

INFINERA XTC-2 AND XTC-2E

# INFINERA DTN-X XTC-2 AND XTC-2E PLATFORMS

## Extending the DTN-X Family to Lower-bandwidth Metro and Regional Networks

Mobile data services, video traffic and cloud computing are driving exponential growth in demand for bandwidth on optical transport networks. As networks transform to the simplified model of cloud services (Layer C) and intelligent transport (Layer T), new traffic patterns are evolving. The traditional user-to-data center traffic is being overshadowed by the massive growth in east-west data center-to-data center traffic. This explosive growth in traffic and a shift to cloud-based delivery of applications is accelerating the transformation of metro networks from 10 gigabits per second (10G) to 100G. Numerous applications are being virtualized, leading to the creation of mini data centers closer to the end user throughout metro and regional networks. These traffic patterns require a right-sized, mesh transport

network optimized for the metro that is open, programmable and can scale with simplicity.

Infinera provides Intelligent Transport Networks that accelerate service delivery and simplify optical network operations at Layer T. Intelligent Transport Networks include the award winning DTN-X Family, integrating wavelength division multiplexing (WDM) with packet-optical switching. Infinera is expanding the DTN-X Family with the introduction of two new platforms in the XTC Series—the XTC-2 and XTC-2E.

The Infinera DTN-X XTC-2 and XTC-2E are purpose-built for extending the DTN-X experience from the long-haul to lower-capacity metro and regional networks. The XTC-2 and XTC-2E offer a smaller form

