

How do I extend Ethernet services to the substation using my existing T1 infrastructure?

The Scenario:

A medium-sized municipality utility provider wants a simple means of extending its corporate LAN to each of its four transmission substations, but does not want to add any additional infrastructure to make it happen. The municipality already has a linear network of IMUX 2000 T1/E1 Multiplexer to handle SCADA and protection traffic between substations using a single T1 via TDM. The municipality is poised to migrate to fiber interconnects, with a complete loop between substations already in place. Ethernet usage is only expected to be required occasionally and needs to support one to four connections at each of the remote substations. The most important criteria is that traffic cannot have a detrimental effect on existing high-priority protection traffic.

The Solution:

A single point-to-point Ethernet service was

created around a UPSR ring over OC-12 using the IMUX 2000s and the 3200 MK-10 managed switch at each node. Each substation is provisioned to provide a 500 Mbps point-to-point link to the East and West to the substation one hop away. With the use of the Link Capacity Adjustment Scheme (LCAS) of the virtually concatenated group, bandwidth can be automatically adjusted to meet the demand from a particular node. A failed member will automatically cause a decrease of the bandwidth and after repair the bandwidth will increase again in a hitless fashion.

The Results:

The customer was able to establish a multi-node Ethernet network similar to the example below. Each node is able to exchange data with any other node via IP Phones and PC's. One-way traffic including surveillance video was configured to route back to the control center. The SCADA controller is able to send out configurations and

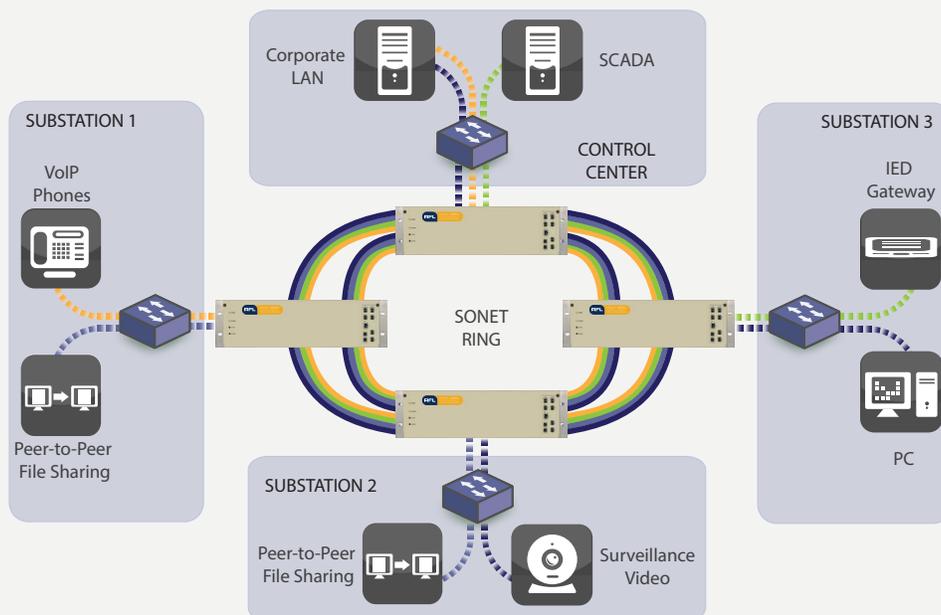


Figure 1: Architecture Overview - Ethernet Services

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query gateways to Ethernet IED devices. And most importantly, legacy SCADA and protection traffic is protected from the possibility of Ethernet traffic congestion.

Related Products:



IMUX 2000s

The RFL IMUX 2000s SONET / SDH Multiplexer

is an innovative and cost-effective solution from RFL that leverages your existing IMUX 2000 T1/E1 multiplexer and MDACS equipment to instantly expand your infrastructure for delivery of Gigabit Ethernet services, while continuing to support existing traditional TDM services.



3200 MK-10

The RFL 3200

MK-10 managed switch is equipped with eight (8) fast Ethernet ports with the option to configure 4 ports as fiber and two (2) GigE ports with RJ-45

and SFP cages installed in parallel allowing the installation of industry standard SFP fiber heads for 100 or 1000 Mb/s operation. These switches are designed to operate in harsh environments such as those found in electric utility substations.

About RFL

RFL designs and manufactures a comprehensive line of highly-reliable, mission-critical, 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.



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