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T&M: Testing the network

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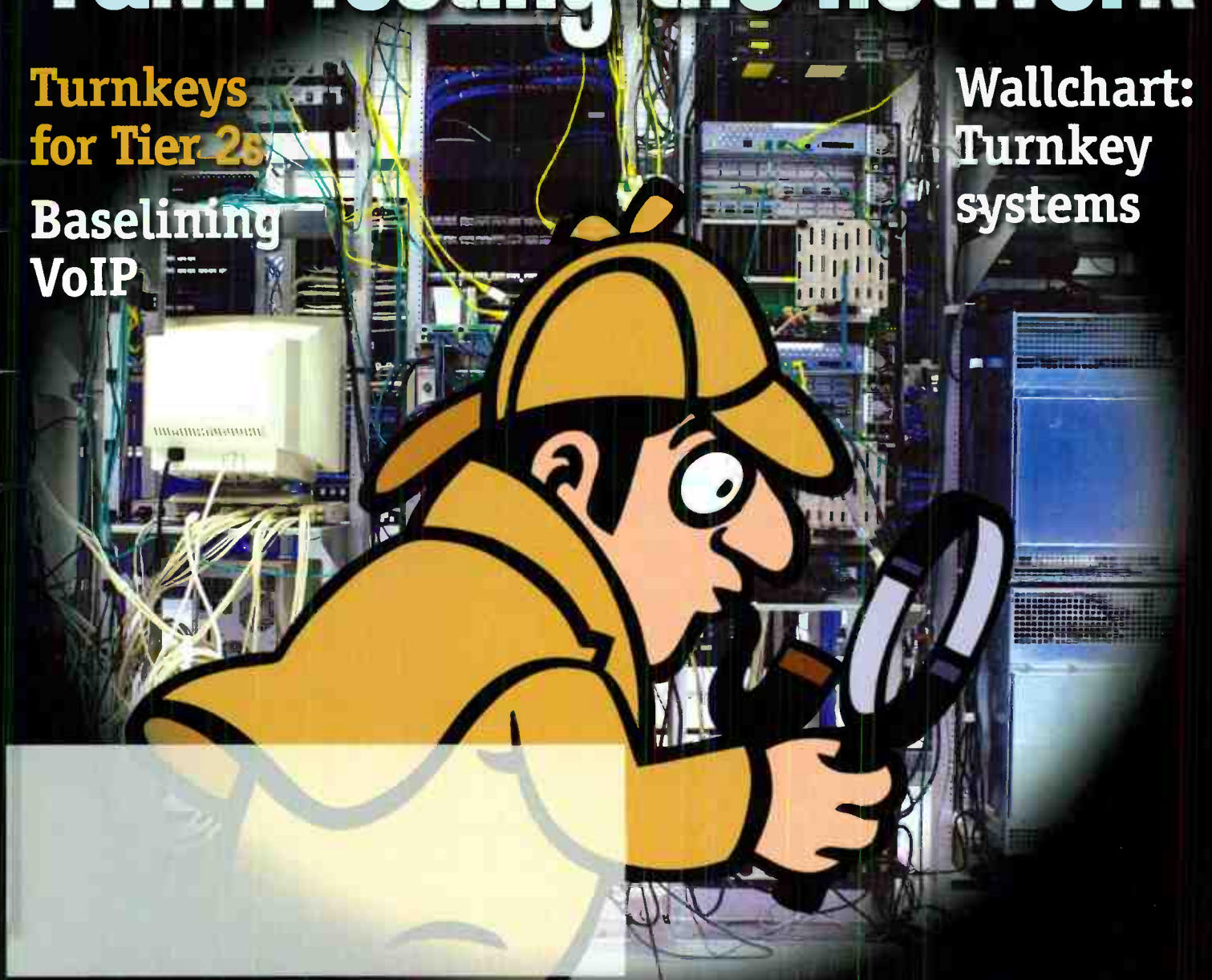
Baselining VoIP

Wallchart: Turnkey systems



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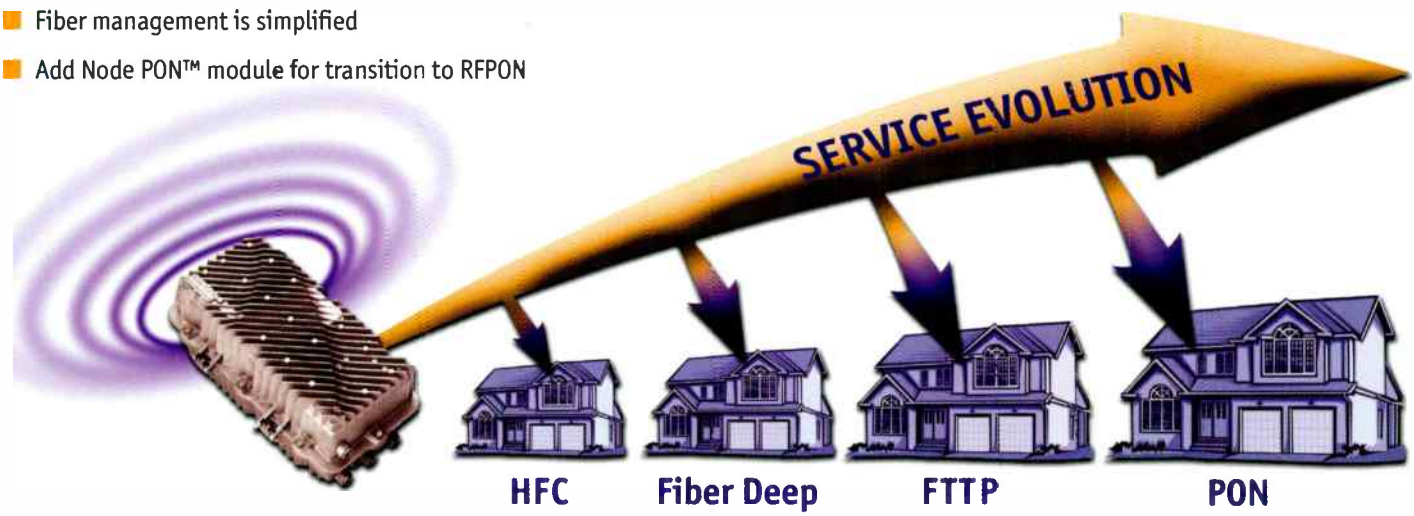

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Unsung heroes

By Brian Santo

Editor

More services, more features and complicated installs simply serve to increase opex costs. But there's help.

Actually having to compete with each other is putting cable operators and other service providers in an odd bind. On the one hand, there's the ongoing effort to reduce operating costs by encouraging self-installs and trying to engineer more intelligence into the network so that more service problems can be evaluated, and even fixed, by customer service reps in remote locations, thereby reducing costly truck rolls.

But there are countervailing needs. In a competitive environment, quality of service (QoS – making sure your plant is up and running) gives way to quality of experience (QoE – making sure your customers are getting consistently excellent TV quality). That puts service providers under additional pressure to make sure their networks are as clean as they can be – which means getting technicians and installers out there in trucks.

At the same time, MSOs are providing more services that interact with each other in increasingly complex ways, which serves to compromise the success rate of self-installs. That's compounded by the growing desire of consumers to network all of their entertainment services and devices. The home networking trend, by necessity, forces service providers to expand their responsibility beyond modem, set-top, router or gateway into home networks. That all leads to more time-consuming, and therefore more expensive, installs.

There are a lot of unsung heroes working diligently to counterbalance increasing customer service demands with new technologies and techniques to keep opex costs from accelerating out of hand.

There are organizations dedicated to helping train installers and techs. Companies that make self-install technology are continually expanding and refining their techniques (see my first blog entry online under "And Another Thing").

And test equipment vendors are consistently coming up with lighter, faster, more sophisticated test systems that consistently do more, and do it less expensively, making it easier to install, test and monitor services (see "A preponderance of evidence" on page 18).

To read past columns, visit www.CEDmagazine.com

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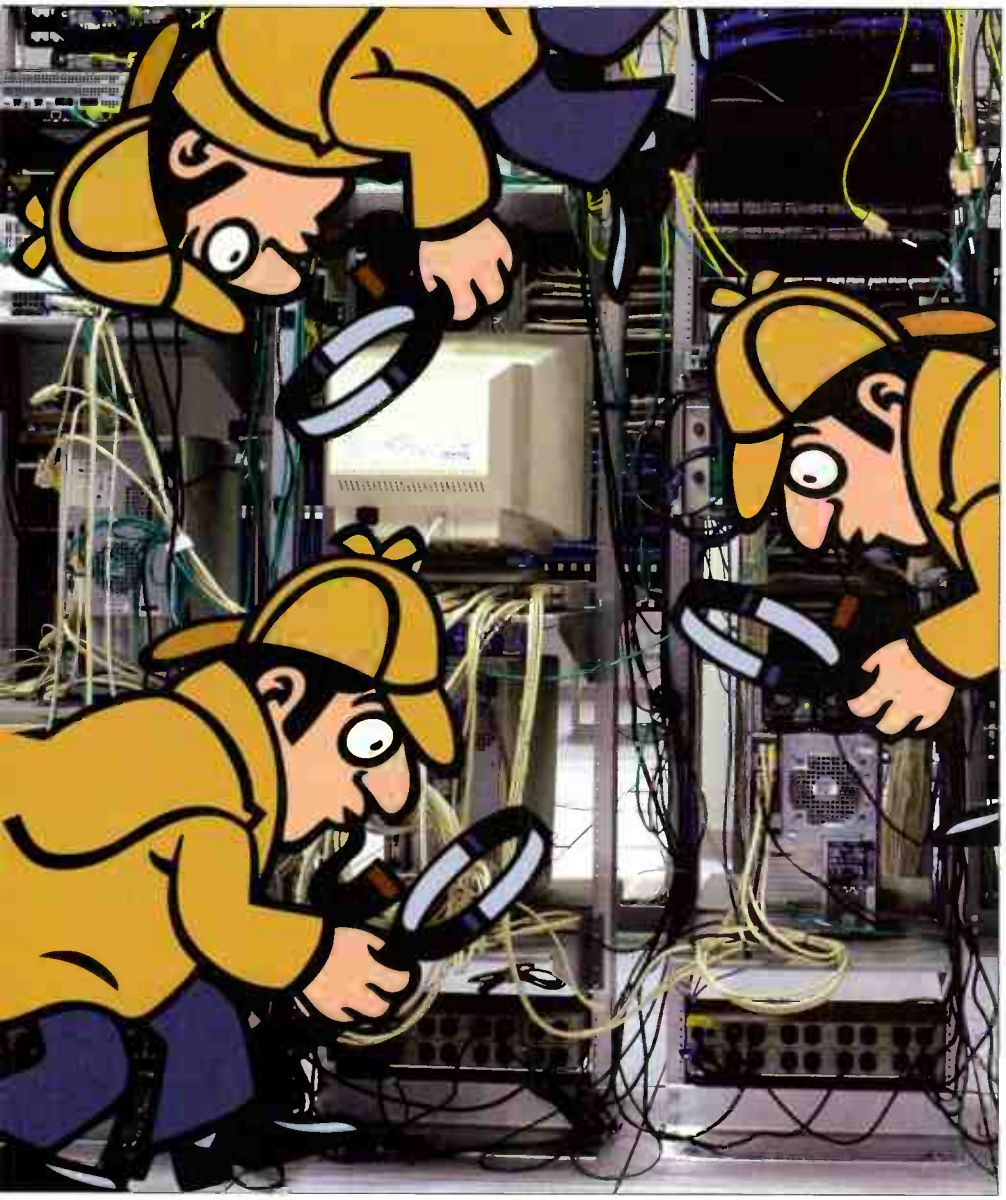

