

commtel

# Delivering MPLS-TP for a major power network operator.

A CommTel Case Study



# How smart and secure technologies can be utilised in power transmission networks that need to respond to advancements in energy generation, such as renewables.

## Power transmission networks need to become more flexible and technologically advanced as renewable power generating sources such as wind and solar farms deliver a growing proportion of the power delivered.

As the reliance on traditional coal and gas power stations reduces, these networks need to integrate the new renewable power sources and this requires greater flexibility and capability.

Many power utilities have been using TDM-based operational telecommunications networks to manage their power transmission and distribution networks. This technology is reaching end-of-life and doesn't provide the flexibility to support Distributed Energy Systems (DES) to deliver wide area protection and control (WAPC) schemes that are a mandatory requirement for renewable power sources.

Because of this, many major power utilities are searching for alternative technologies to upgrade their power management capability.

### About AusNet Services

AusNet Services owns and operates the Victorian electricity transmission network, one of five electricity distribution networks, and one of three gas distribution

networks in Victoria. CommTel's association with AusNet Services is primarily in the communications networks for its electricity transmission and distribution.

AusNet Service's power transmission network transports electricity from where it is generated, through terminal stations and high-voltage transmission power lines across Victoria to Victoria's five lower-voltage distribution networks. Its electricity distribution network feeds lower-voltage electricity to customers across all of eastern and north-eastern Victoria, and in Melbourne's north and east.

AusNet Services wanted to evaluate new technologies to manage its grid to enable it to better incorporate its growing reliance on renewable power generation. It approached a number of providers including CommTel and requested concept communication solutions to deliver the network flexibility and capability it was looking for. It also had niche requirements for its Teleprotection (Current

Differential) services to keep the latency and variation of latencies within microsecond intervals, which was a challenge for most next generation technologies.

