

REPORT REPRINT

Pure Storage mixes AI into a data management tonic for US healthcare provider

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Storage system reliability and management overheads are being heavily improved by the use of machine learning in cloud-based technical support and management services – as a large US healthcare provider has found.

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Summary

In addition to being part of the infrastructure on which analytics and machine learning (ML) are implemented, storage systems are themselves a prime candidate to benefit from the use of those two technologies and over the past few years, this has become a major area of competition for storage vendors. So far, the focus has been on the use of analytics and machine learning to improve technical support and storage systems management, most commonly in cloud-hosted services. One major result has been the delivery of so-called predictive maintenance, in which multiple providers claim to anticipate the majority of issues in their customers' storage systems before they happen.

Another result has been a significant improvement in the ability to accurately forecast storage capacity utilization, as well as the load on storage systems and their resulting performance. Roanoke, Virginia-based healthcare provider Carilion Clinic has heavily committed to Pure Storage's all-flash arrays (AFAs), and this report describes the benefits it is enjoying from the use of the provider's ML-enhanced, cloud-based storage management and monitoring service, Pure1.

Snapshot

COMPANY NAME	Carilion Clinic
ACTIVITIES	Not-for-profit healthcare services
HEAD OFFICE	Roanoke, Virginia
NUMBER OF EMPLOYEES	Undisclosed
LY REVENUE	\$1.7bn
LY NET INCOME	Undisclosed
KEY SUPPLIERS	Pure Storage

451 TAKE

A little over two years ago, the Pure1 service was not a major factor in Carilion's decision to make Pure Storage its preferred storage supplier. A year later, Pure enhanced its Pure1 service with an artificial intelligence (AI) engine it calls Meta, and now Carilion says the service is providing significant value. That demonstrates how quickly this technology area is developing, and is helping to contain both operational and capital costs for storage in the face of exponential growth in the volume of data being handled by enterprises. While the competition between storage vendors in this field is intense, we think Pure has so far enjoyed a leading position, making its Pure1 service a good example of the state of the art in cloud-based storage management.

Carilion operates at 225 sites to provide healthcare services to approximately one million residents of western Virginia. The healthcare provider's IT services are used by about 16,000 people, comprising its own 13,000 employees and another 3,000 staff at partner organizations. Carilion's primary electronic medical records application is the Epic suite from Epic Systems, and the organization also runs Oracle, Microsoft SQL Server and other applications.

Before the switch to Pure Storage AFAs, the slower performance of Carilion's previous disk-based storage contributed to problems meeting a service-level agreement that required that end users had to experience less than 25ms response time from the Epic suite. In 2016, Carilion moved from a multi-vendor to a single-vendor storage strategy based around Pure, and has since deployed 14 of the company's FlashArray AFAs. Those AFAs now store 1.2PB of data for Carilion, and all of them replicate data from a primary to a secondary datacenter for disaster recovery. This was Carilion's first deployment of all-flash storage, and it reports that after evaluating three potential suppliers of AFAs, it chose Pure because of the perceived simplicity of administration of the firm's devices, and its familiarity with Epic.

The Pure1 service was launched in 2015, and Pure says it predicts 83% of operational problems in its storage systems before they are detected by customers. The company says the service continuously scans telemetry data from its installed base and alerts customers of known vulnerabilities, including potential issues beyond its storage systems.

Business drivers

The growing degree of automation in infrastructure is allowing IT organizations to reduce their dependence on staff with skills in specific domains such as storage, and increase their employment of IT generalists. However, the continuing growth in data volumes and pressure to achieve more agility is increasing the workload for enterprise storage staff. In 451 Research's Voice of the Enterprise: Storage Organizational Dynamics 2018 survey, 64% of respondents reported that their workload had increased over the previous year, compared with only 7% who said it had lessened.

Depending on the systems in use, the administration and maintenance of storage can be a labor-intensive task requiring significant levels of skill. This not only increases costs for IT organizations, but also reduces agility and creates challenges in achieving service levels in terms of performance and data availability. Carillion's storage team comprises just three people. Alongside the 1.2PB of data stored in the Pure Storage AFAs, this team also manages another 5PB of data in disk storage that had been deployed before the Pure all-flash storage. The team is also responsible for backup and recovery, as well as disaster recovery services.

Carilion and Pure1 Meta

Carilion notes that across all of its Pure Storage arrays, it has so far experienced 100% uptime. The features of Pure1 that have most impressed the healthcare provider are the capacity and performance forecasting tools within the service, which it says significantly outperform the equivalent tools offered by other storage vendors. These tools have helped Carilion expand its storage capacity exponentially without expanding the size of its small storage team.

Prior to a recent update of Microsoft Exchange, Pure1 forecasted that the capacity of the associated AFAs would be entirely consumed within two months. That warning gave time for the storage team to identify unused VMware datastores and create headroom for growth. Separate to capacity, storage workload and performance forecasting has traditionally been a challenging task. Storage systems must provide headroom for growth in workloads to maintain performance above SLAs. However, it has been very difficult to accurately predict the relationship between load and performance. As a result, IT organizations have had to allow for large margins of error in their estimates of the storage resources – in the form of controller and backplane configurations – that they need to deploy. They have also been fully aware that the resources they are deploying are likely to be heavily in excess of true requirements, and have therefore involved undesirably large but unavoidable capital overspending.

The Meta AI engine extended Pure1 with workload and performance planning tools that are based on machine learning models developed using telemetry data collected and aggregated from Pure's installed base of AFAs. Carilion says the result is a major improvement over what it describes as the 'rough estimate' forecasts that it was using previously. While the healthcare provider has not publicly quantified the capex savings that have resulted, we note that the subscription to the Pure1 SaaS platform is included for all Pure customers with current maintenance contracts.

Carilion reports that it deploys the Pure1 forecasting tools on a regular basis, and exports the forecast reports to senior management. This is in addition to the day-to-day monitoring of storage system performance, in which the healthcare provider notes that Pure1 reports the performance of every array – in terms of IOPS, latency and bandwidth – from a single pane of glass. Carilion also describes the Pure1 mobile app for iPhone as highly useful as a means of monitoring system status and performance when personnel are offsite, and as the only such mobile application from a storage provider that has been truly functional, in its experience.