

South Central Indiana REMC Upgrades Substation Networks with Magnum 6K and DX

A Utility Networking Application

TECHNOLOGY TODAY

In recent years, there has been a dramatic increase in electric utility automation, specifically substation automation. Within the substations, power utilities are increasingly turning to industrial Ethernet because of its high reliability, and feature rich specifications. These include built-in fiber for high EMI noise immunity, 48, 110, and 125VDC operation, and extended temperature operating capabilities. These specifications allow Ethernet networks to be designed into substations with control and instrumentation equipment to maintain high availability of electric power to the public.

To interconnect the substations--particularly when the substations are remote--wireless has become an increasingly reliable and cost effective means of delivering the bandwidth. Wireless backhaul--that is, the transmission of voice or data from the remote cell to a central office location or switching center has become increasingly important.

ABOUT SOUTH CENTRAL INDIANA REMC & MAPLENET WIRELESS

South Central Indiana REMC is one of 39 rural electric cooperatives in Indiana. It is the largest distribution

cooperative in Indiana with over 34,000 members in seven counties. Its electricity generation and transmission service is provided by Hoosier Energy in Bloomington, IN.

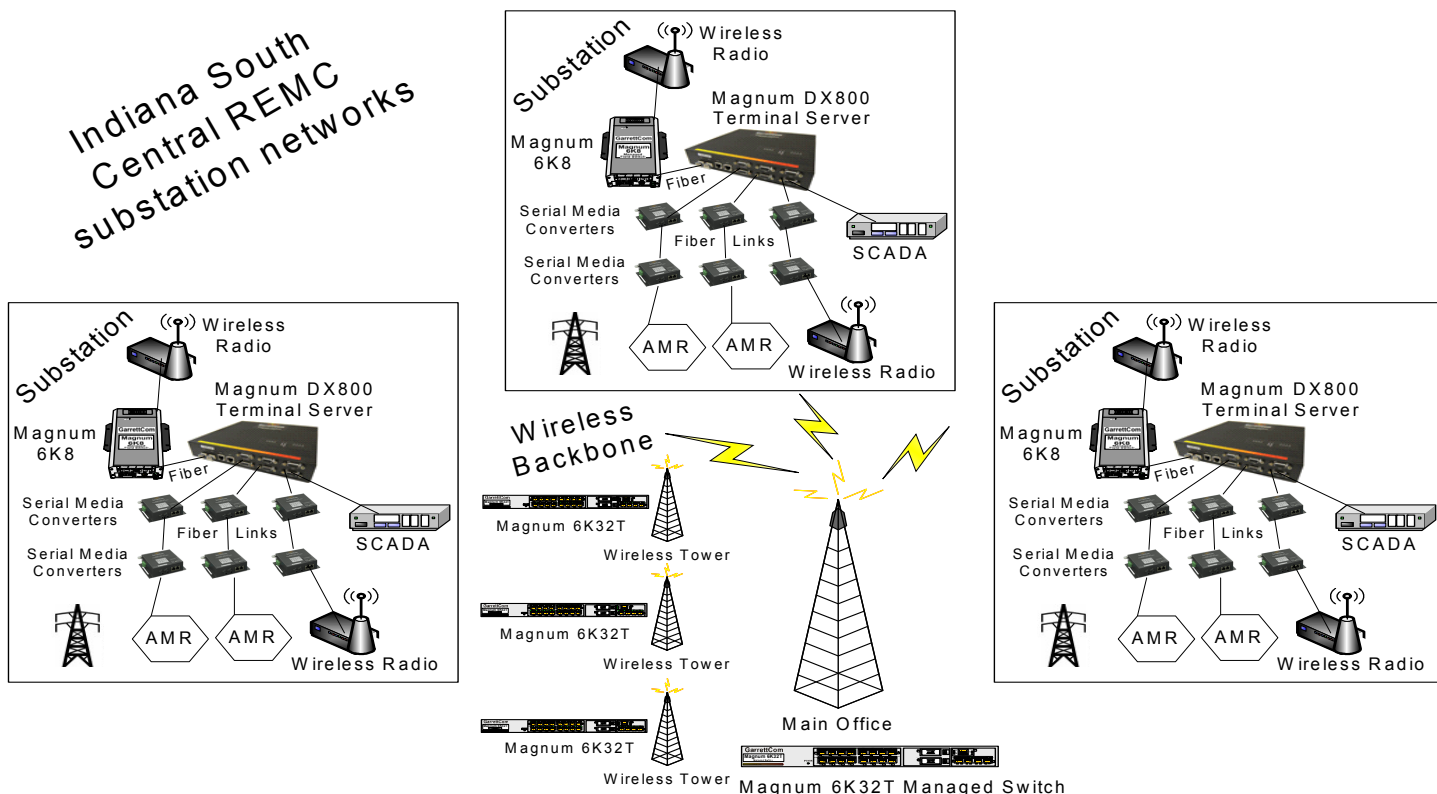
MapleNet Wireless is a national leader in wireless communications technologies. MapleNet's corporate focus is on mission-critical, high capacity IP wireless networks for utilities, healthcare, K-12, enterprise and government.

