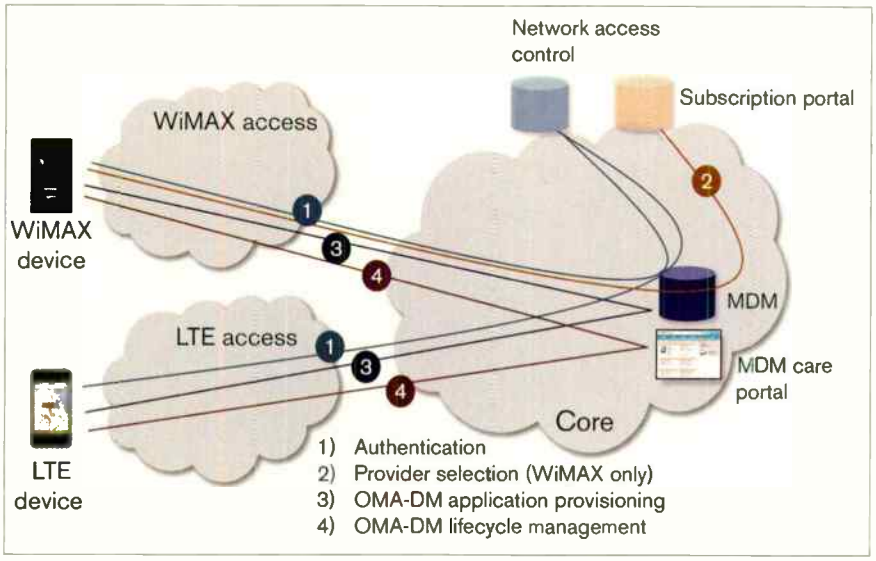

Figure 1: Device provisioning and management across WiMAX and LTE.

What MDM brings to the table

Briefly, MDM establishes an over-the-air connection between the subscriber's phone and tech support, streamlining the tech support process, saving time in troubleshooting and reducing device returns. As such, established operators are deploying MDM for both cost reduction and customer satisfaction, the latter relating to customer retention – critical in the current economy. MDM consists of a server located within the care organization, at either a wireless operator or a handset vendor, and a client on the device. The over-the-air link uses protocols defined by the Open Mobile Alliance Device Management (OMA-DM) Working Group and supports a set of "enablers" that define capabilities, including updating, checking and changing configuration settings; loading applications; controlling hardware settings; and, if the device is lost or stolen, locking or wiping all data. With OMA-DM, once the client receives notification from the server, it creates a secure data connection over the air. Alternatively, the connection to the server may also be client-initiated, where the user wishes to perform some OTA action. In either case, the server receives feedback on device management commands sent to the device. This last point is critical and separates OMA-DM from earlier OTA technologies that were one-way, referred to by some as "fire-and-forget." Through OMA-DM's closed-loop connection, the server administrator can remotely conduct a number of critical care actions.

Whither WiMAX?

MDM plays a crucial, upfront role in WiMAX device provisioning and network registration. When a device first enters the network, MDM plays a role in initial provisioning of network settings and applications (see Figure 1). More recently, OMA-DM has begun to supplant those "fire-and-forget" methods for application configuration due to its flexibility and reliability.

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In 4G, MDM is used to send configuration settings of basic applications – including MMS, e-mail and Internet connectivity – to the device. However, within WiMAX, MDM also plays a role in network identification – the interaction between the device and the network operator in selecting a preferred network and then authenticating. In fact, WiMAX access in the presence of multiple operators is much like dial access. In most cases, a software client on the device makes first contact with the server for this provisioning. LTE device activation will more closely follow the GSM model, so this step is unnecessary. Once the subscriber is connected to the WiMAX network, OTA manageability ensures that any configuration or usability issues can be quickly addressed. Greenfield operators in regions competing with incumbents look to MDM to provide a positive, 'out-of-the-box' subscriber experience, critical when deploying a new technology. Finally, in some locations, incumbents have been issued licenses for WiMAX spectrum, providing them with a non-LTE path to 4G. Here, the advantages that MDM

