Mobile Backhaul

Thinking Differently About 4G Mobile Backhaul

Strategies for Managing Increased Bandwidth Demands

Leading the Way in Carrier Ethernet for Mobile Backhaul

Policy Issues - Impacting Demand for Mobile Backhaul

Complimentary Registration Info Enclosed
Fujitsu Packet Optical Networking Platforms (Packet ONPs) bring the power of standards-based Connection-Oriented Ethernet (COE) to your existing optical networks:

» Efficiency and flexibility of Ethernet
» Guaranteed connection performance
» Comprehensive fault management
» Cost savings over routed solutions
» Reliability and security of SONET/SDH

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Leading the Way

The past few years have taught all of us lessons about what it means to be a leader during tough times. Struggle can leave us either watching to see what others are doing, or else taking the lead with calculated risk and a heavy dose of gumption. For some, that can be a tough choice.

We have found our customers expect us to take a leadership position for them. Among other things, we do that with our manufacturer relationships, service offerings, and our choices in focus technologies.

During a recent meeting we discussed some of the hottest technology trends driving today’s telecom industry. One that emerged as a leading topic is mobile backhaul. With wireless data usage growing at rapid speeds, service providers regard fiber connections as a strong solution for supplying mobile backhaul, which is the most effective tool in delivering high speed broadband. In fact, mobile backhaul is in such high demand now that many companies are making a living on providing a fully managed end to end backhaul solution to carriers, in order to aid Ethernet backhaul in support of 3G and 4G services.

We are very comfortable with claiming a leadership role in mobile backhaul deployment projects across the country. Mobile backhaul has been a focus technology for Walker for many years. We aligned ourselves with a broad range of manufacturers to ensure that Walker offers customers full access to a complete product mix for this technology. The strength of our relationship with these manufacturers has given Walker the ability to offer some of the best products, prices, and availability in the industry. Many of our carrier customers take full advantage of our position and have used Walker as their main equipment supplier for this application.

Speaking of leadership, Walker will host the Mobile Backhaul educational track at “TIA 2011: Inside the Network,” scheduled for May 17 – 20 at the Gaylord Texan in Dallas, Texas. Our experience as a mobile backhaul leader made us an obvious sponsor for this event, and we will be joined by many of our strongest manufacturers on the expo floor.

Walker and its manufacturer community offer real solutions for the challenges of maintaining affordable, reliable bandwidth to support the exploding demand for smart devices. As an industry leader, it’s the least we can do!

Jennifer Beck
As Director of Engineering Services for Walker and Associates, Rodney Wise confronts a variety of technical questions on a daily basis. His broad background provides him a real-world perspective of challenges and opportunities telecom engineers and project planners face in the field. This experience, along with continual training from the manufacturing community and a staff of equally talented Sales Engineers provide customers with a wealth of pre and post-sales engineering support. The Wise Guy is a regular feature in The Skinny Wire and on our website, www.skinnywire.net.

Having the responsibility for wireless backhaul in the old days as a wireless carrier “facility” engineer, quality and reliability was the order of the day. Bandwidth to an individual cell site didn’t mean much. We had one to seven T1’s at each site and above two or three only at special event sites such as arenas and stadiums. In those days, the T1’s were delivered through leased services or licensed microwave and we tried to balance out the backhaul so that a catastrophic failure would take down as few sites as possible. If the cell site was served with a microwave link then we tried to use our microwave backbone all the way back to the MTSO and vice versa with the leased lines.

The primary stress inducing issues in those days for a facility engineer were building in enough redundancy as my budget would allow and maintaining the best possible relationship with the operations team to make sure the lowly facilities (as compared to switch issues) garnered enough of their attention in case of complete brain fade on my part. What was the least stressful part you ask? It was only voice! Bit crunch it up to 8 to 1 and run it through thirty-five hops of microwave around three counties or send it through three SMARTRings then drop it off at the MTSO and no one noticed. In the rare event someone noticed, run it through the rack of echo cans laying around for LD (long distance for those of you that are either young enough not to know what that is or old enough not to remember). Today, the “smart” has migrated out to the customer premise in the form of Smart Phones and tablet devices creating bandwidth demands we couldn’t comprehend twenty years ago.

The increase in bandwidth requirements is creating challenges for those responsible for wireless backhaul. In many cases, the wireless towers are still being served with copper facilities. The advancements in copper bonding technology allow copper to continue to be a viable option in non-urban or picocell environments. The Network Termination Devices used in typical copper bonding applications use between one and eight pairs and deliver up to 45 Mb/s and supports TDM traffic with PWE3 capabilities. Figure 1 illustrates how copper bonding can be deployed using an aggregation unit at the Mobile Switch Center (MSC) which simplifies the network by allowing a single network element in the MSC to interface multiple base stations. In locations where fiber is available or being deployed, SONET Rings, Connection Oriented Ethernet (COE) and other carrier Ethernet solutions are implemented.

SONET Rings have been deployed in wireless backhaul application for many years. The resiliency, scalability and survivability of these SONET rings while providing TDM traffic backhaul made them the most logical evolution to providing Ethernet backhaul as well. Ethernet over SONET components were added to most ring deployments in the last few years. The carrier class nature of these rings has lead manufacturers to build on these concepts to offer COE and new Packet Optical Networking Platforms. As illustrated in Figure 2, these platforms are capable of providing the SONET ring connectivity, COE and terminating native Ethernet from Ethernet Termination Devices.

Ethernet Termination Devices have been around a few years providing reliable Eth-
As more services are requested, standards are developed and implemented on the devices to ensure these devices offer resiliency, simple provisioning and monitoring. Recently, pseudowire TDM services have been added to the Ethernet Termination Devices. With the additional standards and TDM services, Ethernet Termination Devices are now being deployed in wireless backhaul applications. The Ethernet Termination Devices usually connect to some form of aggregation device at the Mobile Switch Center to simplify connectivity to the Radio Network Controller as shown in Figure 3. In order to accommodate future bandwidth requirements, the scalability of the Ethernet Termination Device has been an important factor for choosing it for deployments.

There are still as many solutions in wireless backhaul deployments as there are wireless carriers. For the foreseeable future, it appears that an all Ethernet solution meets the scalability and cost requirements. An all Ethernet solution using WDM as the aggregation device at the wireless tower where each carrier in a network receives their own wavelength looks promising. The hurdle for this solution is the differential cost of WDM SFP/XFPs. Once the cost of these units is driven down by high volume deployments, the cost issue will be minimized. Beyond tomorrow’s bandwidth requirements, visions of complex algorithms in the RF spectrum creating backhaul “tunnels” in the wireless carriers’ airwaves may not be far off.

