Buyer Case Study

Cloud Provider Peak 10 Deploys Nexenta to Improve Efficiency and Performance While Lowering Costs

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IDC OPINION

As information technology (IT) organizations look to evolve their infrastructures to take advantage of newer storage technologies like flash and software-defined storage (SDS), improved agility, easier management, and better cost efficiencies are important measures of success. This is particularly important in the cloud services market where razor-thin margins often dominate. Peak 10, a large cloud services provider catering to compliance-sensitive customers with global IT requirements, was specifically looking to leverage these two technologies (flash and SDS) to provide better service to its own customers as the company's legacy storage platforms came up for technology refresh. Looking to start with its Recovery Cloud, which provided the backing infrastructure for Peak 10's disaster recovery-as-a-service (DRaaS) offerings, Peak 10 evaluated several all-flash arrays (AFAs) and SDS offerings before selecting NexentaStor, a unified block- and file-based SDS platform from Nexenta, to run on the SanDisk (now Western Digital) InfiniFlash hardware platform. Peak 10 expected that by leveraging these newer technologies, the company could provide the same or better service to its customers at lower cost to itself while better positioning the company to accommodate continued growth in the future. Peak 10's experience with both AFAs and SDS is similar to many other companies — high satisfaction in the use of both of these technologies has led most organizations to plan to move more workloads to these technologies over time as legacy storage platforms come up for technology refresh. IT organizations are not afraid to bet their business on them, and those organizations that make the leap reap significant performance, efficiency, agility, ease-of-use, and cost benefits. Peak 10's experience has proven this out, and the company has achieved the following benefits:

- A significant reduction in storage latency variability, allowing Peak 10 to more consistently deliver on customer service-level agreements (SLAs) — with its legacy hard disk drive (HDD)-based platforms, storage latencies varied from 5ms to 20ms, while with flash, Peak 10 is delivering 1-2ms latencies even during peak periods
- A reduction in rack space requirements of over 90% (from 100U in Peak 10's legacy environment to 7U in its flash-based environment) and energy consumption by 75% (for the same capacity under management) — two factors that will help Peak 10 more cost effectively accommodate anticipated business growth
- NexentaStor's ability to support all-flash configurations, along with its proven scalability, enterprise-class data services, datacenter ecosystem integration capabilities, and ease of use enabled Peak 10 to meet its predefined performance, agility, and cost goals
- An estimated total cost of ownership (TCO) reduction of 35% relative to Peak 10's legacy HDD-based storage for a new infrastructure that is faster, denser, more power efficient, more reliable, and easier to scale and manage

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IN THIS BUYER CASE STUDY

This IDC Buyer Case Study summarizes how Peak 10, a national provider of secure cloud and cost-saving managed services solutions, leveraged all-flash and software-defined storage technologies to evolve to a more flexible, easier-to-manage, and more efficient IT infrastructure. Peak 10 has committed to these technologies in a big way and services both its customers' and its own IT needs using cloud infrastructure solutions based around these technologies. This Buyer Case Study explores what drove Peak 10's initial interest in these technologies, what the company's deployment experiences have been, and what the company's plans for expansion around these technologies are in the future.

SITUATION OVERVIEW

Organization Overview

Peak 10 is a large IT infrastructure provider offering a portfolio of secure, flexible cloud solutions; datacenter and network services; and managed services to customers across various industries around the world. Originally founded in 2000, Peak 10 provides compliant cloud infrastructure that meets certification requirements such as SOC 1, 2, and 3; PCI DSS 2.0; HIPAA/HITECH; and ISO 27001:2013. The company offers cloud services tailored for both production and disaster recovery and drives a best-in-class Net Promoter Score of 67 with its customers (for more information on Net Promoter Score, see *Why Enterprise Storage Managers Need to Understand the Net Promoter Score,* IDC #US41185416, April 2016). Peak 10 services thousands of customers, many of which have global IT requirements, and its cloud business is growing organically at 25% year over year. Focused on servicing the need of midmarket businesses, Peak 10's technology partners include Cisco, Microsoft, VMware, Dell EMC, ServiceNow, Zerto, Fortinet, BAE Systems, NetApp, and Commvault.

Peak 10's Recovery Cloud provides scalable, flexible, secure disaster recovery that supports a wide range of heterogeneous storage and provides DRaaS for colocation customers using other Peak 10 cloud services to run production workloads as well as those noncolocation customers that just want cloud-based disaster recovery. As the legacy storage hardware backing the company's DRaaS infrastructure came up for technology refresh, Peak 10 was looking toward newer, more flash-optimized platforms that would give the company better performance, improved efficiencies and lower TCO on a per-terabyte (TB) basis, and be easier to manage. Peak 10 looked to implement this kind of solution first for its colocation customers where data movement operations for backup and recovery were not limited by the latencies of wide area networks, and flash performance was expected to have a noticeable impact on service levels.

In considering an all-flash technology refresh for its DRaaS infrastructure, Peak 10 had some very specific business goals. As the use of cloud-based services became more widespread, its customer base was growing rapidly. Given the amount of data that customers generate and retain, however, its data growth rates were even higher. As Peak 10's business expanded to accommodate more customers across more industries with highly varied workloads, the company wanted to ensure its ability to continue to deliver on its performance and availability SLAs. As Peak 10 evolved its storage infrastructure, the company had a clear business objective of providing predictably good performance and maintaining "five-nines plus" (99.999%) availability even as it grew its infrastructure well beyond the multipetabyte (PB) range. Peak 10 had a variety of heterogeneous storage platforms from established enterprise storage suppliers and was well versed in the administrative overhead required to manage those platforms effectively, and the company was also clearly looking for newer storage

solutions that were much easier to integrate into its automated workflows and was overall much easier to manage. Given developments in the SDS market, Peak 10 also felt that it could use all-flash and scale-out technologies to deliver on these requirements at a noticeably lower cost than it was paying for its legacy storage infrastructure on a fully loaded (capex and opex) basis.

