Cisco Delivers Enterprise-Class Next-Generation Acceleration Solution for Disaster Recovery and SAN Extension

Large enterprise customers have multiple data centers spread across different geographical locations, primarily because of the economics related to the cost of running data centers and governmental disaster-recovery regulations. According to “The InfoPro Storage Initiatives 2009”, backup redesign and disaster recovery will be among the top initiatives for businesses going forward. Hence, Business Continuity and Disaster Recovery (BC/DR) emerges as one of the critical areas of focus as these data centers virtualize, unify, centralize, and scale out their storage resources. Both online and offline data mobility between data centers is a critical requirement to support resiliency and operational agility. IT departments today must address several challenges related to deploying simple yet scalable replication and backup applications in order to meet the growing expectations of BC/DR mandates.

Cisco has introduced the Cisco® MDS 9000 I/O Accelerator (IOA), which provides a highly scalable and comprehensive next-generation I/O acceleration solution capable of dramatically reducing both the complexity and cost related to the BC/DR initiatives.

This document discusses some of the critical challenges related to the BC/DR solutions and how the Cisco MDS 9000 IOA addresses each of them.

Extend Data-Replication Distances

Challenge: Extend the distance between data centers for replication solutions to bring flexibility in choosing data-center locations.

An effective BC/DR plan mandates the deployment of multiple data centers located at optimal distances and locations to protect against regional power failures or disasters yet close enough for data replication without affecting the application performance. In many cases the primary data center replicates to a relatively nearby secondary data center over a metropolitan-area network (MAN) and the secondary site in turn backs up the data to a more-distant DR site across a WAN. This approach provides a good balance of recovery point objective (RPO) and recovery time objective (RTO) for all levels of outage, but depending on the location, such a model can be costly. The challenge is to optimize the cost by finding the right data-center locations for BC/DR.

Solution: The new Cisco MDS 9000 I/O Accelerator can extend distances for replication solutions such as the EMC Symmetrix Remote Data Facility (SRDF), MirrorView, and HDS TrueCopy.

By reducing the latency of the I/O exchanges between the replication node and the secondary storage, the IOA allows replication over longer distances, providing flexibility in selecting the locations while minimizing the effect on application performance. The actual distance depends on the application requirements and infrastructure.

Reduce Tape-Backup Windows

Challenge: Reduce the backup window to meet your backup service-level agreements (SLAs).

Electronic data vaults using virtual or physical tape-backup applications have become an integral part of an enterprise’s BC/DR plan. However, uninterrupted and timely completion of the backup jobs is critical to meeting the stringent SLAs.

Solution: The Cisco MDS 9000 IOA reduces the backup window.

The Cisco MDS 9000 IOA accelerates tape read and write I/Os between the backup applications and virtual or physical tape libraries, not only reducing the backup windows but also enabling remote tape vaulting over extended distances without affecting the application performance. The latter gives customers the flexibility to locate their tape-backup data centers remotely, and to back up and restore in real time without having to manually ship tapes to remote locations.

Simplify BC/DR Infrastructure Management

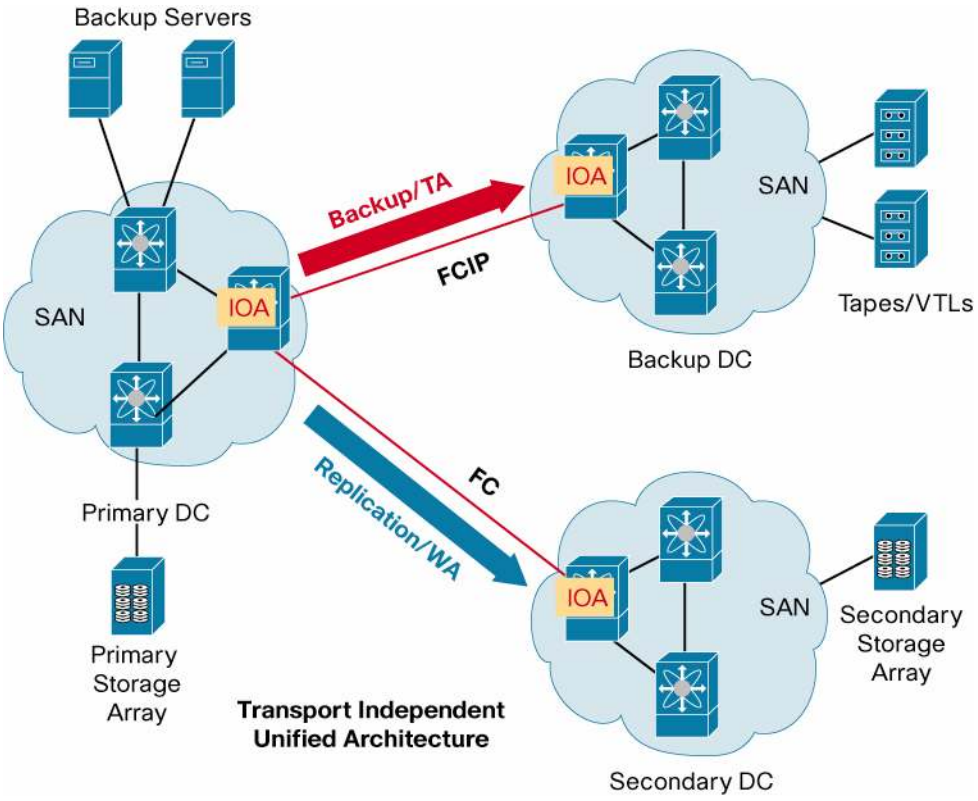
Challenge: Manage different types of acceleration solutions.

