



Smarter Tools, Smarter Technicians

Equipping Yourself for Converging Environments

BY LEE BADMAN

Convergence is one of those buzzwords that eventually touches everyone in the IT industry, from the cable installation crew to the chief information officer. When applied to burgeoning applications like voice over IP (VoIP) and PC-based telephony, convergence is the almost natural evolutionary fusing of voice applications with data networks. Apply the term to markets, and we see a growing trend in companies trying to stretch their wings to provide more slices of the telecommunications pie to the customer. At the support level, installers and technicians are called on to become more tech-savvy in several areas, especially in smaller companies where bigger technician “bang for the buck” means survival. For a number of telephone systems, network switches and even certain cabling test-equipment, PC skills are required for installers and maintainers to configure systems and maximize productivity. Knowledge of drawing programs like Visio can make or break a sales proposal, and it is often the technician called upon to diagram networks and systems. These trends in the integration of skills and applications can’t help but contribute to a certain degree of depolarization between the telecom and datacom communities. In today’s world, it’s not unusual to see the same individuals who install cabling involved with telephone systems and at least basic network installations, testing and maintenance. This trend is some-

what inevitable and benefits both telecom companies, in the form of increased sales, and employees, who reap the benefits of gaining expanded technical skills.

The migration into the network world by voice and cable technicians, as well as the necessary cross training into the voice and cable arena by network technicians, does not come without costs. Tools, test equipment and training are necessary for the expansion of technical roles. Luckily, there is an abundance of high-quality, specialized gear on the market to assist those charged in cable installation and testing, voice, and/or first-response network troubleshooting. The following provides a sort of snapshot representation of the excellent tools a modern telecom/datacom shop would do well to have to function within the framework of convergence.

Collectively forming a “dream toolbox” of sorts, many of the following products are recently new to the market, while some are old standbys. All are representative of the kinds of quality assets available from numerous manufacturers to support contemporary converging environments.

Wiring Support

Since any application begins at the physical level, our overview begins with cable/fiber test equipment. Whether certifying, identifying or troubleshooting, the right tools for your application are out there.

Open-book Partnership Important to Project's Success

By Stuart Froman

For simple cable identification, The Siemon Company's STM-8 is a versatile, low-cost tester that you'll come to rely on for identification and troubleshooting twisted pair wiring (including patch cords and telephone station wires). When combined with its optional set of passive remotes, the STM-8 consistently verifies T568A, T568B, USOC, 10BASE-T, Token Ring, and TP-PMD wiring, including shielded UTP. Tone generation (on the pin of your choice) is a bonus. Similar products are available from IDEAL Industries and Hubbell Premise Wiring, among others.

When UTP certification is required, there are many excellent choices among cable analyzers available. Most have the ability to dump data to specialized software for the generation of reports, and many can accommodate modules that allow for the testing of fiber optic cabling for even more versatility. Shop carefully, and units can be found that allow for voice communications between main and remote units. Any tester purchased today should support the proposed TIA Category 6 standards, and test to 350 MHz. One example of choice is the WireScope 350 from Agilent Technologies. Featuring a color touch-screen user interface, the WireScope 350 rapidly tests basic link and channel paths, and accepts Agilent's Fiber SmartProbes for testing installed fiber plant. Included software makes report generation a snap, and firmware upgrades are available via Agilent's web site (this approach is the norm among cable analyzer vendors and should be considered when purchasing). Other sophisticated products are available from Fluke Networks, Microtest, Acterna and Datacom Textron.

When combined with available fiber probes, many cable analyzers can provide most installers with an almost

Engineers at Brown and Caldwell, an environmental engineering company headquartered in Walnut Creek, Calif., design and execute innovative environmental solutions for public agencies, government and private industry. This type of work requires a sophisticated high-speed structured cabling system to enable the bandwidth-intensive applications required. So, when Brown and Caldwell planned to move its headquarters to a new building in Walnut Creek, the company sought an experienced, reliable installer for its high-speed data cabling network – one who could fully understand its needs.

"We interviewed several companies, both large and small, but we were extremely impressed with Rancho Santa Fe Technology," said Felix Valadez, corporate network manager for Brown and Caldwell. Rancho Santa Fe Technology (RSFT) is a privately held, minority-owned business with offices in San Diego and Alameda, Calif., and Tempe, Ariz.