Departments

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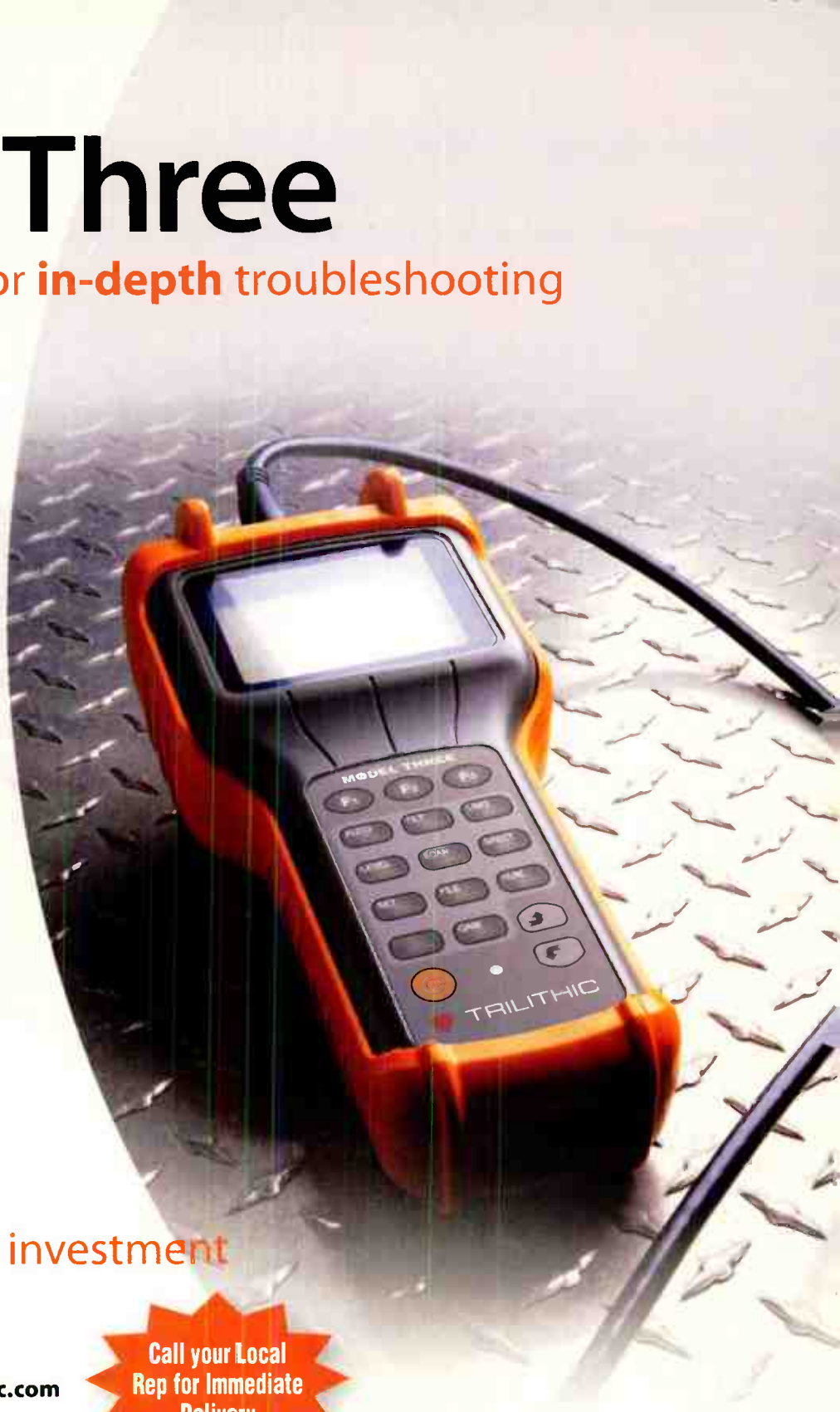

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Liao takes helm at CableLabs

CableLabs' board of directors has named Paul Liao as the laboratory's new president and CEO. Liao, who most recently served as Panasonic North America's CTO and vice president, is replacing Richard Green, who announced his retirement in September.

Liao was named the new president and CEO after a CableLabs board meeting on June 9 in Washington, D.C.

"From my perspective, I have big shoes to fill," Liao told *CED*. "Dick Green helped found CableLabs, and the labs have done some really remarkable things like DOCSIS, PacketCable and, of course, OpenCable. Those things have been really remarkable achievements that have reshaped the cable industry and given the industry a revenue potential that has been realized. I would like to continue in that vein."

As far as CableLabs' specifications go, Liao is intimately familiar with OpenCable due to Panasonic's work on tru2way projects with cable operators such as Comcast. While at Panasonic, he led the company's technology direction and research development in North America.

Prior to joining Panasonic, Liao held a number of positions at Bell Communications Research Inc. (Bellcore) and Bell Laboratories. He is a graduate of the Massachusetts Institute of Technology and Columbia University and is a recipient of the IEEE Millennium Medal.

"What is unique about Paul, and in my opinion why he is so perfect for this job, is that like Dick, he brings a lot of academic and intellectual credibility from MIT and Columbia University," said CableLabs Board Chairman Brian Roberts, chairman and CEO of Comcast. "I just think all the way around I'm thrilled and pleased with the selection. I had the fortune to meet a lot of people [during the selection process], but we were unanimous that once we got to spend time with Paul that we knew we found the right person.

"Dick had a certain gravitas about him, and we wanted someone who was authoritative and not just theoretical. It was a very special moment when Dick said he was thrilled that someone like Paul would take his life's work to the next level. For someone like Paul to leave a company like Panasonic to help lead our industry is the ultimate affirmation of what we're doing here."

Liao's appointment as president and CEO could also lead to improved relationships with the consumer electronics industry. And in the same vein as SCTE President and CEO Mark Dzuban, Liao said he wants to work with other cable industry organizations to make sure all of them are tracking the industry's needs.

"One of the things I would like to do is also continue the efforts that Dick started to expand the collaborative efforts of the cable industry with its suppliers and other industries – including, of course, the consumer electronics industry," Liao said.

In regard to further defining the roles and responsibilities of cable industry organizations, Liao said he briefly spoke with NCTA President and CEO Kyle McSlarrow in early June, and that he plans on having similar conversations with the SCTE.

"There's just so much to do," he said. "I think everyone is looking to work together and to maximize our effectiveness. What I'm hoping to do is help the labs create a technical vision for the industry, drive that industry toward real business results, and assure the industry can play its rightful role in communications and entertainment."

Green will continue in an advisory role for CableLabs. As for Liao's start date, that's still up in the air for now. "I am working on the schedule for winding down my involvement in some projects at Panasonic, and my starting date will be determined shortly based on that schedule," he said.

Timko joins Canoe Ventures as COO

Canoe Ventures has hired Kathy Timko as COO of the company. Timko started her new job June 1 and reports to Canoe Ventures CEO David Verklin.

For the past 10 years, she's held a range of senior leadership roles at various business units within IDT Corp. Most recently, Timko was the COO of carrier services at IDT. In 2006, she was named COO of IDT Telecom; Timko has also served as CTO of IDT Telecom.

Timko currently serves as an independent director on the board of Motionbox Inc., a company that provides Internet-based personal video sharing services.

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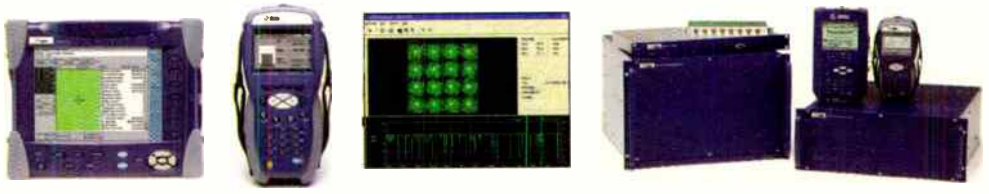

CableLabs bows software tools for interactive content

CableLabs has bulked up its tru2way toolbox with the release of new software tools that were designed to enable more interactive content for cable networks.

CableLabs has completed the beta development phase of its tru2way Reference Implementation, which was first announced in April, and has made it publicly available through java.net, Sun Microsystems' open source project site.

CableLabs said the tru2way Reference Implementation is a

source code implementation of its OCAP middleware specification and provides device manufacturers and application developers with a consistent interpretation of the specification. The Reference Implementation includes the OCAP DVR extension, and future versions will track with other OCAP extensions such as home networking.

The tru2way Reference Implementation also has a PC Emulator. With the new software tools, Java developers can run precompiled OCAP applications within a Windows-based PC development environment without needing a cable headend or other live cable equipment.

The tru2way Reference Implementation can be downloaded under GNU GPL v2 open source license terms from the OpenCable Project. Under the open source release model, developers will also be able to contribute back to the evolving software code and tool base. As an alternative to the open source licensing model, a parallel commercial license through CableLabs is also available.

