RFL UTILITIES SOLUTIONS

How do I upgrade an existing SONET network to an Ethernet network while maintaining the existing legacy devices?

The Scenario:

Sunflower Electric Coop in Garden City, Kansas has an existing microwave SONET network which includes two SONET rings interconnected with T1 links that bridge RS-232 SCADA traffic from one ring to the second ring. Both the Main and Backup Control Center SCADA masters are located within that second ring. Teleprotection circuits connected to T1 Multiplexer spurs presently exist off the SONET ring and will remain as part of this ring upgrade. The requirement was to upgrade one existing SONET microwave ring to Ethernet micro-wave and upgrade to ethernet access multiplexer in this ring. The second SONET ring containing the SCADA Master sites will remain as is for the present with future upgrade to Ethernet. Minimal disruption to the existing network is required as part of the solution.

The Solution:

The RFL eXmux 3500 TDM over IP access multiplexer was chosen by Sunflower Electric for this ring upgrade from SONET (figure 1). The network was expanded to include both Ethernet and T1 spurs off this ring. The eXmux 3500 supports the transport of legacy TDM T1 and DS0 using pseudowire TDM over IP technology. As an Ethernet access multiplexer, the eXmux 3500 will be provisioned as the backbone for the Ethernet microwave radio network. All serial RS-232 SCADA RTUs can remain in place using the Asynchronous RS-232 Interface Unit available in the eXmux 3500. This is accomplished without any hardware upgrades to the existing SCADA equipment. Any future IP based RTUs can easily be added to the network with minimal programming. Existing T1 sites configured as spurs off the ring can

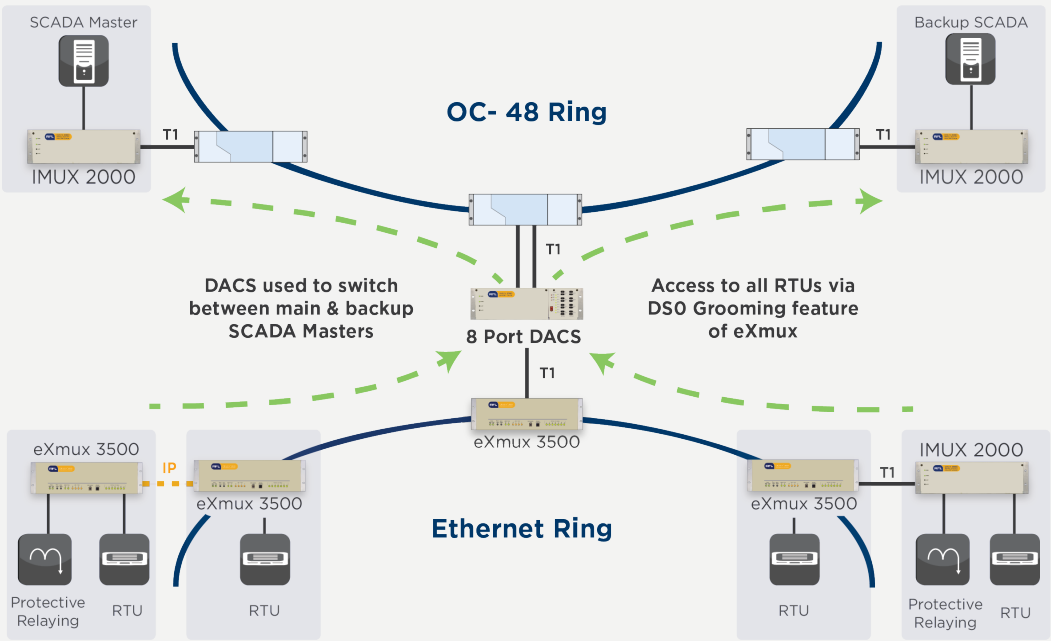

Figure 1: SCADA communications through multi-protocol rings

Because RFL and Hubbell® have a policy of continuous product improvement, we reserve the right to change designs and specifications without notice.

remain by using the T1 Interface Unit installed in the eXmux 3500. The DS0 grooming capability (DACS functionality) of the eXmux 3500 allows the routing of DS0 traffic between other T1s in the network and/or dropping of that channel at any Interface Unit installed in any eXmux 3500 in the network. These features allow the teleprotection circuits to remain as-is in the existing T1 Multiplexers or added as an interface to the eXmux 3500.

The Results:

Sunflower Electric was able to upgrade one SONET microwave radio ring to Ethernet by taking advantage of the eXmux 3500's capability to support both Ethernet and TDM services with any reconfiguring of existing services. Complete Ethernet and TDM services including T1 and DS0 interfaces are now available at each site. The SCADA RTUs connect directly to the eXmux 3500 RS-232 interface eliminating the need for the T1 channel bank and SONET node at the ring sites.

Related Products:

eXmux 3500

The RFL eXmux 3500 is a substation-hardened IP Access Multiplexer engineered for mission critical infrastructures to transport voice, serial, relaying protection, SCADA, video and Ethernet data communications over Ethernet/IP or MPLS networks, providing the flexibility of backward compatibility with Ethernet devices on the same communications platform.

About RFL

RFL designs and manufactures a comprehensive line of highly-reliable, mission-crit-ical, cost-effective communications and protection solutions for the electric utility and transportation markets, oil and gas markets, government agencies and engineering consulting firms. RFL is focused on guaranteeing mission-critical data will arrive on-time, every time.

RFL
353 Powerville Road
Boonton, NJ 07005,
USA
Tel: 973.334.3100
Fax:973.334.3863
www.rflelect.com