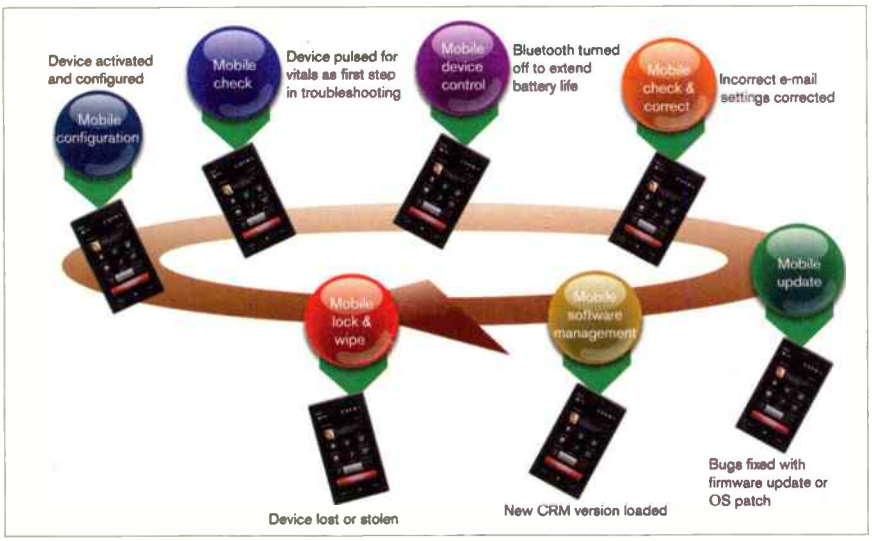

Figure 2: Lifecycle device management.

brings to the table echo those presented to greenfield operators, since in many cases these operators will compete with LTE.

LTE lovin'

Despite wide adoption of WiMAX, LTE is expected to be the technology of choice for most operators due to cleaner migration from GSM, and even CDMA.

In February, the GSMA reported that more than 26 operators globally have made plans to deploy LTE in the 2009-2012 timeframe. These operators span all regions and include both GSM and CDMA. Over the next decade, as 4G deployment follows the earlier 3G deployment curve, hundreds of millions of subscribers are expected to be connected to the technology. In the U.S., Verizon Wireless, looking at an early migration from CDMA, is expected to deploy LTE in 2010, while AT&T, with HSPA at its disposal, will begin deployment in 2011. Globally, major operators announcing support include Vodafone, DoCoMo and China Mobile. All told, operators representing almost 2 billion subscribers have announced their plans. As with WiMAX, MDM will play a major role in provisioning, and in frontline customer support. Naturally, both CDMA and GSM operators that have already deployed MDM will leverage their investments by adding LTE to the list of supported network types.

MDM saves green

Once the device is registered and operational on the network, the same set of lifecycle management capabilities are available under WiMAX or LTE (see Figure 2). If the user is experiencing difficulty with e-mail access, for example, they'll call tech support. With MDM and its real-time OTA connection between the frontline CSR and the device, the problem can now be quickly identified and corrected, with the first step being a quick check of the device to determine current hardware, software and network settings. This information alone will go a long way in creating a more efficient troubleshooting call. If the device manufacturer issues a firmware update or the operator wishes to patch an application it controls, MDM will provide the conduit for pushing it to one device, or potentially hundreds of thousands of devices. And, if the device is lost, tech support agents will be able to quickly lock and/or wipe it. In fact, at a 3G operator of 20 million subscribers, MDM's positive impact on the frontline could result in savings of more than $100 million each year. Savings for 4G operators, with their more modest initial deployments, will therefore be proportionate.

MDM technology differences between 3G and 4G

When deploying MDM in support of 4G devices, there are a few critical technology differences from today's MDM deployment technology. The technical support agent's experience, as well as that of the subscriber, will be pretty much the same. These users will have the same tools and the same client capabilities (except for the initial WiMAX provisioning described above). However, connectivity between the server and the device, be it handset, dongle or some other advanced device, will be exclusively conducted over an IP channel (with the exception of interim, dual-mode 3G/4G devices

that may be reached over either network for both provisioning and management). With 4G networks, there is no SMS, and the network has finally transitioned to all-IP. So all communication between the server and the device, from initial activation through updating and troubleshooting, is via IP (see Figure 3). This implies some notable changes in the OMA-DM protocol, which in versions through 1.2 had relied on SMS for the initial notification to the device, with ensuing communication taking place over IP. With 4G, DM 1.3 and its support for HTTP Push for notification are key, replacing SMS.