"Having an open source reference implementation to help developers interpret the specification will lead to a more consistent and stable television platform across the various retail devices and set-top boxes provided by each cable operator," said Sree Kotay, Comcast's senior vice president and chief software architect. "This should improve the pace of innovation, evolution and deployment of the tru2way platform, which in turn should enable more interactive services and features for our customers."

ACA insists ESPN360.com fees unfair

Should content owners be allowed to force Internet service providers to adopt the cable video business model? Disney, Comcast and an influential Wall Street analyst say, "Yes." The American Cable Association says, "No," and it's taken its objection to the FCC.

Most pay Web sites charge users directly. Disney, which owns ESPN and the ESPN360.com Web site, apparently believes it can make more money by eliciting per-subscriber fees from ISPs, just as it gets per-sub fees from MSOs for the ESPN channel. When no ISPs agreed, Disney began to block all subscribers from certain ISPs from accessing ESPN360.com.

Comcast has apparently agreed to pay the fee. Now the Epix Web site, backed by Paramount, Lionsgate and MGM, is prepared to follow in Disney's footsteps. The ACA, in documents filed with the FCC regarding national broadband policy, complained that this kind of activity would force up the price of broadband.

ESPN has objected to the ACA's charge: "ESPN360.com is a business that would simply not exist but for this economic model, and it offers over 3,500 live events, which would mostly not otherwise be seen."

Pali Research analyst Richard Greenfield isn't buying the disclaimer. In fact, he's applauding such deals. "We firmly disagree with the ACA and believe content owners should be aggressively seeking monthly fees from ISPs for their content/services," he wrote.

ACA President and CEO Matthew Polka is standing firm. "Media conglomerates and other Web giants must be prevented from using their market power to drive up the cost of basic broadband access and deny independent access to their Internet content for individual users. The Obama administration, Congress and the Federal Communications Commission must take notice now before these high-cost, "closed Internet" business models are replicated and damage the prospect of universal and affordable broadband access."

LaJoie named to SCTE board

Comcast's Charlotte Field, senior vice president of infrastructure and operations for National Engineering and Technical Operations (NETO), and Time Warner Cable's executive vice president and CTO Mike LaJoie were recently appointed to the SCTE's board of directors.

Field and LaJoie were named to the director-at-large positions on the board, which increased the number of board members to 19. While the other 17 SCTE board seats are voted on by the SCTE's members, the SCTE board's executive committee filled the two at-large seats.

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TVN partners it up

This Technology's MetaMore server

Time Warner Cable has entered into a long-term agreement with TVN Entertainment to use TVN's VOD platform to support its on-demand initiatives. TVN will provide TWC with content delivery services and advanced asset management tools, including the use of TVN's Adoniss interactive system.

Financial terms of the deal weren't available.

Also in June, TVN struck partnerships with This Technology and BlackArrow for enhanced VOD advertising.

TVN and This Technology said that they've integrated their respective technologies to provide advanced advertising content and advertising supply management for delivered VOD assets. Their combined offering enables both national and local integrations with any standards-compliant campaign management and video insertion equipment across a VOD footprint for a national cable network, regional connect or local operator.

The integrated products include Adoniss – TVN's asset management and distribution platform with open-standard interfaces – and This Technology's MetaMore and SpotBuilder offerings. Earlier this year, CableLabs picked MetaMore to help drive its Metadata project.

With the integrated offering, TVN customers can make content available for ad insertion while integrating with the most prevalent industry standards. The integration with Adoniss also gives cable operators localized access to MetaMore for increased security and real-time updates.

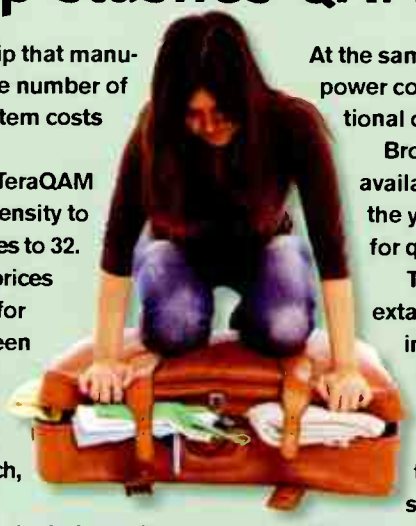
"This Technology and TVN Entertainment are making it easier than ever for cable operators and content owners to manage advanced advertising for VOD," said Jeffrey Sherwin, founder of This Technology. "Because we bring an independent solution to market, our mutual customers have ultimate flexibility to roll out advanced advertising across any campaign management system to take full advantage of existing resources in the field."

TVN's partnership with BlackArrow utilizes TVN's ad distribution process and BlackArrow's dynamic VOD advertising platform in order to enable customized metadata for advertising assets and provide a methodology for the rapid transfer of metadata between the two systems.

The joint TVN and BlackArrow platform will use the CableLabs ADI 1.1 standard to allow for the management of programming and advertising assets independently, offering a standard communication interface to ensure the accuracy and timeliness of asset management throughout the ad lifecycle. The integration between TVN's Content Information Services (CIS) and BlackArrow's advertising sales suite is automated, scalable and compliant with SCTE 130 specifications.

And in May, TVN and Avail Media announced that they were merging, and the two companies are currently sorting out what, if any, new branding will take place for the combined companies.

BroadLogic chip slashes QAM prices



BroadLogic is set to introduce a new chip that manufacturers of QAMs can use to quadruple the number of QAM channels per port while dropping system costs and lowering power consumption.

BroadLogic will offer two versions of its TeraQAM BL85000 chip – one that increases QAM density to 16 channels per port, and a second that goes to 32. The chips should help manufacturers lower prices significantly. A year ago, QAMs were going for about $400 a unit, and they recently have been selling at around $200, said BroadLogic President and CEO Danial Faizullabhoy. He calculates that QAM manufacturers using BroadLogic chips should be able to approach, and eventually beat, $100 a QAM.

BroadLogic said that by one calculation, the industry is going to need about a 0.1 QAM's worth of capacity per home. Ultimately, that means the need to deploy another 5 million QAMs. At $200 a pop, that's an investment of $1 billion.

"We need a breakthrough in economics," Faizullabhoy said. "The TeraQAM means that $1 billion investment is cut in half to $500 million."

At the same time, the chips should help slash QAM power consumption by 85 percent, leading to additional opex savings for end customers.

BroadLogic's TeraQAM ICs will be commercially available in production quantities by the end of the year. The 16-channel version is priced at $500 for quantities of 1,000 units.

The TeraQAM is an ASIC, whereas most extant chips, Faizullabhoy said, are FPGAs. By implementing the TeraQAM as an ASIC, that lets system designers offload the QAM functionality from the FPGA and then use a less-expensive FPGA to implement the other system functionality, or to integrate even more system functionality into the existing FPGA.

"FPGAs need dedicated logic per QAM. Our ASIC can process 32 QAMs with one piece of logic. It's a unique way of addressing it," Faizullabhoy said.

The TeraQAM BL85000 chip is compliant with standards ITU-T J.83 Annexes A, B and C for global use, and it meets the DOCSIS DRFI specification in conjunction with currently available third-party digital-to-analog converters (DACs).

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Dzuban: On a mission

When the SCTE first approached Mark Dzuban, he was told that the society had a mission for him, and the now president and CEO said he felt like he was back in Vietnam.

Thankfully that mission had nothing to do with wartime and everything to do with engineering. Lots of engineering.

"I do recognize that my predecessor was a marketing guy," the self-described "applied science guy" told members of the SCTE's Rocky Mountain Chapter at the 14th Annual Cable-Tec Symposium and Golf Outing in June. And he added that the SCTE would have a "much more focused engineering perspective" going forward.

The society needs to be a "well-organized, well-groomed machine," Dzuban said, and one way to move in that direction is to improve the level of chapter support. "That's where the workforce comes together and gets it done." (For more on the benefits of SCTE chapters, see "The value of learning through an SCTE chapter" on page 16.)

Dzuban, a 41-year cable industry veteran, was vice chairman and executive vice president at Cedar Point Communications before taking over the head role at the SCTE on Feb. 2.

Canoe Ventures suspends launch of 1st targeted ad initiative

Canoe Ventures, the joint advertising venture funded by the nation's six largest cable operators, is pulling all of the oars out of the water on its first addressable advertising product.

Canoe Ventures said it has discontinued testing and suspended the launch of its community addressable messaging (CAM) offering, which was the company's early-stage addressable advertising product.

Speaking on a panel at The Cable Show '09 in April, Canoe Ventures CEO David Verklin said CAM would launch around the end of May, but Canoe and its MSO backers decided to pull the plug on the launch after encountering difficulties.

"This decision was made after extensive testing with networks and cable operators identified operational dependencies found to limit the current product's commercial viability. But testing has proven that addressability is, in fact, a valuable advanced advertising capability for the television platform. So Canoe is taking the extensive set of lessons learned during the testing of CAM's early iteration and focusing resources on building future, more flexible iterations of CAM and our ultimate goal of more advanced addressable advertising products that best serve the industry as a whole," according to a statement issued by Canoe Ventures.

Canoe said it remains on track for an interactive campaign based on EBIF that is slated for the fourth quarter of this year.

Canoe Ventures is backed by Comcast, Time Warner Cable, Cox, Cablevision, Charter and Bright House Networks.

RGB, OpenTV pair up on advanced advertising demo

RGB Networks and OpenTV have teamed up on an advanced advertising demonstration that is designed to show cable operators how they can use the vendors' advanced, standards-based advertising capabilities to generate new revenue streams from VOD and linear programming.

The combined platform uses RGB's broadcast network processor (BNP) and OpenTV's campaign management offering to help operators overlay video, graphics or text into ads, or directly within programs.

RGB's overlay capability combined with OpenTV's real-time insertion and campaign management abilities – all of which are based on the SCTE 35 and SCTE 130 standards – gives cable operators several advanced advertising options.

The first is to localize national ads by adding locally relevant information. Operators can also use overlays as ads themselves, which can be added to live or on-demand programming. Because these ads appear within actual programs, they can't be skipped and do not interrupt program viewing. Additionally, overlays can be used as "triggers" for interactive or telescoping ads.

"The advertising opportunity for cable operators is already substantial, and with the new generation of advanced advertising capabilities that we're offering with OpenTV, cable operators will have the tools they need to dramatically grow their advertising revenues," said Jeff Tyre, director of product marketing for RGB Networks.

