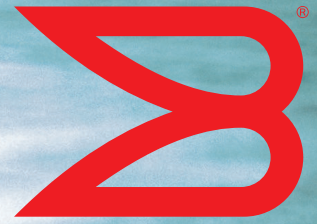


BROCADE AND SMARTOPTICS SOLUTIONS



DATA CENTER

Enabling Simple Fibre Channel Data Center Connectivity with Embedded WDM

HIGHLIGHTS

- Provides cost-effective alternative to active DWDM systems
- Reduces complexity with embedded WDM transceivers
- Handles all 1/10 GbE Ethernet and 2/4/8/16 Gbps FC protocols on the same system
- Reduces power and cooling costs by 40 to 60 percent
- Reduces the rack space footprint by 80 percent

SmartOptics provides DWDM connectivity solutions and 4/8/16 Gbps Fibre Channel transceivers that are certified in all the latest Brocade® Fibre Channel (FC) switches (FOS and DCR). With SmartOptics products, organizations have a data center connectivity solution that is more simple and cost-effective than DWDM transmission systems.

THE BROCADE AND SMARTOPTICS SOLUTION

SmartOptics Embedded WDM solutions enable the long distance C/DWDM transceiver to be connected directly into the Brocade FC switch rather than through a traditional DWDM platform. This design uses a single passive optical multiplexer to generate up to 16 CWDM (Coarse Wavelength Division Multiplexing) or 40 DWDM (Dense Wavelength Division Multiplexing) channels through a single pair of fibers that support distances up to 70 km.

With this approach, Capex and Opex are significantly reduced compared to active DWDM networking platforms. System capacity is exactly the same as a traditional DWDM platform, but with far fewer elements at risk of failure. Reduced power, cooling, and space requirements result in the ultimate green data center solution.

Today's companies are planning for disaster recovery scenarios more than ever. Because of this, most data centers have multiple geographic locations for minimizing disruptions when unexpected events occur. Connecting these locations is usually accomplished over dark fiber, and with the growing quantity of data being transferred, it is becoming increasingly popular to maximize the throughput of that dark fiber using WDM.

Today, WDM networks account for approximately 30 percent of data center connectivity and that figure continues to grow. Until now, active WDM solutions were required for data center connectivity and they typically have accounted for 50 percent or more of the total site connectivity project cost. Combining these details with the fact that active WDM is complicated and requires significant rack space and power and cooling costs, it is easy to see the many benefits of the innovative Brocade and SmartOptics solution.

One benefit of the passive, embedded WDM approach is system simplicity. Deploying embedded WDM transceivers with passive mux and demuxes keeps things simple and cost-effective, and allows more budget for core SAN/IP equipment. This solution also

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enables Brocade to offer the full end-to-end connectivity solution that minimizes yearly service fees while enabling a faster customer ROI.

From a technical perspective, there are significant benefits to deploying this solution as well. Fewer active components means fewer potential points of failure. It is completely passive solution, requiring no additional power, emissions, or noise. Installation requires only simple plug-and-play and management does not require any additional equipment.

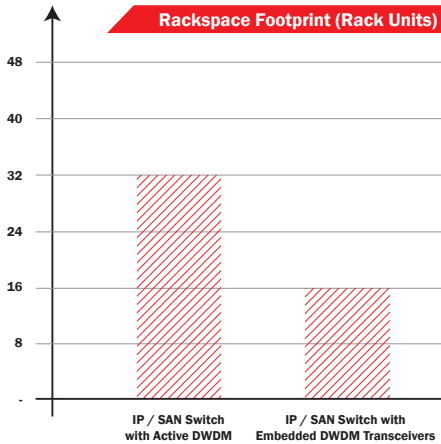


Figure 1.
Reduced Data Center Footprint.

The SmartOptics Fibre Channel data center connectivity solution is the most simple and cost-effective on the market. This embedded WDM solution is much less expensive compared to traditional WDM solutions because it eliminates the need for expensive and complicated active WDM systems, while still allowing multiple wavelength Fibre Channel and IP connectivity at distances up to 70 km.

The combined Brocade and SmartOptics solution is ideal for organizations that need

to deploy one or more remote data centers and implement disaster recovery between geographically separate sites. It offers the simplest design and installation solution with no compromise on distance or channel count. As a purely passive solution, it means significant overall reductions in power, noise, and emissions, while simultaneously assuring the utmost reliability.

LEARN MORE

Brocade partners with companies of all sizes to deliver innovative solutions that help organizations maximize the value of their most critical information. To learn more, visit www.brocade.com/alliance.

ABOUT BROCADE

Brocade networking solutions help organizations transition smoothly to a world where applications and information reside anywhere. Innovative Ethernet and storage networking solutions for data center, campus, and service provider networks

help reduce complexity and cost while enabling virtualization and cloud computing to increase business agility. Learn more at www.brocade.com.

ABOUT SMARTOPTICS

SmartOptics is a leading provider of optical network solutions for WDM Networks worldwide. Based in Oslo, Norway with deployments worldwide, their innovative products allow data centers and network and storage service providers to build simple, cost-effective WDM-based solutions that maximize infrastructure capacity while reducing complexity. With their team of engineers and international partners, SmartOptics is revolutionizing the way WDM networks are built throughout USA, Europe, and Asia. Learn more at www.smartoptics.com.

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Separate WDM System Investment (first two years)

| | |
|-----------------------------|------------------|
| 1 × Fiber pair (two years): | \$28,000 |
| 32 × 10 Gbps-SX SFPs: | \$15,000 |
| 16 × 10 Gbps DWDM XFPs: | \$50,000 |
| 1 × DWDM system | \$300,000 |
| 2 × 8-ch Mux/Demux: | \$7,500 |
| Total Cost | \$400,500 |

Continual operational costs per year

| | |
|----------------------|----------|
| Fiber leasing costs: | \$14,000 |
| SLA and SW license: | \$40,000 |

Notes:

- Complicated and unnecessary
- Introduces more failure points
- Service usually high

Embedded WDM Investment (first two years)

| | |
|-----------------------------|-----------------|
| 1 × Fiber cost (two years): | \$28,000 |
| 16 × 10 Gbps CWDM SFPs: | \$42,000 |
| 2 × 8-ch Mux/Demux: | \$5,000 |
| Total Cost | \$75,000 |

Continual operational costs per year

| | |
|----------------------|----------|
| Fiber leasing costs: | \$14,000 |
|----------------------|----------|

Notes:

- Same distance and channel count for synchronous applications
- Easily installed by customer. No additional opex
- More budget for additional SAN/IP equipment

Figure 2.

Active Versus Passive WDM Comparison.



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