

INFINERA DTN-X XTS SERIES

INFINERA DTN-X XTS SERIES MESHPONDERS

Delivering super-channels with scalability, flexibility and programmability to transform subsea networks to cloud scale

Subsea operators are facing an unprecedented growth in bandwidth demand due to the rise of new cloud-based services. Many subsea cable systems are running out of capacity faster than previously planned. Trans-Atlantic bandwidth is forecast to grow at 40 percent annually through 2025, with most of this traffic generated by private networks [Telegeography]. This private traffic, as opposed to public internet traffic, is dominated by N x 100 gigabits per second (100G) “elephant flows” traveling between the data centers of internet content providers as they move and pre-position content around the globe. Subsea operators need to maximize the fiber capacity and reach of their cable plants while simultaneously optimizing their networks to efficiently handle these 100G flows and support smooth scale-out capacity expansion. Subsea operators, thus, require cloud scale networks that are scalable, programmable, and flexible, with best-in-class techniques for robust security and rapid reconfigurability. The next generation of Infinera Intelligent Transport Networks brings cloud scale technology to subsea transport networks, addressing these diverse traffic requirements extremely efficiently when compared with conventional architectures.

The DTN-X XTS Series, powered by Infinera’s Infinite Capacity Engine, is designed to power cloud scale networks for subsea operators. It

combines 2.4 terabits per second (2.4T) super-channels with sliceable photonics and is designed to support in-flight line-rate Layer 1 encryption (encryption software license required for activation) in a low-power compact form factor. The XTS Series features subsea-optimized modulation formats such as matrix-enhanced phase-shift keying (ME-PSK) and 3 quadrature amplitude modulation (3QAM), as well as Infinera’s Advanced Coherent Toolkit featuring the industry’s first commercially-available Nyquist subcarriers to enhance capacity-reach performance. The XTS Series enables super-channels to be sliced, providing wavelength-level granularity so each wavelength can be tuned across the C-band, modulated and then routed to the



XTS-3300



XTS-3600

appropriate destination. The XTS Series platforms are the industry’s first subsea transport-optimized meshponders, combining muxponder technology with sliceable photonics in a server-like wavelength-division multiplexing (WDM) appliance. The XTS Series interoperates with the DTN-X XTC and XT Series, providing a unified end-to-end Intelligent Transport Network portfolio, and when combined with Infinera’s Instant Bandwidth it allows for instant end-to-end network reconfiguration covering subsea, long-haul, metro and data center interconnect (DCI) applications.

The XTS Series includes the following platforms:

- **The XTS-3300 meshponder** delivers up to 1.2T of line-side capacity in 1 rack unit (1RU) and provides enhanced capacity and reach for subsea applications in an ultra-compact form factor at 600 millimeter (mm) rack depth, with low power consumption.
- **The XTS-3600 meshponder** delivers 2.4T of line-side capacity in a compact 4RU form factor. With redundant controller, 470 mm rack depth, a mix of OTU4, 100 Gigabit Ethernet (GbE), 10 GbE client interfaces and Optical Transport Network (OTN) multiplexing, the XT-3600 provides a multi-service platform for subsea applications.

The XTS Series is designed to support new subsea software tools and interfaces for open networking. These tools allow subsea operators to partition and monetize valuable fiber spectrum so that it

can be safely and securely shared with multiple customer tenants, independent of both cable and submarine line terminal equipment (SLTE) suppliers. Mission-critical subsea link performance data is available in real time on-demand via open software-defined network (SDN) application programming interfaces (APIs). Subsea operators can monitor transmission health as well as identify opportunities for capacity adjustments. In addition to these new tools, Infinera’s Time-based Instant Bandwidth enables operators to instantly change network capacity as well as duration, facilitating a dynamic Intelligent Transport Network. Now operators can closely match traffic patterns to address bursty service demands from customers, align bandwidth to revenue, and instantly reroute bandwidth in the case of network disruptions.

