

INFINERA PRODUCT OVERVIEW

# WHY YOU NEED AN INFINERA INTELLIGENT TRANSPORT NETWORK

Network operators have come to expect that with scale comes complexity and cost, especially when it comes to optical networks. This continues to be the case unless you have a Intelligent Transport Network.

**Intelligent Transport Networks** leverage disruptive technology to combine the art of optical networking with the predictability and deterministic behavior of digital networking to make networks more efficient. This is done using photonic integrated circuits (PICs), a component about the size of your fingertip that condenses hundreds of optical components onto a single ultra-reliable micro-chip. Infinera's PIC, which optimizes bandwidth and hardware, simplifies just about everything else. In fact, PICs and the Intelligent Transport Network offer the unique ability to combine the speed of optical networks with the simplicity of the digital domain to change the rules of networking forever. Benefits include being able to build networks that deliver Terabit **SCALE**; leverage plug-and-play architecture, digital automation and GMPLS-based network intelligence to make networks **SIMPLE**; and converge functions, increase density and reduce power consumption to make networks more **EFFICIENT**.

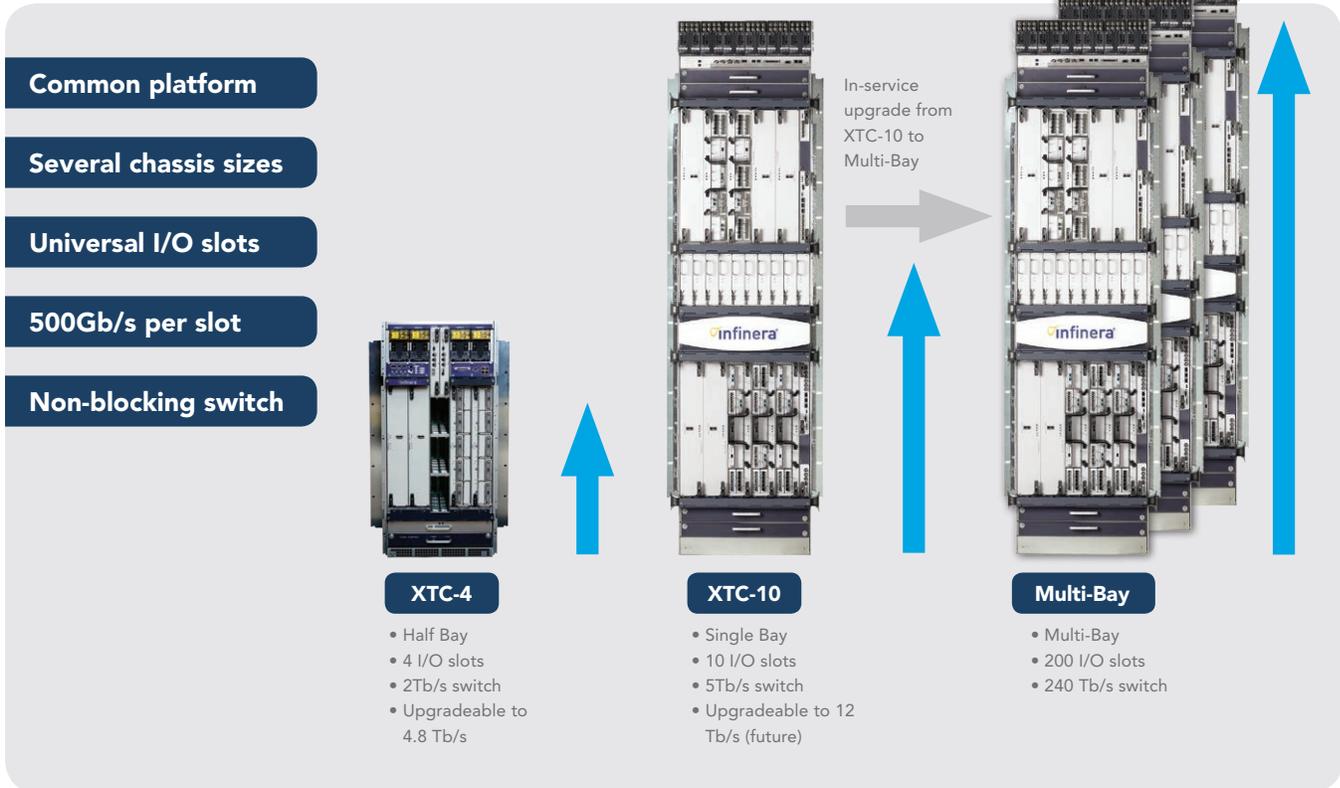
To harness the power of the Intelligent Transport Network, Infinera brings to you a family of products designed from the ground up to maximize network value. Across metro, core and even subsea

applications, Intelligent Transport Networks leverage unparalleled innovation in technology, architecture and operations and have been proven by customers to help improve PROFITABILITY.

