

Hitachi Replication Software

Solution Brief

Accelerating Hitachi Replication Software with Infineta DMS

Data Mobility Switch

Performance benefits:

- ✓ Protect more critical data
- ✓ Maximize replication performance
- ✓ Multiply WAN capacity

BCDR benefits:

- ✓ Increase distance
- ✓ Meet or exceed SLAs
- ✓ Cut RPOs and RTOs

The goal of any BCDR (Business Continuity and Disaster Recovery) plan is to provide resilient data protection and automatic fail-over capabilities so that critical digital assets are available, and usable, when needed. Large organizations depend on Hitachi® replication software, including Hitachi Universal Replicator, Hitachi TrueCopy® Extended Distance, and Hitachi TrueCopy Synchronous, to provide continuous local and remote replication for high availability and disaster recovery.

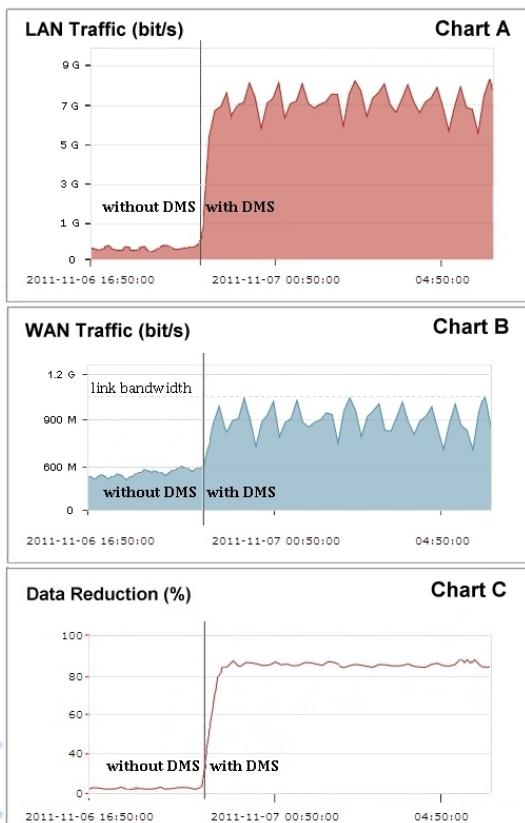
Two things are critical to the success of any BCDR solution: speed and distance. As data changes at one site, the speed at which the changes can be replicated to a remote location determines how much data is at risk of loss. The distance determines the likelihood that the same event will impact both locations.

The WAN infrastructure between sites is therefore key to meeting both stringent RPO/RTO requirements and BCDR assurances. In particular, throughput must be high and latency low, but this is a significant challenge over long-distance WAN links, be they private leased lines, MPLS circuits, or IP VPNs.

- ◆ High latency reduces throughput and constrains RPO/RTO goals
- ◆ Congestion and packet loss disrupt or prevent replication

Upgrading WAN bandwidth may provide temporary performance improvements, but only at high costs and with diminishing returns. The best long-term strategy is to optimize the WAN link to improve throughput and minimize the impact that latency and congestion can have on replication flows.

Figure 1. Hitachi TrueCopy traffic on a 1Gbps WAN with 80ms RTT.



Fixing The WAN Bottleneck

The Infineta Data Mobility Switch® (DMS) is an enterprise-class WAN optimization solution designed for the connections between Data Centers. It works at sustained speeds of up to 10Gbps to accelerate replication traffic. Although Hitachi replication software improves WAN bandwidth usage by transferring only modified data, the DMS enhances these transfers by reducing the traffic footprint by 5-7x. In addition, the DMS manages TCP connections on the link mitigate the effect of latency and loss to ensure complete bandwidth utilization. In practical terms, this means:

1. Significantly lower RPOs and RTOs.
2. Reduced BCDR costs.

Figure 1 (Chart A) shows replication traffic from Hitachi TrueCopy. Without the DMS, replication flows averaged less than 500Mbps over a 1Gbps WAN link. The WAN was a bottleneck to performance. With the DMS, WAN traffic was reduced by 6x and throughput almost tripled (to saturate the link) for a combined gain of 17x.