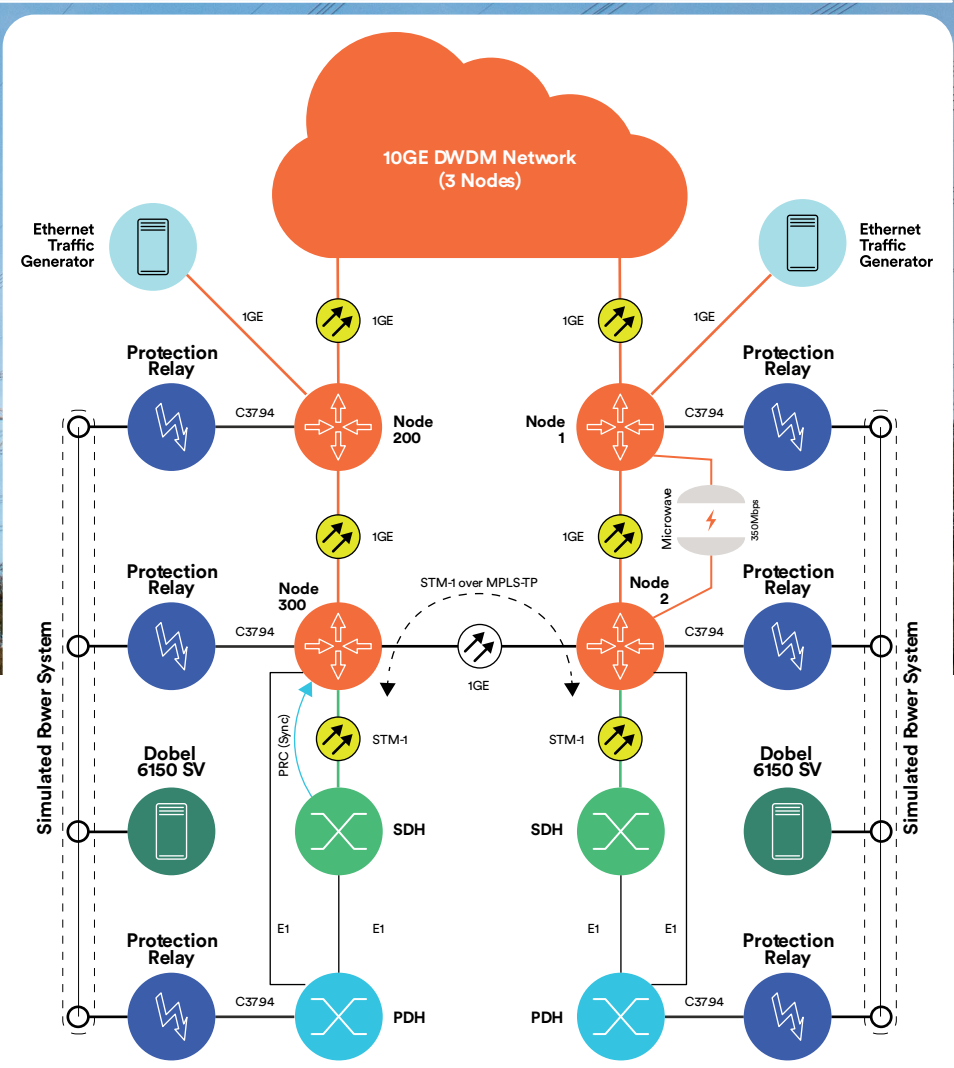
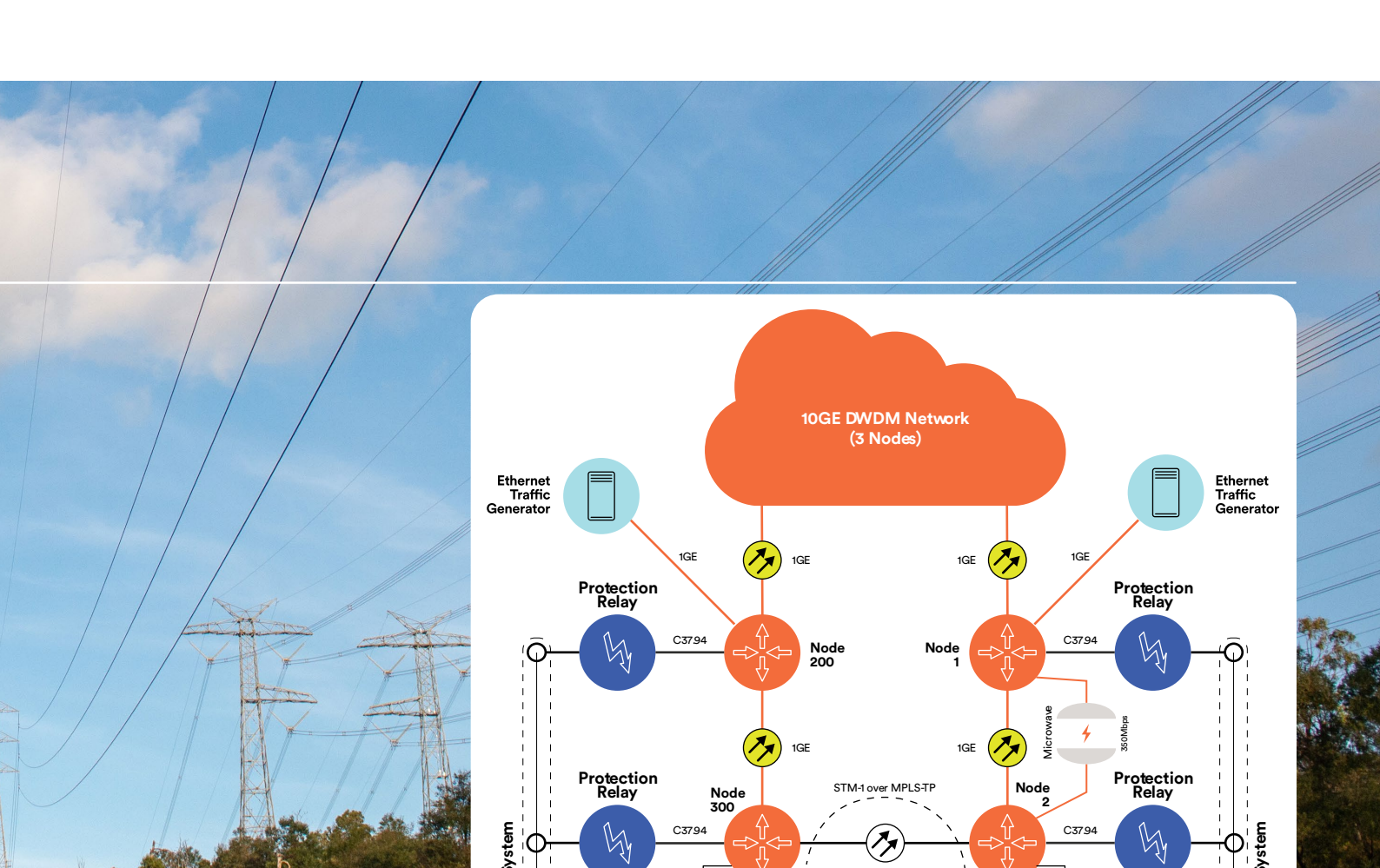
CommTel proposed a solution based on packet-based MPLS-TP technology with XTran devices to deliver this capability, and this solution was chosen by AusNet Services. However, to proceed, we needed to prove to AusNet Services that this technology would deliver for them before the power utility rolled it out across its wider network, and we did this through a detailed proof of concept.