## DTN-X: The Flagship P-OTN Platform

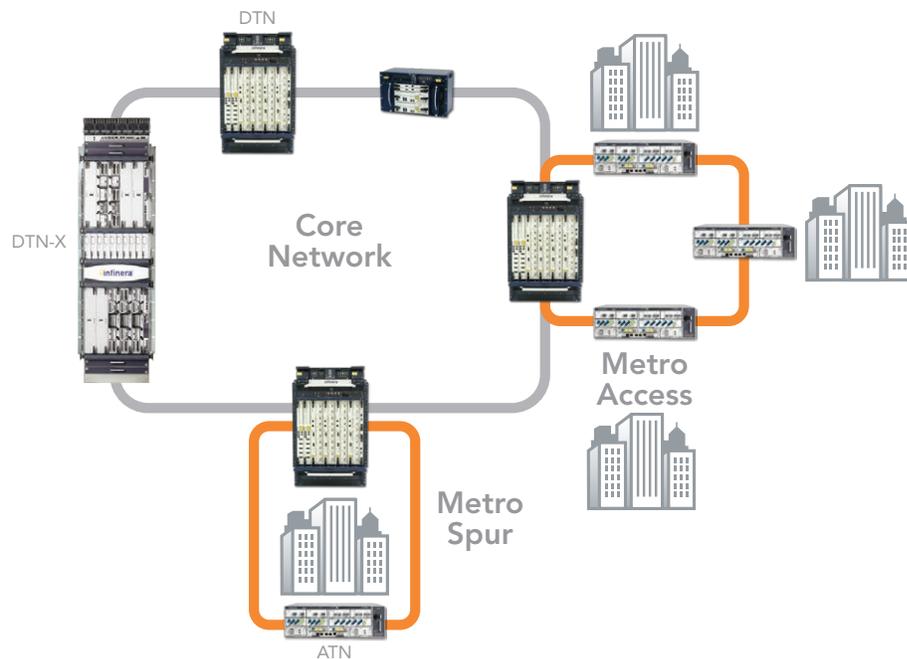
Designed to address the ever-evolving needs of the core network, DTN-X leverages the latest generation of PIC technology to deliver the

<b>SCALABLE</b>	<ul style="list-style-type: none"> <li>• 500 Gb/s super-channel</li> <li>• 5 Tb/s with future upgrade to 240 Tb/s</li> </ul>
<b>SIMPLE</b>	<ul style="list-style-type: none"> <li>• Intelligent GMPLS automation</li> <li>• Converged DWDM/OTN; packet switching</li> </ul>
<b>EFFICIENT</b>	<ul style="list-style-type: none"> <li>• 50% less power</li> <li>• 33% less space</li> </ul>



industry's fastest, simplest and most efficient Packet Optical Transport Platform. Through a unique combination of innovative architecture and cutting-edge technology, the DTN-X brings revenue to network operators faster, simpler and more efficiently than any of the leading competitors. Sized to fit your application needs, the DTN-X is built to scale in multiple dimensions without sacrifice. DTN-X integrates the

world's highest density 500 Gb/s PICs, upgradeable in the future to 1.2 Tb/s, and offers 5 Tb/s of digital switching capacity today with up to 240Tb/s of capacity in the future. In addition, the DTN-X automates many traditional network engineering steps, so operators spend less time engineering the network and more time delivering services and generating revenue. Further, with built-in GMPLS-based intelligence,



the network is always aware and able to tap into available resources, optimal routing paths and most importantly, mesh-based network protection that protects customer traffic, even in the event of catastrophic failures as fast as <50ms. Finally, sample operator network modeling has shown that DTN-X can save as much 50% in power and 33% in space over competing systems.\*

## Cloud Xpress

Built for the metro cloud market, the efficiency, scalability and the small form factor of the Infinera Cloud Xpress enables service providers to support up to a 500Gb/s of line-side capacity in just 3.5" or two rack units (RU) with a mix of 10 GbE, 40GbE and 100 GbE client side interfaces. For data center operators that need scale, Cloud Xpress leads the industry with an unprecedented 21 Tb/s of input and output per 42RU rack. Each fully integrated Cloud Xpress packs in a massive 1 Tb/s of input and output capacity, while its maximum power consumption is a mere 845 watts of power which accounts for all components of the platform including client interfaces and built-in amplifiers, and is the lowest in the industry. The system also features rapid provisioning to help data center operators turn-up bandwidth quickly. Infinera Cloud Xpress management can be done with simple CLI (Command Line Interface) or Infinera's robust graphical point-and-click DNA management system or leveraging application programming interfaces (APIs) to plug into an SDN control layer.

