Optical Networking Services

Improving service delivery and increasing revenue

Hybrid Solutions

With increased use of video and more users accessing networks from more places over multiple devices every day, meeting ever higher bandwidth demands is becoming increasingly difficult.

The solution to meeting higher bandwidth demands is to the shift from traditional time-division multiplexing (TDM) transport networks to packet transport networks. This technology shift is critical for many reasons:

- Traditional SONET/SDH transport networks have reached their limit. The OC-768 standard limited the maximum data rate of this technology to 40 gigabits per second. Additionally, a large majority of TDM traffic (DS1, DS3, OC-N) continues to migrate to Ethernet-based services (GE, 10 GE and even 100 GE). For higher speeds and densities, customers are now looking to higher capacity transport technologies that include Dense Wavelength Division Multiplexing (DWDM), Optical Transport Network (OTN) multiplexing and IP/Ethernet service aggregation.
- Traffic volume is increasing and traffic patterns are changing. Many factors are contributing to the increased volume of traffic with over half of it being attributed to video. Companies are using more dynamic services than ever before, and as more of them are moved into the cloud, new traffic patterns are placing an ever-increasing demand on the network architecture.
- Packet networks are delivering services more efficiently. As customers start deploying more packet transport networks, they are realizing benefits such as statistical multiplexing, dynamic bandwidth allocation and quality of service (QoS). The returns on their investment become apparent with more efficiently delivered services and better positioning for future growth.

By addressing these increased bandwidth needs now, customers are not only realizing the benefits of increased efficiencies, but are better prepared to face the continued growth and demand on their network infrastructure while increasing employee and customer satisfaction in the process.

Is Optical Networking the Right Fit?

Originally designed for service provider voice networks, optical networking technology is rapidly expanding to business end-users. Large enterprises and public sector entities now consider it to be the transport medium of choice for mission-critical networks. There are many reasons to consider optical networking solutions in your network architecture, and the experts at OneNeck® IT Solutions can help you decide if it is your best option. Some things to consider when making this decision include:

- **Bandwidth and Latency** — Do you need higher bandwidth or low latency transport? With optical networking technology, you can support a wide range of new, high-bandwidth applications while improving manageability, scalability and efficiency.
- **Multi-service** — Do you have service requirements that include multiple protocols and rates? With optical transport capabilities, you can support a wide variety of services such as DS1/DS3, OC-N/STM-N, 1/2/4/8/10G FiberChannel/FICON, 1/10/100 GE, SDI/HDSDI video and ESCON.
- **High Availability** — Do you require five or six nines availability and sub-50ms switchover in the event of a failure? An optical platform can be architected to supply six nines availability, and services can be protected using Layer-1 protection mechanisms that guarantee sub-50 ms failover.
- **Cost** — Are you paying way too much for local loop charges and/or leased carrier circuits? Optical networking can help you reduce capital and operational costs.
- **Distance Limitation** — Are you challenged with the geographic distance between your facilities? An optical backbone can expand your service reach and reduce the need to maintain multiple wide area networks.
- **High Growth** — Are you in a high-growth environment? With ROADM-based DWDM technology, you have the ability to easily turn up virtually unlimited bandwidth through simplified reconfiguration.

By exploiting the architecture simplicity and operational flexibility of an optical network, you can significantly reduce costs of operating a network while increasing service flexibility and your revenue-generating network footprint. In addition, an optical network provides the opportunity to significantly improve your network by simplifying the architecture, consolidating transport and bandwidth management, enabling flexible add/drop, and providing end-to-end service management.

OneNeck services encompass turnkey solutions for our customers including planning and architectural design, implementation and integration as well as ongoing support of the transport network.

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Cisco Optical Networking: The Transport Medium of Choice for Mission-Critcal Networks

OneNeck delivers the answer: Cisco's Integrated DWDM and Packet Optical Transport Platform. OneNeck's optical networking experts are uniquely positioned to help you with the design and implementation of your next generation DWDM and Packet Optical Transport architecture. Cisco's Carrier Packet Transport (CPT) platform, the industry's first standards-based packet optical transport system (P-OTS), combines packet and transport technologies by integrating carrier class DWDM transport functions with Layer-2/3 packet switching capabilities.