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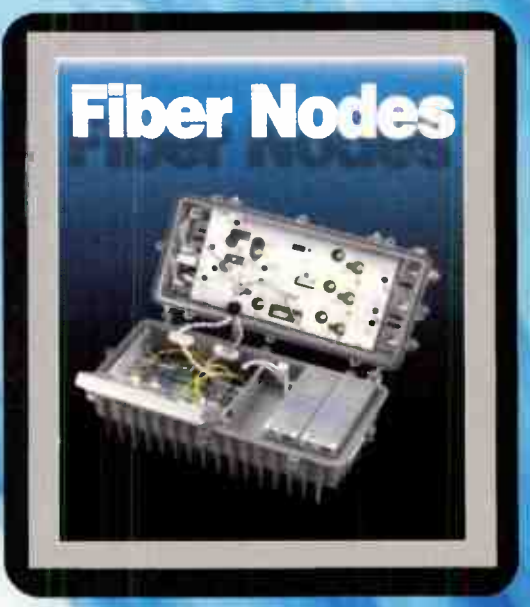

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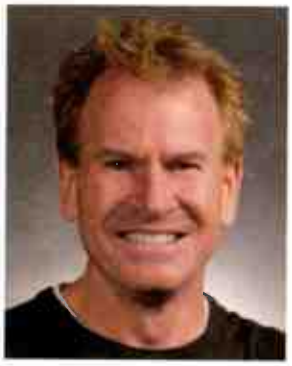

By Stewart Schley

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"Mother, I didn't realize how dark our house was until we got electric lights"

According to the 1930 U.S. Census, 90 percent of the nation's rural dwellers had no electricity. That is to say, no way to store meat without it spoiling and no way to light rooms at night except for candles or kerosene lamps. These conveniences were by then familiar to the majority of Americans who had electricity in the 1930s. But farmers and rural homeowners remained suspended in a sort of yesteryear bubble as power companies refused to spend the capital needed to extend lines into sparsely populated areas.

The Roosevelt administration identified the disparity as an imbalance deserving of federal remedy, and it came up with a plan to bring electricity to rural America. The main instrument of rectification would be money: low-cost loans and grants that would help rural electric cooperatives and small, private power companies string electric lines to isolated houses and farmsteads. They would be administered through the Rural Electrification Association, one of the New Deal agencies Roosevelt created in an ambitious drive to lift the country from economic depression.

If the goal was to light up the nation's farmsteads, the REA certainly succeeded. By 1939, REA-funded electrical cooperatives brought power to 90 percent of rural homes, transforming life for close to 300,000 farmers and rural homeowners.

"The first benefit we received from the REA service was lights, and aren't lights grand?" wrote a customer of the Shelby, Ark., Rural Electric Cooperative in 1939. "My little boy expressed my sentiments when he said, 'Mother, I didn't realize how dark our house was until we got electric lights.'"

It seemed hard-hearted to argue against the virtue of empowering young farm children to read books into the evening, or keeping food from spoiling in the same farms that produced it for the rest of the country. But REA detractors were abundant. Some, representing industry, argued that devoting taxpayer money to create electricity represented a step toward socialism. In 1935, the executive secretary of the National Coal Association, John Battle, told a congressional hearing that a federal plan to draw electrical power from water dams – an outgrowth of the REA-backed Tennessee Valley Authority – represented a brash intrusion on capitalism. "We feel that the American businessman is far more capable of visualizing the needs for electrical power and far more capable of designing ways and means by which it may be furnished to prospective customers than is the government itself," Battle proclaimed.

Others pointed out that stringing power lines to America's farmland did relatively little to further a policy ambition of the Roosevelt administration: to preserve America's agricultural economy. By the 1970s, 98 percent of U.S. farms had access to electricity – clearly a demonstration of the REA's impact – but the number of family farms had dwindled severely as a decades-long exodus to urban and suburban areas continued. Even so, the REA lived on and extended its funding role to encompass rural telephone service in 1949. The agency was abolished in 1994 as the Rural Utilities Service assumed its mission.

The RUS is back in the news today as one of two federal agencies charged with distributing roughly $7.2 billion in federal loans and funding for the expansion of access to broadband communications capability. The parallels between the Obama administration's broadband stimulus program and the rural electricity component of Roosevelt's New Deal are striking.

Many of the arguments for and against the broadband stimulus are derivations of what lawmakers heard in the 1930s: On one hand, industry advocates argue that private enterprise is better suited to decide where and how to make service available; on the other, public interest groups rail against the private-sector Scrooges that refuse to extend broadband connectivity beyond densely populated areas. Somewhere in between, proponents argue that no matter who builds it, the availability of broadband will spark spillover economic benefits as newcomers buy upgraded computers, shop online and participate in the information economy. (This is a nifty companion to the 1930s finding that the availability of electricity meant good things for makers of refrigerators, radios and washing machines.)

Among all of the similarities, though, one disparity emerges. In the 1930s, almost no one argued that rural Americans might not want electricity. The same can't necessarily be proven about broadband. A Pew Internet and American Life survey recently found that of the 25 percent of the U.S. population that isn't connected to the Internet, about half said they're simply not interested. For all the furrowed concern about broadband as an instrument of global competitiveness, it's possible that policymakers have overlooked one important dynamic: Not everyone desperately wants broadband. Even with $7 billion of juice behind it.

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The value of learning through an SCTE chapter

By Tom Gorman

SCTE board chairman and vice president of field operations for Charter Communications

tom.gorman@chartercom.com

Training exists in every organization in our industry. Your company's initiatives, new service deployments, your supervisor's goals and our industry's news are all critical items to communicate. On any given day, at any cable operator's tech center, training is going on for: safety, competition, VoIP, SDV, tru2way, HD, new sales incentives, customer service, how to use reports, Cable 101, etc.

Does the list look familiar? Is there a way to grasp it all and store it? There's a lot of it! As a matter of fact, training is so commonplace that we've forgotten an important element: learning. What causes learning to occur? Is it interest in the subject matter, interest in what it will lead to, or just brute force information that is partially absorbed through osmosis? Is all of that information being absorbed? Better yet, is all of that information being retained and used?

I would think that with all of the information coming your way, that a means to absorb this information is by considering the implications. It's a new way to handle the term WIIFM (What's In It For Me). When considering upcoming activities (some are in place in some markets) such as switched digital video, all-digital platforms, IP video and numerous tru2way applications, the implications reach all ends of your company. This is where being involved in a local SCTE chapter can be of great benefit.

Chapters = learning

Last year, the nearly 70 chapters in the U.S. and Canada held 365 training seminars, with an average attendance of 25 people. (For you mathematicians, that's reaching nearly 10,000 techs, engineers and installers with the latest information on the newest technologies, how to deploy them and how to maintain them.) Chapters held sessions on deploying business services, using OSS to manage networks, what it takes to design a switched digital video platform for your headend, as well as safety, installation and service primers.

The implications of joining your local chapter go beyond being able to learn and grow through seminars. It also affords the opportunity to serve on a local board of directors and chart the course for the chapter's planning of training events. Does your company desire to reduce truck rolls? Plan that session on techniques for troubleshooting and send your techs. Are you interested in power supply monitoring? Invite the companies that provide solutions and ask them to educate the attendees on what it takes to do such a deployment. The opportunities are limitless.

Joining your local chapter also affords the opportunity to serve on a local board of directors and chart the course for the chapter's planning of training events

Speaking of chapter board involvement, it was great to see nearly 150 chapter leaders from across the U.S. and Canada attend the 2009 SCTE Chapter Leadership Conference in Salt Lake City. This annual event helps them to sharpen their skills in order to run a good chapter that provides great value to its members. But what also occurs is they are learning business skills that will help them in their careers. How to plan sessions, how to hold successful board meetings, and understanding the roles and responsibilities of each officer are but a few of the things learned that will help them in career growth.

So back to implications: The implications of involvement are many. You can meet with your peers and discuss the latest operational and technology issues. You can grow as a leader by being involved in your chapter's board of directors. You can send the people who will be learning because they understand the implications of a particular topic. I think the best thing about being involved is that you can also present material at a seminar. What a great place to hone your own presentation skills – another plus for career development. And on it goes.

That's 365 seminars in one year – daily value being provided to members, operators and vendors. Not sure what chapter to attend? Go to http://www.scte.org to find out which one is closest to you. I look forward to seeing you at one of them!

—

Next month, Jason Schnitzer, founder and principal of Applied Broadband, will write about IPDR/DOCSIS 3.0.

If you've got an idea for a column, send it to michael.robuck@advantagemedia.com

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Society of Cable Telecommunications Engineers

A preponderance of evidence

One challenge in testing a network is too much data

By Brian Santo, Editor

A requisite of keeping service networks up and running efficiently, even as they become increasingly complicated, is the ability to get data out of the network in real time. The problem is not a lack of information, however.

The problem is a surfeit of data so overwhelming that frequently it is literally impossible to extract meaningful information from the overflow in a timely manner. Oddly enough, the other half of the problem is that this volume of data is often hard to get to.

Consequently, accessing, sifting and analyzing network data for actionable intelligence is becoming an enormous priority. Test and measurement (T&M) equipment vendors, which by nature concentrate on the data extraction side of the equation, are now coming up with increasingly clever means of making sense of raw data for their customers.

Institutional resources are being brought to bear, as well. A few weeks ago, in mid-June, the SCTE approved a new standard that addresses the issues of verifying, monitoring and evaluating video transport streams. Meanwhile, CableLabs is engaged in a project in which it is creating a set of best practices for extracting data from DOCSIS cable modems and turning it into actionable information.

CableLabs is exploring how to tap the vast amount of operational data collected by cable modems and make proactive use of it, so that this data can be used not only to diagnose failures or service glitches after they're reported, but potentially also to evaluate connections for incipient problems and potentially fix them before they manifest as something detectable by customers.

> **With the complexity you have today, anyone who turns something on and prays? His boss should fire him."**
>
> **– Chernock**

CableLabs declined to comment on the effort.

The subject of the CableLabs program did not come up in conversation with JDSU product marketing manager Kevin Oliver, but the subject of getting access to HFC network monitoring data did.

SNMP – the Simple Network Management Protocol – is specified in the Internet Protocol Suite as a standard, common means of monitoring network-attached devices. T&M companies aren't getting full access to SNMP information out of DOCSIS systems, according to Oliver.

"SNMP queries are part of the spec," Oliver said, "and we need to have access to that. Operators tend to be stingy providing that access."