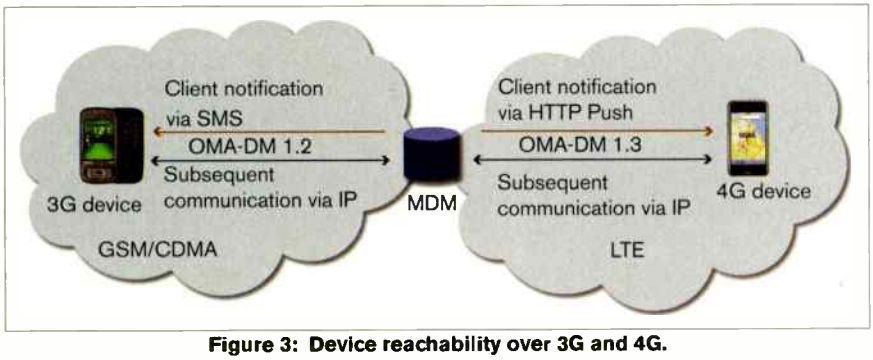

Figure 3: Device reachability over 3G and 4G.

In addition, the MDM server must be network-agnostic, communicating with any device – 3G or 4G – over the most appropriate network connection. The client must also be capable of utilizing the most suitable connection. Lastly, the MDM server must be capable of properly locating the device, associating a user with an IP or SIP address. No longer is there an absolute identifier in the form of a phone number (the MSISDN). For example, the user could be mobile, changing his or her IP address periodically. Here, the MDM server must be either notified of changes or must be capable of querying some database or proxy server in the network to locate the subscriber.

No matter the path to 4G, operators will need strong device care capability to smoothly transition their subscribers to the new network. Lessons learned in operator 3G MDM deployments will prove critical in enabling MDM's quick deployment within 4G. This, in turn, will lead to faster, more error-free and lower-cost device deployments across both LTE and WiMAX. With MDM ensuring service reliability and new 4G networks offering high-speed connections, subscribers will be able to increasingly untether and adopt a truly mobile lifestyle. ■

NEW products

Adva ups Ethernet-based transport capacity

Adva's FSP 150CC-GE206

Adva Optical Networking has introduced the FSP 150CC-GE206, which enables Ethernet and synchronization to be delivered over fiber-based Ethernet transport for service providers looking to deploy an Ethernet service optimized for mobile backhaul applications.

The majority of today's mobile base stations are currently connected by T1/E1 TDM links. With the growing number of mobile handheld devices that are capable of sending and receiving video and other advanced applications, the drive to high-capacity, high-bandwidth traffic is increasing.

The FSP 150CC-GE206 enables synchronous Ethernet to replace traditional T1/E1-based synchronization in the delivery of Ethernet services. Adva said the ability to deliver intelligent Ethernet services that are functionally identical over a variety of access technologies is a key advantage of its FSP 150 product family.

Amino, Minerva team up for whole-home DVR

Amino Communications and Minerva Networks have together introduced an end-to-end, whole-home DVR (WHDVR) solution.

AmiNet530 DVR IP STB

At the NAB show in April, Amino demonstrated its AmiNet530 DVR IP set-top box integrated with Minerva's WHDVR control module.

The combined solution allows service providers to offer advanced DVR services throughout a subscriber's home while using a single DVR, the companies said. Subscribers will be able to independently play, pause, rewind and fast-forward programming stored on the DVR from any TV in their home via other STBs – even from those without embedded storage.

The WHDVR offering will provide added viewing flexibility to subscribers without impacting the cost of the CPE, according to the companies. Users can access recorded content from any TV in the home.

"Operators want to use the in-home broadband network to offer new services without increasing their infrastructure cost," said Mauro Bonomi, CEO at Minerva. "Amino and Minerva are demonstrating how to extend the DVR functionality throughout the home without requiring additional set-top boxes with embedded storage, keeping costs low while enabling a better subscriber experience."

CABLES

Fujikura's C-Groove cable

Fujikura introduces C-Groove cable

Fujikura Europe has launched the C-Groove cable, a new design that enables fast access to fibers without compromising the structural integrity of the cable. This allows access to individual fibers within minutes, creating a 50 percent reduction in installation time for engineers, according to the company.

The Fujikura 'Easy Split' bend insensitive Ribbon Fiber offers a smaller diameter than conventional Loose Tube cable. This allows for more space in fiber ducts, the company said.

