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New Way to Monitor Cable Links Quickly Pinpoints Noise Sources

OSS BroadNet Says Its Technology Has Demonstrated Significant Op Ex Savings

By Fred Dawson

The ever more rigorous performance requirements of cable hybrid fiber cable networks have inspired a new approach to proactively identifying potential trouble spots that could significantly lower operations costs and reduce customer dissatisfaction.

The new solution comes from OSS BroadNet, a firm whose president and CEO, Ejii Miyazoe, has long worked with Japanese MSOs to perfect not only the technical means applied to identifying network problems, but also the operations systems support mechanisms that are essential to timely transfer of information from the technical operations side to customer service management.

With investment support from Japan's J-Com, the country's largest MSO, and several Japanese banks, OSS BroadNet has brought its technology and OSS platforms to the U.S. and is now engaged in a trial with its first U.S. customer, San Bruno Cable, an independent California operator. "The architecture and operational requirements in U.S. cable are very similar to those of the Japanese operators," Miyazoe says. "We believe the need for a better approach to addressing performance issues is as great here in the U.S. as it is in Japan."

OSS BroadNet, operating in the U.S. out of offices in San Jose, has patented a unique approach to pinpointing trouble spots in the network that allows technicians to find and resolve problems quickly, often in advance of when they become sources of complaints from subscribers. The key to achieving this proactive capability is the use of sophisticated software in conjunction with data generated by cable modems to precisely locate where unwanted signals, known as ingress noise, are leaking into the cable system.

"Ingress is often a cause of signal degradation, but it's also an indicator of problem areas even when the ingress itself isn't strong enough to be noticeable by subscribers," Miyazoe notes. "Our system is able to let operators know where ingress is happening in either the downstream or upstream paths and to help identify potential causes. Based on our experiences with current deployments, operators using the technology can expect significant reductions in operations costs by 20 to 30 percent."

Even more important is the degree to which proactively identifying potential trouble spots can prevent network weaknesses from causing service degradation to a point that it irritates subscribers. "We don't have any precise metric as to the impact on customer satisfaction, but it's really the biggest benefit to use of our technology," Miyazoe says.

OSS BroadNet has developed a back-office system that provides a direct feedback to customer service departments in instances where network issues are generating customer complaints. "We knew we had to do more than come up with a technology solution that reduces the time it takes to pinpoint and correct problems," Miyazoe says. "So we put a lot of effort into creating a solution that integrates with existing OSS to give CSRs the information they need to keep customers informed."

By knowing the location and potential impact of a problem early on, the system can alert customer service departments to shift customer support staff to handle a heavier load of calls. And the system provides up-to-the-minute information on what's happening along with messages CSRs can read to customers to keep them informed, he notes.

OSS BroadNet's OPEN STM IM (Status Monitoring Ingress Management) technology differs from traditional status monitoring systems, which rely on generation of out-of-band pilot signals and periodic polling of amplifiers, set-tops, cable modems and other electronics in the cable system to identify potential problems. This legacy approach might pick up a problem in the making or, more likely, one that's already causing complaints, but it leaves it to technicians to locate the source, which can take hours.

Moreover, such polling, performed in linear sequence across hundreds of amplifiers and thousands of devices, can take hours to cycle through, often resulting in delayed identification of a new problem. And because the pilot signal is generated out of band, it does not precisely reflect what is happening within the specific spectral bands of the upstream and downstream paths, resulting in frequently missed problems in the making.

OSS BroadNet claims to overcome these limitations by relying on the data collection and reporting capabilities that are intrinsic to cable modems conforming to the DOCSIS (Data Over Cable Service Interface Specification) standard. While DOCSIS addresses the status monitoring needs of the modems and the CMTS (cable modem termination system), it does not cover all the electronics in between, including trunk amplifiers, bridgers and line extenders. But by creating a precise block diagram of the positioning of all plant electronics in conjunction with all cable

modems, OSS BroadNet can use the signal-to-noise ratios reported by all the modems to determine exactly where the causes of fluctuations in SNR on the downstream path are originating from, Miyazoe explains. Detecting problem locations in the upstream employs the block diagram in conjunction with use of the bridger gate switches typically used in cable amplifiers to control the signal power level. By switching specific gates off, which allows the signal power to increase, and then reading the SNR registered on a particular CMTS port associated with a particular modem, the system detects whether the SNR ratio goes up as expected or fails to hit the expected mark, which means there is unwanted noise in the system. Threading rapidly through this process the system locates exactly which modems are sending noise and therefore which plant electronics are subject to ingress.

The system overcomes the limitations of linear polling techniques by using a multi-threading approach that polls multiple cable modems in parallel and simultaneously, allowing information to be collected at a fixed polling period that can be as short as 20 seconds, the company says. And because it uses the standardized SNMP (Simple Network Management Protocol) of the DOCSIS regime, it eliminates the use of proprietary commands associated with specific CMTS and modem vendors.

Japanese operators who have deployed the system attest to significant improvements in operations costs and customer satisfaction. "During any outage, OPEN STM plays a crucial role for pre-support before dispatch," says Touru Jinguji, vice president of the engineering division at Nihon Network Service, which serves about 165,000 customers in Kofu City.

"Based on information like signal levels and quality degradation, it becomes easy to judge whether the error is with an individual cable modem or a wide area outage," adds Massayuki Aihara, vice president of communications technology at NNS

OSS BroadNet has developed an extension to the platform with tools that can be used by installers when they connect customers to digital voice services, Miyazoe notes. "Once the MTA (modem terminal adapter) is turned on our system can poll the device and locate any potential problems, which can cut the number of post-installation trouble calls significantly," he says. ■