



BUSINESS CHALLENGES:

- » Around the clock access to high bandwidth, real-time video content straining available network resource.
- » Poor WAN performance jeopardizing Disaster Recovery; Not able to maintain 3 hour RTO and 24 hour RPO.
- » Limited floor space in data centers requires extensive virtualization.

NETWORK BACKGROUND:

- » Two data centers in Pennsylvania with a disaster recovery site in Colorado.
- » All sites in active/warm configuration moving to active/active.
- » Multiple 10 Gbps WAN connections between locations with 65 ms average latency.

SILVER PEAK RESULTS:

- » 63GB of data replicated in about 20 minutes for 478Mbps of throughput. Prior to Silver Peak, replication took six hours.
- » Peak throughput reached 646.6 Mbps
- » SnapMirror performs flawlessly within their desired RPO/RTOs. Prior to Silver Peak, Snap Mirror took 8 to 9 days.
- » Deduplication ratios exceed 90 percent with NetApp at 94% and Solr at 93% .

Leading Entertainment Provider Optimizes Offsite Disaster Recovery with Silver Peak

The Entertainment Company is a leading provider of entertainment, information and communications products and services in the United States.

When The Entertainment Company wanted to establish a disaster recovery site, it faced a challenge all too familiar to many enterprises: How to replicate large amounts of data across the country and still meet Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs)?

Buying more bandwidth wasn't the answer. The Entertainment Company already had multiple 10 Gbps lines between sites and yet NetApp SnapMirror was still unable to replicate data on time. Wide Area Network (WAN) optimization was the logical choice, but space was at a premium in Acme Services' data center.

"Every inch of our data center floor space is already allocated for future expansion," says the lead architect for The Entertainment Company. "There is a big pushback on deploying new physical devices of any kind in our data center. It was clear from the get go that we needed the virtual WAN optimization solution with the highest capacity that we could find."

After extensive research, The Entertainment Company purchased Silver Peak's VRX-8, the industry's leading virtual WAN optimization solution for data centers. With Silver Peak, The Entertainment Company improved replication throughput by 18x, enabling The Entertainment Company to meet their stringent Recovery Point and Time Objectives (RPO/RTO). In addition, with the VRX-8 The Entertainment Company got a scalable WAN optimization solution that fit with the company's virtualization strategy, enabling them to reduce hardware costs while maximizing available floor space in their data centers.

THE DISASTER RECOVERY CHALLENGE

It's no surprise that The Entertainment Company faced such high traffic demands. The division is the think-tank behind the service provider's next generation entertainment strategy.



“To make it easy for our customers to find their favorite shows, we are always indexing our enormous volume of content and distributing it for fast retrieval”, says the lead architect.

The goal of this project is to personalize the TV experience. At any one time, The Entertainment Company's viewers have access to tens of thousands of movies. Such a vast array of choices is overwhelming for most viewers. The Entertainment Company addresses the problem with a combination of sophisticated search, redesigned user interfaces, and more to enable the television to reflect a user's interests, favorite TV series, sports teams, movies and music.

“To make it easy for our customers to find their favorite shows, we are always indexing our enormous volume of content and distributing it for fast retrieval”, says the lead architect. “This places enormous burden on our network infrastructure. In addition, it places a big burden on the company's disaster recovery (DR) initiatives as all this consumer content as well as backend systems like accounting, billing, email, and file sharing have to be protected from unforeseen events.”

As such, the company built out two data centers in Pennsylvania and one disaster recovery site in Colorado. Initially, the data centers ran in active/warm configuration with a 20 minute failover. Eventually, though, The Entertainment Company expected them to run in active/active configurations, which meant synchronizing the data between the sites. NetApp SnapMirror was chosen for job and needed to replicate 35 TB of data from across eight volumes between the data centers.

“The company established a goal of full data recovery within 3 hours, with an RPO of 24 hours. However, we were not coming close to meeting those objectives as our replication process were not able to complete across the WAN,” says the lead architect. “We simply could not move that much data over long distances in a reasonable amount of time without very expensive and time consuming manual intervention.”

The Entertainment Company tried everything - even manually moving the data between filers - but they would immediately fall out of synch because of the lack of throughput on the line. While there might have been gigabits of bandwidth, effective throughput was left to only several megabits. The culprit is the interaction between a line's latency, bandwidth, and packet loss. With latency at 65 milliseconds and packet loss at .01% ,the amount of effective throughput available to The Entertainment Company's applications was typically under 10 Mbps, regardless of the size of the WAN link – hardly enough to move 35 Terabytes of data between Pennsylvania and Colorado and meet The Entertainment Company's RPO and RTO requirements.



The Entertainment Company team began looking at a range of virtualized WAN optimization solutions from various vendors, including Cisco and Riverbed. As these vendors did not have virtual appliances that could scale beyond 50 Mbps, the team quickly turned to Silver Peak.

The Entertainment Company was also concerned about the impact of packet loss on the network. The company's current point-to-point network had little packet loss, but The Entertainment Company had plans to move some applications into the public cloud, where packet loss rates can routinely exceed one percent. This would have a further debilitating effect on effective throughput if not properly addressed.

SILVER PEAK: DATA CENTER CLASS, VIRTUALIZED WAN OPTIMIZATION

As testing and development progressed, teams began to complain about the delays when using the WAN. Those complaints simplified the purchase of WAN optimization. "The business case for WAN optimization was clear," says the lead architect, "It was an absolute requirement for us to meet our DR objectives. The challenge for us was finding the right WAN optimization solution for our needs."

More specifically, given the limited physical space in their data centers and the high volume of traffic that needed to be moved between data centers, The Entertainment Company required a very high capacity virtual WAN optimization solution.