The new cable boasts a C-shaped core; once the outer coating is removed, the core remains intact and fibers can be removed from the open face of the C-Groove. Once the desired fibers have been extracted, the outer coating can be resealed by pressing the cover back over the cable. And since this process is repeatable, Fujikura said, adding new subscribers in the future is a simple procedure.

"The time savings offered by this truly innovative, Ribbon Fiber-based cable are phenomenal," said Fujikura product marketing manager Grant Ogilvie. "Being able to conclusively demonstrate that, by using our C-Groove cable and Easy Split fiber, an engineer can almost double their productivity is a compelling offering for service providers around Europe undertaking fiber installations."

The C-Groove cable was developed in Japan to meet the demand for economical construction of access networks.

Tokyo-based Fujikura, which has been in business for nearly 125 years, manufactures and supplies fiber-optic technology and electronics components.

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FEATURES

5 Ways to Optimize ROI in QoS/ QoE Monitoring Systems.

Steve Liu, vice president of product management and business development at Mixed Signals, discusses how a service provider should evaluate its goals for QoE and the potential for savings, even before buying network monitoring equipment.

Liu writes: "Cable operators and IPTV providers have been buying quality of service or quality of experience monitoring systems to improve video service quality as a way to compete for new subscribers and combat churn. Many have found, however, that traditional monitoring tools are difficult to use and often generate so many alerts that it is hard to determine which to react to first. As a result, operators are getting a diminishing return on these tools as they become impractical.

"Just like any other investment, a return on investment assessment should be considered before a monitoring system is purchased, and the results closely tracked following deployment.

"Service providers should consider whether the monitoring system can help identify critical subscriber-impacting issues, especially those that are intermittent, and annoying issues such as video tiling and audio disruptions in the digital TV system."

WEBINARS

We have several Webinars archived, with complete audio and PowerPoint presentations. The most recent are:

Critical Impact: Delivering Comprehensive Business Services to Advanced SMBs.

To satisfy the needs of the increasingly sophisticated SMB market, service providers can offer advanced business services and complex features to unify and manage communications services.

The panel includes: Charles Scarborough, director of product development, Cox Business; Barry Rogers, director of telephony product development, Rogers Cable; Brian Cappellani, chief technology officer, Sigma Systems; Gerry Kaufhold, principal analyst, In-Stat; and Paul Adams, director of product management, BroadSoft.

Time-Shifting: Optimizing Bandwidth for New On-Demand TV Applications.

This Webinar touched on several methods of delivering content on-demand, including classic VOD, network PVR and Internet video. No matter how content is served on demand, network operators are going to have to handle more traffic; this Webinar goes over methods for managing bandwidth resources in an on-demand environment. Panelists included Yoav Schreiber of Current Analysis; Nabil Kanaan, director of product marketing, RGB Networks; and Alan Hoff, vice president of product marketing, SeaChange International.

ADindex

COMPANYlist

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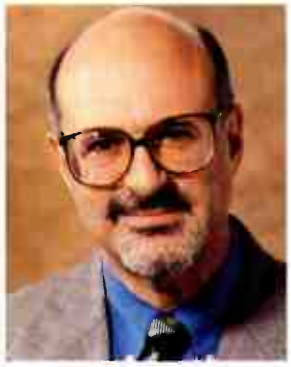
Motorola vs. the cable industry



By Jeffrey Krauss

President of Telecommunications and Technology Policy

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"Don't bite the hand that feeds you"

It's not too often that you see a telecom equipment vendor taking a public position that is adverse to the position of its customers. But that's exactly what is going on in the FCC white spaces proceeding. Motorola is promoting mobile opportunities that will cause harm to its customers in the cable industry.

I've written about this contentious FCC proceeding before, but I've never focused on Motorola's role. There are some 35,000 comments in the FCC's docket file, and I only read some of them. But (only) 17 petitions for reconsideration were submitted in late March, a much more manageable number. The NCTA submitted one, and so did Motorola. They take very different positions.

In summary, the NCTA wants the power levels decreased and other restrictions tightened, while Motorola wants the power levels increased and other restrictions loosened.

The FCC adopted power limits of 4 watts for fixed TV Band Devices (TVBDs) and 100 milliwatts (mW) for portable devices. In addition to power limits, the FCC imposed many operational restrictions on these unlicensed TVBDs. They include requirements to check into a database to identify available frequencies at TVBD transmitting locations, requirements to sense the presence of wireless microphones and limits on antenna heights.

