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Enhancing Data Center Interconnect with the 1FINITY™ S100 Switch

The continuing explosion of bandwidth associated with over-the-top (OTT) Internet applications has led to substantial growth in the number of data centers and point-to-point traffic between them. This traffic is widely known as data center interconnect (DCI).

A new Fujitsu product, the 1FINITY S100 Switch, is purpose-built for high-capacity, pay-as-you-grow Ethernet switching. The S100 offers clear value to service providers in the DCI market, positioning them to leverage the new technology cycle associated with metro 100G services using emerging, low-cost optical platforms.

The Data Center Interconnect Dilemma

The objective of DCI is to efficiently and economically transport 10 GbE and 100 GbE services between data centers. Service providers who don't own data center facilities pay monthly rent and power fees to data center operators, regardless of who owns the fiber plant. These colocation lease expenses can become significant contributors to the total cost of networking equipment ownership. Thus, density, power, and cost per bit are important equipment considerations to service providers.

Carriers today generally use 10G DWDM for DCI transport. The large volume of traffic results in a number of 10G lambdas, and these, by their sheer numbers, are exhausting DWDM capacity. An effective solution is moving to 100G lambdas to reduce the number of lambdas required. Once 10 GbE services are aggregated to 100 GbE, these flows and other 100 GbE flows are transported between data centers on DWDM fibers.

The Fujitsu Solution

The Fujitsu 1FINITY disaggregated platform is ideal for the growing volume of point-to-point DCI traffic. In cases where only 100 GbE client-side services are present, the 1FINITY T100 and T200 Transport blades carry 100 GbE between data centers on 200G optical lambdas, as shown in Figure 1. The T100 is designed for high-density metro DCI applications, and the T200 provides longer-reach DCI with multiple modulation schemes.
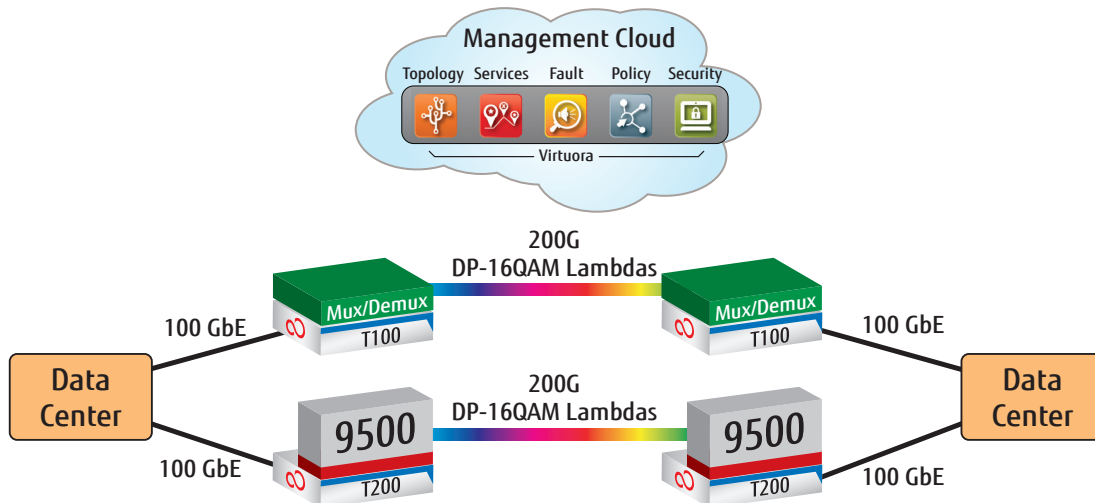

Figure 1: 1FINITY 100 GbE DCI applications

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While most data center operators (DCOs) and service providers agree that 100 GbE transport is the most efficient and cost-effective method for DCI, a significant percentage of client-side services are still 10 GbE. In these cases, the Fujitsu 1FINITY S100 Switch provides dense 10 GbE to 100 GbE aggregation. A single S100 blade can aggregate up to 36 × 10 GbE into 3 × 100 GbE. The combination of the S100 and the T100 or T200 can efficiently transport 10 GbE and 100 GbE services on 200G lambdas.

As shown in Figure 2, the S100 switch aggregates 10 GbE traffic from the data center to 100 GbE. This 100 GbE traffic is connected to a 100 GbE client port on the T100 or T200 for multiplexing and transponding onto a 200G lambda.

Figure 2: 1FINITY 10 GbE and 100 GbE DCI Application

Benefits

The modular S100 blade has a low initial cost. Traditional solutions consisting of a shelf and associated commons can be significantly more costly. Users who choose modular, disaggregated blades can right-size their initial investments and expand capacity on a pay-as-you-grow basis.

Less is more when it comes to space and power. The compact S100 blade is smaller than shelf-based solutions. The switch contains low-power, next-generation chips. Higher density minimizes recurring rack space rent, and low power dissipation minimizes energy use and potential power fees.

Performing 10 GbE to 100 GbE aggregation, the S100 reduces handoffs and minimizes the need for ports, slots, and lambdas. These savings are reflected in lower capital and operating expenses.

The switch provides E-Line services with sub-50 millisecond ITU-T G.8031 service protection and link aggregation for facility protection. Additionally, ITU-T Y.1731 support provides a full suite of rich OA&M including per-service performance metrics.
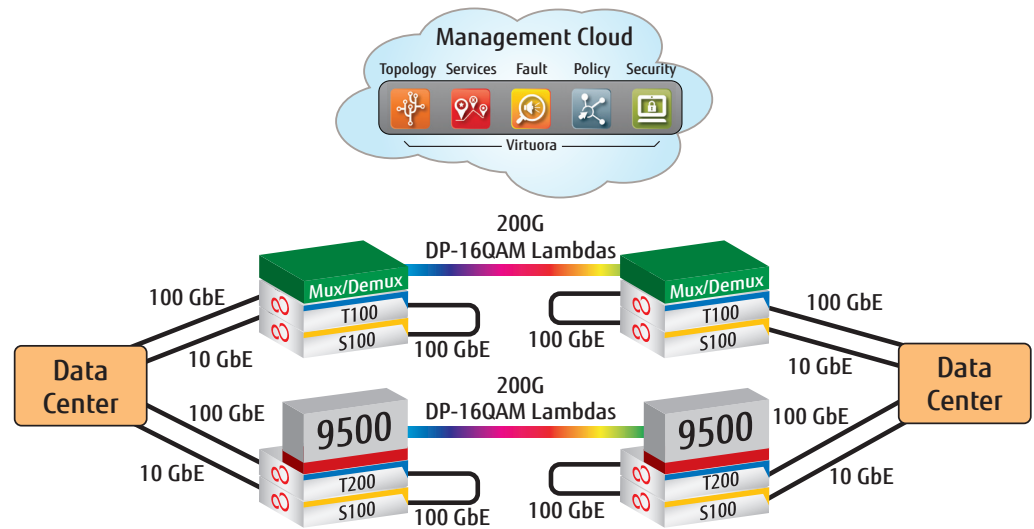
Summary

DCOs and service providers have been challenged to implement higher-capacity data center interconnect, and historically they have used multiple 10G optical lambdas to transport growing bandwidth. A better solution lies in the use of 100G and 200G optical lambdas supported by emerging, cost-effective, modular switching and transport solutions. The 1FINITY S100 Switch delivers dense 10 GbE to 100 GbE aggregation, and the 1FINITY T100 and T200 Transport blades deliver industry-best density for carrying traffic between data centers. These modular switch and transport blades support a flexible, pay-as-you-grow economic model that reduces capital and operating expenses.