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Silver Peak's VRX-8 offered the highest capacity of any virtual WAN optimization solution on the market, able to optimize 1 Gbps of WAN throughput. However, Silver Peak also offered the VX series of virtual WAN optimizers, which are targeted at smaller offices with WAN capacities from 50 Mbps down to 4 Mbps. Both the VRX and VX families utilize the Virtual Acceleration Open Architecture (VXOA), Silver Peak's open framework for high-performance WAN optimization. VXOA addressed The Entertainment Company's biggest challenge with three essential optimization technologies:

- **Network Acceleration** would address The Entertainment Company's latency problem by overcoming TCP's limitations in passing large data volumes. Network Acceleration uses techniques such as window scaling and selective acknowledgements; Network Acceleration also corrects CIFS chattiness, which was less of an issue for ASR.



Today, The Entertainment Company has chosen to deploy the VRX-8 within its core network. The VRX-8 continues to give data center class performance and enhance The Entertainment Company's ability to address changing network conditions.

- **Network Integrity** enables real-time packet loss correction over the public Internet or any other network using Silver Peak's Forward Error Correction (FEC). Packet Order Correction (POC), the second part of Silver Peak's Network Integrity features, will reorder packets helping to reduce or even eliminate network packet retransmission, which reduces an application's maximum throughput. Advanced Quality of Service (QoS) techniques also prioritize traffic and guarantee network resources.
- **Network Memory** is Silver Peak's patent-pending solution for deduplication over the WAN, which dramatically reduced the volume of data replicated over The Entertainment Company's network. With Network Memory, the Silver Peak appliances inspect all traffic sent between Pennsylvania and Colorado and stores information as a local instance. Repetitive information is then delivered locally rather than being sent across the WAN, improving application performance and WAN utilization.

THE TRIALS

Initial trials of the VRX-8 showed vast improvements in SnapMirror replication times over the WAN. The Entertainment Company was able to initialize their remote sites and replicate 63GB of data on their 10 Gbps backbone in about 20 minutes, which equates to 420Mbps of throughput. In other tests, they moved 9 TB of replication traffic in under 50 hours. Prior to Silver Peak, they could not complete this task at all.

But The Entertainment Company has seen other benefits as well. Solr, the protocol used to facilitate the video searches, originally consumed over 56 Tb of bandwidth. With the VRX in placed, Solr traffic was reduced by 95 percent. Oracle performance was also improved with SQL traffic dropping by over 75 percent.

MOVING FORWARD

Today, The Entertainment Company has chosen to deploy the VRX-8 within its core network. The VRX-8 continues to give data center class performance and enhance The Entertainment Company's ability to address changing network conditions. Ultimately, The Entertainment Company will improve look at moving VRX-8 instances between sites through software enabling based on seasonal or other traffic demands.



Performance continues to meet traffic demands. At a high level, SnapMirror performs flawlessly today within their desired RPO/RTOs. At the network level, deduplication ratios continue to exceed 90 percent with NetApp SnapMirror seeing 93% deduplication and Solr at 95% deduplication. Throughput has even exceeded initial testing reaching 646.6 Mbps. (See “Network Memory: Deduplication for Top Ten Applications”).

“The VRX-8 hasn’t just enhanced our replication efforts. It’s made them possible,” says the lead architect.

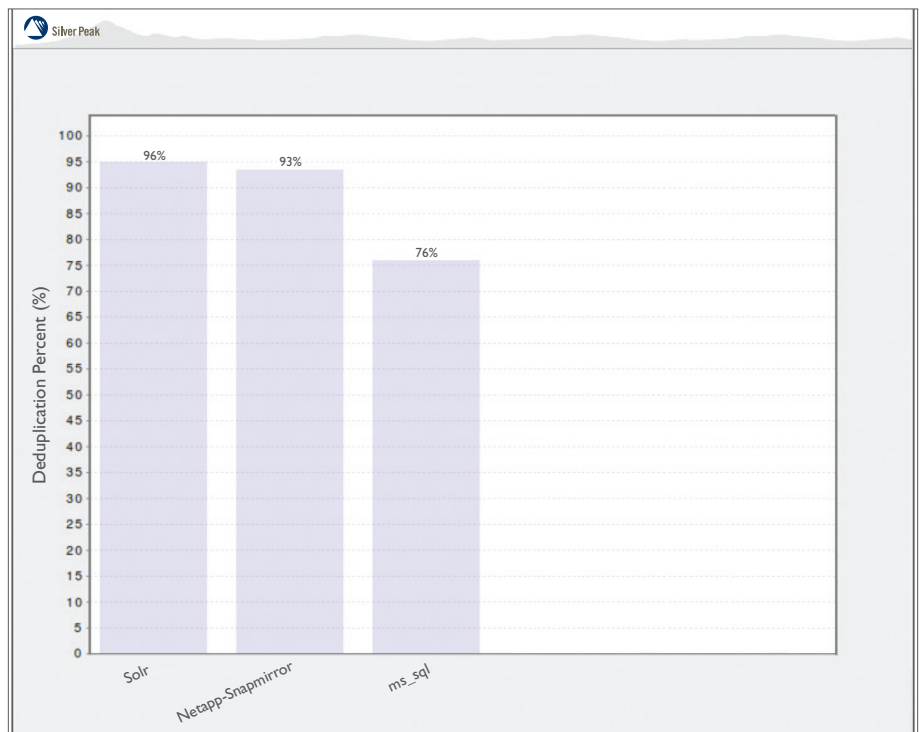


Figure 1: Deduplication for Top Three Applications