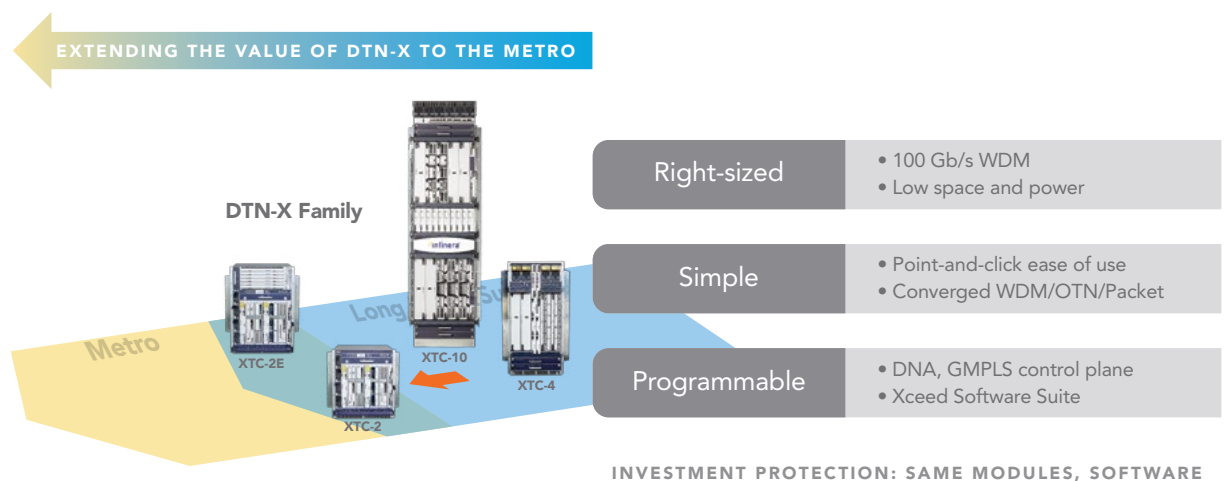


Figure 1: Infinera DTN-X XTC-2 and XTC-2E Platforms

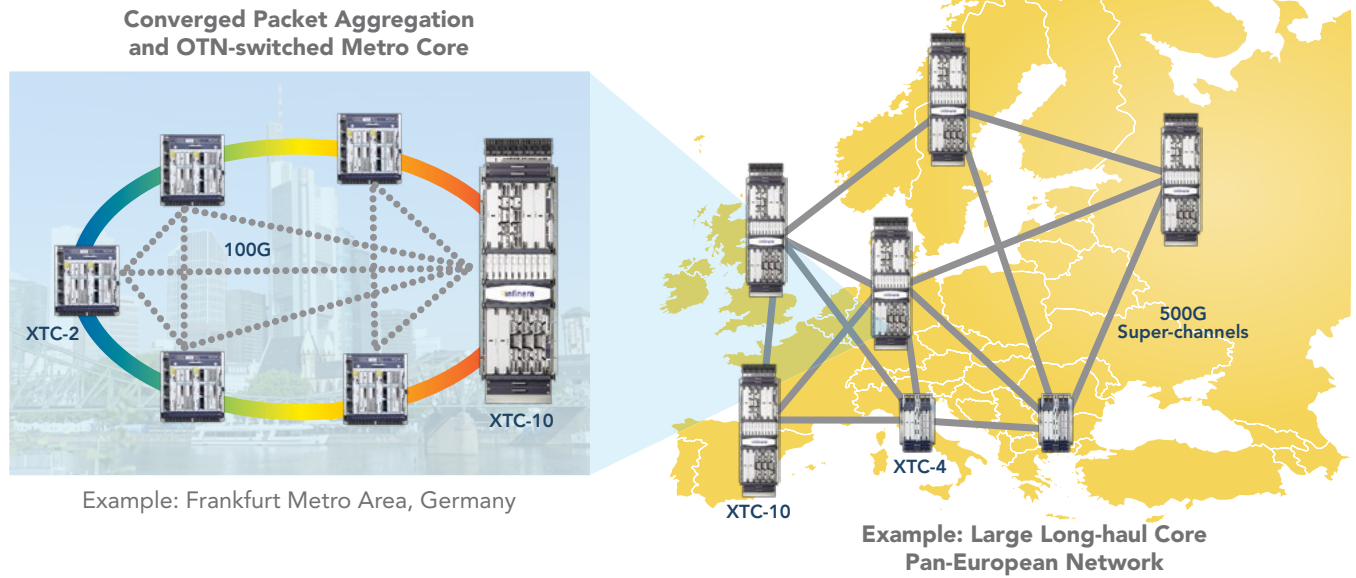


Figure 2: Extending the DTN-X Experience to Metro Core

factor with lower bandwidth compared to the widely deployed XTC-4 and XTC-10 platforms.

These compact platforms deliver a converged packet, Optical Transport Network (OTN) and WDM solution for metro core and regional 100G applications. The XTC Series supports our new oPIC-100, the industry's only large-scale photonic integrated circuit (PIC) optimized for metro 100G. The line-side interface includes an Infinera FlexCoherent® processor that allows customers to optimize fiber bandwidth and reach for a given link. The XTC-2 and XTC-2E support 1.2 terabits per second (1.2T) of non-blocking OTN switching as well as Ethernet and Multi-Protocol Label Switching (MPLS) packet services. The XTC-2 and XTC-2E support a wide range of client-side interface speeds from 155 megabits per second to 100G, including traditional Synchronous Digital Hierarchy (SDH)/Synchronous Optical Networking (SONET),

Ethernet/packet, storage area network (SAN), Fibre Channel and video. The XTC-2E also integrates optical and electrical line system modules into a single chassis, supporting reconfigurable optical add-drop multiplexers (ROADMs), line amplifiers, 100G WDM modules and client service modules in a single 15 rack unit chassis.

### Right-sized For Metro and Regional Networks

As part of the Infinera DTN-X Family, the XTC-2 and XTC-2E platforms offer network operators a rich set of client services for lower-bandwidth sites, common in intra-city and metro networks, and provide a lower power and space profile for these applications. Figure 2 shows an example of a metro area with an OTN-switched core and 100G mesh to lower-bandwidth sites. These 100G WDM links are aggregated in a central location at an XTC-4 or XTC-10 that then hauls the traffic long distance to connect seamlessly with other metros.

The XTC-2 and XTC-2E are also applicable to regional transport networks at sites where the bandwidth requirement is optimal for

a medium- to small-sized switching core. The XTC-2 and XTC-2E are purpose-built for lower-bandwidth sites needing packet-optical switching using seamless 100G WDM interconnection with the rest of the DTN-X Family, including the XTC-4, XTC-10 and FlexILS line system, as shown in Figure 3.

### Simple High Performance

The XTC-2 and XTC-2E extend the Infinera DTN-X experience of simplicity and high performance from the subsea and long-haul core into lower-bandwidth sites in metro and regional networks. The DTN-X Family is part of Infinera’s end-to-end Intelligent Transport Network portfolio, as shown in Figure 4 (see next page).

