USE CASE

Network Modernization in Rural America

The challenge of creating a fit-for-purpose backbone network in rural communities

Local power utilities, historically dominant in rural areas, now face opportunities to embrace industry innovations such as renewable energy, smart meters, and smart grid technologies.

LOCAL UTILITY COMPANIES

The core business of every utility company is the supply of reliable electrical power. Today's consumers require more. They want cost-effective solutions, automated billing, smart meters, real time use monitoring and more. Grid modernization delivers on these expectations.

The expansion of renewable energy distribution and bidirectional energy flow, the growth of smart meters in homes and businesses, and the increasing electric vehicle ecosystem are all placing more strain on existing infrastructure.

INDUSTRY TRENDS

- Renewable energy
- Smart meter rollout
- Move to smart grid
- OT/IT convergence

Many rural utilities are still heavily dependent on TDM for the substation WAN with T1s to backhaul basic SCADA (Supervisory Control and Data Acquisition) traffic into control centers.

However, this approach does not scale to meet the demands of smart grid. Additionally, these copper-based services are at end of life and service providers are no longer supporting them, often setting pricing deliberately intended as a disincentive.

Investing in a multi-service backbone addresses the core utility operations challenges, while providing new opportunities for the provision of rural broadband in served local communities.

WHAT ARE THE DRIVERS?

One of the most important drivers is the ability to add more monitoring and control capability. With thousands of Performance Measurement Units (PMU) in a grid, utilities are being forced to update data networks.

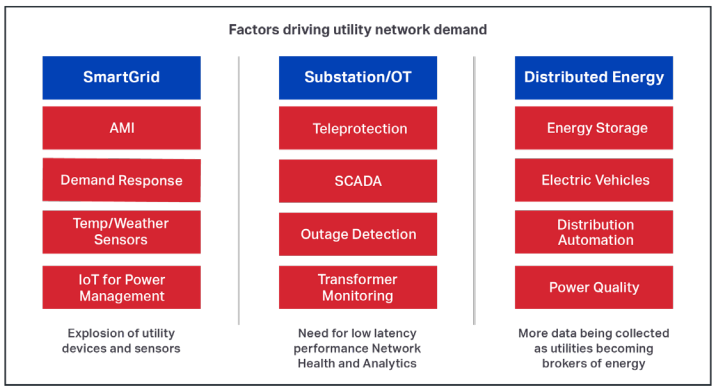
Historically, utilities have had two separate communications teams: Operations Technology (OT), and Information Technology (IT). These units typically operate on differing communications networks with different performance requirements. Today's utilities, however, must focus on reducing costs and modernizing networks by creating a single, agile, packet network that meets the needs of both OT and IT.

CHALLENGES AT A GLANCE

- Legacy equipment
- Inflexible and non-scalable
- Need to modernize
- Limited skill set
- Increased critical usage

In addition, increased data created by substation surveillance cameras, smart meters and electric car charging stations require a new approach to the OT/IT dilemma.

Rural utilities require a solution that allows all of this data to be aggregated together, as well as being scalable for the future.



WALKER EXPERTISE IN NETWORK MODERNIZATION

Walker is uniquely positioned to assist rural utilities with this backbone upgrade. With years of expertise and established industry partnerships, Walker provides a wide range of network solutions.

Rural utilities require real-time solutions to monitor and manage customer consumption, power generation, and transmission, while providing the highest level of security to safeguard consumer information. There is a real business justification for investment in high-capacity packet-optical transport between substations and data centers, and Walker has the knowledge and partnerships to help with this.

Walker assists utilities in leveraging existing infrastructure to aggregate internet traffic from broadband services to meet the needs of communities, while creating a new revenue stream.

> **“Not only for solving grid modernization and residential middle mile, but also enabling fiber network utilization and monetization models.”**
>
> **Trey Hall**
> Senior Solutions Engineer

CIENA'S SOLUTION

Walker works closely with Ciena, whose 5171 next generation 100G packet aggregation platform delivers high-density 10GbE aggregation. It is compact in size and temperature-hardened for varied, remote, and often hostile environments, making it ideal for serving rural areas.

All of this is managed using Ciena's Manage, Control and Plan (MCP) domain controller for complete visibility and centralized software control of the network so that provisioning, monitoring and service assurance operations can be performed most efficiently.

The FCC opened subsidy programs to rural utilities because two networks with common parts needed to be built in rural areas. Substation Connectivity Modernization and Middle Mile transport for residential broadband share a transport application space that Ciena excels in. This common network need is a great case for what the toolbox dedicated transport brings to the table. Not only for solving grid modernization and residential middle mile, but also enabling fiber network utilization and monetization models such as mobility xHaul, enterprise business services, and wholesale transit.