The FCC requirements might be adequate to protect over-the-air TV reception (although broadcasters dispute this), but they are not adequate to protect cable TV reception. Consequently, the NCTA filed a 144-page Petition for Reconsideration. Much of it consists of two new test reports, a study of TV receiver susceptibility to direct pickup (DPU) interference and a study of headend reception interference.

Even though there may be white spaces in the over-the-air TV broadcast environment, there are no white spaces on a cable system – all of the channels are carrying signals. So TVBD signals that leak into a TV receiver can cause interference to cable reception, even on frequencies that are not used for OTA broadcasting. The NCTA hired a test lab to test the shielding effectiveness of seven representative TV receivers (five new digital/analog receivers and two older, analog-only receivers).

The FCC actually has receiver shielding requirements, but the tests showed that many receivers don't meet those requirements. Worse yet, the tests found that internal cables and F-connectors, even when professionally installed, could contribute to the DPU interference. But most customers use cables and connectors that are far inferior to those used by professional installers. Even Motorola admitted, in a December 2007 FCC filing, that in-home wiring (and the interaction between that wiring and receiver tuners) can be the dominant mode of DPU interference.

In summary, the tests found that DPU interference from a 100 mW portable TVBD could propagate as far as 80 feet into an adjacent apartment, even taking into account the attenuation of an intervening wall. And a fixed 4 W TVBD could interfere into TV sets as far away as 1000 feet. The NCTA asked the FCC to reduce the power limits to 50 mW for portables and 1 W for fixed devices.

The report of headend interference tests showed that interference could result from TVBDs at greater distances and angular separations than the FCC rules will protect. So the NCTA proposed several changes to the FCC's headend protection rules, including a requirement that all fixed TVBDs must coordinate with all cable headends within 100 km of the TVBD transmit location.

Motorola sees things differently. It wants higher power limits for vehicle-mounted portables and higher antennas for fixed TVBDs.

The power limit for portable TVBDs, whether handheld or vehicle-mounted, is 100 mW. Motorola wants that increased to 4 W, like fixed devices. Motorola listed the supposed benefits "for critical infrastructure industries and other enterprise users: Access to data through low-cost, wide-area mobile broadband connections protect the American public and improve industrial efficiencies and productivity, increase competitiveness globally and, therefore, help build job strength." Wow! I'm impressed! But Motorola never addressed the increased likelihood of DPU interference that these high-power mobile TVBDs might cause.

The FCC imposed a height limit of 30 meters for fixed TVBDs. Motorola proposed that the height limit be raised to 100 meters. This would, of course, increase the interference distances, so Motorola agreed that the required separation distance between the TVBD and a TV station's protected service area be increased. While current rules require that a TVBD with a 30-meter-high antenna be at least 14 km outside of a TV station service area, Motorola proposed that the separation distance for a 100-meter-high antenna be 28 km. While that increased separation might protect off-air TV reception, it provides no mitigation for the increased DPU and headend interference that will occur.

It used to be that the NCTA and Motorola (and before that, General Instrument Corp.) were on the same page when it came to FCC proceedings. I find it quite remarkable that the situation has changed so dramatically.

The Motorola business segment that includes cable TV products had sales of $10 billion and profits of nearly $1 billion in 2008. That year, its mobile devices division had sales of $12 billion and losses of $2 billion. Motorola evidently forgot the old adage, "Don't bite the hand that feeds you."

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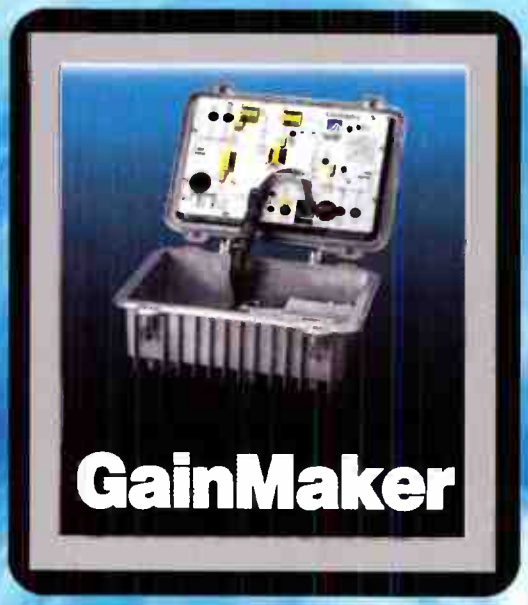

