

Infinera Corporate BACKGROUNDER

Overview

Our Business

- Optical transport systems based on unique photonic integrated circuits
- Deployed worldwide in long-haul and metro dense wave division multiplexing (DWDM) network
- #1 market share in backbone DWDM in North America, #4 worldwide
- Customers include carriers, cable network operators, internet content providers, government agencies, and research and education networks

Our Company

- NASDAQ: INFN
- Strong balance sheet: \$300M cash, no debt
- Headquartered in Sunnyvale, California
Offices worldwide with R&D centers in California, Maryland, & Pennsylvania
- 900+ employees focused on optical transport innovation

Benefits at a Glance

- Simple and fast roll out of new optical network capacity
- Rapid revenue from new services
- Simplified network engineering and operations
- Full control and visibility for network operator
- A flexible optical transport layer that integrates effectively with modern IP and Ethernet services
- Low-Latency Transport services for all services that demand the lowest possible end to end delays

Infinera changed the world of optical telecommunications when we pioneered “Digital Optical Networking”, a new approach enabled by photonic integration. The Infinera DTN combines DWDM scalability, digital bandwidth management and protection, and GMPLS-based networking intelligence. Introduced in 2004, the Infinera DTN is now carrying live traffic in long-haul, regional, and metro core networks around the world.

Integration is the key

The key concept for Infinera is integration. This starts with our photonic integrated circuit, or PIC, where dozens of complex optical components are integrated onto a single tiny chip. With 100Gb/s of capacity concentrated in that PIC, it now becomes practical to integrate an electronic switching chip to allow this capacity to be managed using a technique we call Bandwidth Virtualization. The next stage of integration is to provide a GMPLS dynamic control plane that allows many of the Bandwidth Virtualization functions to be managed automatically, while offering full control and visibility to the network operator. Finally, we include an Optical Express capability so that bulk, bypass traffic can be sent through a DTN enabling our customers to choose the most effective configuration to optimize CapEx and OpEx in their network.

Rapid Network Deployment

Infinera customers tell us that entirely new optical network capacity can be rolled out around four times more quickly with an Infinera solution than with a conventional optical network. Engineering, Furnishing and Installation (EF&I) of a high capacity, pan-European network was completed in only 13 weeks, compared to the 9 months for which the customers had budgeted. A UK national optical network was deployed in only 8 weeks. With a Digital Optical Network the protracted and complex planning required by analog equipment can be

avoided, and installing an individual Infinera DTN digital node from scratch takes less than an hour.

“ Infinera is the undisputed leader in high-level photonic integration with commercial PICs today, with a staggering lead over the competition ”

*Heavy Reading, Vol. 6, No. 3, March 2008:
Photonic Integration and the Future of
Optical Networking*

Rapid Service Activation

Once the network backbone is in place, services can be turned up in seconds because the backbone wavelengths in a Digital Optical Network are already lit and waiting to be assigned to a service demand. Service activation is now totally deterministic, and that means we can use an automated protocol – GMPLS – to perform the entire provisioning process in a “point and click” fashion. It is possible to override this process and configure services by hand, but GMPLS will still provide you with a dynamic inventory management and topology discovery capability. The network becomes the database of record, always up to date. Unforecasted service demands are a serious issue for the transmission industry because the lead times for ordering conventional optical transponders can be so long, and the huge variety of transponders means that keeping a stock is impractical. However, the Digital Optical Network does not use transponders. Infinera's Tributary Adapter Modules (TAMs) cover everything from Gigabit Ethernet through to 40G with only four different modules. So we have built a program we call “Just in TAM”, where we commit to deliver TAMs within 10 days of receiving an order, even including our 40G TAM.

Low Latency Transport

DCF fiber and some Electronic Dispersion Compensation implementations add significant transmission latency to the optical signal. For applications such as automated financial trading, that require the lowest possible end to end delays, Infinera offers a unique dispersion correction capability. The Infinera Low-Latency Transport solution is now being deployed in specialist service applications around the world.

“Infinera really does stand alone in large-scale optoelectronic integration today, with a PIC that could very well have an astounding lead time of four years over the rest of the optical industry Infinera’s approach truly is large-scale photonic integration and, today, the company is unmatched”

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Rapid Fault Finding

Sooner or later a fault will crop up on any network. At that point the network operator needs the right information as quickly as possible in order to isolate and fix the problem as quickly as possible. In an all-optical network, digital information is only available at the ingress and egress points. Once the traffic disappears into the core, only analog measurements are available. But in a Digital Optical Network, full digital Performance Monitoring and OAM functions are available at every node. Tracking a fault can be as easy as a few clicks on the NMS screen. Digital service protection is available, of course, but the Digital Optical Network also allows shared restoration to be offered using GMPLS and OSPF. This support for both 50ms protection and bandwidth-efficient GMPLS restoration allows operators to deliver higher levels of customer satisfaction at dramatically lower costs.

Infinera Products

Infinera delivers its benefits with a complete set of hardware, software, and services products for network operators, including:

Infinera DTN: The industry’s first, and still only, optical networking system based on photonic integrated circuits. The Infinera DTN provides DWDM capacity, ODU1 switching, and service interfaces from 40G to 155M.



Infinera Line System 2 (ILS2): ILS2 is a 160 wavelength line system to extend the reach between DTNs up to 2500km. ILS2 includes both Raman and EDFA amplification options and provides industry-leading 25GHz channel spacing.

Infinera IQ Network Operating System: The IQ NOS includes GMPLS intelligence for rapid, point and click provisioning. IQ also includes the automation and protection features which make the DTN and ILS2 perfect platforms for flexible, fast delivery of reliable and differentiated bandwidth.

Infinera Management Suite: The Infinera Management Suite provides applications and interfaces to manage your Infinera Digital Optical Network. It consists of six major

components that can be purchased individually, or as a set.

- Infinera Graphical Node Manager (GNM)
- Infinera Digital Network Administrator (DNA)
- Infinera Network Planning System (NPS)
- Infinera SNMP Fault Integration Server
- Infinera CORBA Integration SDK (CIS)
- The Infinera TL-1 Interface (TL-1)

Infinera Services Offerings: We offer a broad set of service capabilities to help you design, deploy, and manage your network. Our QuickSwitch™ capability helps you get the benefits of a Digital Optical Network with minimal time and effort. Our professional services team can custom design programs for your particular needs. See www.infinera.com for details.



Summary

Network operators around the world have deployed Infinera’s “Digital Optical Networking” systems for their long-haul, regional, and metro core optical networks. Our products offer simpler network engineering and operations, faster time to service, lower latency, and a more flexible optical transport layer that integrates more effectively with modern IP and Ethernet services. For service providers this provides a cost-effective transport solution that streamlines their business processes, delivers more rapid revenue from new services, and this translates to a significant competitive differentiation.



Infinera Global Headquarters
169 Java Drive
Sunnyvale, CA 94089
USA
Tel: +1.408.572.5200
Fax: +1.408.572.5454
www.infinera.com

Sales Contacts:
Americas
sales-am@infinera.com

Asia and Pacific Rim
Infinera Asia Limited
391B Orchard Road
#23-01 Ngee Ann City Tower B
Singapore 238874
Tel: +65.6832.8099
sales-apac@infinera.com

Europe, Middle East, and Africa
CityPoint
1 Ropemaker Street
London, EC2Y 9HT
UK
Tel: +44.207.153.1086
sales-emea@infinera.com

Customer Service and Technical Support
Within North America
Tel: 1.877.INF.5288
Outside North America
Tel: +1.408.572.5288
techsupport@infinera.com