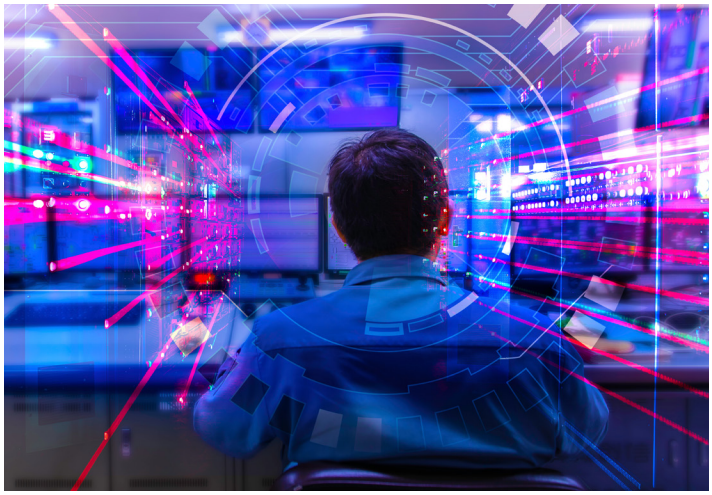
DIVERSIFYING INTO BROADBAND SERVICES

With the smart grid upgrade, the utilities get the performance needed to fulfil internal operational goals, as well as the extra capacity to diversify portfolios and be ready to provide broadband services to the communities served.

Historically, high quality broadband has been limited in more rural areas of the United States. Around 10% of US households do not have broadband service (defined by the FCC as 25Mbps).

Yet they have the same need for it, if not more, as those in more urbanized areas. The ability to work from home, and access critical healthcare information and education online is vital in rural communities.

The Covid-19 pandemic has increased internet usage around the world, and high speed, reliable broadband is no longer an optional service, but one as essential as water or electricity. Local utility companies, including co-operatives, municipalities, IOUs, Power Boards and PUDs, are stepping in to provide this service to complement the smart grid upgrade programs.



Access to fiber-based internet opens opportunities for rural communities in education, economic development, healthcare and more.

WHAT SETS WALKER APART?

Walker has supported service providers for more than 50 years. Clients include organizations with telecommunications as their core business, in addition to local power utilities, for whom communications networks underpin their main business activity. Walker's customer reach also spans the full range of government entities, including local municipalities, DoD, and the federal government and its agencies.

Walker is committed to working closely with its clients, using a consultative approach to fully understand customer business operations and their business needs. A reputation of strong, enduring customer relationships is evidenced by customer testimonials and referrals.

This customer-focused commitment, combined with 50 years of experience, allows Walker's engineers and project managers to understand challenges from the client's perspective. Focused on creating solutions integrated into the customers' overall business objectives, these professionals ensure they understand everything involved in a project, whatever its scale.

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This means on-site attention to detail, consideration of space, power, and cooling, as well as the meticulous specification of hardware and software to be used.

Walker takes pride in going the extra mile for customers. Documentation, for example, can be overwhelming. Walker takes the added step of distilling hundreds of pages of a vendor's technical documentation into a single, focused, customer-specific reference. Likewise, deployment of a solution can be complicated. Walker simplifies this process through the build, configuration and set up of hardware so that it's ready to plug-and-play as soon as it arrives at a customer's site. The results of these extra steps bridge the gap between costs associated with these projects and the goal of transforming them in community services that drive revenue growth.

Walker assists, advises, and guides customers through the complete project journey, from planning to post-implementation testing and support. Keeping a focus on the big picture, as well as the individual moving parts, ensures solid results in every project.

SUMMARY

Due to aging technology and increased demand, electricity grids in rural America face an immediate need for infrastructure upgrades. Unique paradigm shifts, such as the growth in renewables, and the shift to smart grid technologies, require the attention of network operators.

While network modernization requires investment, multiple funding sources are ready to assist. It should be noted, however, that the network backbone must be fit and designed for all the services it carries now or in the future, for internal smart grid traffic as well as residential and business broadband. Readiness for diversified portfolios must be considered.

Walker offers solutions that support both smart grid and broadband applications. Among those solutions is Ciena's 5171 next generation N x 100G packet aggregation platform, which offers the scale to support emerging applications. It is compact in size and temperature-hardened for varied, remote, and often hostile environments, making it ideal for serving rural areas. Ciena's 5171 supports multiple services, ensures mission-critical teleprotection services remain secure, and meets the highest QoS standards. As a consultative partner, Walker adds value by bridging the gap between project costs and the goal of transforming community services into revenue growth.

As rural utilities embark on this journey, a solution that delivers carrier grade performance requires consideration. Likewise, the value of a partner that delivers a smooth modernization conversion cannot be overstated. Partnering with Walker and Ciena ensures a graceful transition to a multi-service fiber-based network while reducing the inherent risks of modernization projects. Leveraging proven smart grid and broadband applications within your IT network for a world class user experience is attainable.

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