In 2011 and beyond, a key growth driver for the electronics industry is an insatiable bandwidth demand from all corners of the globe. The sheer magnitude and reach is mind boggling, transcending generations, cultures and societies. The projected levels of data traffic are so extreme that analysts regularly struggle to translate the massive scale and quantity into comprehensible terms. For example:

- In 2014, annual global IP traffic is projected to exceed 3/4 of a zettabyte (1,000,000,000,000,000,000,000 bytes!).
- To try and put this quantity into perspective, it would take 72 million years to watch all video content expected to cross global IP networks in 2014 (Source: Cisco Visual Networking Index).
ADTRAN Leads the Way in Carrier Ethernet for Mobile Backhaul

By Kevin Morgan
Director of Product Marketing, CN Division
ADTRAN

Earlier this year, ADTRAN was recognized by Frost & Sullivan with the 2010 Global Frost & Sullivan Award for Product Differentiation Excellence of the Year based on its recent analysis of the Carrier Ethernet Demarc market. In the carrier infrastructure market, differentiation is critical and yet very hard to achieve. The Ethernet Demarc market has evolved considerably, and ADTRAN’s early recognition of market trends and its response speed in incorporating relevant features in its products are noteworthy accomplishments.

A key characteristic of the converged, next-generation mobile backhaul network is that mobile operators need to support multi-generation traffic at the cell site. This is one of the important factors that drive critical decisions on network migration. ADTRAN’s most recent product NetVanta 8044M is a true differentiator for ADTRAN in the Carrier Ethernet Demarc market. The modular device with the ability to support Ethernet over any media allows mobile operators to address the need to support multi-generation traffic and scale in a modular way.

While competitor products support some combination of Ethernet and copper across the portfolio, ADTRAN’s NetVanta 8044M supports Ethernet, fiber, copper and bonded TDM interfaces in the same 1RU device. It delivers Ethernet and legacy TDM services via GPON, Gigabit Ethernet (EoF), as well as bonded copper using e.SHDSL and VDSL2/ADSL2+ technologies.

ADTRAN has focused on key features that provide flexibility with regards to scalability, interfaces, management and important aspects such as synchronization. The NetVanta 8044M clearly supports some important mobile backhaul specific features that are critical to support the migration process.

The NetVanta 8044M offers scalability of bandwidth on demand through 64kbps increments that can go up to 1000Mbps of Ethernet service for 4G/LTE. It has a low time-to-market with support for Ethernet over multiple media – Ethernet over Fiber, Ethernet over Copper, Ethernet over TDM as well as G.984 compliant GPON. The NetVanta 8044M provides a seamless migration path to all-packet architecture, SyncE and 1588v2 support. Further, ADTRAN offers performance and SLA assurance through an Ethernet based SLA management along with Ethernet OAM based trouble-shooting and performance monitoring tool sets.

Along with its solid reputation as a provider of access products including the flagship Total Access 5000, ADTRAN is now seen as a provider of complete Ethernet access migration solutions that also include a single operational model regardless of access technology.

Overall, ADTRAN has differentiated itself in the highly competitive Carrier Ethernet Demarc market through innovation and service and is proud to be the recipient of the 2010 Global Frost & Sullivan Award for Product Differentiation Excellence of the Year in this sector.

By Kevin Morgan
Director of Product Marketing, CN Division
ADTRAN

Working harder than ever. Managing more people. Responsible for greater results. Losing grasp of a sane framework to accomplish strategic objectives. Executive Coaching produces transformative results for management at any level of responsibility, and is an ideal solution for the highly talented and time crunched. Boost your performance levels through executive coaching. Contact us today to learn more.

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Mobile Backhaul: End-to-end Solution

End-to-end Solution for Converged Mobile Backhaul Simplifies Operations

Mobile broadband services are driving a transformation to IP and Ethernet with the deployment of new technologies — Long-term Evolution (LTE), High Speed Packet Access (HSPA), Evolved Packet Core (EPC) and IP Multimedia Subsystems (IMS). The access network between Ethernet edge and IP core must keep pace or become a quality of service bottleneck, and the main component of a growing operational expenditure.

The NetVanta® 8044M, combined with the ADTRAN® Total Access® 5000 Multi-Service Access and Aggregation Platform, provides a complete end-to-end Ethernet access migration solution including a single operational model regardless of access technology. This solution enables service providers to compete effectively in any market while planning and implementing their transition to 3G and 4G mobile networks.

What does simplified operations mean for you? Discover the difference ADTRAN Mobile Backhaul Solutions can make by visiting us at www.adtran.com/mobilebackhaul
Newmar designs and builds DC power components and systems for a wide range of demanding network power applications.

Whether you need a complete system with rectifiers, batteries, distribution and alarms or an individual power component or accessory, Newmar manufactures a full range of high quality power products you can choose from.

Contact a Walker and Associates representative for your Newmar Power choices.
Traffic on wireless networks is growing dramatically, driven in large part by the growing popularity of wireless data and video. Carriers are upgrading from traditional T1 copper cable to fiber to support higher-speed connections between cell towers and high-speed backbone networks. Although the mobile operator is the ultimate user of these connections, often the mobile operator does not have landline infrastructure and does not own its own cell towers, instead relying on other operators for those elements of its network.

Installing fiber in backhaul networks is a key investment area for a wide range of companies—including mobile operators and tower operators, as well as telecom carriers and cable companies that provide backhaul network connectivity. Moreover, connectivity issues are involved with upgrading to a fiber-based backhaul network infrastructure for all of these companies, which is why connectorized fiber can play a critical role in supporting these new backhaul fiber deployments.

**The Benefits of a Connectorized Approach**

As tower operators, mobile operators and backhaul providers upgrade portions of the backhaul network with high-bandwidth fiber connectivity, they must decide whether to splice fiber or to use a connectorized approach. Spliced connections are fused together using splicers that create a high-temperature arc to “melt” the fibers together. A connectorized approach uses multi-terminal connections in place of splices, enabling installers to quickly complete connections with plug-and-play, factory-installed fiber connectors.

More and more companies supporting the wireless backhaul network are finding that they can more quickly install fiber solutions while reducing total installation costs. At the same time, the plug-and-play approach provides more network flexibility. The connectorized approach also simplifies the troubleshooting process—an important consideration when multiple parties are involved in providing the underlying network connectivity.