There might be a reason for that, he allows. "My understanding is that it bogs the equipment down if everyone's constantly pinging it all the time. But maybe operators can pull that info and put it into a database, and then provide access to the database," Oliver said.

While CableLabs is exploring the issue of getting device data out of cable modems, both the SCTE and ANSI approved a new standard that describes the parameters a video transport stream should conform to, and defines strict limits for each parameter.

As a practical matter, however, relatively large deviations in some parameters can have little effect on video quality, while small deviations in other parameters might have a clear, adverse effect on video quality that will be immediately obvious to viewers.

"I see something is wrong, but do the problems matter? Are they serious?" Those are some of the questions that the new standard, Recommended Practice for Transport Stream Verification (SCTE/ANSI 142), tries to answer, said Triveni Digital CTO Rich Chernock.

SCTE 142 recommends ranges of deviation in different parameters that operators might consider tolerable before deciding the problem requires being corrected. "It lets you set up filters. Only the stuff that matters is exposed," Chernock added.

T&M companies lament the onus is on them to get information about test needs from their customers. There just aren't a lot of RFIs or RFPs going out for T&M systems.

"You have to stay close to your customers," VeEx CEO Cyrille Morelle observed.

Now that cable, telco and satellite are all offering similar bundles of services, service quality is a competitive issue. Service providers are nearing the point where if they respond immediately to a complaint, they're already too late.

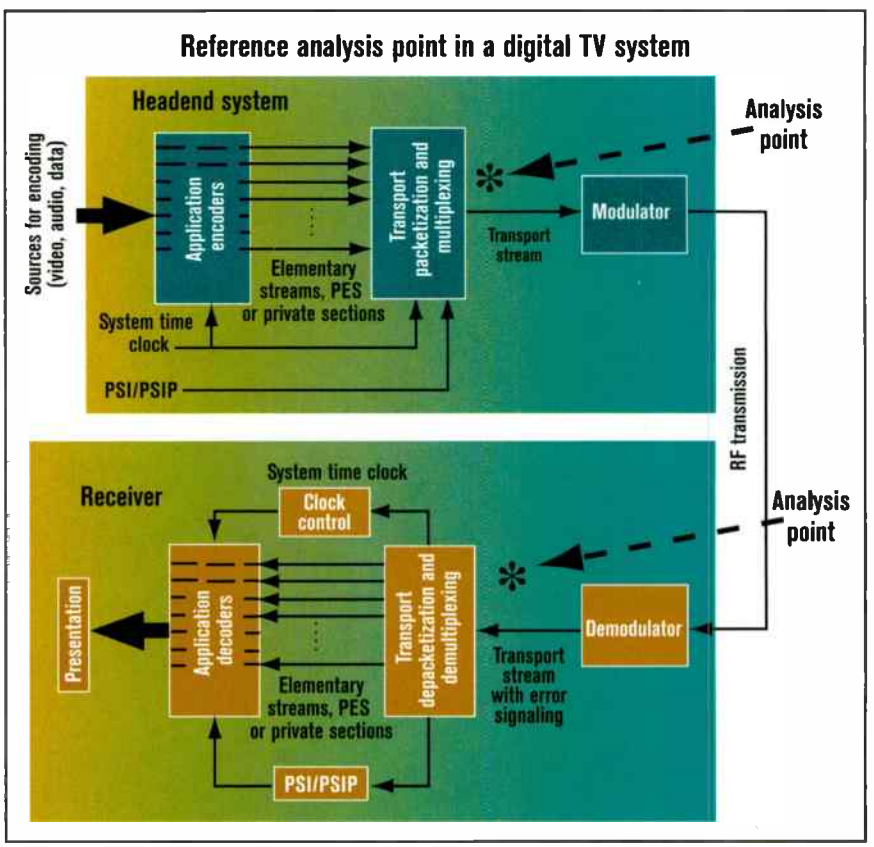
The CableLabs effort and SCTE 142 serve to point out how quality of service (QoS) and quality of experience (QoE) issues are serving to blur whatever line there might have been between testing and monitoring.

"Yes, that has definitely started," JDSU's Oliver noted.

"That's something Empirix has based our whole business on – the quality experience, from end to end," said Tim Moynihan, a vice president of marketing for Empirix, a company that specializes in test and monitoring solutions for voice services.

"Operators are beginning to understand the value of monitoring," Oliver said. "It's better than dispatching guys with network analyzers."

It must be valuable. "You can spend 10- to 15 percent of the cost of the total network build-out on monitoring," said Fred Sammartino, another Empirix vice



The SCTE has just approved a new standard that specifies what video transport problems to test for and how to prioritize problems in terms of likely severity. The standard (Recommended Practice for Transport Stream Verification; SCTE 142) assumes the reference point in a digital TV network will be between the emission remultiplexer and the QAM modulator.

Size Matters

A new dimension in CATV analysis

Key features at a glance

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- MPEG evaluation
- QAM 16/64/128 USG
- DOCSIS modem emulation
- ASI interface
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president on the call with Moynihan.

End-to-end quality is becoming difficult. With the growing deployment of IMS cores and true IP backbones, signaling between different providers and different applications is getting far, far more complicated than the old homogenous PSTN.

That necessitates both passive and active monitoring. Passive methods typically require storage of network data in databases that grow enormous with months' worth of data.

The data can be useful – if a service provider helps itself by making sure the data is accessible. There's a very typical organizational configuration that works against accessibility, VeEx's Morelle observed. Corporate information should be on a centralized platform, but too often isn't.

The database with all of the cable modem information is typically maintained by a provider's IT department – which might even be contracted out to an IT contractor (IBM, for example). "The task is to get that information to operations," Morelle said. "Better yet, the system should be able to mine that data live."

But assuming the data is accessible, it's great to have it to sift through so that a problem can be pinpointed.

If it can be pinpointed. It turns out a lot of problems in modern networks are ephemeral, Sammartino said. "You're looking for needles in haystacks." Tracking an error can be a painstaking process and can sometimes take days.

So an alternative is to load the network with test signals, with the aim of recreating the conditions that triggered the original error, hoping to force the error to occur again so that you can identify it in real time.

Starting up new services is equally complicated. "Before services are turned on, you have a whole class of products you use for turning on the physical network, so you can qualify the network," said JDSU's Oliver.

You need to simulate the network before you even attach CMTSs and EMTAs at either end of the network. "You need to be sure there's no jitter, no latency, you want to check for packet loss," Oliver said.

Simulation is also critical before adding services or features. DOCSIS 3.0, for example, vastly expands return channel capacity. JDSU's DSAM line of testers actually incorporate a CableLabs-approved cable modem. "You want to generate or sweep QAM signals on the upstream, test to make sure the HFC network can carry the traffic before launching the upstream," Oliver added.

What's the score?

The final form of SCTE 142 also underlines the increasing importance of not just providing raw data, but presenting the

results of analysis in a format that's easy to digest. It's becoming a theme across a wide variety of test and monitoring applications.

Last month, *CED* spoke with companies that specialize in network monitoring and companies that provide equipment that manipulates video as it goes through the network, and *CED* reported on how many of these systems are rendering processed data about video quality in the form of ratings or scores – for example, on a scale of 1 to 5, or from 1 to 100 (see "Are you experienced?" June 2009).

The approach harks back to the telephony world, where phone companies use MOS scores, a standardized approach for evaluating call quality on a scale of 1 to 5.

T&M vendors have increasingly been doing the same thing, providing equipment that can take readings from various tests performed by installers or technicians, and rather than generating a table of numbers or a graph or a wave trace, it provides a score or a pass/fail indicator.

JDSU is providing field technicians with test equipment that provides results similar to MOS scores, Oliver explained, but on a scale of 1 to 10. "That's different with today's equipment from before," he said. "Now if I tighten a connector, I know immediately if I've fixed something."

And, of course, network test is guiding JDSU into monitoring, as well. The company has a system that sits between edge QAMs and consumers. "With eQAMs, you've got GigE in and RF out," Oliver said. "An eQAM is a very complicated device. It does a lot of multiplexing, time stamping. ... If the video coming out of it is bad, you want to determine that quickly."

That process also requires some monitoring at the headend to make sure the source is good in the first place.

Getting to both ends to attack the middle is another means of improving testing, monitoring and overall network quality. "It's a divide and conquer strategy," said Trilithic product manager Steve Windle. "In plant troubleshooting – say you have ingress. A cool thing we can do is show what's happening at the hub site and at the remote position simultaneously on the screen."

That allows the technician to isolate the position of the problem. "If you have impulse noise or ingress at the headend, but not at the test point, then the problem is nearer the headend," Windle said.

VeEx's VePal line similarly includes field testers with upstream signal generators, and it can be used in conjunction with VePal monitoring equipment installed in headends to pinpoint the location of various faults in the network.

For more details on SCTE 142 and what it accomplishes, see "SCTE 142 sets new standard for transport stream monitoring" by Triveni Digital CTO Rich Chernock. First published in November 2008, it is online at www.CEDmagazine.com. ■

Triple-play readiness in greenfield deployments

Completing thorough testing and performance verification is essential

By Yumi Kato,
product marketing manager,
and Ken Fridley, system engineer,
of Sunrise Telecom

Most new developments, also known as greenfields, benefit from the use of new fiber-to-the-premises plant. Alternatively, the service provider may choose to utilize existing copper plant in a fiber-to-the-node configuration. Whatever form the outside plant (OSP) takes, most greenfields will have some form of structured cabling that may be terminated at a centralized location – called a smart panel. This can result in fast and efficient installations; but while seemingly ideal, service providers and technicians should not assume that everything will work just because it's new.

Before any inside installation begins, technicians must verify that the OSP was provisioned properly. For FTTP installations, that means installing and checking the optical network termination unit. The ONT terminates and converts optical signals into various electrical formats, such as Ethernet, HPNA or MoCA. Each interface should be checked for valid operation before moving indoors.