Today a variety of point solutions are running on different hardware to accelerate I/O. Some solutions work with replication traffic only, whereas others are transport-dependent. Fibre Channel replication requires different hardware infrastructure from Fibre Channel over IP (FCIP), increasing complexity, cost, and resources required to manage multiple solutions. Technology complexity is often one of the biggest barriers to fulfilling initiatives.

Solution: The Cisco MDS 9000 IOA is a truly comprehensive solution capable of accelerating I/O whether it goes over FC or FCIP while supporting both disk and tapes under one infrastructure.

The Cisco MDS 9000 IOA is both transport- and speed-agnostic and hence enables customers to standardize on one infrastructure that will be compatible with future versions (Figure 1). The IOA unifies both tape and disk acceleration under one umbrella, unlike other solutions in the market, and thus reduces the complexity of managing different replication and backup solutions. Because it is deployable as a transparent fabric service, customers can deploy the acceleration function anywhere in the storage area network (SAN) with respect to the locations of the hosts and storage devices.

Figure 1.



Reduce Capital Expenditures and Operating Expenses

Challenge: Minimize capital expenditures (CapEx) and operating expenses (OpEx) by reducing the number of replication ports and optical infrastructure Lambdas.

Businesses generally overprovision the required infrastructure elements to meet the worst-case requirements, increasing CapEx. For example, the storage array-based replication throughput typically depends on the number of the replication ports used because throughout per port is restricted by latency of the data-center interconnect. The required number for the expensive replication ports depends on the distance between the data centers. The replication ports have to be overprovisioned to compensate for the latency. The leased optical Lambdas can carry up to a certain amount of data. Any additional Lambda required to meet the worst-case scenarios increases costs.

Solution: Deploying more IOA engines throughout the existing infrastructure and increasing the amount of data transferred over the Data Center Interconnect (DCI) can help reduce both CapEx and OpEx.

Reduced latency means higher application throughput per replication port. Hence the number of replication ports required to meet current application throughout may be reduced to achieve saving on CapEx.

Savings can be realized on the OpEx side too. The Cisco MDS 9000 IOA supports Fibre Channel compression, which increases the effective DCI bandwidth without costly infrastructure upgrades or leases.

Highly Scalable and Resilient Infrastructure

Challenge: The BC/DR infrastructure needs to be resilient to avoid any disruption.

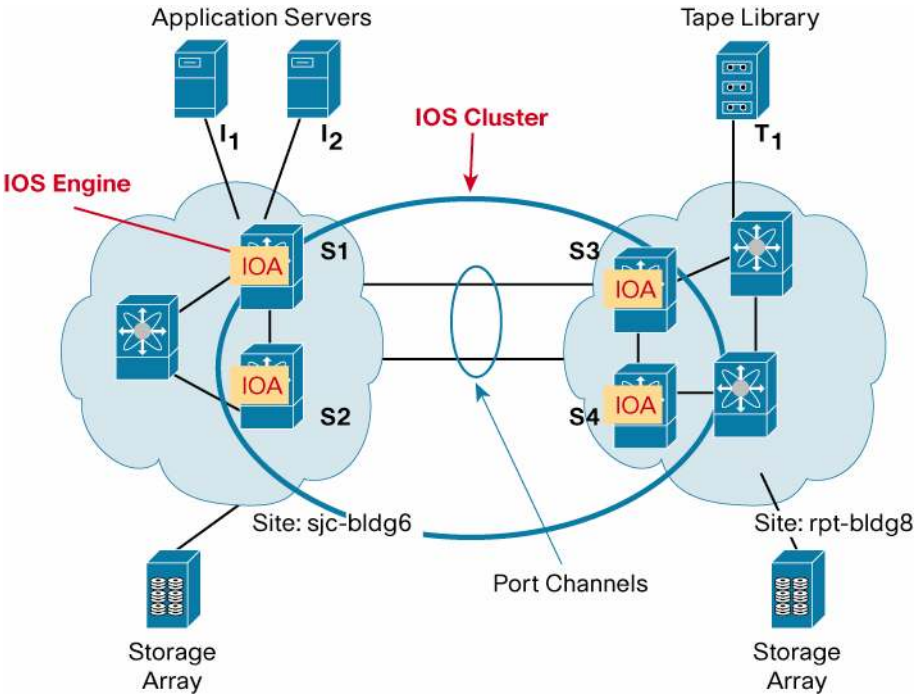
DCI link failures are very detrimental to BC/DR objectives because they can cause backup jobs to abort and replication storage arrays to go out of sync. The affected tape backups have to be restarted, a process that might extend the backup window and hence disrupt the customer's SLA. The problem is more acute if the acceleration engine fails because of hardware or software problems. Current tape-backup and replication-acceleration solutions are not resilient enough to protect against DCI link or engine failures.

Solution: With a clustered architecture and support for multiple path and port channels, the Cisco MDS 9000 IOA provides a robust and highly available solution.

The Cisco MDS 9000 IOA supports port channel—which is a logical group made up of physical links—and multiple paths, which not only guard against DCI link failures but also help to scale the DCI and engine capacity when required.

The cluster architecture allows the SAN administrator to group the acceleration engines at each site into a cluster, thereby load balancing the acceleration flows among the engines in the cluster and also reassigning flows from a failed engine (Figure 2). The administrator can grow the acceleration capacity dynamically by simply adding more IOA engines.

Figure 2. Cluster Architecture



In addition, using the Lightweight Reliable Transport Protocol (LRTP) with the Cisco MDS 9000 IOA brings TCP-like reliability to Fibre Channel and retransmits lost packets on failed links to avoid any effect on the application.

Conclusion

The new Cisco MDS 9000 IOA provides a comprehensive, scalable, and highly resilient acceleration solution to meet next-generation data-center BC/DR requirements while decreasing OpEx and CapEx.

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Printed in USA C11-566553-00 10/09