Installers can easily make connections using connectorized fiber. The process does not require the specialized training required for splicing, eliminating the need to use highly specialized—and more costly—labor and equipment to handle fiber installations.

Installers also can install the network more quickly when they use connectorized fiber rather than splicing. ADC estimates that connections that would require an hour to splice would require only about three minutes using connectorized fiber. Faster installation can be a particularly critical requirement when upgrading mobile backhaul networks because often those upgrades are driven by network capacity concerns on the part of the mobile operator, whose data traffic has increased more quickly than anticipated.

Nowhere is it more important to minimize the time required to make connections than at the antenna. Upgrading those connections typically requires installers to climb the tower—and making splices from a position high up on the tower is challenging, especially in inclement weather or when high winds are blowing. The time savings that result from choosing a connectorized solution, coupled with lower labor costs, can generate significant cost savings for the company installing fiber.

**A Solution Tailored For Higher Service Quality**

Cell towers, and the backhaul network that underlies them, are a dynamic element of today’s mobile networks. In the past, it might have been acceptable for cell towers to be out of operation for a few hours, but as mobile communications are becoming more and more critical, that is no longer true. Consumers expect more up time and a higher service quality. To help meet their high expectations, some mobile operators may have a service level agreement with their tower operator that penalizes the tower operator for any downtime.

By using connectorized fiber, the companies involved in mobile backhaul networks can maximize their ability to meet mobile consumers’ high expectations by minimizing the time required to make changes to the network configuration or to troubleshoot problems.

For example, a new mobile operator might want connectivity to the cell tower, or an operator that is already connected may want to increase the speed of its cell tower connection. Those changes will be much quicker and easier if the parties involved have used connectorized fiber.

Another important benefit of the connectorized approach is simplified troubleshooting. Troubleshooting fiber connections at a cell site typically involves disconnecting the fiber and using an inexpensive light source on one end and a power meter on the other end. If the light can be detected at the one end, the technician knows to look elsewhere for the source of the outage. When connectorized fiber is used, it is much easier to disconnect the fiber for testing than when the fiber has been fusion spliced—and reconnection also is simplified.

Upgrading mobile backhaul networks to fiber to support higher data rates is a key priority as data traffic on these networks continues its dramatic rise. By using connectorized fiber, rather than fusion splicing, the companies involved can save time, minimize costs, simplify troubleshooting and make the network more future-proof by providing a higher level of flexibility to support future network upgrades and changes.

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ADC is now Tyco Electronics
Thinking *Differently* About 4G Mobile Backhaul

By Ken Morris
Channel Program Development Director
Fujitsu Network Communications, Inc.

Emerging fourth-generation wireless packet switched networks herald the arrival of secure voice, data, and streaming multimedia at much higher data rates than previous-generation mobile networks. They offer users the promise of anytime, anywhere access to true personal broadband services.

New smartphones connect through 4G radio access networks to the network elements that comprise the new Evolved Packet Core (EPC) and functions of the IP multimedia subsystem (IMS). Mobile backhaul connecting these elements plays a critical role in ensuring good performance for bandwidth-intensive and time-sensitive applications, such as wireless broadband Internet access, multimedia messaging services with real time audio and mobile HDTV.

In short, the proper design and implementation of mobile backhaul is linked directly to the successful growth of smartphones and broadband wireless usage.

Even as some argue how 4G mobile wireless will soon replace current 2G and 3G mobile networks, network operators understand the importance of maintaining interoperability with existing wireless standards. They understand that it is critical for well-established SONET and TDM technologies to coexist with Ethernet as their mobile backhaul infrastructures evolve to handle an explosion of bandwidth.

GSM and UMTS backhaul is still migrating circuit voice and best-effort data services from TDM and ATM to IP-over-Ethernet. Overlaid on top of this are all packet-based 4G technologies like LTE and WiMAX. Understanding the importance of incorporating legacy 2G and 3G backhaul networks into any LTE backhaul planning is critical.

The number of cells will typically increase by a factor of between four and eight with 4G cellular deployments. Additionally, bandwidth requirements at these cell sites are increasing dramatically, from less than 10 Mbps to a typical LTE base station that will need backhaul capacity of somewhere between 200 and 300 Mbps or more.

Network operators must think differently about the challenge of designing and building mobile backhaul networks as new IP over Ethernet services are connected directly into the EPC. This means much larger quantities of Ethernet virtual channels must aggregate into much higher bandwidth services that route over longer distances into the EPC.

Connection-Oriented Ethernet (COE) has emerged as the foundation for growing the 4G wireless packet-switched mobile backhaul market. COE offers a lower cost, packet-based solution with high performance and high data transfer rates, as well as the reduced latency that its flatter, IP-based architecture provides to ensure good quality of services.

Several prominent telecom and cable/MSO providers, including Verizon, have selected the Fujitsu Packet Optical Networking Platform (Packet ONP) to address the 4G backhaul challenge. The Fujitsu Packet ONP incorporates COE, allowing providers to support and consolidate their SONET, Ethernet, and wavelength traffic in a variety of applications, including mobile backhaul.

Fujitsu incorporates COE because this technology promises highest quality, protected, broad-scale aggregation for the Ethernet traffic that will dominate 4G backhaul networks. COE provides deterministic point-to-point paths for Ethernet connections, and reserves resources for those connections through the network. The resource reservation, coupled with admission control, minimizes packet loss, latency, and jitter and allows for 50 ms dedicated protection switching.

Our customers are finding the Packet ONP, with COE, allows them to set the direction for a reliable and profitable 4G backhaul architecture.
As the next billion users come online, the complex web of technologies that make up the global network will face critical issues that must be addressed to keep everything spinning. Keeping up with the exponential need for bandwidth, the demands of users for a 100% reliable always-up network that is protected from disruption, and keeping their information secure is a big job. Success depends on innovation and cooperation within the industry. TIA 2011—Inside the Network is the start of finding solutions for the most important information communication technology issues we will face in the coming years. Join your peers and industry leaders at the most important conference you may ever attend.
Concluding its first fiscal year since acquisition of non-affiliated assets of Windstream Communications, Walker and Associates held its annual Sales and Marketing Meeting in Winston-Salem, NC at the Graylyn International Conference Center. Continuing its tradition of recognizing associate accomplishments and contributions, Walker presented numerous awards and acknowledgements.

**President’s Citation Award**
Jennifer Beck, Richard Dempster and Tyson Philyaw were presented the President’s Citation Award, which is presented to Marketing Development Managers who achieve 100% of their annual plan. The marketing manager role is a technical marketing position, requiring an understanding of the dynamics of the products and technologies that drive the telecommunications industry. By developing and applying market strategies they increase sales growth in particular technologies, product types, and overall manufacturer sales levels.

