Pure Storage and Rubrik Keep TTX on Track to Optimize Railcar Pooling Operations

TTX®

INDUSTRY
Transportation

USE CASE
- Database – Microsoft SQL Server®
- VSI – VMware® vSphere®

THE CHALLENGE
- Storage bottlenecks caused delays in the company's critical railcar-tracking application.
- Initial use of solid-state storage failed to eliminate performance problems.
- Lengthy backup windows and recovery times increased the complexity of managing multiple fragmented solutions.

BUSINESS TRANSFORMATION
The business-critical railcar-tracking application runs without delay, ensuring peak utilization of the company's key assets. Complex BI analytics can now run without impacting routine business functions.

IT TRANSFORMATION
- Simplified data protection delivers instant recovery time objectives, more granular recovery performance objectives, and the ability to archive to the cloud.
- Performance problems with key asset tracking, asset management and data warehouse applications disappear.
- Complex BI analyses can be run without impacting production workloads.

TTX Company is responsible for the efficient management of nearly a quarter million railcars. To ensure each railcar maintains optimal utilization, the company's IT infrastructure must operate at peak efficiency. When lagging performance of its storage system created bottlenecks, the company installed all-flash arrays from Pure Storage. The new data platform coupled with Rubrik's comprehensive data management solution have eliminated performance problems and vastly simplified storage management tasks for the lean IT staff.

At a casual glance, a long freight train carrying scores of shipping containers may not seem like a very technology-intensive activity. But it certainly is from the perspective of TTX Company. TTX is a railcar pooling company that owns, maintains and manages a fleet of more than 230,000 railcars used by the nine North American railroads that own TTX. By using TTX, the railroads save capital and operating costs, and benefit from the assurance of always having railcars when and where they are needed.

In 2016, TTX carried 11 million intermodal shipments (shipping containers on flat railcars), and transported 11 million autos and trucks, as well as other goods including lumber, steel, paper and raw materials. In the last five years, TTX has invested $3.8 billion in new railcars, and spends more than $600 million annually on maintenance, using a network of facilities spread across the country.

Tracking the movement of railcars is at the heart of TTX operations and the IT department that supports it. That task is handled by the company's flagship application, Unified Fleet Distribution® (UFD), developed in-house and based on Microsoft SQL Server.

"It is a highly transactional application that handles more than a million messages on a routine day," noted Chad Plemons, Director of Digital Operations. "Each message contains information about the location of a railcar, so the size of each message is not very large, but the volume we handle is huge. So, there's a lot of I/O activity and a lot of reads as TTX employees track where a car is."

A QUEST FOR A SOLUTION LEADS TO PURE STORAGE

With the high volume of queries and messages, "we were beating on that database very heavily. At times the system would fall behind, meaning a message might not appear on the user interface for a couple of hours after it was received. That is unacceptable, as our goal is to operate as close to real-time as possible. We quickly determined storage was a bottleneck. So, we started looking for options," Plemons said.

The first approach was to add a shelf of solid-state memory to the company's legacy spinning-disk storage system. "That helped a little, getting us past some pain points," Plemons recalled, "but eventually it brought the array to its knees. So, we had to look again for other options."

Having given end-users a taste of the performance gains from flash storage, "a lot of people outside the IT infrastructure group were saying they wanted more solid state. Ultimately, our CIO said everything was going to solid state."

To start executing on that commitment, the company purchased a high-performance array from a flash-storage start-up (later acquired by a large IT vendor), "but we quickly ran into reliability issues. While the array was fast, it required a lot of care and feeding and contact with their support group. It had too much of a time-consuming impact on our day-to-day operations for us to commit to it on an enterprise scale."

Finally, TTX looked in depth at Pure Storage. "Everything we saw with Pure made a lot of sense, and addressed all of the issues we had with our spinning-disk system as well as the solid-state products we tried," said Plemons. We especially liked the Evergreen™ Storage program, for the way it protects our investment over the long term and ensures that we benefit from upgrades to the latest technology without disrupting operations."

In late 2013, TTX acquired a Pure FlashArray with the intent of running a proof-of-concept trial, "but in the end, we didn't need to spend a lot of time evaluating Pure." According to Plemons, "Once we got it up and running and saw what it could do, we said, 'this is what we need'."