Particularly appealing was the innovative open-book, partner-style relationship offered by RSFT. "...Before we even wrote the RFP, and without any contract signed, they actually offered to create the initial design document and budget model that would serve as the basis for the final project definition," said Valadez. Throughout the project, Valadez said that RSFT facilitated "regular and constant" communication. "As part of that, we would see all the costs as the project went forward, and they would pass savings, such as better negotiated final pricing on materials, back to us," he added.

SOLUTION

RSFT proceeded to plan, develop and manage an efficient, flexible, and serviceable communications network system designed for a useable life of eight to 12 years. In order to provide for high-speed applications, RSFT utilized state-of-the-art components, including Avaya Communication's SYSTIMAX® structured

cabling, which guaranteed that all components would meet or exceed the proposed Category 5e standards and that they would work together seamlessly.

The project included three floors consisting of local LANs with dedicated links to the main cross-connect (MC). The connectivity between floors consisted of a fiber optic and copper backbone installed in a star topology originating from the MC on the third floor. The project also included two telecommunications rooms (TRs) located on Floors 1 and 3. The TRs were provided with six strands of multimode fiber connecting to the MC.

Approximately 275 station information outlets (SIOs) were installed throughout the three floors, and the cabling from the TR to the SIOs consisted of Category 5e data cable and Category 5e voice cable. The project also included the racking and termination hardware at the MC.

BENEFITS

Valadez's review of the completed project was consistent with his enthusiasm at the start. "The project was delivered on schedule, and we now have a high-quality cabling system that will serve us well now and for some time into the future. And Rancho Santa Fe Technology provided us with excellent service. They had a dedicated project manager assigned to the job, and throughout the project we met at least weekly to get status reports and go over any issues."

Communication was also the key to resolving the only real challenge that arose during the project. "RSFT worked directly with us," explained Valadez, "not as a 'sub' to the contractor doing our build-out. This inevitably led to issues of timing and responsibility, but we were able to resolve this relatively easily because the RSFT team was able to communicate effectively with our contractor as well."

But while Valadez was pleased with the processes established by RSFT for the

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100 percent ability to test and troubleshoot UTP and fiber environments. For advanced optical fiber troubleshooting, however, experts turn to the more sophisticated optical time domain reflectometer (OTDR) class equipment. Typically ruggedized for use in outside plant installations, modern testers like EXFO's FTB-100 Mini-OTDR bring a solid complement of testing abilities and integrated features to bear in the field. Supporting essential wavelengths for all fiber applications including long-haul networks, the FTB-100 will host a variety of OTDR modules, provides a crystal-clear touch screen interface, and sports Windows CE as an operating system (which means easy synchronization with a PC). Today's OTDRs will store hundreds of traces, and perform a broad range of specialized tests on singlemode and multimode fiber runs. Other providers of excellent OTDR and related equipment include Corning Cable Systems (formerly Siccor) and Tektronix. For cabling shops that have not yet ventured into the world of terminating installed fiber cabling (or for IT specialists having the occasional need to have a fiber connector repaired or replaced), no epoxy/no polish tools like AMP's Light-Crimp and Corning Cable System's UniCam® systems are worth looking into. Connectors can be installed in a matter of minutes, with very high success rates and minimal training.

Testing the Active Environment

Testing active network connections requires test equipment that, until recently, was not very portable or very user-friendly at the technician level. Recently released and designed for the tool bag or pocket, Fluke Network's NetTool™ is arguably the best (and possibly the only) of its type available to the technician or network manager

today. Combining accurate network and PC configuration testing with the ability to reliably test UTP, the palm-sized NetTool makes diagnosing Ethernet connections and installed wiring equally easy, even for those new to the live side of the network. Testing all aspects of 10 Mbps and 100 Mbps UTP connections, the NetTool is an excellent all-in-one tester and a perfect introduction to the world of network testers. Often, the NetTool will allow a first-responder technician to pinpoint network configuration errors that in the past would require the expertise and higher-end diagnostic tools of a network engineer.

Advanced technicians and network managers can benefit from the OptiView, also by Fluke Networks. Providing for a host of advanced network diagnostics in a highly portable PC-based tester, OptiView can test both connectivity and cabling (UTP and fiber) in virtually any environment. This impressive newcomer supports 10 Mbps Ethernet, 100 Mbps Ethernet and Gigabit Ethernet. As network engineers are stretched thinner in today's talent-hungry enterprises, the OptiView puts a tremendous amount of network support ability in the hands of those at a lesser support level, benefiting both the organization and the technician.