**Investment protection** The XTC-2 and XTC-2E provide investment protection by supporting all DTN-X client modules. Existing XTC-4 and XTC-10 pluggable client tributary interface modules (TIMs) can be inserted in any XTC-2 or XTC-2E, vastly reducing the cost of spares for those operators deploying the XTC Series across their networks. The XTC-2 and XTC-2E extend the Infinera Experience, accelerated service innovation and simplified operations at Layer T.

**Switching** The XTC-2 and XTC-2E provide 1.2T of OTN switching for optimal performance at lower-bandwidth sites in metro and regional networks. The switching function is integrated with the WDM platform, reducing the number of wavelengths in the network and boosting efficiency. Moving from two chassis to a single-chassis solution reduces line modules, power and space while simplifying network operations at each location.

**Network Resiliency** Infinera’s FastSMP™ provides intelligent protection for Infinera Intelligent Transport Networks. FastSMP is Infinera’s unique approach to delivering shared meshed protection (SMP) and is based on the emerging ITU-T standard for service recovery. FastSMP provides multiple failure recovery and deterministic hardware-assisted sub-50 millisecond (ms) protection switching. FastSMP is accelerated by dedicated processors on each DTN-X line module to enable sub-50ms protection switching performance. FastSMP provides shared protection bandwidth savings by reducing the use of expensive router ports.

**Packet Services** The XTC-2 and XTC-2E support the same packet services as the XTC-4 and XTC-10, including the PXM (packet switching module), which provides statistical multiplexing and quality of service (QoS) capabilities. The PXM enables service providers to

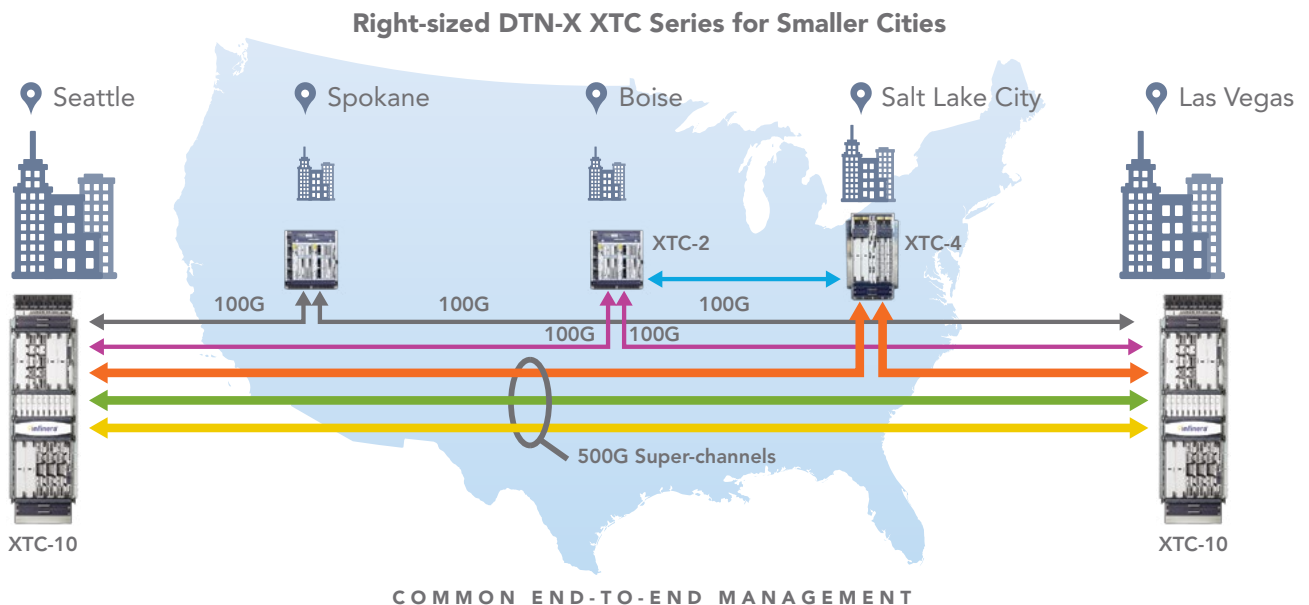


Figure 3: Extending the DTN-X Experience to Lower-bandwidth Metro and Regional Sites

