Application Brief

Next-Gen Substation Connectivity

Challenge: Reliable, Real-time Connectivity Between Substations with Digital Transformation in Power Grids

As power systems are undergoing digital transformation, there is an increased need for real-time data exchange across the grid, as well as reliable and scalable data communications. To reduce the risk of power outages, substations need to exchange information about events that are occurring in different parts of the electrical grid, and data transmission must maintain reliability, ultra-low latency, high bandwidth, cyber security, and scalability.

IEC61850 GOOSE (generic object-oriented substation event) is the common communication protocol for the exchange of real-time information between different IEDs (intelligent electronic devices) located in the substation, over Ethernet links. GOOSE messages are reliable and fast: they can be sent within a few milliseconds, way faster than traditional communication protocols, making them ideal for protection schemes and automatic control systems. However, while IEC61850 addresses communications **within** the substation, communications **between** power substations are also critical for the proper operation of the entire system.

Solution: Secure & Ruggedized Communications with Backup and Automation

Power utilities have recently begun to extend GOOSE communications between substations over fiber-optic links to an MPLS or GPON WAN (wide area network). RAD's SecFlow are ruggedized IEC61850-certified gateways that are used to extend GOOSE communications over fixed WAN, as well as over cellular – using 4G/5G connectivity to ensure continuous communication in case of fiber network failure. It also functions as a multipath gateway to aggregate SSL tunnels, support load-sharing and control message delivery to specific substations.

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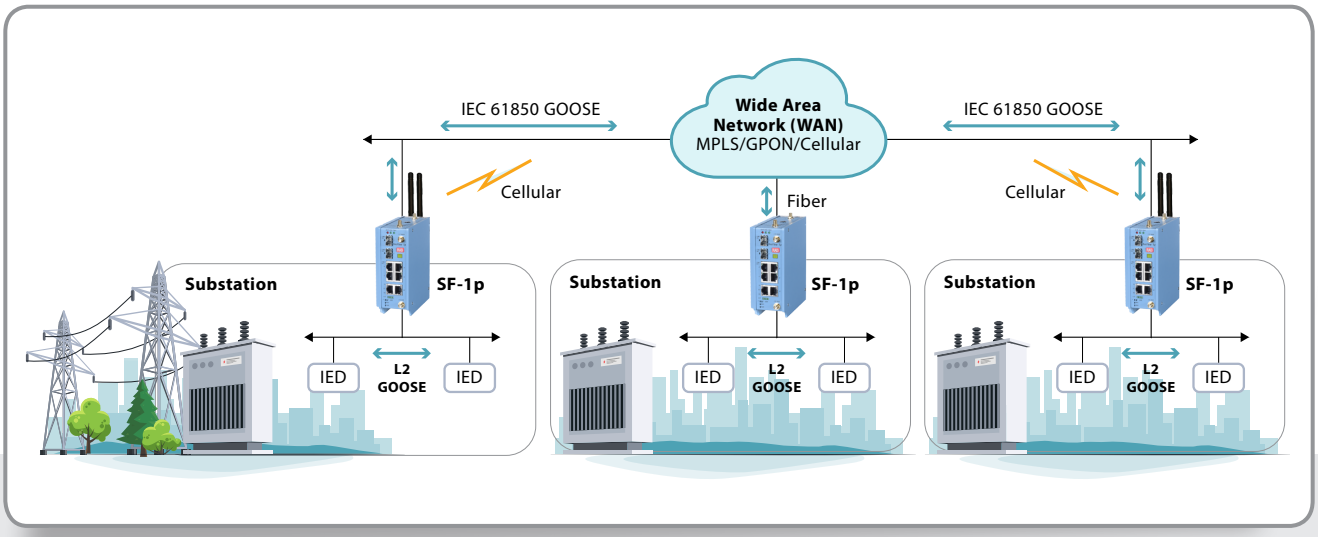
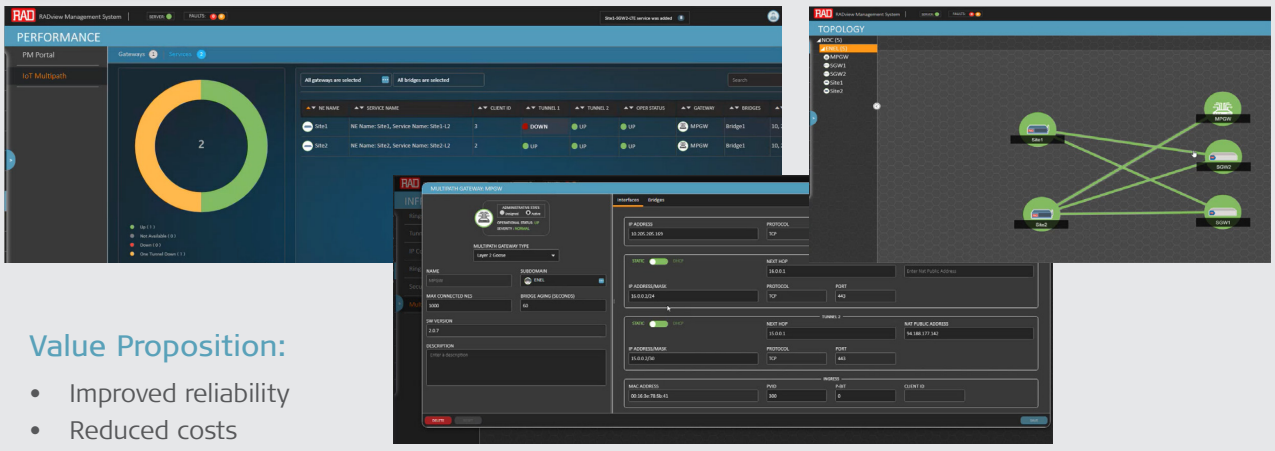
In addition to IEC61850 GOOSE, supports IP SCADA protocols, such as IEC 104, DNP3 and MODBUS. Traffic using the latter can be forwarded over either L2 connections or separately encrypted L3 tunnels.

An integral part of the solution is the RADview NMS, featuring a network element manager, end-to-end service manager for IPsec and L2 tunnel services, performance monitoring, and fault management. RADview also provides Zero-touch and auto-discovery capabilities for the SecFlow, to simplify operations via automation.





Value Proposition:

- Improved reliability
- Reduced costs
- Increased efficiency

Learn more about RAD's SecFlow here»

To discuss your Remote monitoring needs for power transmission towers, contact us at market@rad.com.

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