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– Chad Plemons, Director of Digital Operations

The first application migrated to the Pure array was the business-critical enterprise asset management platform. "The migration was very easy for us because we are 100% virtualized. We could do it in the middle of the day with no downtime in operations. And as soon as it started running on Pure, we stopped seeing any problems with delays or response times," Plemons noted.

Within a year, TTX had purchased four FlashArrays, which have since been upgraded to //M70 models. "We went all in," Plemons said, "and now everything runs on Pure arrays. We no longer have discussions of whether storage is the reason for any performance problems."

In addition to Unified Fleet Distribution, other key applications now running on Pure include a version of IBM's Maximo asset-management system customized for railcars, and an internally developed data warehouse based on SQL Server.

RUBRIK PROVIDES UNPRECEDENTED BACKUP AND RECOVERY PERFORMANCE

Finding a high-performance backup and recovery solution for TTX's large databases and data warehouse was a long-term struggle. Plemons said TTX had tried several products over the years with varying success, but in 2016 decided to standardize on Rubrik, a Pure Storage partner and the leader in cloud data management solutions. "We selected Rubrik as the single platform for all our data protection needs for both structured and unstructured data."

"Rubrik is very straightforward to deploy and administer. And that's exactly what we were looking for given our emphasis on simplicity. We don't have the luxury of having a backup engineer on staff. Now, it's a function every member of the infrastructure team is able to manage. The simplicity of performing file-level recoveries allows us to execute this through our support desks."

Another valuable feature, Plemons added, "is that archiving to the cloud is a built-in functionality of Rubrik. Our cloud strategy recognizes that there is some data worth putting in the cloud and some on-prem. With Rubrik, we have the flexibility to utilize cost-effective public cloud storage for long-term data retention. What we put into the cloud can also be accessed instantly at a granular level via search."

PURE STORAGE AND RUBRIK RADICALLY SIMPLIFY IT OPERATIONS

"Together, Pure and Rubrik help our operations in that we have the high performance in the front end and we have the performance in the backend by minimizing impact to our primary storage in terms of stun time and backup time," Plemons said.

The move to all-flash arrays has greatly simplified operations in the IT department. "If we were still on spinning-disk, we would have to be managing different data stores for each application and always worrying about whether we had the right amount of storage matched to every need. Now, with Pure, we don't have to differentiate between workloads from a storage perspective. We just have two pools of resources – one in each data center. We no longer have to think about where the storage resides."

The new storage systems support TTX's strategy of an "active/active" approach to its two data centers. "We want to get our IT infrastructure out of the disaster-recovery business and into being a high-performance, reliable platform for applications," Plemons noted. "The performance and reliability provided by Pure Storage has allowed us to implement an active/active strategy high up in the application stack."

The simplicity of managing Pure Storage arrays is a welcome change in the lean IT infrastructure department, which has a staff of only five to manage the entire infrastructure. "When we first looked at solid-state, we had a person on staff whose day-to-day job was just storage administration," Plemons observed. "With Pure installed, anyone on the team can perform whatever tasks are necessary for storage. And there's not a lot to do. It's a set-it-and-forget-it system."

With Pure arrays so easy to manage, he added, the IT staff can devote more attention to higher-value projects with a greater impact on the company. For example, the Pure arrays give the IT department the ability to support evolving business needs, such as business intelligence (BI) analysis. "We have a lot of data that can be mined," Plemons said, "but the work the BI team does can be very resource-intensive. Now, we don't have to worry about the impact on performance. With Pure, we're able to spin up new systems, attach the data, and allow the BI group to do its thing, without concerns about what it'll do to our production environment."

Plemons praised the support he receives from both Rubrik and Pure Storage.

"Pure is like an extension of a NOC (network operations center). Their customer support team have their eyes on our system 24/7 and proactively identify issues – which are rare – whenever necessary. Rubrik takes the same approach to support."

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Rubrik delivers instant application availability for recovery, search, cloud, and development. Hybrid cloud enterprises mobilize applications, automate protection policies, recover from Ransomware, search and analyze at scale on one platform.