## DTN: The Original Game-Changer

In 2004, the Infinera DTN changed the rules of optical networking by creating a Digital Optical Network. This forever broke the mold of how optical networks should be built, and was the precursor to the Intelligent Transport Network. With fully integrated transport and switching, the DTN not only dramatically simplified the service provisioning process, but also shortened time-to-revenue while eliminating the need for complex optical components. Some ground-breaking features include:

- Service-ready architecture to enable service turn-up in minutes rather than days. Integrated WDM transport, OTN switching & GMPLS intelligence in a single platform
- 100Gb/s Photonic ICs in a single, thumbnail-sized, ultra-reliable micro-chip
- Built-In colorless, directionless and contention-less digital ROADMs
- Bandwidth Virtualization to optimize network usage, on-demand

\*Based on specific network architecture and configuration, results may vary.

These features create a unique architecture unmatched in its ability to deliver speed of revenue, scale of services, and network efficiency that has added up to a profitable solution for the world's largest network owners and operators.

## ATN: Extending Digital Economics into the Metro

Infinera ATN extends the Intelligent Transport Network into the metro optical access network, where economical service aggregation and delivery is paramount. ATN is ideally suited for applications including mobile backhaul, broadband access, data center connectivity and content delivery networks, in which small form factor, cost-effective add/drop and multi-service aggregation as well as simplicity of deployment are essential. ATN extends Infinera's Intelligent Transport Networking benefits into the metro environment through integration and interoperability with the Infinera DTN from a data plane as well as operations and management perspective. With ATN, metro aggregation rings can be deployed in a standalone manner or as extensions off of DTN networks, providing more flexibility and additional CapEx savings over conventional metro CWDM/DWDM solutions. The management integration capability delivers seamless, centralized management of services across the network for simplified end-to-end management.

## FlexILS™: Unleash the power of your transport network—Automate Everything!

The Infinera Flexible Grid Line System (FlexILS) is the optical line system that enhances the scalability, efficiency and flexibility of



**DTN PLATFORM**

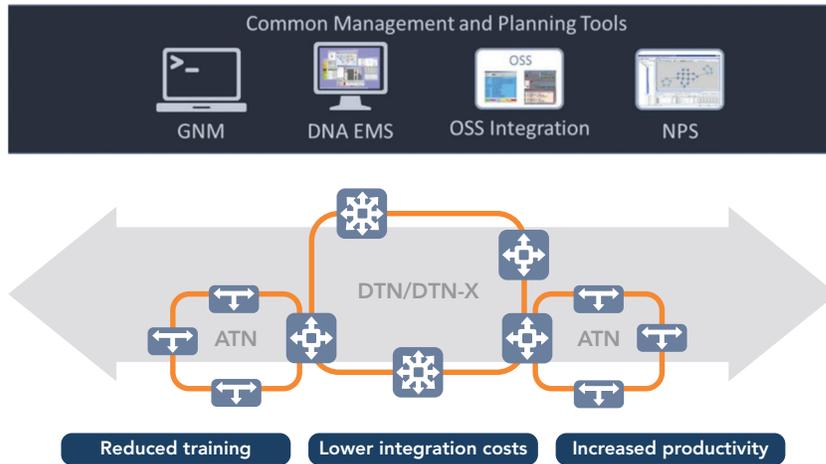
- SCALABLE**  
6.4T per fiber, 10G & 40G Coherent
- SIMPLE**  
Plug-and-play hardware, point-and-click circuits
- EFFICIENT**  
New 40 GbE and 100 GbE interfaces

Intelligent Transport Networks. FlexILS uses the ITU-T flexible grid channel plan with granularity of 12.5GHz, allowing efficient packing of any combination of optical carriers, modulations, and data rate on the same optical fiber, and enabling more capacity over optical fiber with future-proofing for terabit super-channels. FlexILS introduced industry's first super-channel FlexROADM for unconstrained switching in optical domain. FlexILS when deployed with DTN-X provides the benefits with multi-switching architecture: digital switching for efficient packing of client services and super-channel based optical switching for operational simplicity and flexibility of express traffic. FlexILS also introduces industry's first GMPLS based, SSON (Spectrum Switched Optical Network) compliant, unified control plane providing efficient network planning and end to end simpler multi-layer service management in the network.

### IMS: Unifying the Network

Critical to achieving scale and service simplicity is unified network management that maximizes the value of the network elements as well as the network as a whole. The Infinera IMS is a feature-rich suite of tools that extract value from the entire Intelligent Transport Network. IMS brings together GMPLS-based network intelligence, plug-and-play network elements and the point-and-click service provisioning in a single package that leverages all the enhanced OAM that is possible with a Intelligent Transport Network. Designed to integrate into virtually any IT environment, IMS also features an easy-to-use graphical user interface that can view across the entire network, down to an individual service element and its performance, in an environment that is secure and customizable to meet the needs of today's demanding operators.

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