**Outside and Inside Sales Performance Awards**
Walker recognized multiple sales associates who performed at optimal levels in 2010. Outside sales awardees were Ben Dierker, Lynn Soldano, and Eddie Lester. Inside sales recipients were Annette Bittner, Brandi Greene, and Dwayne Miller.

**Sales Person of the Year Awards**
Sales management also announced the two highest achieving company sales award winners, recognizing individuals from both inside and outside sales. Along with a trophy, the outside sales person of the year also receives the legendary Walker Red Jacket. The Chris Walker Red Jacket is the highest award attainable by an Outside Sales Executive, represents strong sentiments, values, and emotions for everyone at Walker. The founder, Chris Walker, made the Red Jacket his trademark when calling on his customers during the establishment of Walker in the early 1970’s.

The 2010 Inside Sales Person of the Year for the North Carolina office was presented to Dwayne Miller, who has been with Walker for 12 years. The 2010 Inside Sales Person of the Year for the Georgia office was awarded to Annette Bittner, who has been with Walker for three years.

The 2010 Outside Sales Person of the Year Award was presented to Eddie Lester. Eddie is known in the industry as a hard worker and relationship builder, whose drive and motivation to be successful makes him a valued sales person and role model to his colleagues. Eddie has worked for Walker since 1995, and this is his third time receiving this award.

**Corporate Top Honor Awards**
It is also Walker’s annual tradition to present two outstanding associate achievement awards. These are the Al Stokes Customer Care Award, and the Chris Walker Award. The Al Stokes Customer Care Award recognizes an associate who exemplifies persistent effort in voicing and acting upon the needs of customers. The Chris Walker Award honors an associate who “unwittingly lives by the values of our namesake and co-founder, and who regularly demonstrates the dynamic and charismatic resolve in his or her daily effort”.

The 2010 recipient of the Al Stokes Customer Care Award went to Nicholle Britt, who manages the inside sales team at the Alpharetta, Georgia office. Nicholle is a tenacious individual who doesn’t back down when striving to obtain solutions and resources for her sales team and customers. Nicholle has been with Walker and Associates for nearly 14 years.

The 2010 Chris Walker Award was presented to Angie Hunt, who has been with Walker and Associates since 1995. Angie has always worked within inside sales, holding a number of leadership roles in her career. She spends a great deal of time training inside sales team members on system requirements, Walker’s sales strategies, and most importantly Walker’s values and essentials. Angie is seen as a great mentor within Walker and Associates as she lives by the values that Chris Walker created for the company.

**Hank Ford Award**
Lisa Smiley, Vice President of Marketing for Walker and Associates, presented the annual Hank Ford Award, which is presented each year in memory of Hank Ford, who died of cancer in 2003. Hank’s years of service to Walker were performed at a superior support level, setting the bar for other representatives. The purpose of this award is to recognize a manufacturer representative who understands and exemplifies the ideal vendor partner. The 2010 award was presented to Joel Theisen of ADC, now Tyco Electronics. Joel has supported Walker as the ADC channel representative for years, and has always demonstrated a strong commitment to the success of our partnership. His dedication to building ADC/Tyco relationships within Walker’s sales, marketing, engineering, and management teams has equipped Walker in effectively assisting customers and delivering on their expectations. Walker is honored to recognize Joel for his outstanding achievements.

**Awards Presented to Walker**
Walker and Associates was recognized by ADTRAN for outstanding sales achievement in 2010. An award was presented in recognition of being its largest service provider distribution partner of the year. This is Walker’s eighth straight year earning this honorable award from ADTRAN. Walker was additionally recognized by Symmetrix as being a Platinum Distributor and the only Stocking Distributor in 2010.

Congratulations to all of Walker’s award winners, who together represent the combined talent and skills of all associates who work tirelessly on behalf of customers. Customers are indeed the beneficiaries of people who commit themselves to quality, excellence and high levels of service.
CLEAR THE PATH FOR TERABIT NETWORKING.

Your success depends on providing virtually limitless levels of always-available bandwidth. With so much on the line, 100 percent service delivery is not an option—it is a requirement. The ground-breaking Brocade® MLXe Core Router meets this challenge by delivering high-performance, extremely scalable Carrier-grade solutions that support nonstop networking—and maximum ROI.

Learn more at www.brocade.com/mlxe-dc
Tyco Electronics and ADC have come together to create a world leader in the design and deployment of next-generation networks, including innovative FTTX solutions. This powerful combination helps service providers accelerate construction and deployment of the “quadruple play” services required to retain subscribers and generate new revenue.

You are Here. So is Tyco Electronics.

• Innovative solutions. Tyco Electronics (TE) and ADC fiber connectivity and cable management solutions are designed to reduce CAPEX and OPEX and minimize installation time for service providers building FTTP networks.

• A wide breadth of RUS-listed products. Tyco Electronics has hundreds of products to support US Stimulus Program-funded projects.

• Best-in-class support. Tyco Electronics provides industry-leading technical pre- and post-sales support for product installation and integration.

Tyco Electronics' Leading Fiber Infrastructure Solutions:

Patch and Splice Enclosures
FIBRBox splice enclosures offer Tyco Electronics' proven fiber splice management and organizing performance in a rugged enclosure designed for today's FTTx applications.

FIBRBox splice enclosures combine a corrosion resistant enclosure, gasket and grommet entry points, and the familiar stair-stepped, hinging tray design in an enclosure that will accommodate 2 feeder cables and up to 16 drop cables (depending upon drop cable design).

Gel Sealed Splice and Patch Closures
The FOSC family of fiber optic splice closures is a family of closures for use in all outside plant fiber splicing applications. Utilizing compressed gel cable sealing and a quick release dome-to-base clamp for fast access to the splicing area, there are a variety of sizes to choose from, each capable of handling a range of cable styles & sizes, and incorporating such features as hinging splice trays. FOSC closures are accompanied by a full line of accessories as well.

Aerial Splice Closures
AIR FOSC fiber optic splice closures are designed for aerial, strand-mount FTTH “tap” locations where drop cables are spliced to distribution cables. These free breathing closures combine Tyco Electronics' GelGuard cable sealing gel technology and standard FOSC splice tray in a strong, rodent-proof outer body.