Application-optimized Scalable Transport Platform

As demand for bandwidth continues to drive the need for network scale, service providers seek reliable solutions to grow their infrastructure while offering a range of differentiated services and meeting stringent customer service level agreements (SLAs). The XTS Series is purpose-built for subsea transport, offering high bandwidth, flexible reach, simple installation, and easy operations. It delivers optical super-channels of up to 2.4T that can be provisioned in a single

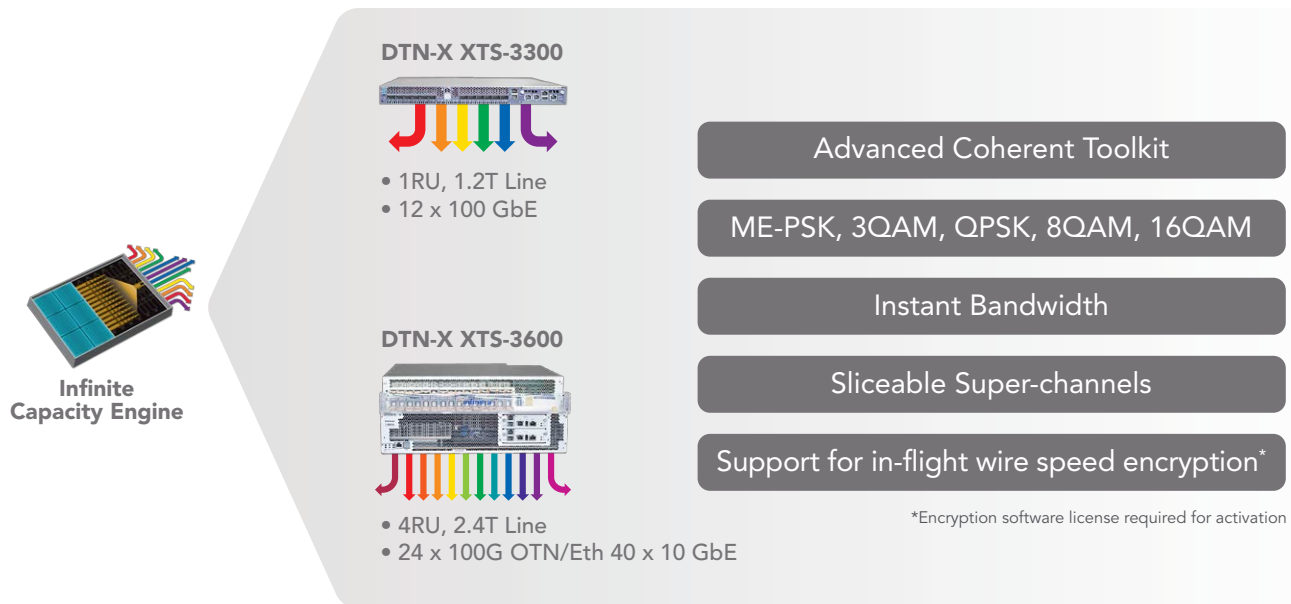


Figure 1: DTN-X XTS Series: Powering Cloud Scale Networks for Subsea Transport

operational motion. This capacity is delivered in up to 4RU, resulting in a high-density bandwidth solution with low power consumption. The XTS Series provides up to 25.6T of capacity on a single fiber pair in the C-band from a single rack while supporting a flexible combination of 10 GbE, 100 GbE and OTN client modules. Powered by the Infinera Infinite Capacity Engine, the XTS-3300 and XTS-3600 multi-terabit meshponders support the cutting-edge approach of sliceable photonics combined with muxponder technology in transport networks. Service providers can become more competitive in the marketplace by drastically reducing both operational rigidity and forecasting complexity. This solution provides fine-grained and flexible control of wavelengths with the ability to tune and route N x 100G super-channels in separate directions with the appropriate modulation, which in turn can be combined with packet-aware OTN switching in the DTN-X XTC Series.

Plug-and-play Flexibility

The XTS Series features the Infinera Advanced Coherent Toolkit, enabling service providers to optimize network performance across a wide range of applications. The Infinera FlexCoherent® technology in

the toolkit uses a number of software-programmable coherent modulation formats including binary phase-shift keying (BPSK), ME-PSK, quadrature phase-shift keying (QPSK), 3QAM, 8QAM and 16QAM. The toolkit features the industry’s first Nyquist subcarrier technique that synthesizes each optical carrier into multiple subcarriers that are closely spaced to each other. Additionally, the soft-decision forward error correction (SD-FEC) gain sharing technique mathematically combines output from two channels so that the stronger channel can be used to enhance the quality factor (Q value) of the weaker channel. Both these techniques dramatically improve tolerance to non-linear impairments. Also, Infinera’s Time-based Instant Bandwidth technology on the XTS Series enables service providers to adopt a cashflow-efficient business model, deploying additional bandwidth rapidly with a few mouse clicks when demand arises, without the need to order, install and deploy additional equipment.