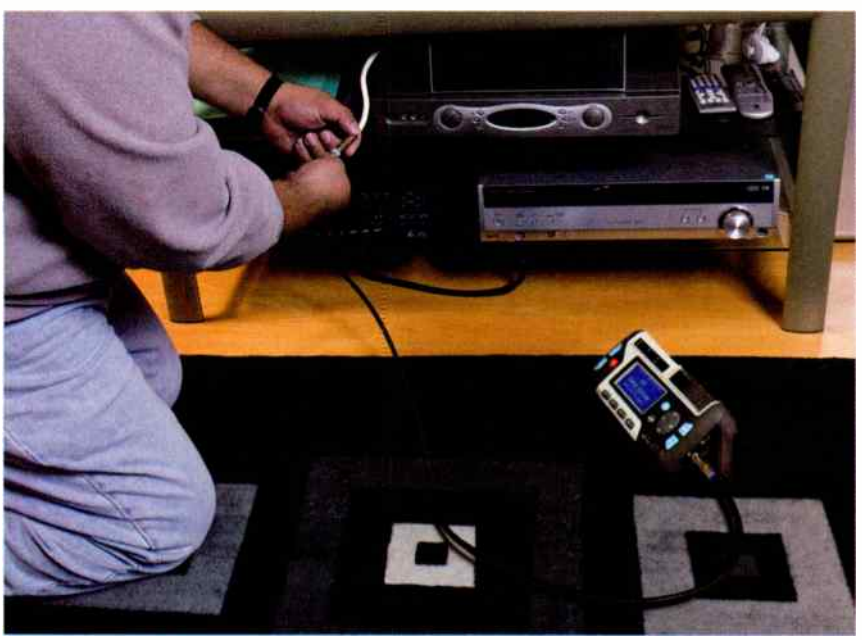
For FTTN installations, installers should verify that an acceptable signal exists at the network interface device (NID). Using test equipment, the technician can plug into each port to verify services. If TDM or VoIP voice services are provisioned, the technician should also verify connectivity by placing/receiving a call directly from the ONT/NID. Both types of installations require proper grounding for safe operation. Once verified, the technician is ready to move inside the home.

Inside, technicians must determine and verify that the cable installation was done properly by the installation company. A good installation company will ensure that every cable is properly terminated, labeled and ready for activation. Some installation companies pay by the wire, which tends to motivate their installers to finish as quickly as possible – the more wire run in a day, the more money made. Wiring may also be installed by a contractor with only a basic understanding of telecommunications services and technology. Consequently, the wiring may have to be redone or corrected, significantly increasing installation time and costs. Working with developers from the beginning usually results in a better installation.

Most greenfield applications will have at least one unshielded twisted pair (UTP) and/or coaxial wire run per room, but sometimes there may be more. Technicians may find a home that has eight, 10 or 12 jacks scattered throughout the house, when, for example, only four may be needed – one per set-top box in each of the four rooms is typically all that's necessary.

During installation, it's normal to connect only the jacks that will be used, and to disconnect any that aren't needed. This helps prevent vacant cable runs from acting as an antenna and contributing noise ingress and other disturbances. It pays to make sure unused jacks are in fact disconnected.

Better test platforms include cable identification devices, called dongles, which plug directly into the outlet and are numbered for easy identification. Once set up, technicians go to the main termination location and connect their test set to each individual cable run, one at a time. The test set reads out the number and identifies the room where each cable terminates. Alternatively, in a multiple-dwelling unit, the technician may use a tone generator that attaches at the customer's residence and a receiver wand at the main feed. The technician simply waves the receiver wand



Service verification requires end-to-end testing to check for excessive signal loss and proper termination.

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across the termination point, listens to the tone and identifies which feed belongs to their customer.

The next step is service verification. This requires end-to-end tests to measure for excessive signal loss and proper termination. Excessive loss can result from poor-quality cable, improper or loose terminations, or excessive splitters. If unshielded twisted pair wiring is used, it must be at least Cat-5 or greater quality for Ethernet applications. Technicians must verify that the termination at both ends conforms to only one cabling standard, either TIA-568-A or TIA-568-B, as each have different RJ45 pinouts. Mixing the two standards on each end of the cable will render that run unusable.

For coax qualification, it is important to conduct a coax cable loss test to ensure the cable supports the frequency range required by the digital signal to be transmitted. For example, HPNA can transmit from 4 to 28 MHz. At these frequencies, the average expected signal loss over RG-6 and RG-59 coaxial cable is about 1 to 1.2 decibels (dB) per 100 feet of coaxial cable. Most average-size houses have wire runs this length or shorter. Cable loss testing sends a set of frequencies from a source transmitter at a known and repeatable level. The test set acts as a receiver and calculates the difference between the power transmitted and that received by the test set.

Loss of 3 dB or more indicates three possible problems that, if not rectified, can cause service issues: a bad F-connector, a splitter exists or a bad cable. Trouble associated with F-connectors is usually due to improper installation. Once corrected or replaced, a loss of 3 dB

or more indicates that there may be a hidden splitter. A single splitter of acceptable quality may be left in place for wire runs going to set-top boxes. If the signal loss is due to impairment, the coaxial cable needs to be replaced. Damaged cable is extremely rare in a greenfield environment, but it can happen.

The primary cause of cable loss is usually at the termination points. During cable qualification, technicians should confirm that F-connectors are compression-type, barrel connectors are connected securely, and all wiring is properly terminated and tightened. Barrel splices exposed to the elements should be insulated with shrink tube or electrical tape to prevent water ingress. The rule with F-connectors and barrels is, "When in doubt, swap them out."

After cable qualification, technicians should perform a final, all-encompassing test to verify the quality of the service performance. Service verification tests can find imperfections that, if left unrepaired, can result in service calls. Most greenfield installations will use Ethernet, making service verification straightforward. For HPNA and MoCA installations, point-to-point and whole-home testing verifies that each cable run and each device is working at peak performance. Technicians should verify that the cables and IPTV work and run standard tests that send packets to every node on the home network. This verifies maximum bit rate, signal-to-noise ratio, received errors, etc., and checks real-life performance.

While technicians – and leadership – may expect faster, simpler installations in greenfield sites, assuming that the developer's installation contractor delivered fully functional cable runs can lead to problems and costly truck rolls in the future. As triple-play services evolve, new and improved test systems will debut, designed to reduce or eliminate provisioning and maintenance challenges. Completing thorough testing and performance verification before turning new services over to the customer is essential. For the service provider, and even pre-wire installation contractors, an all-in-one test set lowers the total cost of ownership by eliminating the need to acquire and maintain multiple test sets for each technician. For technicians, all-in-one test sets simplify each deployment by ensuring the right tests are available for every situation they may encounter. ■

Baselining VoIP service quality

Simple changes to the installation procedure can provide significant returns

By Charlie Baker, director of product management for Exfo Service Assurance

The network and infrastructure are architected, the product is developed, load testing of the infrastructure is complete, the marketing campaign is underway and customers are signing up at a blistering pace. You want your triple-play installation to go smoothly and don't want to send a technician to the house for installation issues that can be detected automatically. The ideal scenario is a self-installation by the customer. No one has to be home, there is no truck roll and costs are kept to a minimum.

Unfortunately, the technical competence of customers and the number of unsuccessful installations has kept the percentage of self-installations relatively small. Most carriers still send technicians for at least one triple-play service installation, and some are sending a technician for every new service turn-up. Truck roll costs vary from carrier to carrier but range up to $500. If a second truck must be rolled just to correct the initial installation, 10 months' revenue from a $50 service is wasted.

The self-installation

For those carriers advanced enough to provide self-installation of a VoIP service, the installation is usually considered complete when the customer hears a dial tone and successfully makes their first phone call.

But what if the quality of calls made on the line is poor? It's well within the capabilities of a service provider to go one step further and immediately establish call quality, allowing the provider to address any quality issues right away.

Imagine an installation scenario in which customers are instructed to dial a number within the provider's own network. The phone rings, and a friendly welcome message is played to the customer, thanking them for signing up for the service and letting them know the installation is complete. From the customer's perspective, this phone call is a pleasant introduction to the service.

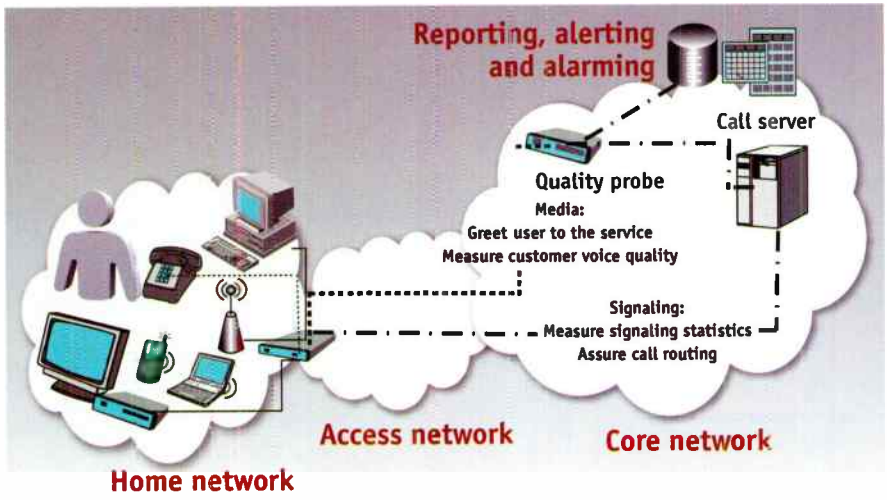
From the provider's perspective, the call serves a specific technical function. The provider can measure the voice and signaling quality of that initial phone call, scoring it and comparing it with thresholds established within its network.

If the call quality is acceptable, the quality report is automatically logged as a baseline for that customer, and no action is required. If the call quality is unacceptable, an automated alert is sent to the NOC to take action.

The purpose is to identify installations that are a problem and take action before a truck roll, or before the customer returns the gear within their "30-day trial" period. This increases customer satisfaction and ensures the stickiness of the service.

Dial tone and move on

For those installations where a technician is on site, the scenario can be used in the same way. The majority of carriers today only require a technician to check for a dial tone before calling the installation complete. A simple phone call from the customer's home phone can validate the installation, provide the test call results to the technician, and give the technician confidence to move on to the next installation or stay to fix a problem. This simple test is done without any custom equipment, with limited technician training and for a minimal investment.



Measuring the quality of a customer's service starts with a simple phone call and results in correlated data that guarantees a consistently high quality of experience.

The metrics

The signaling and media metrics used to determine an acceptable call are based on the standards in the industry:

- Post-Dial Delay (PDD) – The time it takes, after you've dialed, for the phone you're calling to ring.
- Post-Pickup Delay – The time that elapses between answering the call and receiving the first packet of media (conversation).
- Call Setup Delay – The time from receiving the request for the call until the final acknowledgment from the caller that the call setup has been successfully completed.