- **Simplified Network** — By combining functions such as Reconfigurable Optical Add/Drop Multiplexing (ROADM), TDM/OTN switching, Carrier Ethernet, IP/MPLS-TP into a single platform, you can reduce the management complexity of your network, collapse multiple layers of the network and reduce space and power consumption.
- **Integrated Wavelength and Packet Services** — Use a consolidated platform to provision 2.5 G/10 G/40 G/100 G wavelength services along with carrier Ethernet services and MPLS label switch paths.
- **Integrated IP/MPLS and MPLS-TP Architecture** — This integration is accomplished with a single control plane and forwarding mechanism. This enables you to set up simple connection-oriented paths for point-to-point or point-to-multipoint connections with in-band operations, administration, management and sub-50 millisecond automatic protection switching.
- **Standards-based Technology** — Full standards-based implementation of Packet Optical technology, in compliance with the ITU, IEEE and IETF for DWDM, Carrier Ethernet, IP/MPLS and MPLS-TP transport.

Cisco's suite of optical transport products offer an array of options for today's high-demand network architecture:

- **Long Haul DWDM** — Cisco's core solutions deliver high-capacity, reliable DWDM capabilities scaling to 80 wavelengths of 100 G for distances up to 3000 kilometers. Industry-leading 40 G/100 G Coherent Optics, Colorless/Directionless ROADM capabilities and amplification options make the Cisco 15454 solution a market leader in long haul DWDM transport.
- **Metro Core** — Cisco Metro DWDM products enable rapid wavelength delivery and offer high service density at a low cost per wavelength. This family of products includes ONS 15454 MSTP featuring single module ROADM technology, the CPT-200 and the CPT-600 series.
- **Metro Edge Access** — Cisco Metro Edge Access solutions extend the metro edge to customer premises while supporting any service and reducing costs. The family of products includes the CPT-50, ONS 15216 and the ONS 15300 Series.

OneNeck's Optical Engineering Services Simplify Deployment and Operation

Our optical transport practice is unique in the industry and a clear differentiator in the partner community. OneNeck services encompass turnkey solutions for our customers including planning and architectural design, implementation and integration as well as ongoing operational support of the transport network. The OneNeck optical team has more than 50 years of experience in the space and specializes in design, deployment and support of DWDM, SONET and Packet Optical WAN architectures.

OneNeck offers a comprehensive suite of optical transport services:

- **Planning and Design**
  - Architectural design, pre-deployment engineering
  - Itemized statement of work and implementation plans
  - Fiber optic characterization
  - Staging and logistics
- **Implementation**
  - Site surveys
  - Professional rack, stack and cabling
  - Software configuration and turn-up
  - Circuit/Service provisioning
  - "Over the shoulder" training
  - Network acceptance testing
- **Integration**
  - Cutover planning and assistance
  - Detailed method of procedures creation
  - Node insertions and migrations
  - Hardware and software upgrades
  - System verification
  - As-built documentation
- **Operation**
  - Managed services with 24/7 monitoring
  - Dedicated post-implementation engineering support
  - Ongoing knowledge transfer

About OneNeck® IT Solutions

OneNeck IT Solutions provides world-class, hybrid IT solutions for thousands of businesses around the globe. From cloud and hosting solutions to managed services, ERP application management, professional services, IT hardware and top-tier data centers in Arizona, Colorado, Iowa, Minnesota, Oregon and Wisconsin, OneNeck has the expertise to help customers navigate the cloud to get the right application on the right cloud at the right time.

OneNeck is a subsidiary of Telephone and Data Systems, Inc. [NYSE: TDS]. A Fortune 500® company, TDS provides wireless; wireline and cable broadband, TV and voice; and hosted and managed services to approximately six million customers nationwide.

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