THE CHALLENGE

MapleNet Wireless was challenged with developing a high bandwidth Ethernet network for the South Central Indiana REMC. This new Ethernet network would then have to be integrated with the legacy serial network at the substations. Future-proofing the network was also a consideration as South Central Indiana REMC anticipates even more IP-based services in the future, such as video security.

The substation networks needed to be interconnected via backbone towers with microwave radios. Here the utility required an Ethernet solution that would quickly re-route traffic in the event of a link failure.

Indiana South Central REMC substation networks



South Central Indiana REMC App (cont.)

THE SOLUTION

MapleNet Wireless chose a series of hardened Magnum managed Ethernet switches, terminal servers, and converters from GarrettCom to provide the network. The Magnum 6K32T Managed Switches are placed at the wireless towers where they offer 100Mb/s Ethernet connections. The wireless towers supply 50Mb/s Ethernet (plus 8xT-1 capacity) and are part of the backbone. They are interconnected back to the main office with Ceragon Fibear licensed microwave radios. One or two Magnum 6K32T Managed Switches was deployed in the equipment racks located at each of these tower sites. The 6K32T Switches include premium MNS-6K-SECURE management software for extra security.

At each of the substations, a Magnum 6K8 Managed Field Switch is connected into a cluster management module (CMM) and then out to a 900Mz wireless access point radio. A fiber link then interconnects the 6K8 with a Magnum DX800 Terminal Server. The DX800 Terminal Server also provides a serial link into the existing SCADA. The DX800 also offers other serial copper connections into serial media converters. A serial fiber link then connects to other serial media converters and out to 220MHz radios and Automated Meter Reading (AMR) equipment. In some situations, a Magnum CS14 Converter Switch (media converter) is used to connect directly to the wireless radios.

ABOUT MAGNUM PRODUCTS

Magnum 6K Managed Switches are highly configurable switches, providing modular slots for user selection of 100Mb, 10Mb, or Gigabit Ethernet fiber or copper ports. The switches are substation hardened with "no-fans" or fan-based cooling. Power input choices include AC, 125VDC, -48VDC, 24VDC, and dual DC input for redundancy. GarrettCom products meet or exceed IEEE 1613 and IEC 61850 standards for electric power substations.

Magnum DX Industrial Routers and Terminal Servers combine features of a Terminal Server, Ethernet Switch and an IP Router in a single product. Magnum DX Products deliver secure multi-protocol networking in a compact, rugged package built for harsh environments.

MNS-6K Managed Network Software provides the latest technology for switch management, network management and security. Based on network standards, it is easily integrated into existing networks, and features standards-based redundancy functionality and Secure Web Management (SWM) GUI. MNS-6K offers standards-based cyber security tools for supporting NERC CIP network and systems compliance for power utilities and other critical industrial operations. MNS-6K-SECURE is available for those customers demanding extra security in their networks.

ABOUT GARRETTCOM

GarrettCom, Inc. is the leading manufacturer of industrial networking products. GarrettCom offers a comprehensive line of hardened industrial routers, Ethernet switches, and serial products for use in utilities, surveillance, traffic control, industrial automation, and telecommunications (with many NEBS L3 certified products). The company's management software supports redundant rings and secure web-based access to local and remote networks. GarrettCom markets its products through a network of resellers, OEMs, system integrators, and distributors worldwide. For more information on GarrettCom and its products, visit www.GarrettCom.com.



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A BELDEN BRAND

47823 Westinghouse Drive
Fremont, CA 94539
PH: (510) 438-9071
FAX: (510) 438-9072

Email: gcimktg@garrettcom.com
Web: www.GarrettCom.com