

BUYER CASE STUDY

AT&T: Disaster Recovery with WAN Application Delivery Products

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IDC OPINION

IT departments offering disaster recovery services to their users live within the constraints of their infrastructure. Sometimes, as exemplified in the case of AT&T, the user duty cycle strains the infrastructure as data growth or changing business requirements come into play. In the disaster recovery world, one of the obvious first places to look for relief is at the infrastructure of the network that ties the company together, also known as the wide area network (WAN):

- ☒ Is there enough capacity to handle the demands of the business? How does poor WAN performance impact application behavior? Even bandwidth providers such as AT&T are monitoring these assets looking for ways to improve network utilization with WAN application delivery products.
- ☒ IDC is of the opinion that WAN application delivery products offer several advantages across many applications and that disaster recovery and storage software-based replication in particular are strong examples of where they can be implemented effectively.

IN THIS BUYER CASE STUDY

This IDC Buyer Case Study takes a high-level look at how WAN application delivery products are in use for disaster recovery and data replication applications at AT&T, a customer of Silver Peak Systems Inc. Potential users of WAN application delivery technology can see the factors affecting deployment decisions at AT&T and determine how those factors affect their own situations.

WAN Application Delivery Product and Its Benefits

Essentially, WAN application delivery products optimize WAN communications. These products are deployed at the branch and in the datacenter, and they not only provide bandwidth savings but also enable secure consolidation of file servers, emails, and print services across the WAN, as well as for business-specific applications such as retail point-of-sale and bank teller transactions.

Typically, WAN application delivery products compress datastreams, monitor traffic flow, prioritize traffic, optimize bandwidth, and provide file caching. They also optimize and accelerate the performance of particular applications. The benefits of WAN application delivery include the following:

- ☒ Support ongoing investments in new consolidated datacenters and associated infrastructure
- ☒ Satisfy demand to accelerate business applications as a result of application centralization (Applications get pulled out of the branch and back into the datacenter, and application performance issues continue to fuel the demand for WAN application delivery solutions.)
- ☒ Provide cost/performance advantages (When a technology solution such as WAN application delivery solves a major pain point for IT, is easily deployed, and results in cost savings for the company, and its ROI is readily quantifiable, the business case is usually persuasive.)

The use of WAN application delivery for the purpose of speeding up backup procedures associated with disaster recovery efforts also has been gaining ground. Companies have found that WAN application delivery solutions are eliminating the need to purchase additional bandwidth to crunch backup windows, thereby saving money over the long run.

WAN Application Delivery as Applied to Storage Replication and Disaster Recovery

WAN application delivery products that are deployed in storage replication or disaster recovery environments fulfill the role of minimizing, optimizing, and compressing the data flow from one location to another. AT&T utilized pattern matching, TCP acceleration, and other features of Silver Peak's NX family of appliances as described in the Results section of this document.

SITUATION OVERVIEW

Organization Overview

The Network Planning and Support group is an internal AT&T function supporting worldwide offices but with an emphasis on North America. They support AT&T offices and personnel rather than AT&T customers. The network supports more than 20,000 servers throughout the internal environment. Hundreds of terabytes of storage are involved. This organization does all planning and architecture work for routers, switches, and appliances attached to servers and storage in the network. A request for information (RFI) document was issued, and competitive providers were asked to provide data about their products and how they could be deployed to address AT&T's needs. The following criteria ranked in order of importance were used to make the selection decision: performance, compatibility with installed infrastructure including management products, and price. Silver Peak was chosen as the successful vendor based on internal testing and these criteria.

Performance was measured by whether users could be expected to meet their recovery point objective (RPO) and whether users could be expected to accomplish their backup and archival work in the time windows set aside for these purposes. Anticipated growth of data sets and new applications soon to be "stood up" had to be factored into performance headroom proposed. AT&T took advantage of internal labs for testing which workloads would benefit most from the Silver Peak technology.

Compatibility with the installed infrastructure was key to avoiding disruption while the new systems were coming online. AT&T wanted a seamless, transparent integration so that no service outages would have to be endured. AT&T employed redundant NX configurations so as to not subject the organization to a single point of failure (SPOF).

