



Smart Distribution

SecureMesh® WAN for Better Reliability and Operational Efficiency

SOLUTION BRIEF

Trilliant helps utilities and energy retailers successfully deploy a broad range of smart grid initiatives – from smart metering to smart distribution and smart consumer capabilities. The breadth and depth of the Trilliant Communications Platform delivers the flexible and proven smart grid solutions needed for utilities and energy retailers to deploy mission-critical applications to achieve their business goals, and deliver consumers the best energy experience possible.

Industry Facts

- The average age of a substation transformer is 42 years, but the transformers today were designed to have a maximum life of 40 years.
- 24 states have adopted an Energy Efficiency Resource Standard, which sets long-term energy savings targets and drives investments in utility-sector energy efficiency programs.
- There are more than 12 million distributed generation sites within the U.S., and North America will add more than 400,000 megawatts of renewable capacity from 2012 through 2015.
- Forecasters estimate that annual worldwide sales of electric vehicles will reach 3.8 million by 2020, drastically changing the energy consumption patterns of typical homes and businesses.

Savvy utilities understand that a paradigm shift is happening in the electric industry. On top of industry-mandated indices like System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI), many states have implemented or are considering a range of grid efficiency regulations. Further complicating a utility's efforts to meet energy needs is the infrastructure itself. Today's electric grid has changed little since its inception in the early 1900s.

Unlike many other businesses, utilities must make critical spending decisions on a 20- to 30- or even 40-year horizon. These constraints require investments to be made in solutions that can adapt and grow to meet shifting energy needs and regulatory mandates.

Potential of Grid Modernization with Smart Distribution

Leading utilities reviewing grid modernization challenges are discovering that smart distribution offers a strategic, holistic way to approach grid efficiency and reliability upgrades. A smart distribution communication network provides a solid foundation for smart distribution, smart metering and smart consumer capabilities.

Effective smart distribution can also translate into real dollars as the network begins to help utilities automate switching processes and shorten or even prevent outages. These improvements can mean significant savings. The Electric Power Research Institute (EPRI) estimates annual outages cost the nation about \$150 billion each year, which is about \$500 for each person in the country. (Source: U.S. Department of Energy. "The Smart Grid: An Introduction")

Using a mesh network, a smart distribution system becomes a powerful tool that delivers increased reliability, better network control, improved efficiency and shorter outages.

Introducing the newly enhanced Trilliant SecureMesh® WAN for Smart Distribution

The Trilliant SecureMesh WAN, part of the Trilliant Communications Platform, is a broadband mesh network built specifically for utilities that provides the reliability, bandwidth and low latency necessary for advanced smart distribution applications such as Volt/VAR control, fault detection, isolation and restoration (FDIR) and other real-time smart distribution applications. The enhanced SecureMesh WAN 1100 Series uniquely addresses utility communications need.

Utility-Grade Reliability and Redundancy

- Trilliant's SecureMesh WAN is built on the company's award-winning mesh technology, which is inherently redundant and reliable. The system features integrated dynamic routing and near-immediate failover to ensure uninterrupted communications.
- Trilliant's UnitySuite™ Network Element Management System (NEMS), which provides a single platform for managing both AMI and WAN deployments, simplifies smart grid communications for utilities and enables economic, reliable, and real-time network management.

Industry-Leading Latency and Bandwidth

- Extending our lead in speed, Trilliant has further reduced the latency of SecureMesh WAN in the 1100 Series, cutting its already impressive time per hop down to less than 7 milliseconds, and thereby supporting the most demanding distribution automation applications.
- With 54 Mbps per second throughput, the newly-enhanced 1100 Series supports orders of magnitude more capacity than mesh networks traditionally used for AMI.
- New application domain partitioning functionality allows utilities to segment applications from each other to uniquely satisfy each application's specific Quality of Service (QoS) needs.

Integrated, End-to-End Security

- End-to-end safeguards across multiple layers of the OSI stack ensure that the SecureMesh WAN network remains private and secure.
- The SecureMesh WAN is compliant with the latest industry security standards, including the North American Electric Reliability Corporation's Critical Infrastructure Protection reliability standard (NERC/CIP) and is consistent with the requirements of NISTIR 7628 and NIST SP 800-53.
- SecureMesh WAN supports virtual private network (VPN) and Internet Protocol Security (IPsec) capabilities to enable safe and controlled access of the network.

- Application domain partitioning available on the SecureMesh WAN includes standards-based 802.1q VLAN tagging of network traffic, which ensures that access to or a breach of one application does not affect other applications or devices.
- SecureMesh WAN supports node-by-node two-way authentication using a Public Key Infrastructure (PKI) with x509-like signed certificates and the Advanced Encryption Standard (AES-128) encryption.

Low-Cost Territory Coverage

- The SecureMesh WAN 1100 Series now supports up to 12 mesh hops, allowing utilities to cover up to 10,000 square miles of territory with a single network takeout point. This reduces the cost to cover large service territories for all utilities.
- The SecureMesh WAN network automatically circumvents barriers, routing around large buildings, mountains, RF interference, and other obstacles, ensuring both low-cost deployment and long-term reliability.
- The Trilliant SecureMesh WAN now supports secure remote management of the entire WAN network including SSH telnet capability to remote devices.

Expanded Interoperability

- SecureMesh WAN is built on an open, interoperable IP platform, supporting both legacy IPv4 and future IPv6 protocols
- SecureMesh WAN is compatible with a wide variety of legacy devices and can seamlessly work with a wide range of existing distribution assets
- SecureMesh WAN has proven interoperability with devices made by ABB, Cooper, GE, Schneider Electric and Siemens, among others
- SecureMesh WAN supports key utility industry standards, including DNP3 and IEC 61850.
- SecureMesh WAN and the broader Trilliant Communications Platform can also flexibly adapt to meet future standards as they evolve.



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