Visit www.TE.com or www.adc.com for more information on FTTX solutions.
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Tyco Electronics is committed to providing excellent service and value to our customers. We are committed to offering:

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Visit [www.TE.com](http://www.TE.com) or [www.adc.com](http://www.adc.com) for more information on FTTX solutions.
Powering the Mobile Backhaul Network

By Eric Harmon
Director, Marketing Communications
Newmar Power

For essential Mobile Backhaul applications in 24 or -48 VDC, Newmar’s new Centurion II power system offers incredible functionality, flexibility, and scalability in a low profile 2 RU (3.5”) shelf. Newmar offers a broad selection of power solutions to meet your changing site requirements. The new Centurion II features three power bays that accept 1,000 or 2,000 watt rectifiers in 24 or -48 VDC in high reliability N+1 redundant configuration, enabling easy configuration to site power requirements. The system accepts 90-250 VAC power factor corrected input, producing up to 6 kW (111 amps) DC output. Battery temperature compensation sensor is standard feature for precise charging of back-up batteries in varying climatic conditions.

An integrated 16 position DC circuit breaker distribution panel features in-shelf protection for critical loads, and are fitted to ‘tripped breaker’ alarms. In addition, battery disconnect breakers are standard to protect the system and allows for easy replacement of batteries while the system is running. A built-in low voltage disconnect circuit protects batteries from extreme discharge and loads from receiving low voltage during an extended utility power outages.

The system also features a programmable digital controller with alpha numeric display read-out of system parameters with TCP/IP interface and SNMP monitoring/logging of critical functions including rectifier voltage and current, circuit breaker trip, and LVD activation. A built-in control feature allows remote shut down and activation of rectifiers for periodic battery testing and backup power data logging.

Complete system integration by Newmar is included providing a turn-key system for your DC power needs. Contact your Walker and Associates sales representative with your system requirements and we will prepare a customized proposal for your review.

Timing and Synchronization in Next Generation Wireless Networks

By Symmetricom

Mobile operators are racing to deploy high-speed data services in order to acquire and retain lucrative mobile professional users. Because high-speed data services require increased backhaul capacity, mobile operators are seeking alternative, lower-cost backhaul methods in order to meet increasing data demands. At the same time, cost reduction measures must not sacrifice consistent and high-quality service. As the network shifts to an Ethernet/IP backhaul, maintaining precise frequency distribution throughout the network is essential for maintaining service level assurance. The quality of synchronization mobile operators put into their network directly impacts the quality of service (QoS) that comes out of their network.

“The volume of traffic traveling over networks continues to increase exponentially and users aren’t willing to deal with backhaul limitations. One of the most essential ingredients to successful packet-based synchronization is to have very precise timing and synchronization solutions in each and every network infrastructure,” said Tim Frost, principal technologist at Symmetricom.

Optimizing Mobile Backhaul with Synchronization
Symmetricom offers a comprehensive set of materials on their website, which is designed to help network managers and engineers understand how to best solve the synchronization issue to optimize mobile backhaul.

Available resources include the following:

White Papers
• Advances in Backhaul Synchronization – Maximizing ROI: Download PDF

MultiMedia Files
• Best Telecom Practices in Precision Time Protocol Deployment: Download PDF
• Deployment of Precision Time Protocol for Synchronization of GSM and UMTS Base Stations: Download PDF
• Issues in Mobile Backhaul Audio-only MP3 of Presentation: Download ZIP of Audio
• iPod Video Presentation: Download ZIP of Video
• Wireless Backhaul Migration Audio Podcast: Download ZIP of Audio

These resources are available by creating a complimentary user account at www.symmetricom.com/user/register.

As the number one ranked distributor for Symmetricom, and their only stocking distributor, Walker and Associates provides unique opportunities for Symmetricom customers. Current stock levels assist in reducing and/or eliminating lengthy lead times. Walker’s engineering staff is trained by Symmetricom, providing customers with quality front line support on both pre and post sales inquiries. And, Walker’s installation team has coast to coast experience in deployment of Symmetricom solutions. Customer testimonials confirm Walker’s solid reputation as a resource for Symmetricom products.
Mobile Broadband Backhaul: Addressing the Challenge

By Rajesh Chundury, Customer Solutions Sales Director, Ericsson

Cost considerations are the key decision-making criteria for planning backhaul networks. The success of mobile broadband calls for changes to radio access and backhaul network architectures. Technical adaptation is needed alongside the support of new business models.

Why Next-gen Backhaul?
High-speed packet access (HSPA) subscriber growth and increased usage of mobile multimedia services are driving the success of mobile broadband around the world. This serious complement to fixed broadband has become a source of new revenue streams for mobile network operators. In 2007, mobile data traffic surpassed voice traffic in most HSPA networks. The growth in data traffic can be attributed to attractive offerings and high-bandwidth applications.

RAN Requirements
All Radio Access Networks (RAN) put specific sets of requirements on backhaul. Other requirements stem from type and number of end-user services. Base stations require accurate synchronization to generate a radio signal. As a result, strict requirements are put on backhaul networks.

When operators move from fixed-latency circuit-switched networks to variable-latency packet-data networks, they must be able to maintain voice quality. To attain high mean opinion scores for voice quality, packets must arrive in sequence within a tight delay window.

For video needs, backhaul networks must also offer low packet loss rates and be able to handle at least four classes of service to support the four types of traffic: network control, voice/video, best effort data, and network management.

To achieve high availability, radio network control nodes are typically built with carrier-class features that would require redundant connectivity with 50 to 100ms in service restoration times.

Vision: IP in the RAN, Ethernet in the Backhaul
As the radio nodes evolve toward IP, the backhaul evolves toward Ethernet. The best and most cost effective way of transporting IP connectivity is to use an Ethernet backhaul. IP over Ethernet gives cost and capacity scalability advantages and is future-proof. The Metro Ethernet Forum (MEF) has listed five attributes that carrier-grade Ethernet must have: standardized services, scalability, service manageability, Quality of Service, and reliability.

Backhaul Migration
Backhaul providers need to understand the evolution of the transport interfaces offered by radio hardware vendors. One incremental approach to evolving the backhaul network is to employ HSPA offload with packet overlay. The assumption here is that the majority of mobile broadband data is best-effort in nature and based on flat-rate pricing. Ethernet is a good fit for LTE backhaul.

Key Technical Considerations
OSI layer functions are fusing together due to packet data communication and technology merging with legacy services and technology. Steps have been taken to evolve pure Layer 2 networks into scalable carrier-grade Ethernet. For Ethernet in Low Radio Access Networks (LRAN), the industry recommendation is to build simple point-to-point Layer 2 connections by employing provider bridging and then to carry TDM natively. High Radio Networks (HRAN) are dependent on operator assets and can be either simple optical network with embedded Layer 2 aggregation or a richer multiservice network with full Layer 3 IP or IP/MPLS capabilities. The decision to employ Layer 3 or Layer 2 based architecture is dependent on the nature and mix of applications. Switch where you should, route where you must, and transport everywhere.