### Proof of concept

CommTel's proposed solution used MPLS-TP technology to transport tele-protection services based on C37.94, G703/64K. It was demonstrated to AusNet Services that the proposed XTran devices and MPLS-TP technology would perform similar to existing TDM devices, and we tested protection mechanisms, emulation services and future digital protection schemes based on IEC61850 (GOOSE, SV and RGOOSE).

We worked closely with AusNet Services throughout this stage to understand and meet its needs, with considerable support provided by XTran vendor OTN Systems.

The proof of concept program was delivered onsite at our main facilities in Melbourne.



It required us to ensure the new packet-based technology could work seamlessly in a hybrid telecommunication network based on PDH/SDH/DWDM/Microwave Radio equipment and:

- At least matched the existing TDM technology in terms of performance
- Provided the additional flexibility required for new applications
- Had the resilience and longevity needed in the field
- Could integrate and work with the new network applications required
- Was interoperable with the existing TDM infrastructure for smooth migration
- Was easy to use so that existing maintenance personnel could easily be trained on this next generation network
- Complied with all network security requirements
- Offered value for money

The proof of concept was carried out over three months and proved a success, and AusNet Services selected the solution for its power transmission communications network rollout.

**Challenges**

- Our solution met all of AusNet Services technical, financial and practical expectations. The challenges included:
- Setting up all different technologies (PDH/SDH/WDM/MPLS/Microwave) to simulate the hybrid network environment
  - Synchronisation handover between TDM – MPLS-TP technologies and vice-versa

- Transporting MPLS-TP over Microwave radio
- Defining the right circuit emulation technique to achieve the same performance as TDM
- Fine tuning of design variables to achieve optimised latency values for protection services.

Network Management System (TXCare) was an important part of the solution, offering end-to-end service provisioning and management control for AusNet for their new network communications system.

**Our key differentiators**

- Some of the key differentiators of the CommTel solution included:
- Hitless service protection/switching at interface levels such as C37.94, X.21
  - Asymmetrical delay less than 400 micro seconds
  - Fully interoperable with third party PDH networks
  - XTran cyber security management to protect management plane, control

- plane and data plane
- OLS (Optical low speed interface card to eliminate X.21 optical converter)
- State of the art NMS platform (TxCare) for end-to-end service provisioning and monitoring.

**What can CommTel do for you?**

We are proud of our work with AusNet and what we achieved together to help this leading power company transition to the latest network technologies offering greater management capability and network flexibility. This is one of many success stories where we have used our unmatched technical know-how, experience and capability to deliver the right solution.

We partner with businesses across many industry sectors to deliver the technical solutions they need to future-proof their networks, and offer the management and network capabilities to more effectively and efficiently serve their customers.

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