Capital and Operational Expense Savings Versus a Bandwidth Upgrade

AT&T did not quantify how much capital expenditure or operational expenditure levels were avoided in terms of servers, storage, or network bandwidth as compared with a pure bandwidth upgrade. Bandwidth itself was not the issue for AT&T. Rather, *usage* of the bandwidth it already had provisioned was the key to this implementation.

And the Winner Is ...

AT&T evaluated Citrix (Orbital Data), Cisco, Juniper, Riverbed, and of course Silver Peak. Citrix, Riverbed, and Silver Peak were comparable products, but it was Silver Peak's UDP tunnel architecture that suited AT&T's requirements best. AT&T felt that Silver Peak's solution met its immediate and longer-term requirements cost effectively.

Challenges and Solution

AT&T turned to Silver Peak for two WAN acceleration projects. The first was a one-time data migration between California and Mississippi. This was a massive project that had to be concluded over a single weekend. With Silver Peak's support standing by, AT&T moved 18TB of data without incident. The task was completed well within AT&T's planning window, and the organization could resume normal operations in a new location the following Monday morning. Those participating in this data migration described their experience as "far exceeding expectations."

The second project is still ongoing. The need for timely backup and archiving projects on an ongoing basis became a requirement across the entire infrastructure. The plan was for each location to back up its data on a daily basis and to archive it weekly. Every location set aside its individual backup windows between 10:00 p.m. and 2:00 a.m. during which the transfers would take place. The process was only marginally successful because inevitably two or three locations per week would miss completing their backup activities in the time windows provided. This resulted in increased risk to the organization. AT&T is pleased to report that all backups are completing within the window now. Prior to deploying the Silver Peak solution, some of the backups were not completing at all.

To address this issue, the first idea was to simply provision more bandwidth so that data transfers could conclude that much faster. However, that assumption does not necessarily prove true for reasons described in the fourth bullet point ("recognizing

that faster may not be faster") of the Take a Holistic View of the Alternatives Available section of this document. They then decided to pursue a different strategy involving WAN application delivery products and eventually chose Silver Peak Systems of Santa Clara, California.

Nine locations have been installed, with the balance of locations coming online during the coming year. Since the Silver Peak project began rolling out, there have been no "missing the window" incidents where backup/archive activities did not complete in time. Once again, those AT&T personnel with responsibilities in this area have described "outstanding support" from their Silver Peak counterparts.

Results

Customer AT&T took advantage of the following Silver Peak features for its network project: network-level deduplication (byte level); support for multiple protocols (UDP [including tunneling support] and TCP/IP); support for heterogeneous brands of storage, compression, packet striping, and forward error correction; and parallel data flows, high-availability configuration option for the WAN application delivery products, and policy-based routing (PBR).

Impact of Compression and Deduplication: Still More Upside Potential

In terms of further deduplication beyond that provided by either the storage subsystem or a separate deduplication appliance, Silver Peak claims as high as an additional 10–20x performance improvement when combining its deduplication techniques with other WAN data reduction techniques. The reasoning is that because the company is looking at all IP traffic, not just storage traffic, it is likely it would have seen the data previously during normal business operations. If Silver Peak has seen it, it will not have to go through yet another deduplication process. This factor helps Silver Peak get more dedup out of the gate. Consider email: The backup of an email server is a first pass to the storage devices but a second or third pass to Silver Peak because it was performing deduplication during the original email traffic.

Apart from these, Silver Peak's deduplication is at the byte, not the block, level. This finer granularity means it only needs to dedup byte-level differences. If the unit of reference were an entire block (and just one byte changed within that block), then with block-level deduplication there would be far more to deduplicate. Silver Peak also points out that its deduplication is working all the time and in both directions on the WAN. Solutions that work only on the primary to secondary storage traffic transmission will "pattern match" less often. For this reason, the Silver Peak NX benefits not just the backup/replication process but also the recovery steps following an outage. Silver Peak also continues to perform network integrity checks to fix packet loss and use network acceleration techniques such as parallelizing the data flows (if possible) to overcome latency.

With regard to compressed data, this traffic can still be put through the Silver Peak deduplication process although performance will be better if it reaches Silver Peak appliances uncompressed. The rationale here is that given the fact that Silver Peak has dedicated hardware to do compression (which is a very CPU-intensive workload), most end users prefer to turn off compression in the application and do it inside the

WAN application delivery product device. This typically results in improved performance and scalability while preserving server processing power for true application-level work.