Security is more inherent at the lower levels of the network. To reduce the risk of intrusion, one can restrict access from one zone to another by firewalling traversing traffic. When deciding on the appropriate level of security, bear in mind that WCDMA payload traffic is encrypted. IP/Sec can be used at a non-secure site to interface a non trusted network to protect non encrypted payload from other radio systems.

To maintain a low and strict latency budget, one should only emulate circuits when absolutely necessary. This is because circuit
A Case Study In Mobile Backhaul Solutions

The following article is a brief synopsis of a white paper published by Brocade. This resource presents an overview of the mobile backhaul market, illustrating the unique challenges facing mobile operators and backhaul transport providers and describes strategies for commercially viable transport of multi-generation mobile technologies; stresses the performance criteria mobile operators expect if they are to trust their backhaul network to third parties. This white paper is available for free download at http://walkerfirst.com/brocade.php

With rising demand for mobile broadband services due to the ever-increasing proliferation of cellular phones, PDAs, and other mobile communication devices, operators are seeing a sharp increase in bandwidth requirements. To keep pace with demand, operators must migrate to new packet backhaul networks that offer increased capacity at lower cost, while providing the necessary service, reliability, and quality of experience. However, migrating from TDM to Ethernet backhaul does not come without challenges, one of which is how to maintain precise timing and frequency for applications such as Gigabit Passive Optical Network (GPON), mobile backhaul, and LTE.

The Brocade®-RAD-Symmetricom mobile backhaul solution is a validated end-to-end (E2E) solution delivering a graceful evolution to packet backhaul in support of all mobile generations, including 4G. It provides flexible access/aggregation transport options, including native Ethernet/MPLS, and enables the cost effective delivery of new IP-based services requiring high bandwidth and superior Quality of Service (QoS). This joint solution from Brocade and partners meets and exceeds the requirements for backhauling applications.

CARRIER ETHERNET SERVICE DELIVERY: FOCUS ON WHOLESALE MOBILE BACKHAUL
Wholesale backhaul is typically the catalyst for service providers offering best-effort Ethernet services to enhance their offering and provide carrier Ethernet services to retail carriers and enterprise customers. While this solution focuses on wholesale mobile backhaul, it can be easily adapted to cover other wholesale and retail service delivery. It includes features such as stringent QoS, powerful Operations, Administration, and Management (OAM), Service-Level Agreement (SLA) assurance, circuit validation, and diagnostics critical for carrier Ethernet service delivery. The solution also features Time-Division Multiplexing (TDM) pseudowire and precise clock recovery features, which are targeted more at the mobile backhaul market.

TDM Pseudowire
Despite the trend toward LTE, mobile operators still have extensive 2G/3G networks and typically require T1/E1 and Ethernet backhaul services. Therefore TDM pseudowire or circuit emulation is an important complement to Ethernet backhaul because it helps support legacy 2G/3G backhaul over a single converged access infrastructure. Brocade tested the RADMux, Gmux, and MiTOP and the Brocade MLX, and NetIron CES products, and validated that the Brocade-RAD network provides the QoS and performance required to support not only Ethernet with QoS and SLA assurance, but also TDM circuits with the low latency and accurate clock recovery required for 2G/3G backhaul.

SYNCHRONIZATION OVER PACKET-SWITCHED NETWORKS
Synchronization is a critical factor in any wireless network, but particularly in mobile
backhaul, and probably the most challenging capability to be supported over packet-switched networks. In a TDM network, clock is transported natively over the network. But with a packet-based transport network that is asynchronous in nature, a dedicated mechanism must be developed to transport the clock in an accurate and reliable manner with minimum bandwidth consumption and to overcome packet-based network issues such as varying delay, jitter, and packet loss.

Deploying RAD ETX, Symmetricom TP-5000, and Brocade MLX/NetIron CES products, the solution validated the option to add precise clock synchronization based on IEEE 1588-PTP support from the Symmetricom grandmaster out to the RAD ETX-A series demarcation devices. The RAD ETX not only recovered the timing, but also acted as a timing gateway to deliver 1588-PTP, SyncE (ITU G.8261), and E1/T1/2Mhz on RJ-45, BNC, and DB9 interfaces to the base stations. Integrated timing support in the Ethernet demarcation devices eliminates the need for dedicated hardware or GPS installations. Note that if TDM pseudowire is deployed, precise timing can also be achieved via adaptive clock recovery between pseudowire entities.

SUMMARY
A Brocade-RAD-Symmetricom solution was validated in Brocade labs to enable mobile backhaul customers to meet the stringent requirements for SLA guarantees, bridge multi-generational backhaul technologies, and meet clocking and synchronization requirements—while providing the lowest Total Cost of Ownership (TCO) for these networks. Key differentiators of this solution are:

• Enables wholesale operators to respond to Tier 1 mobile carrier’s RFP successfully by providing
  » Architecture blueprints
  » Pre-tested configurations
  » Pre-validated performance, test reports, and results
  » Deployment guides
• Enables single-pane-of-glass network management for access, aggregation, and core via Brocade Network Advisor end-to-end management platform for configuration, performance management, and fault management
• Provides service providers with the freedom to choose best-of-breed devices and eliminate vendor lock by leveraging Industry-standard interoperable features
  » Ethernet OAM (IEEE 802.3-2005; IEEE 802.1ag and ITU-T Y.1731)
  » RFC-2544 support for end-to-end validation
  » Protection mechanisms: LAG (802.3ad), (G.8032), EVC protection (G.8031)
  » Precise timing with 1588 PTP
• One-stop-channel and technical support with expert help for design and consulting
• Lowest TCO solution

Following are industry trends in the mobile backhaul space:
• Mobile backhaul equipment spending increased 21 percent in 2009, to $7.2 billion worldwide*
• Mobile backhaul equipment market to growth to $10.4 billion by 2014*
• Almost 1.5 billion new mobile subscribers and approximately 1.2 billion new mobile broadband subscribers between 2010 and 2014, which will require more base stations and cell site connections, higher backhaul capacities, and equipment for each cell site connection*
• Most wireless operators have backhaul plans in place in the major markets, so most backhaul growth in the future will be in building out second- and third-tier markets for 3G and 4G coverage**
• “Ethernet Quickly Eclipsing T1s for Backhaul” (Source: Light Reading)
• Two of every three towers already has more than one mobile operator on it
• Growing dependence on mobile connection for business applications.