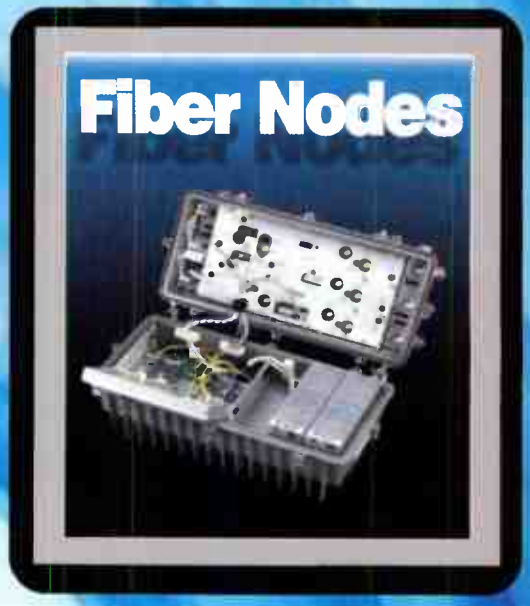

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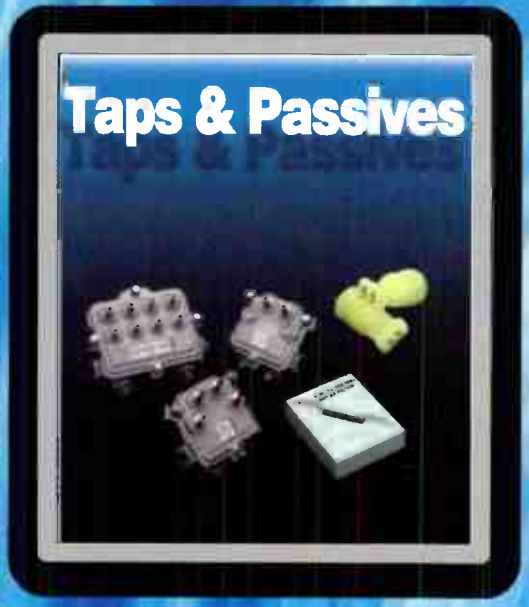

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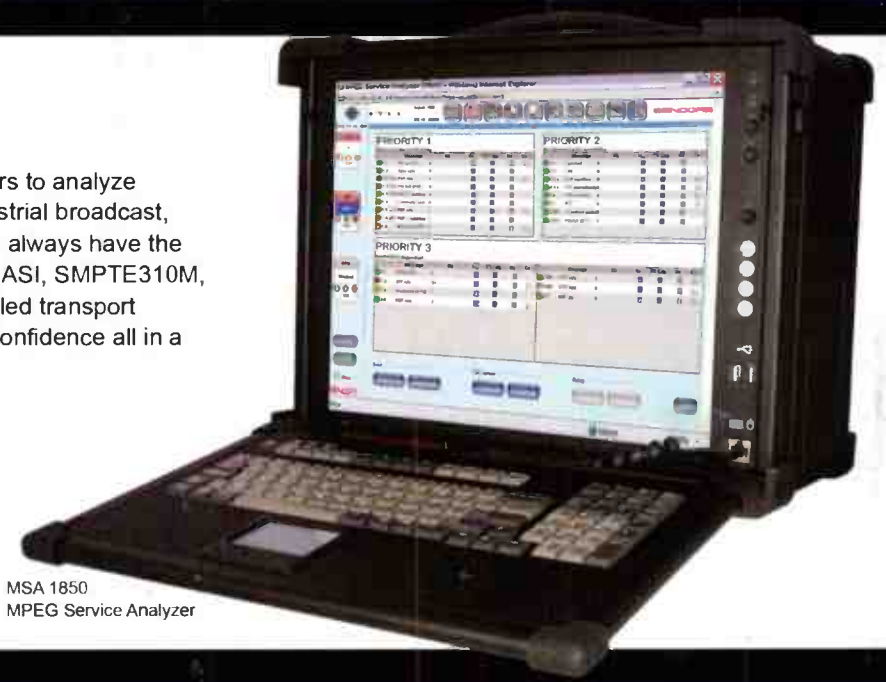

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