Simple and Programmable

The DTN-X XTS Series is managed by the Infinera Management Suite, a collection of carrier-class applications, including integrated Wet Plant Link Manager (WPLM), a full-featured graphical element

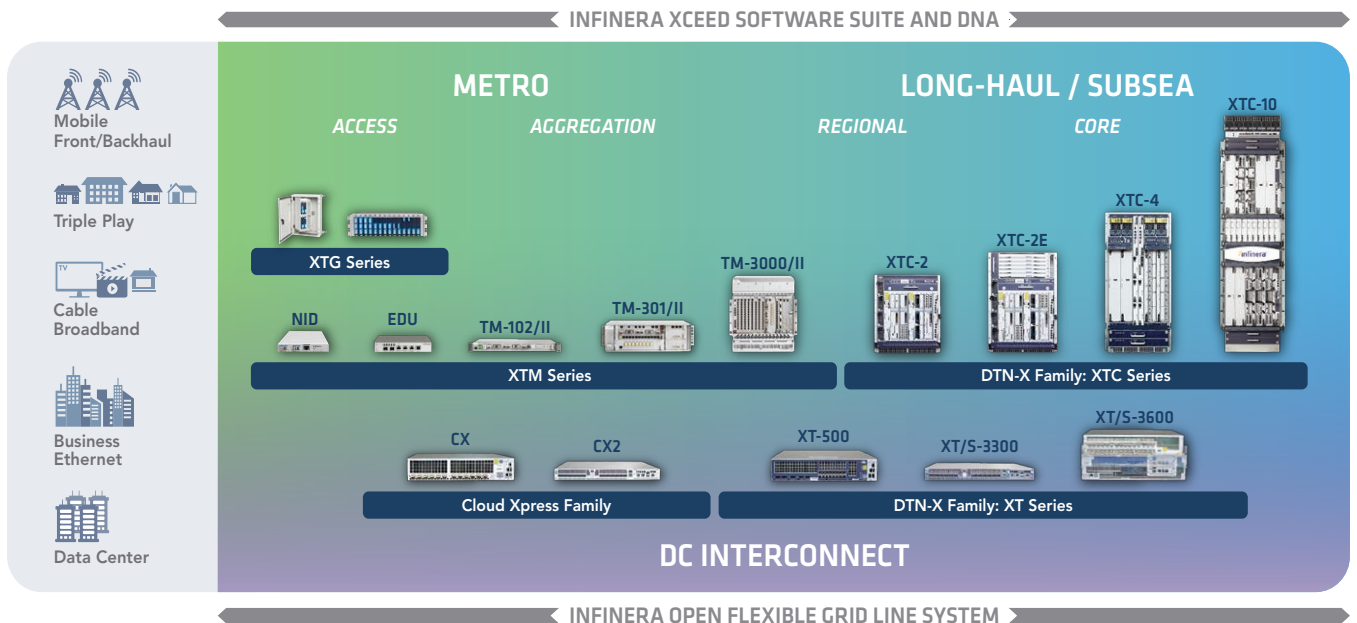


Figure 2: The Infinera End-to-End Portfolio

and network manager, Infinera Digital Node Administrator (DNA), and Infinera Network Planning System (NPS) offline engineering, planning and optimization tool. The DTN-X XTS Series can be SDN-controlled with Infinera's Xceed Software Suite, which uses open software and interfaces with third-party solutions via open APIs to provide revenue-ready applications for agile, assured orchestration of new services. Xceed makes bandwidth more dynamic and flexible. Xceed combines an open, multi-layer SDN control platform with modular, commercially deployable applications that enable new revenue sources while increasing network efficiency. The Xceed Multi-layer SDN platform seamlessly interoperates with the Infinera Management Suite, enhancing Infinera's robust portfolio of software

solutions to control and manage subsea, long-haul, metro and DCI networks.

The XTS Series is a member of the DTN-X Family within the Infinera Intelligent Transport Network portfolio. Infinera has extended its award-winning DTN-X Family with the introduction of XTS-3300 and XTS-3600 to power cloud scale subsea networks. The Infinera DTN-X XTS Series provides a highly scalable, flexible and programmable subsea transport platform, delivering on Infinera's vision of enabling an infinite pool of intelligent bandwidth that the next communications infrastructure is built upon.

[Contact us](#) to learn more.

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