As the mobile world continues to expand, so does the need for backhaul capacity. In the rural and regional wireless world especially, exponential growth for data services and devices has just begun. This growth will drive the continued need for additional backhaul.

RCA has repeatedly called for an end to handset exclusivity and for access to handsets by all compatible network operators. Handset exclusivity does not just impact a rural or regional carriers’ marketing plan; this anticompetitive policy has very real implications on access to capital for further network build-out and, in turn, the need for backhaul capacity.

According to RCA’s 2010 benchmark survey, RCA’s carrier members’ voice service average revenue per user (ARPU) nearly equals the top four national carriers’ voice service ARPU. That makes sense, as RCA members typically offer their customers similar or superior voice services to the nationwide carriers. However, the benchmark survey revealed that RCA members had considerably lower data service ARPU when compared to the top four national carriers. This disparity is due to the level of subscriber uptake of data services, including unlimited data plans. As a result of handset exclusivity and limited access to the latest smart phones, RCA members’ subscribers purchase fewer data services that power next-generation capabilities.

Handset exclusivity is only one of several anticompetitive tactics employed by the large carriers to keep rural and regional wireless competition out of the market. Lack of interoperability in the 700 MHz spectrum band is another competitive barrier. With the development of LTE networks and the release of 4G devices in the 700 MHz spectrum, data usage and the need for additional backhaul will exponentially increase, with speeds enabling mobile access to data-heavy services such as video chatting and full-time data connectivity. However, due to proprietary band classes established by the largest two mobile carriers after the auction of the 700 MHz spectrum, many rural and regional carriers will again face steep challenges accessing equipment and devices necessary to provide these cutting edge services. As with handset exclusivity, lack of interoperability will dramatically reduce the number of consumers who subscribe to robust data service plans.

Additionally, difficulties in securing data roaming agreements at fair and reasonable terms further increases the disparity in data ARPU between RCA carriers and the dominant national carriers. Uncertainty surrounding Universal Service Fund reform causes rural and regional carriers to second-guess plans for further network deployment. Without certain, technology-neutral, success-based USF reform, continued wireless growth in high cost areas will stagnant, and so will the need for additional backhaul.

Despite these challenges, and as RCA works with Congress, the Federal Communications Commission, and the White House to resolve these critical policy issues, rural and regional carriers will find creative solutions to provide their consumers with advanced services and contribute to the nation’s economic recovery. With that economic growth, the industry must be ready for increased network deployments, greater use of data services, and the dramatic spike in mobile backhaul needed to support it. Rural and regional carriers will be ready.
Primary Reference Sources

• Best in class PRS – Exceeds ANSI, Telcordia, ITU and ETSI standards
• State of the art technology – Cesium, Rubidium and BesTime®
• Full PRS diversity – Cesium (autonomy), GPS (rooftop, through the wall or through the window)
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Mini BITS (Edge Distribution)

• Scalable to synchronize up to 64 network elements
• Fully protected – universal inputs and outputs
• Best in class performance – BesTime® and SmartClock™ technologies
• Configurable as stand alone PRS with integrated GPS
• PackeTime™ enabled

Sync Management

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  Alarm escalation and automated actions
• Configuration Management
  Dynamic configuration and upgrade
• Accounting Management
  Trend analysis and inventory management
• Performance Management
  Performance characterization
• Security Management
  Secure web access – anywhere, anytime

As wireline, wireless and cable networks evolve, timing and synchronization technologies are addressing the new requirements and Symmetricom is leading the way. Visit ngn.symmetricom.com/walker to download valuable application briefs.
Shortcuts to hiring the best
By: Brenda Abdilla

No manager is born a great recruiter. Great recruiters are made. Most of us who are skilled at recruiting became so, kicking and screaming, through trial and error—mostly error. As a matter of fact, in my twenty-plus years of working with managers at all levels, I have found that recruiting and hiring are among the most dreaded tasks on a manager’s to-do list. But what if you had some critical shortcuts that could improve your recruiting process, saving you a ton of time and increasing your rate of success? Really, why should you suffer when so many of us already have? Below are some secrets to help you recruit the best of the best in your market.

Recruitment Shortcuts

Be stingy with your time. One of the reasons managers hate recruitment so much is that it sucks up time. From this point forward you need to scrutinize your system and get rid of the habits that cost you time and do not increase your chances of hiring the best. If you invest some time initially, you can organize your process in such a way that it puts the onus on the candidates to prove their worthiness to you, and things will go much smoother and much faster.

Spend time writing a great ad now instead of trolling through hundreds of resumes later. Write the perfect ad and be as specific and direct about the job as you can. Think about the key qualities you are looking for and then move onto the requirements of the job. Be sure to include a description of the most challenging parts of the role in your ad so that you can literally scare away some of the unqualified people who might apply. For example: This high-stress, high-stakes role requires nearly constant navigation of competing agendas from customers and suppliers. Spending some creative energy on a great ad will pay high dividends when you attract fewer candidates overall, leaving you with a small pool of qualified people to contact when you get to that step.

Advertise your posting through the best available channels. Sure, Craigslist is free—but is it the best choice for the circumstances? Probably not. As a matter of fact, when our clients ask us to use Craigslist as part of our search, we comply, but we require applicants to apply through other, more formal channels instead of just spamming us with their resumes. Depending on the job you should consider paying for a proper ad on LinkedIn, Yahoo! HotJobs (now owned by Monster), CareerBuilder, etc. It can be tedious to set up but is a great investment of your time and money if done right. Once you place the ad, send an email with the link to your key networking groups so they can forward your email to qualified candidates, giving you the most bang for your buck.

Do not delegate the screening of resumes to administrative assistants. The reason most administrative assistants are good at their job is the very thing that can make them poor resume screeners—they tend to be very structured, systematic thinkers. Now that you have significantly fewer people applying you will want to have an experienced, managerial eye reviewing those resumes rather than someone with good intentions who is simply parsing elements according to a list of criteria you gave them. Same goes for parsing software.

Stop talking during interviews and start listening. If you are doing all the talking during an interview with a candidate then you are simply projecting your own thoughts and feelings onto the candidate and you are therefore finding out nothing during the process. When a hiring manager (or recruiter) gets excited about a candidate, their brain immediately starts flipping ahead and imagining qualities and results that have not yet been proven or even addressed in the process. Talking is an impulse that needs to be resisted. The only way to do this is to ask questions, then shut up and listen hard to the answers. It will also help to ask the same questions of every candidate. Not only will you be holding everyone to the same standard but your HR department will love you for lowering the chance of discrimination lawsuits.