Average	With DMS		Without DMS	
Throughput	LAN: 8.2Gbps	WAN: 920Mbps	LAN: 490Mbps	WAN: 490Mbps
Reduction	84% (6x)		--	

The DMS is a high-performance networking system built with merchant silicon. It is architected around a non-blocking switch fabric, high-speed packet processing engines, and programmable logic. Port-to-port latency averages 50µs, making the DMS the only solution capable of optimizing Hitachi TrueCopy Synchronous replication.

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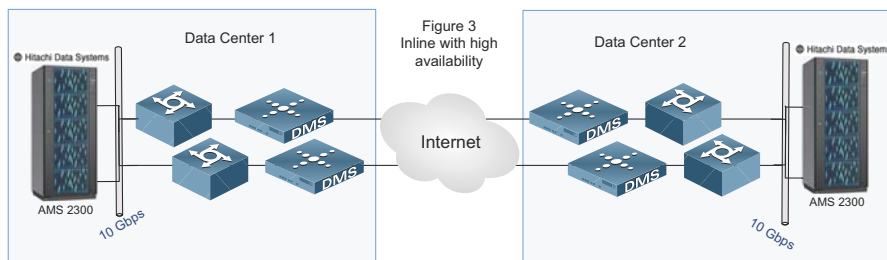
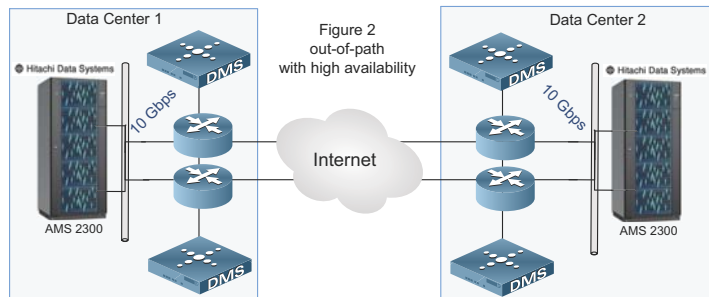
TCP Acceleration and Flow-level Control

Long distance, inter-data center WAN links are characterized by high RTTs, bursty packet loss, out-of-order packet delivery, and routing asymmetries, and replication flows tend to be “fat,” bursty, and long-lived. Traditional TCP is not well suited for these links or for this kind of traffic, and the result is low per-flow throughput. To improve performance, WAN bandwidth upgrades are common, but this is a costly choice and the benefits are usually limited.

The DMS addresses the root causes of sub-optimal application performance on Data Center Interconnects (DCIs): poor overall link utilization and low throughput when distances are long. The DMS provides aggressive TCP congestion control and active flow management to fill the WAN link. Adjustable TCP window sizing and selective acknowledgements mitigate the impact that latency and congestion have on throughput, and reduction shrinks the size of replication packets by as much as 85%.

Flexible, Highly Available Deployment

The DMS can be deployed out-of-path (Figure 2) or inline (Figure 3) to optimize homogenous or heterogeneous replication environments. High Availability is supported in both options. A single DMS pair (available at 1Gbps, 2Gbps, 5Gbps, or 10Gbps performance) can be deployed to accelerate all replication traffic, and built-in Layer-4 QoS features allow replication transfers to be prioritized over non-critical flows when they are traversing a shared WAN link.



Conclusion

Infineta’s Data Mobility Switch complements Hitachi’s BCDR solutions by optimizing long-distance WAN links and providing performance increases of 10-20x. The improved data mobility also benefits strategic BCDR and data center planning.

The DMS is the most cost-effective solution for protecting digital assets. It eliminates the need to upgrade WAN bandwidth and/or infrastructures to keep pace with data growth. It is also the only WAN optimization solution that can accelerate *and* reduce both TrueCopy Synchronous and TrueCopy Extended Distance flows, even at speeds of 10Gbps.

About Infineta Systems

Infineta Systems is a privately held provider of WAN optimization systems for Big Traffic.

The company’s patent-pending Velocity Dedupe Engine™ delivers unprecedented levels of throughput, scalability and bandwidth capacity to support critical machine-scale workflows across the data center interconnect.

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About Hitachi

Hitachi Data Systems helps organizations transform raw data into valuable information by making data more accessible and simpler to manage.

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