

CAPABILITIES

MPLS Transition Services

Quanta Technology Expertise

- ◇ NERC regulatory standards development and enforcement practices, including CIP and PRC-005
- ◇ Utility network design, planning, development and implementation
- ◇ Utility telecommunications business case analysis
- ◇ In-depth understanding of digital and analog communications technologies and protocols such as T1, SONET/SDH, Ethernet, MPLS, DNP, IEC 61850, Modbus, audiotone, PLC and more
- ◇ Protective relaying pilot communications and teleprotection requirements, solutions and training
- ◇ Cyber security requirements for relaying, teleprotection and communications devices

Many utilities have already migrated to MPLS networks, except for mission critical applications. These applications have remained on time division multiplex (TDM) infrastructure including leased point-to-point lines and SDH/SONET, to ensure performance requirements can be met. However, with the third party telecommunications carriers eliminating leased point-to-point TDM lines as well as SDH/SONET technology seeing its “sunset” in the next few years, utilities will be faced with the reality of having to migrate the legacy TDM services to a packet architecture.

Quanta experts can assist in the transition of these services to the production environment, which would occur after the initial testing, validation, and proof-of-concept of protective relay and other mission critical applications.

Quanta Technology Capabilities

Quanta Technology can assist utilities with the following activities critical to ensuring a successful transition:

1. Requirements development and justification:

- ◇ Operations Technology (OT) business requirements development, defining mission critical applications requirements to work in the Information Technology (IT) infrastructure

2. Network planning, design, and implementation

- ◇ Infrastructure analysis and design
- ◇ TDM to packet migration; circuit emulation services implementation

The complement of services described here ensures that migration from legacy TDM-based communications can be accomplished in a transparent manner, maintaining operational integrity to both the migrated OT services as well as the ongoing IT services.

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1. Requirements Development Justification

OT Business Requirements Development

Typically, the IT department develops a project and plans for the migration but may not be fully aware of the specific requirements of mission critical applications, especially protective relaying.

Working with utility SME's, Quanta Technology can assist in developing business requirements to aid the IT department in finding equipment and designs that meets the business and technical requirements of mission critical applications. Documentation can be developed which would typically address:

- Identification of the stakeholders and their roles regarding the existing communications network
- Review vendor and industry practices and standards regarding mission critical applications
- Business requirements
- Technical requirements with explanation of relevancy to business requirements
- Risks and issues
- Provide the framework for Service level Agreement between OT and IT

A part of the business case requirements can be the documented need to establish a test bed and proof of concept with vendors to ensure operational readiness.

Quanta Technology's team includes experts in system protection, communications, IT, maintenance, control centers, and NERC reliability standards. This team is uniquely qualified to provide services to bridge gaps, and assist in developing OT requirements to aid in IT integration.

2. Network Planning, Design and Implementation

Infrastructure Analysis and Design

Key applications for OT include SCADA, protective relay, and synchrophasors. These applications alone can drive how a communications network must be configured to support OT. Quanta Technology can support the development of networks for OT through:

- System design and architecture development—modeling and verification
- Technology selection, equipment sizing and benchmarking
- Performance evaluation and operation analysis
- Test plans and model development
- Evaluation of remote access and communications infrastructure
- Network planning and optimization: IP/MPLS, MPLS-TP, MPLS-TE
- Network synchronization planning, GPS, Sync-E, IEEE-1588v2
- Design of low-latency service architectures
- Resilient Service architectures-Pseudowire/L2-VPN, L3 VPRN
- Core/aggregation/Edge layer network design
- Development of a multi-level security architecture with firewalls and intelligent security appliances, capable of meeting NERC CIP compliance.

TDM to packet Migration

Migration of mission critical services from legacy TDM to packet infrastructure is no trivial task. Maintaining reliability of the applications as well as performance levels during migration and after is necessary to ensure the utility's business continuity is protected. Quanta Technology can support this effort through:

- Service auditing and performance benchmarking
- Service migration planning
- Assisting with implementation of Circuit Emulation Services (CES) using CESoPSN/SAToP(VLL/WPWS/C-pipe)
- Application testing and CES validation