FUTURE OUTLOOK

Because AT&T's internal clients are quite happy with their experience with Silver Peak products, they intend to deploy additional units throughout 2009. By the middle of 2009, 16 sites around the country will be using NX products, building upon the success of the 9 original sites. An additional two test and development sites are also slated for Silver Peak products by the end of 2009.

Silver Peak is also being deployed by a sister organization, AT&T Internet Services. This organization works with the general public. End users input their files of interest (music, photos, traditional spreadsheets, Christmas letters, even small business data, etc.) to AT&T Internet Services, which will protect them, manage them, and return them as requested. In services such as these, the location of the data is usually as close as possible to the user base to avoid latency or (speed of light) transmission delays. Best practices may mean that a Boston location is used for data from New England subscribers and New York City is used for mid-Atlantic customers. From a backup point of view, each location could back up the other and serve as its long-term archival location. A Silver Peak NX solution would be inserted in the data flows between locations and save potential bandwidth.

AT&T is also looking at application delivery as a key enabler for non-disaster recovery applications.

ESSENTIAL GUIDANCE

Advice for Vendor Silver Peak

In This Market Space, Focus on Storage-Based Replication and Disaster Recovery Use Cases

It is tempting for sales and systems personnel to recount all product features and itemize the beneficial results of each and every feature to prospects, particularly those not yet familiar with the company. With a product that has many favorable use cases such as the Silver Peak NX series, there is much to convey. Yet IDC counsels spokespersons to "go narrow; go deep" on each particular use case. Here we suggest this approach in just the replication and disaster recovery areas. The benefits of this approach are twofold: First, the customer appreciates the focus based on the problem "presented" because it represents the actionable pain point to the organization and may even have budgets set aside; second, it is during the drilldown solution of the initial pain point that information can be exchanged leading to additional opportunities for WAN application delivery products within the firm. By solving the first problem, the vendor earns credentials to solve subsequent problems or better, problems the user did not even know were at issue.

Continue to Expand Storage Partners List

Silver Peak is a technology partner for some of the industry's strongest players. A partial list includes NetApp, EMC, HDS, IBM, Brocade, Compellent, Lefthand (now part of HP), EqualLogic (now part of Dell), Double-Take Software, CommVault, Data Domain, Symantec, and VMware. While this list is impressive, it makes sense to consider other fast-growing organizations such as Xiotech, CA, Neverfail Group, and Iron Mountain. Although many of these vendors primarily serve the midmarket, some have customers at organizations with household names and others are seeing strong growth as the market matures. It is important to continually reassess vendors and to be part of their ecosystems just as they are part of Silver Peak's.

Capitalize on the Economic Downturn to Showcase Documented Capex and Opex Savings Persuasive to Architects and Planners

Your audience may not have been listening so well earlier last year as you made the case for WAN application delivery products, especially for disaster recovery and storage-based replication purposes. It is time to go back. The worldwide economic downturn has virtually all management levels looking for levers to pull that will help them avoid hardware replacements and upgrades (capex) and get more use out of existing investments such as telecommunications costs or avoiding provisioning faster pipes (opex). A proposal not accepted last year may get a fairer hearing this year or have a new set of decision makers this time. These solutions have an economic story that deserves in-depth consideration, especially now.

Advice for Customers in Circumstances Similar to AT&T's

Oversight

Like AT&T, it is wise to have an oversight organization that has sign-off responsibility for vendor and product selection criteria. Subjects under the domain of this organization are:

- Whether the vendor meets internal policies with regard to sufficient capitalization, experience, and support infrastructures (Because Silver Peak is privately held, the successful AT&T review process was a highly visible checkpoint prior to implementation.)
- Whether the product solution meets internal security and tracking guidelines
- Whether the product solution meets internal architectural requirements for functionality, performance, ease of use, and compatibility with preexisting hardware and software

In short, would the firm want to buy this product/solution from this particular vendor?

Objectively Determine Your Recovery Point Objective and Recovery Time Objective for Each Independent Workload; Work with WAN Application Delivery Products Provider to Determine Which Features of Their Solution to Employ

The recovery point objective is that point in time where all processes and systems are aligned. As such, each can move forward from this point of logical consistency, or more commonly, users can move backward in time to the point at which all data and systems were known to be valid (known as a "good point in time"). Think of recovery point objective as a common logical checkpoint from which it is possible to restart. Best would be to restart right away with no loss of data, but that will not always be possible. For data that is missing or incorrect, the user must turn to a remediation technique in an attempt to reconstruct the offending data by rerunning transactions or replaying logs.