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- Mean Opinion Score (MOS) – Voice quality based on the G.107 E-model.
- Packet statistics – Packet loss, delay and jitter.

All of these statistics can be measured for every installation call, and the results are consistent across the user base

Service validation

Tens and hundreds of thousands of installations make for interesting data. Turning that data into useful information is unlocking a key to new business intelligence. Now, installers can be tracked for completion time between installations. Direct employee installations can be compared with contracted installations. Quality can be compared by time of day, region or any temporal dimension. Information can be presented to multiple levels of the organization and used to validate the success of the process.

Continuous monitoring and troubleshooting

Post installation, carriers need to identify problems proactively and give technicians tools that allow them to actively troubleshoot VoIP issues. Service providers need to know more than service availability; they need to understand when quality is degrading and address problems before the customer service calls start.

The same system that answers the calls from customers can be used to generate and measure calls when a problem is detected. The message to the customer is different, but the information about the quality of the signaling and media is the same. When a customer complains about poor voice quality, the customer service representative uses the automated system to generate a test call to the home. The customer answers and hears a message explaining that the call is being measured and that the issue is under investigation. The results can be compared with the baseline call and can be used as a starting point to further troubleshoot the issue.

In addition to these troubleshooting scenarios, 24x7x365 monitoring of VoIP service quality can be achieved through a number of standards that allow silent test calls to the home and reporting of quality from devices in the field:

- RTCP XR (RFC 3611) – Defines how any network device can report media quality statistics over RTCP.
- NCS Loopback (PacketCable standard) – Allows an EMTA to act as a mirror for test calls.
- SIP Media Loopback (IETF draft) – Defines how an endpoint (ATA, IP phone) acts as a mirror.
- End-of-call voice quality reports through various protocols, such as SIP and H.248.

How Media Loopback works

The concept of IP Media Loopback testing is simple. A device in the network makes a test call to the endpoint at the customer premises and asks the receiver to circle back every packet it receives during the test. Performance metrics are shared between the source and the mirror (loopback device) using RTCP or RTCP XR, making the data available to the correlation and analysis engine. Test calls are silent, and flexible scheduling policies can be defined for loopback sessions that meet the needs of network operators and don't interfere with customer calls. Since RTCP is already part of the CPE device, there is no need to have a technician sent to the customer's site or to download software agents. Service providers can automate this process for proactive, periodic monitoring or can run on-demand tests as needed.

Small changes = big results

Simple changes to the installation procedure and minimal training can provide significant returns, especially in an economy when every dollar counts. Limiting the repeat truck roll through the final installation call is the first step to assuring the installation. The result is unleashing an entirely new set of data for analysis and taking a step toward the ultimate goal of increased customer satisfaction. ■

Finding the right fit for turnkey platforms

By Mike Robuck, Senior Editor

Selecting the right turnkey platform is somewhat akin to going to a restaurant for the first time and selecting the prix fixe dinner. While you want to satisfy the palate without it taking a huge bite out of your wallet, the last thing you want is something that fails to suit your appetite. There are a lot of turnkey platforms to select from, but asking questions is key to finding the right kind of offering for your network, according to the Comcast Media Center's Gary Traver.

Traver

Matthews

"We've been doing a fair amount of analysis over the last year about this very thing," said Traver, who is the CMC's senior vice president and COO. "What it gets down to is in order for you to be a turnkey provider, you have to provide a whole measure of other components besides just delivering the service into the headend, parking it there and then asking someone to pick it up."

The CMC provides an ecosystem of turnkey offerings, including Hits Quantum, the National Authorization Service (NAS), QT+, VOD In a Box, Hits AxIS and a new remote ad insertion network service, all of which can function independently, or together.

"One of the sectors of a turnkey solution is you have to help people with understanding the core economics of the products that they're putting in," Traver said. "The second thing is we have to help people with elements of the entire system, even things that go beyond our traditional service border. That's why we've aligned ourselves with several hardware manufacturers so they understand the range of the full solution that is available. The third part we're focusing on is the product itself, and helping people understand how to relate the product to their customer base. We have a series of reports and metrics to help them with their business."

The CMC's vendor partners include Motorola and Arris, as well as feeds from SES Americom for Hits Quantum.

"What we've done philosophically is our whole goal has changed not to be just a service provider, but also really focusing on driving up and increasing the operational cash flow of these organizations that we support," Traver said. "In order for us to do that, we came up with the depth and breadth of the services that we provide. What I have my team focusing on is not just providing solutions, but how they're driving improvements in operational cash flow."

Evolution Broadband also has a turnkey platform for cable operators, albeit from a different angle than the CMC. Last month, Evolution was granted a three-year waiver on two of its low-cost STBs that are equipped with DTAs.

The waiver allows Evolution to offer a turnkey platform to small- and medium-size cable operators that includes the low-end STBs with Conax smartcards and the DTAs, which allow the operators to convert their analog tiers to digital to reclaim bandwidth. While the one-way set-tops can stand alone or serve as second and third boxes in the home, Evolution recently struck a deal with TiVo to use its high-end Series3 HD DVRs, which will come with Conax's CableCard.

The TiVo deal will allow Evolution's cable customers access to Internet content from the likes of Amazon and Netflix, which gives smaller cable operators a VOD like service without the expensive network equipment. In addition to Internet movies and shows, Evolution also has a deal in place with Avail Media for linear content.

"This waiver now enables us to aggressively go out there with confidence to package all of this together. We have one particular operator, who we will be able to announce over the next few weeks, who plans to do a very broad deployment of our turnkey solution, including TiVo," said Evolution President Brent Smith. "What we're looking at for a turnkey solution is that we would go into an operator that has limited MPEG-2 legacy equipment, or no MPEG-2 legacy, and drop in a single-rack Avail headend with the full security piece in place that supports both DTA converters in MPEG-4, as well as TiVo boxes for advanced services and for HD."

IPTV turnkey offerings

Turnkey platforms have also played a key role over in the IPTV space as small- and medium-size telcos have installed them as a way to offer competing video services against their cable and satellite rivals.

There has also been a vacuum of sorts after SES Americom announced late last year that it would be shutting down its IP-Prime transport service at the end of this month. EchoStar signed up two former IP-Prime customers in June for its ViP-TV transport service. While EchoStar's current offering consists of a transport service for its MPEG-4, IP-encapsulated video, Steve Skalski, vice president of EchoStar's ViP-TV division, said work is currently underway for an end-to-end turnkey platform.

"We have a couple of trials underway to offer an end-to-end solution all the way to the set-top box with EchoStar technology," Skalski said. "It will be a white-label product where the service providers can do their own branding on the on-screen guides."

Service providers can take all of EchoStar's current services in both HD and SD formats, or just in HD. Skalski said VOD is on the company's roadmap, but currently customers want HD and DVRs.

Skalski said ViP-TV is able to leverage Dish Network's video experience and assets, including the broadcast center in Chandler, Ariz. Once the end-to-end turnkey platform is up and running, it could offer local channels in markets where Dish is deployed.

Avail Media, which recently merged with TVN Entertainment, has its own turnkey platform, as well. In March, Avail announced it had added nine former SES Americom IP-Prime customers to its affiliate base, and in June it added 25. Avail delivers a combination of MPEG-4 linear IPTV, HD Overlay – including MPEG-2 and MPEG-4 – programming and VOD offerings to its affiliates.

"One of the key differentiators for Avail on the market is that we do a lot of the heavy lifting in regard to the integration, while IP-Prime left the integration to the operator," said Brian Matthews, Avail's CMO. "We've integrated with Minerva, Cisco, Latens, Verimatrix, Widevine and others, and we continue to update our integrations. What we do from a business perspective is allow the service providers to pick the vendors that work best with their networks instead of dictating to them which vendors to use."

TVN's customer list for its VOD services include Verizon, Comcast, Charter, Bresnan, Suddenlink and Armstrong, with Time Warner Cable added last month.

"Avail Media's strategy and vision has always been to deliver an integrated, managed turnkey solution to service providers, and that's inclusive of both linear and on-demand content," Matthews said. "The merger with TVN increased the bouquet of content we have significantly, and also accelerates our distribution into the cable space, as well."

Matthews said Avail/TVN's strength was to abstract the complexity out of delivering video services to service providers' customers, while also tailoring those services to each operator's respective market. Avail/TVN is also working on ways to get video content to the second and third screens for consumers.

"We're still in the early stages of lab work and pilots," Matthews said. "We'll do pilots first to the PC, and then to mobile devices, but for mobile we're looking at 2010 or 2011." ■

NEW products

Fujitsu upgrades Flashwave 7500 ROADM

Fujitsu Network Communications has announced the general availability of second-generation 40 Gbps interfaces for its Flashwave 7500 ROADM, an optical hubbing and transport solution that is deployed in cable operator and carrier networks to support core network consolidation, metro/regional capacity relief and triple-play service delivery.

Fujitsu's Flashwave 7500 ROADM

With an Adaptive Differential Phase Shift Keying (ADPSK) modulation scheme and Fujitsu patented Variable Dispersion Compensation (VDC), the second-gen units enable network growth of up to 1.6 Tbps of capacity to help customers meet ongoing demands for increased speed and bandwidth, the company said.

Three new 40 Gbps units are now available for the Flashwave 7500 ROADM, including the 40 Gbps Transponder, the 4:1 Muxponder and the 40 Gbps Regenerator.

Primarily intended for 40 Gbps core router interconnection services, the 40 Gbps Transponder provides a full-band tunable network interface and an OC-768 client interface. Supporting four 10 Gbps client interfaces, the 4:1 Muxponder provides a method for aggregating 10 Gbps traffic and quadrupling the capacity of existing 10 Gbps-based networks. And the 40 Gbps Regenerator provides electrical signal regeneration for long spans, eliminating the cost and complexity involved with the use of back-to-back transponders, according to Fujitsu.

Trilithic releases Model Three SLM

Trilithic has released the first in a series of new signal level meters that enable broadband installers to maximize efficiencies in the field.

The new Model Three signal level meter features tests for both analog and digital channel measurements – from 5 MHz to 1 GHz – including full scan, single channel and spectrum modes; data logging; digital signal measurements, including power, MER, and pre- and post-FEC BER (counting deep interleave); and an optional constellation display.

The Model Three can be customized to use a single keystroke to perform a complete auto test of all channels in the selected user channel plan.