It's not news that many wiring closets are a motley mix of cross-connect and unlabeled UTP, and not everybody servicing either voice or data can figure out what's going on without some potentially disastrous interruption of vital ISDN, T-1 or data circuits. Sometimes, all we have to face this unknown with is our best guess and a traditional analog butt set. Often, just knowing whether wiring has data signaling on it is all that's needed, but has not been easily found out without circuit disruption. Fortunately, there is a new generation of products on the

market that gives the service person a leg up on deciphering the goings on in a sea of live wires, without causing costly interruptions. IDEAL's recently introduced Model 630 Craft Test Set is one example of the industry realizing the cost of technician-induced circuit interruptions. The Model 630 gives both audible and visual alarms when near a digital circuit. It also provides for safe voice circuit testing on a DSL line. Chesilvale Electronics, Harris, and Progressive Electronics also feature data-safe butt sets.

For those not wanting to change from their current inventory of butt sets, Santronics provides the very handy TelCom 205 Signal Detector. The TelCom 205 detects virtually all common telcom signals when it is placed in proximity to active wiring. All of these relatively low-cost testers provide support staff with insurance against lost data and lost business.

Don't Forget the Training

As cabling comes to grips with convergence, the time is right for both technicians and companies to look inward at how training is approached, and what value is placed on ongoing training. Even those with years of experience can benefit from a long-term training strategy. In fact, ever-changing technologies, standards and industry trends demand it. One of the strongest arguments for training is the credibility it brings to both the individual and the business. RFPs often demand that proof of employee skills and training get submitted with bids. Boiled down even further, a company in our industry can live or die on the strengths of its technical force. This effect becomes magnified in smaller companies, where technicians also become involved in administrative and sales roles. Fortunately, good training can come at no cost or low

cost from a variety of sources. And as much as many of us are self-trained to some extent in a variety of specialties, a little classroom time can take months or years off the learning curve and lead to immediate increases in profit. Also important, it is a proven fact in our IT world that employee training often means employee retention.

So where can a cabling company turn to broaden its skills base or formally train its entry-level technicians in proper cabling techniques? Data component manufacturers are usually a good place to start, especially if the installation promises an extended warranty in the sales pitch. Hubbell Premise Wiring, Ortronics, The Siemon Company and many others provide installation training of various sorts that may be required for installers before they will back an extended warranty. Many vendors will send a representative to conduct training at your facility, and it is often free. All shops should take advantage of this basic installer training. Employees are awarded a certificate after successful course completion, and many savvy companies will include salespeople in the class roster. (It's far easier to effectively sell when you have basic firsthand knowledge of what the installers are up against.)

Other certification programs exist, in many flavors. BICSI's Installation Program and Registered Communications Distribution Designer training programs are immediately recognized among industry professionals as benchmarks for professional development. Cabling Business Institute (CBI) has an exciting and diverse range of quality training opportunities for both the technical and sales sides of the house, and CBI's program is now offered at several community and

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technical colleges through the United States. Further, the International Brotherhood of Electrical Workers has a recently formalized interest in datacom training as well.

There is no shortage of training on the network side, either. Cisco, Novell, and Microsoft are among the most common IT providers offering varying levels of training. Each has a “ladder system” of training to provide an avenue for entry-level trainees to become proficient and certified in a variety of relevant specialties. A little detective work will turn up some appealing options for those interested in gaining LAN and WAN networking proficiency, expertise in computer telephony, or other disciplines that move beyond infrastructure and into the active realm. Regardless of specific interest, there is an abundance of quality training available today.

It's All There for the Taking

This is truly an exciting time to be in the cabling and network industries. As lines are blurred, companies and technicians face new challenges and opportunities that will have a direct bearing on many a corporate future. It's an excellent time for pause and reflection. The tools, equipment and training needed to transition into a converged world are out there for the taking. It's up to us to decide what to do with it all.



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project, as well as the results, he reserved his highest praise for the relationship created between Brown and Caldwell and RSFT. “...I can't say enough about how important it was to feel that we were working with a partner instead of a vendor. The Rancho Santa Fe Technology team felt like coworkers who cared as much about the success of the project as I did. They were always available when any issues arose, and they handled them quickly. We developed a very comfortable working relationship.”

In fact, the experience has changed the way Brown and Caldwell does business. “Going into the project, we were preparing our standard request for bids, but after meeting with Rancho Santa Fe Technology, we opted to accept their design-build process, which included the open-book, partnership-style relationship. Having found real value in this, we've really changed the way we look at our other vendor relationships, and want to replicate this model as much as possible.”

Visit Rancho Santa Fe Technology on the Web at www.rsft.com.