Create hoops for candidates to jump through if they pass the first interview. Interviews are relatively ineffective in revealing the truth about people but they are the only line of defense we have in recruitment. You can increase your chances of success if you require candidates to jump through some relevant hoops you create as part of your process. Ask candidates to write a letter, do a business plan or complete a written test (preferably on-line) and then watch every part of that process very closely to assess whether they fit the role and the culture of your company.

Of course, most managers are overworked and overwhelmed already, and the thought of taking time to change-up your recruitment system can seem like an extravagance that cannot be afforded right now. But succeeding at making a great hire can pay enormous dividends in results, revenue, culture enhancement and team success, and we can all use a little more of that.

Insider Secrets from a Recruiter

Top 3 Recruitment Myths

Myth 1– A bad economy is a good time to hire. A tough economy is a tough time to hire unless you have unlimited time to find the 1% of qualified candidates within the siege of applicants. It is NOT like finding a needle in a haystack; it’s more like finding a needle in a haystack, so adjust your expectations.

Myth 2– Specific, related experience trumps all other qualities. This tends to be true in our minds but not in reality. Research overwhelmingly supports less concrete elements as being more important to performance of new hires. Elements such as motivation, strengths and timing will impact results more than the fact that someone has done the job before—even if they were a rock-star at their last company.

Myth 3– The more applicants the better. Refer to myth #1 above.

"When it comes to recruitment, rely on your process—not your intuition." Brenda Abdilla
Cont'd from page 17

 emulation always incurs a certain amount of overhead or delay. When used, circuit emulation affects synchronization, necessitating the regeneration of the service timing. In addition, the scalability of TDM interfaces in base stations might become a problem. A circuit-emulation step in a migration path to completely native packet transport could carry additional cost due to repeated upgrades and same site visits.

There are several ways of distributing the reference timing signals in next-gen packet-data networks. Four considerations to have in mind when employing packet-based timing are:

- Target requirements
- Packet delay variation
- Ability of the clock-recovery algorithm to filter packet delay variation
- Quality of the oscillator in receiving equipment.

The best solution for synchronization is to go with the end-to-end packet-based timing-regeneration technologies that are independent from the underlying transport layer.

**Recommendation**

There is no single backhaul solution that applies to every situation. But, as long as the key radio network requirements are met, either the "transport-oriented" or the "service-oriented" approaches can be used successfully.

*Editor's note: to download the complete article in .pdf format, go to www.ericsson.com and use the search function to look up the article’s author, Rajesh Chundury.*

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We look forward to seeing you at these events!

**February**
- NTCA Annual Conference and Expo
  - Dallas, TX
- UTC Region 8, 9, 10 Meeting/Expo
- Reno, NV
- CalCom Showcase & Tech Expo
  - Sacramento, CA
- GTA Annual Vendor Showcase
  - Macon, GA
- UTC Region 7 Meeting/Expo
  - New Orleans, LA

**March**
- UTC Region 3 Spring Meeting
  - St. Pete Beach, FL
- CTIA Wireless Expo
  - Orlando, FL
- LTA 63rd Annual Convention
  - New Orleans, LA
- ITA Showcase
  - Portland, OR
- RIITA Annual Conference & Expo
  - Des Moines, IA
- MTIA Show-Me Expo
  - Boonville, MO
- MTA Annual Conference and Expo
  - Minneapolis, MN
- TANE Spring Symposium & Showcase
  - Bethel, ME
- UTC Region 6 Annual Meeting
  - St. Lenexa, KS

**April**
- *Texas Communications Expo
  - Belton, TX
- OTA Outside Plant Seminar
  - Newport, OR
- SCTA Spring Convention
  - Charleston, SC
- *NAB Expo
  - Las Vegas, NV
- RCA Annual Conference and Expo
  - Las Vegas, NV
- Broadband Properties Summit
  - Dallas, TX

**May**
- TTA Spring Meeting
  - Franklin, TN
- *UTC Annual Conference and Expo
  - Long Beach, CA
- KTA Annual Meeting
  - Lexington, KY
- *TIA Inside the Network
  - Dallas, TX

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Late last summer Walker and Associates announced Eric Dowson as its new Regional Account Manager for their Mid-Atlantic territory. Along with generating new business opportunities within the territory, he will also call on established customers in the states of Pennsylvania, New Jersey, Delaware, Maryland, as well as New York City and Washington, DC. His office is located in eastern PA.

Eric Dowson has been involved in sales for over 20 years. His interest in technology and telecommunications are a result of his diverse sales experience in cutting edge companies. For the past 11 years, he has been crafting complex sales solutions at AT&T, CSC, and Broadview Networks. He has had success closing managed services, network solutions, collocation Hosting/SaaS opportunities targeting Carriers, CLECs, MSOs, ISPs, Cable, and Enterprises organizations throughout the Northeast USA. He has experience developing customized solutions that involve innovative hardware & software for turnkey infrastructure solutions. “I am pleased to be joining Walker and representing their broad range of manufacturers to provide the most appropriate networking infrastructure solution for Walker’s client base” commented Dowson. Eric resides in Paoli, PA with his wife and two children.

John Peter is the newly appointed Regional Account Manager covering the states of Minnesota, North and South Dakota, Iowa and Nebraska for Walker and Associates. Over the past 14 years, John has developed a broad range of industry experience, including a position with Solunet, an industry leading systems integrator of next-generation telecommunication solutions, and Occam Networks. He is highly skilled and experienced in providing customer solutions in a variety of platforms, including access and IP technology segments.

Peter states “I am very excited to join the team of experienced professionals at Walker and Associates. Walker has a great reputation for combining best of breed technologies with best practices to provide solutions that give you a good return on your investment.”

He resides in the greater Minneapolis/St. Paul area with his wife and three sons. Please join us in welcoming John Peter to the Walker team.

Ben Rickards has joined Walker and Associates in the role of Purchasing Manager. Ben is a Certified Supply Chain Professional as defined by APICS, and completed his Certified Purchasing Manager education at DePaul University. He has over 20 years of experience in supply chain management roles. In addition, he is a certified ISO auditor. Ben will manage a staff of buyers, planners and operations specialists at Walker, all of whom are closely tied to maintaining quality standards associated with Walker’s ISO and TL9000 certifications. Please join us in welcoming Ben Rickards to Walker and Associates!
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