

## Magnum DX/DynaStar SCADA Frame Forwarding for Substation Automation

### A Utility Networking Application

#### THE CHALLENGE

Throughout North America, power utilities are successfully automating their substation facilities with networking technology as the needs and uses of their facilities change. Many factors—among them NERC CIP compliance—are driving this trend. Better access to information and cost savings are playing a major role. Recently, a well known north american utility (AWKNU) consolidated serial-based SCADA connections and other remote access to substation devices over a high performance digital network. This network was designed to eliminate costly analog private lines and insecure dial-up connections to the substation.

#### THE SOLUTION

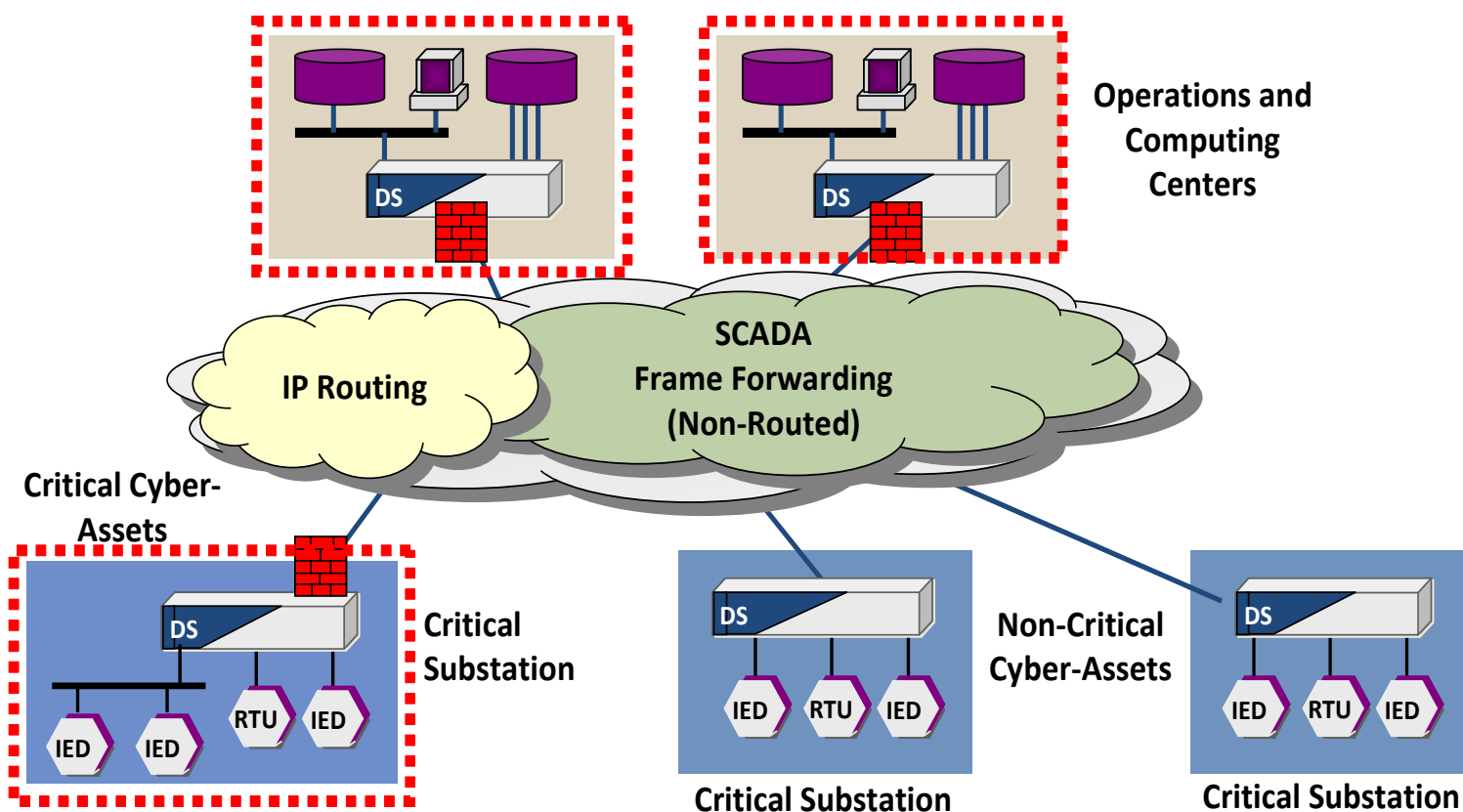
AWKNU chose to consolidate its serial-based SCADA connections and other remote access over a high performance digital network using the SCADA frame forwarding feature of GarrettCom's Magnum DX & DynaStar Routers.

