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THE ELASTIC OPTICAL BACKBONE – A PERFECT FIT FOR R&E NETWORKS

All public or private telecommunications networks are supported by a high speed optical backbone. And while all optical backbones have common core requirements – there are some variations in other requirements depending on the underlying business.

National research and education network (NREN) customers, whose backbone networks provide connectivity for a diverse set of client institutions, have a unique set of needs. Their backbones must support a broad range of applications, from ultra-fast high-performance computing collaboration, to e-learning, and to special links with virtually zero latency. Here are some of their unique requirements.

One requirement worth emphasising that makes NREN backbones truly unique, is the ability to take on special tasks and to 'shine in the spotlight', as they may be called upon for "one off" demonstrations and showcases.

NREN backbones are also expected to support research in and around the various cutting edge technologies they are likely to incorporate, (i.e. high speed coherent transmission, SDN, and NFV). In short, NRENs need a smart and flexible optical backbone, which is dynamically adjustable to user requirements.

NREN REQUIREMENT	WHY	KEY ELEMENTS
High bandwidth with high availability	To support high performance computing collaboration.	A standard set of client interfaces and high capacity network transport between them, as well as mechanisms for dedicated protection and dynamic service restoration.
Platform for innovation	To support transmission and networking experimentation, and to showcase special capabilities.	A willingness and an ability to open up or customize system elements, to permit this.
Tight integration with packet services	While optical networks need to support several types of client interfaces, they need to be particularly efficient at handling dominant packet traffic.	Optical transport packets (L2 packet services) are transported seamlessly over L1 optical or L0 wavelength facilities.
Scalable and flexible	To economically serve a wide variety of institutional customers with different needs.	A family of platforms with interchangeable cards so that solutions can be right-sized depending on customer and demands.
Easy to operate	To manage the network with a reduced operations staff.	A centralised and powerful network management system, with intuitive controls. Plus the ability to centrally and continuously monitor OSNR and other system performance aspects.
Multi-vendor environment	To maximize use of current resources in an evolving environment.	Support alien wavelengths, or run as an alien wavelength on someone else's system. To support third-party equipment under a centralised NMS.
Secure	To protect proprietary research as part of a national infrastructure.	Support L1 optical encryption for all client interface speeds.