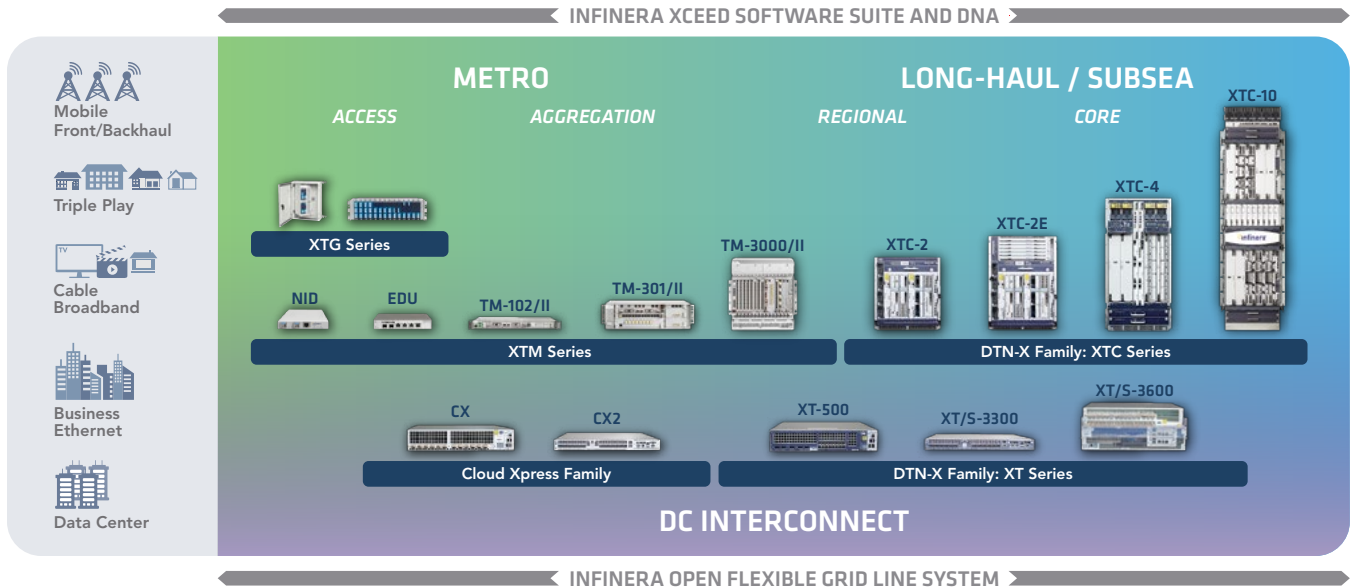


Figure 4: The Infinera Intelligent Transport Network Portfolio

directly map Ethernet and MPLS services with QoS from the edge of their networks to core transport services using OTN, creating a highly efficient packet-optical network. This approach provides an opportunity for service providers to increase revenues by addressing the growing demand for MEF Carrier Ethernet 2.0 services.

### Programmable

The XTC-2 and XTC-2E integrate with the Infinera Xceed Software Suite, an open, purpose-built, multi-layer software-defined networking (SDN) platform with revenue-ready applications that enables a high degree of abstraction and virtualization of the underlying optical network. Xceed provides a simplified programming model that enables service providers to accelerate service innovation and simplify network operations while using network resources as ef-

ficiently as possible. The open and modular architecture of Xceed allows easy integration into a customer’s application, SDN controller or orchestration software layer through standard and secure Web 2.0 application programming interfaces (APIs).

Infinera’s Bandwidth Virtualization is central to both the XTC-2 and XTC-2E, fully decoupling client services from line-side optics and enabling customers to fully leverage their deployed optical bandwidth to carry any mix of traffic, without stranding any capacity. Bandwidth Virtualization provides the foundation for an SDN-enabled platform that connects with SDN controllers for multi-layer and multi-vendor service provisioning.

The Infinera XTC-2 and XTC-2E extend the acclaimed DTN-X experience to lower-bandwidth metro and regional networks with 100G, aligning with Infinera’s vision of enabling an infinite pool of intelligent bandwidth that the next communications infrastructure is built upon.

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