Case Study :: Utility Market

Actelis Networks Lights the Way for PG&E With Copper

Utilities make a perfect fit for Actelis Networks®, since they tend to have their own large and diverse copper infrastructures often serving remote locations with a requirement to distribute broadband applications. The utilities market plays to the strengths of Actelis' Ethernet in the First Mile (EFM) solutions. Built into the company's family of ML Ethernet Access Devices (EADs) is the *Three R's of EFM: Rate, Reach and Reliability*, along with the ability to cope with copper of variable quality, as well as protection against failure of individual circuits. Utilities also demand value for money, especially in the present climate where they are under pressure to insulate their customers as far as possible from escalating wholesale prices for both electricity and gas.

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These were factors in the selection of Actelis for critical business and process control functions by Pacific Gas and Electric Company (PG&E), one of the largest combined natural gas and electric utilities in the U.S. serving 15 million people in northern and central California. As with many utilities, fiber appeared superficially attractive but was dismissed when the cost of deployment and disruption were taken into account. The copper infrastructure was already in the ground so the main question was whether it could provide the required bandwidth to remote locations up to seven miles from PG&E headquarters. Actelis gave a clear and positive answer to this question with a field demonstration of its ML family of EADs, convincing PG&E that it could provide the backbone connectivity for these process control applications or any other application they needed to transport via Ethernet.

PG&E's Requirements

PG&E has a vast transmission network serving 5.1 million households and businesses for electricity and 4.2 million for gas, with many of its customers in more populous areas (where gas is available) taking both services. The network covers an area of 70,000 square miles from Eureka, Calif., to Bakersfield in the south of the California's central valley, with a wide range of installations including power-generating plants, distributed business/administration offices, power substations, and a gas high-pressure storage facility in Burnley. These facilities are served by the utility's own comprehensive copper infrastructure, reaching remote outposts in some cases, but until recently, driven only by low bandwidth legacy technology such as dial-up modems and T1 point-to-point circuits.

PG&E needed to deploy a solution quickly to provide high-speed, reliable communications for critical business and control processes and then looked to copper after dismissing fiber, according to Louis Hatton, senior network specialist at PG&E. But there was a problem: The solution would need to work over copper cables up to 24,000 feet long (even 35,000 feet long in one case). After taking all of these factors into consideration, PG&E was unsure if existing copper solutions could provide the answer.

PG&E's initial plan included costing for fiber, which would have provided the required bandwidth and reach, but the price was far too high, particularly for extending high bandwidths to more remote locations. The utility was uncertain how to proceed, until a pragmatic solution emerged from the world's leading Carrier Ethernet over Copper™ specialist, Actelis Networks, whose corporate headquarters is in the San Francisco bay area. Actelis suggested that PG&E evaluate its family of ML EADs and, subsequently, conducted a field demonstration. PG&E was delighted with the evaluation, and decided at once to proceed with an initial deployment after determining that this solution would cost just a fraction of the fiber alternative while meeting all bandwidth needs.

Requirements

- Ethernet extension
- Long distance reach and reliability
- Using existing copper infrastructure
- Economical alternative to fiber
- Quick, easy deployment and management

Equipment

- ML600 EADs series in point-to-point
- MetaASSIST™ management system

Benefits

- Utilize existing copper facilities
- High performance, low cost
- Quick, easy to deploy
- Highly secure transport
- Fiber-like qualities

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Case Study :: PG&E

PG&E was also impressed by the ML systems' ability to deliver fiber-like reliability and its immunity from failure, on the basis of its evaluation and from existing customer installations. The clinching factor was Actelis' support for high speeds over long cables, according to Hatton. "The 24,000-foot range is one of the primary reasons for looking at Actelis in the first place," said Hatton. "We have two locations that are nearly 24,000. One of them actually uses one of the mid-span units to continue the Ethernet further on another 10,000 feet, so the total network is nearly 35,000 feet in length."

In the summer of 2008, PG&E deployed various EADs from Actelis' ML620 family. Two ML622 models were deployed, operating over two bonded-copper pairs at bit rates around 10 Mbps. Four ML624 models were also deployed over four pairs, delivering 20 Mbps. These speeds lay within the so called "sweet spot" for mid-band Ethernet services, meeting the requirements of most offices and remote sites, as well as smaller businesses. However, Actelis still has the ability to support higher rates up to 100 Mbps.

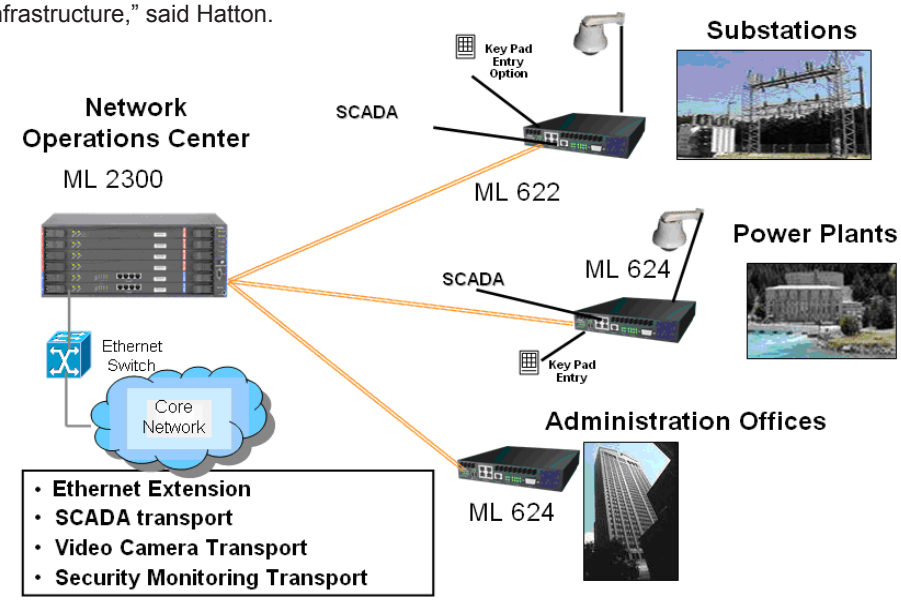
The ML620 family of EADs has a number of features that satisfied PG&E's requirements. In particular, Dynamic Spectrum Management (DSM) techniques which provide the desired combination of superior bit rate, extended reach, and fiber-like resiliency. Another important factor in PG&E's choice of Actelis was ease of configuration and management via Actelis' MetaASSIST™ management software. Collectively, the Actelis solution ensured that PG&E could rely on Actelis to underpin a critical application. "Actelis has allowed PG&E to move ahead with a complex project, and not get bogged down in very expensive upgrades to existing infrastructure," said Hatton.

Since deploying Actelis, PG&E has been happy both with the solution and the level of support, according to Hatton. "Actelis' products have continued to perform as we expected and satisfaction is high here at PG&E," commented Hatton. "We are particularly pleased with the rate and reach of one of the links driven by two ML624s serving a remote site over a distance of 24,000 feet."

Actelis Networks' ML620 Ethernet Access Device

For more information, visit Actelis.com

Hatton was also impressed by the speed (taking a matter of minutes) of deployment and configuration. "My first experience with Actelis in an operational situation was in an old power plant, using a very old copper cable that is about 24,000 feet long. We were able to implement the Ethernet in under 20 minutes or less and make it operational," said Hatton. "It took longer for us to drive from one end to the other than it did to install the hardware and get it online."



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