"This product fits well in the direction we are headed in the cable business," said Terry Bush, president of Trilithic. "Cable service providers are looking for more ways to streamline installations and reduce callbacks, without major capital investments. This economical meter is simple to use and [easily automates] testing – for consistent results."

The Model Three SLM is now available, and Trilithic is accepting orders for shipments.

OPTICAL

Arris adds CorWave feature

Arris' CorWave DXL forward transmitter

Arris now has available a variable output feature for its 1 GHz CHP CorWave forward transmitter that allows customers to configure output power (via GUI software); typically power is factory set.

Arris claims the feature is unique.

The capability provides MSOs with flexibility when finalizing link budgets within their network architectures, and it saves on sparing costs, Arris said.

CorWave is an extension of Arris' multi-wavelength optics solutions.

Additionally, Arris has introduced a 1 GHz CorWave DXL (dual-input, full-bandwidth) forward transmitter that extends analog linearization out to 870 MHz.

The CorWave DXL provides better distortion performance, allowing operators using global channel plans to add incremental bandwidth capacity on as few as one fiber, and it can be monitored by the CorView Element Management system.

In March, Arris introduced two new products in its optical access product portfolio. The company's CorWave optical transmitter was capable of sending signals on two wavelengths; the CorWave II is expandable, in steps, to up to 16 wavelengths. Arris performed trillions of calculations to choose wavelengths that could be used together, while minimizing linear and non-linear impairments the company said were common in long-distance DWDM transport.

And Arris believes the costs of extending fiber directly to subscribers' homes or businesses are now roughly equivalent to stringing coax, and getting cheaper. Arris introduced its FTT Max RFoG CPE, a device that allows operators to extend their HFC plants using fiber (RF over glass, or RFoG). This setup could also be used for PON, Arris said, leaving a clear migration path should Gigabit Ethernet PON or 10 GigE PON become necessary to satisfy subscriber requirements.

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FEATURES

All-Fiber Access Network Design Using Branch-Connected Terminals

It's now thoroughly practical to run optical fiber all the way to the home in new builds. Now it's time to start evaluating the most practical ways of performing an optical deployment. Teresa Bazzle and Mark Conner of Corning Cable Systems discuss how the key can be network access points.

They write: "A key lesson learned from past deployments is the impact that the network access point (NAP) placement strategy has on deployment costs. Placement strategy impacts deployment velocity, installation costs, and the ability to defer component installation until service is needed and revenue is generated. Deferring costs in itself is advantageous, and it's even more important in situations where the anticipated initial take rate will be low, or where the plant construction may occur in phases."

PMD Mitigation Using Exfo's FTB-5600 Distributed PMD Analyzer

Optical fiber may be immune to many of the problems that plague copper wire, but it is still subject to signal degradation. One type of optical degradation is polarization mode dispersion (PMD), and it's becoming a bigger problem than previously anticipated. Mike Andrews of Exfo discusses a means of characterizing and alleviating the problem.

He writes: "While today's network equipment technology can support higher data rates such as 40 Gbps, existing optical links are not necessarily ready for the upgrade, as legacy fibers installed at a time when PMD was not of concern for the prevalent bit rates often exhibit excessively high PMD at broadband speed. Of course, PMD is typically less frequent in newer fibers than in older ones, and solving the problem can temporarily be delayed by avoiding the high-PMD fibers. However, when bandwidth is required, all available fibers will need to contribute. And today, this is more meaningful than ever before, for the following reason: ROADMs make the network reconfigurable, so all fibers are solicited.

"Eventually, the problem must be fixed, either by replacing the whole fiber – a very costly proposition – or pinpointing the worst link sections and replacing only those."

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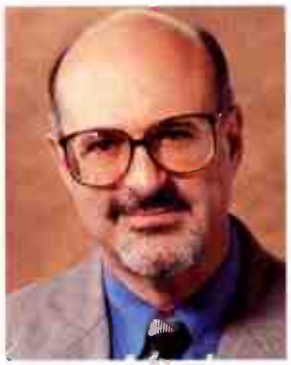
Old waiver requests never die



By Jeffrey Krauss

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Lawyers just appeal and appeal

Back in 2006, a company called Clarity Media filed a waiver request under the FCC's Cable Television Relay Service (CARS) rules to deliver multichannel digital television service at some 250 truck stops around the country. How would they do this? By using spectrum at 2 GHz allocated for the FCC's CARS and Broadcast Auxiliary Service.

In a rare example of rationality in anything affecting the cable industry under the Kevin Martin regime at the FCC, the waiver request was denied. But the case still goes on because Clarity has appealed, in the form of an "application for review." Anyone could tell them that their cause is hopeless. Anyone, that is, except their own lawyers, who keep raking in the fees.

The frequency band in question is the 2025-2110 MHz band, which I have written about before (see "The other digital video transition," December 2008). This band is used for portable electronic newsgathering (ENG) – carrying video from a remote news event back to a TV station or cable headend. While the majority of users are broadcasters, any cable operator that produces its own news programming is also eligible to use this band for portable CARS transmitters.

Clarity claimed that it would be providing a "first service" to "a community of approximately 2.5 million unserved and underserved Americans," namely long-haul truck drivers.

But in order to provide the service, Clarity needed waivers of several FCC rules. It needed a waiver of the underlying purpose of the CARS service, which is to relay signals from one point to another within a cable system. Clarity wanted to use the frequencies for direct delivery of video to customers, rather than as a relay within a network. It needed a waiver of the eligibility rule, since Clarity is not a cable TV operator, nor proposing a cable TV service. It needed a waiver of the frequency plan, which specifies that the channels must be used for mobile or portable, not fixed, operations. It requested a waiver of the rule requiring frequency coordination, the process that assures users won't interfere with one another. It requested waivers of the rules on power limits and occupied bandwidth. Requests like these are certain to draw opposition, and they did.

Clarity promised to deliver up to 75 channels of digital video, including one called the "Safety, Security and Alert Channel," which would publicize Amber Alerts and would post information about missing children. As a result, Clarity drew support from the Lost Children's Network, the Missing Children Task Force and the Klaaskids Foundation.

But everyone else objected, including numerous broadcaster groups, the NCTA and NASA. NASA uses the band for uplink communications during launches of space missions. And, most recently, the cell phone industry registered its opposition. The cell phone interest is the adjacent frequency band, used for AWS by T-Mobile and others. They all complained about interference issues.

Clarity, it turned out, had done some interference tests in 2005. But according to the FCC, they were unrealistic, and in any case did not include the digital ENG links that were then being introduced. Clarity promised to turn off its transmitters when interference occurred. But the biggest problem is that portable ENG and CARS units may be dispatched and relocated without notice, and there would not be time to investigate the cause of interference that might occur during a breaking news event.

The Clarity system operates at distances up to 0.7 km (less than half a mile). Thus, it seems odd that Clarity chose the 2 GHz band. The 2 GHz band is favored by broadcasters because of the propagation characteristics of that band – the signal can travel 40 or 50 miles. In contrast, the higher microwave frequencies are typically used when short distance paths are needed, which seems more appropriate for broadcasting to a truck stop. If they specifically wanted to use CARS frequencies, 18 GHz CARS frequencies are better suited for their multichannel video plans. There might also be suitable spectrum available in the 20 to 40 GHz range. In fact, there may be spectrum at 18 GHz or above that Clarity could use without needing any rule waivers at all.

So why choose 2 GHz? Clarity was planning to use transmitters made by Loma Scientific International, a supplier of MMDS transmitters. As you recall, MMDS (once called "wireless cable") is a multichannel video broadcasting service that is largely defunct in this country but still quite popular in South America. MMDS operates in the 2500-2690 MHz band. So the Loma equipment could most likely be used with little or no modification. At 18 GHz or higher frequencies, however, it might be necessary to develop new equipment – a much more expensive proposition.

Clarity is a subsidiary of Flying J, the largest retail distributor of diesel fuel in North America. Flying J is ranked among the top 20 in Forbes' list of America's Largest Private Companies, with 2008 sales exceeding $18 billion. In other words, plenty of money to pay the lawyers with, right? Maybe not. On Dec. 22, Flying J filed petitions to reorganize under Chapter 11 of the U.S. Bankruptcy Code. Ouch! But somehow the lawyers always seem to be first in line to get paid.

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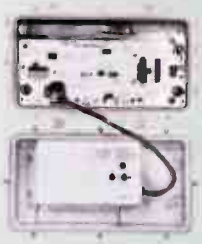

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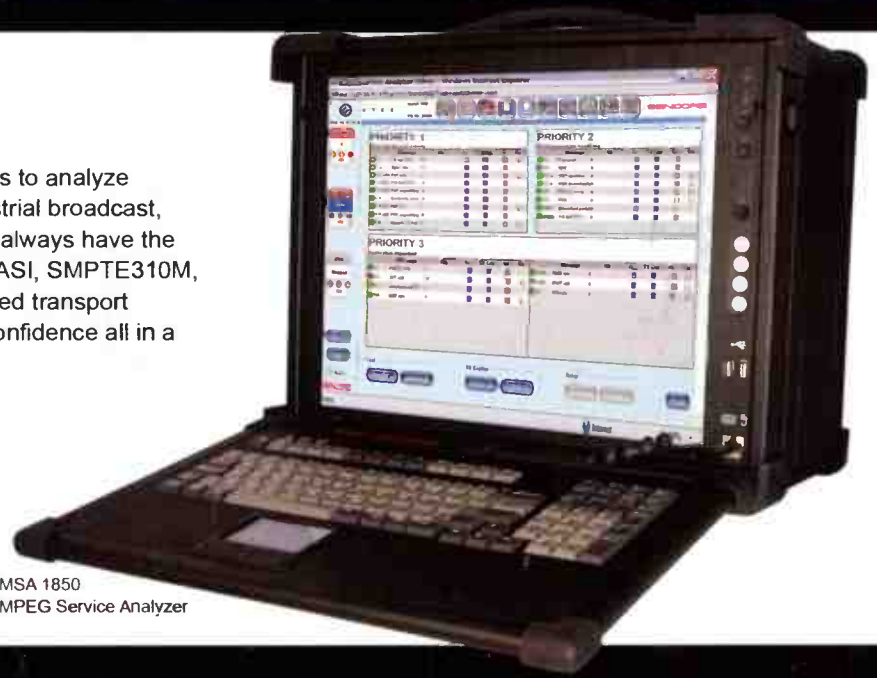

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