The recovery time objective (RTO) is how long it takes to return to the point where consistency was last observed. The RTO unit of measurement may be seconds, minutes, hours, or even weeks. Think of the recovery time objective as the amount of time it takes to get known good data aligned such that the user has confidence in it. Factors include how much data needs to be recovered, whether data can still be reconstructed, speeds of the interconnect, and speeds of the appliances engaged in the recovery effort. For example, if a user must return to a month-old archive tape, the RTO is affected by how long it takes to identify and mount the last good tape, what the transfer rate is of the tape drive, and how long it takes to retrieve the data and align with other relevant data sources plus like times for all other data sources.

Determine which workloads are independent versus which ones are interdependent. If your SharePoint workloads are independent of your CRM workloads, it does not matter if they have the same RPO or RTO. On the other hand, if your email is at all related to your escalation and remediation system, then having a different RPO/RTO for each is not useful. Because email is such a pervasive application, it often is seen as the one with many interdependencies not identified on the first pass.

Take a Holistic View of the Alternatives Available

If, like AT&T, the alternative to WAN application delivery products is provisioning more bandwidth from the carrier, it is important to take a holistic view. Additional considerations meriting your further analysis are:

- Lead times.** How long will it take to order, provision, and place into steady state service the faster interconnections? If problems are ongoing, this delay could be unacceptable.
- Availability.** Bandwidth shortages in your geography may mean that this option is not available to you.
- Upgrades to the rest of the infrastructure.** Evaluate the current capabilities of your installed networking products looking at whether they too may need to be replaced or upgraded.

- ☒ **Recognizing that faster may not be faster.** Performance planning and diagnosis is one of IT's most difficult challenges. As you peel the performance onion, there may be points in the system where throttling has been intentionally or unintentionally injected into the process. AT&T, for example, intentionally set a site-specific limit (by its own policy) of 22Mbps for all "well behaved" TCP/IP applications. Having a connection faster than this would not speed up performance if the speed limit is governed/held back to a slower speed. An unintentional throttle may be in the flow path such as where a firewall setting is slower than it needs to be or where hardware or software elements in the data path are out of date or out of rev.

- ☒ **Knowing and understanding the architectural nuances of your infrastructure.** AT&T uses NetApp's SnapMirror for its replication workhorse. SnapMirror is a single-threaded application, meaning that it cannot take advantage of the parallelism that the NX series offers. AT&T estimates the impact of using single-threading results in no more than 40–50% use of the bandwidth available. Likewise, the choice of the network topology can affect performance. TCP/IP, for example, uses fewer acknowledgment points, and UDP enables tunneling wherein the application can piggyback the infrastructure but its control is specific only to the data movement inside the tunnel. Also, certain replication protocols, such as IBM Global Mirror, are extremely sensitive to receiving packets in the correct order. For them, packet order correction is a huge feature.

LEARN MORE

Related Research

- ☒ *Worldwide Enterprise Networking 2009 Top 10 Predictions: Optimization, Disruption, and Consternation* (IDC #216229, January 2009)
- ☒ *Economic Crisis Response: Worldwide WAN Application Delivery 2009–2012 Forecast Update* (IDC #216008, December 2008)
- ☒ *WAN Application Delivery Market Set to Weather the Storm?* (IDC #lcUS21505808, November 2008)
- ☒ *Worldwide WAN Application Delivery 1H08 Vendor Shares* (IDC #214585, October 2008)
- ☒ *Worldwide Storage Replication Software 2008–2012 Forecast and 2007 Vendor Shares* (IDC #214210, September 2008)
- ☒ *Role of Replication in the Datacenter: How Managers Select and Use Replication to Achieve Business Objectives* (IDC #213718, August 2008)
- ☒ *Worldwide Storage Replication Software 2008–2012 Forecast: Steady Growth Throughout the Segment* (IDC #213162, July 2008)
- ☒ *The Future of Replication Technology: A Market Segmentation and Analysis* (IDC #210293, February 2008)

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