#### THE SOLUTION

SCADA Frame Forwarding operates in “non-routable protocol” mode, multiplexing SCADA and other connections digitally without the use of IP protocols, and thus avoids the establishment of Critical Cyber Assets (CCAs) at remote substations, as defined in current NERC CIP standards. Without CCAs at certain selected critical substations, AWKNU can be fully compliant with current NERC CIP requirements while temporarily deferring more costly and complex substation upgrades. At the same time, the inherent serial-IP, IP routing/firewall and Ethernet switching capabilities of Magnum DX/DynaStar products position AWKNU for a future transition to IP-based networking while using the same network equipment and facilities. In fact, some critical substation have already moved to IP-based networking.

The network backbone is frame relay with the Magnum DX and DynaStar Routers connected to SEL relays, digital fault recorders, revenue meters, and RTUs.

## DynaStar SCADA Frame Forwarding



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### THE SOLUTION (cont.)

The network provides a level of future-proofing in that it allows additional connections to additional systems and IEDs without the cost of additional networking equipment or digital facilities.

The network offers the capability to provide two flexible topology requirements at the same time. AWKNU has reverse terminal servers at the host end of the network and preserves the serial port nature of legacy SCADA systems—including support for virtual multipoint connections using serial multicasting capability of SCADA frame forwarding. At the same time, AWKNU uses dual paths from primary and back-up control centers (dual SCADA masters) with automatic re-routing of the network to the secondary site.

### THE RESULTS

The Magnum DX/DynaStar SCADA frame forwarding network has eliminated costly analog private lines and insecure dial-up connections to the substation, while providing highly reliable and easily expandable connectivity from both primary and back-up control centers. AWKNU has implemented the Magnum DX/DynaStar frame forwarding networking solution in various subsidiary substations. This networking solution is essentially a standard for other smaller utilities in the area, and AWKNU has extended the network out to numerous industrial locations. Over 100 substations have had the networking solution implemented already.

### ABOUT MAGNUM PRODUCTS

**Magnum DX Routers & Terminal Servers** deliver secure multi-protocol networking in a compact, rugged package built for heavy-duty industrial sites, substations, and other harsh environments. The Magnum DX line is IEEE 1613/IEC 61850-3 compliant for power utility substations.

Each DX unit serves as a multi-protocol concentration and access point for a fiber-based Ethernet connection to a small site. Encrypted per-session SSL and IPsec VPN capabilities, along with other industrial firewall and port security features, assure cyber-security protections will extend cost effectively all the way to end-point devices and small facilities.

### ABOUT DYNASTAR PRODUCTS

**DynaStar Routers & Terminal Servers** include hardened routers, switches, terminal servers, Frame Relay Access Devices, and DSU/CSU. These products have been engineering to withstand even the most extreme environments.

In a single hardened product, the DynaStar DS1500-IFR & DS2000-IFR integrate five often discrete networking functions: Terminal Server, Ethernet switch, IP Router, Frame Relay Access Device, and DSU/CSU.

With support for a wide range of Ethernet and Serial devices, the DynaStar DS1500-ETS and DS2000TS consolidate data connections from RTUs, PLCs, IEDs, HMI PCs and other digital data devices.

### ABOUT GARRETTCOM

GarrettCom, Inc. is the leading manufacturer of industrial and power utility networking products. GarrettCom offers a comprehensive line of IEC 61850, NEBS and ETSI-certified switches for use in power utility, factory floor, telecommunications, and outdoor environments. The company's management software supports redundant rings and secure web-based access to local and remote networks. GarrettCom offers a full solution of cyber and physical security solutions design to protect power utilities and other critical industries as well as insure NERC CIP compliance. 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](http://www.GarrettCom.com).



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