SDS was of particular interest to Peak 10 because of the economic, agility, and ease-of-use benefits it brings to the table. All storage management capabilities reside in software that can potentially be run across a variety of different commodity off-the-shelf (COTS) platforms, delivering lower cost than the hardware-defined storage solutions of the past. SDS provides the ability to allocate storage resources in a manner not limited by physical hardware boundaries, offering additional flexibility to configure storage infrastructure in the optimum manner to meet workload requirements. Most SDS products are designed to run on scale-out, x86-based architectures that support considerable choice in terms of compute and storage capabilities, and these architectures are well suited to meet the nondisruptive scalability requirements of high-growth cloud infrastructure environments. And for many of them, autonomous storage management capabilities make it much easier to manage data for the IT generalists who are largely managing storage in both enterprise and cloud environments today. Even for sophisticated storage administrators, autonomous storage management features can significantly increase the administrative span of control, helping lower operational costs. These benefits were a good fit with Peak 10's business objectives during the technology refresh of the company's DRaaS environment.

Challenges and Solution

With an upgrade to an all-flash platform for the company's DRaaS infrastructure, Peak 10 expected to be able to easily scale the system without disrupting production operations, improve its ability to deliver to SLAs across a varying I/O workload even as capacity was scaled, and increase the reliability of its infrastructure, thereby reducing administrative overhead required to meet customer expectations around performance, availability, and cost. Peak 10 was increasingly leveraging datacenter automation to improve the administrative span of control in its heterogeneous storage environment, so an ability to easily integrate into preexisting workflows was also important. This had certain implications for API support, which for Peak 10 included not only snapshot APIs like Windows Volume Shadow Copy Service (VSS), Oracle Recovery Manager (RMAN), and the VMware vStorage API for Data Protection (VADP) but also a command line interface, REST APIs, and system-monitoring APIs like SNMP and SMI-S.

Peak 10 needed to architect a storage infrastructure foundation for the future that would easily scale to tens of petabytes over time and wanted to maintain the configuration flexibility that a disaggregated storage model offered to allow the right mix of compute and storage, given its unpredictable workloads. An ability to support almost any application a customer might bring was important to Peak 10's growing business, so the company needed to be able to scale performance and capacity independently. In the world of cloud services, the ability to set customer expectations appropriately and consistently deliver to those expectations is a key differentiator.

As Chad Buzzard, Peak 10's director of Cloud Infrastructure, and his infrastructure team began to look at options, they had not had prior production experience with all-flash platforms. While they clearly wanted improved performance, they did not feel they needed to deliver sub-millisecond latencies across the board, and the AFAs they initially looked at – while providing this level of performance – cost more than Peak 10 was looking to pay. The SanDisk (now Western Digital) InfiniFlash platform caught the team's eye with its high storage density, low power consumption, and low-cost flash

performance. InfiniFlash is considered a "big data flash" platform that is more optimized for high bandwidth and throughput, energy efficiency, and low cost than low latency but promised very consistent latencies in the range of 1–2ms with the mixed workload environments that are Peak 10's "bread and butter." This seemed an excellent fit for Peak 10's DRaaS requirements, and the team began searching for a unified storage software platform it could run on InfiniFlash that met its performance, availability, and cost requirements while supporting both block- and file-based access.

Given Peak 10's interest in an SDS solution running on top of InfiniFlash, the company looked at the NexentaStor product. NexentaStor is a unified storage solution supporting both block (Fibre Channel [FC] and iSCSI) and file (NFS and SMB) access. This SDS solution is built around open source OpenZFS, a journaling file system that supports a number of enterprise-class features like space-efficient snapshots and clones, inline data reduction (compression and deduplication), and asynchronous replication (both snapshot and continuous options). Designed for enterprise use, NexentaStor features unlimited file system sizes, high-end scalability, comprehensive health status monitoring, built-in data integrity checking, and broad API support, particularly in the VMware vSphere ecosystem. Several members of Buzzard's team had had prior experience with Nexenta, a fact which Peak 10 felt was likely to lead to a positive deployment outcome with that solution.

NexentaStor was already prequalified to run on InfiniFlash hardware and was built around the disaggregated storage model that Peak 10 wanted. NexentaStor is often deployed as a cloud storage back end, supporting features important to these environments like all-flash configurations, enterprise-class data services, easy scalability well into the multipetabyte range, and nondisruptive maintenance and capacity expansion. NexentaStor also supported the APIs necessary to meet Peak 10's requirements for snapshot creation, datacenter automation, and system monitoring. Buzzard's team brought the solution in-house and put it through a rigorous test intended to highlight the platform's performance, scalability, and availability capabilities.

During the evaluation process, Peak 10 noticed some clear advantages to the NexentaStor/InfiniFlash combination. First, the combination provided much higher and much more predictably consistent performance than spinning disk. Second, Peak 10 was able to deploy inline compression (supported by the Nexenta software) without impacting the company's ability to consistently deliver storage latencies in the 1–2ms range. Third, the combination delivered a much more efficient and much higher infrastructure density, not only freeing up existing space but providing the opportunity to significantly grow Peak 10's capacity under management within existing datacenter space. And fourth, Peak 10's review of the management semantics and API integration promised cost and time savings associated with the deployment not only of the initial platform but also with expanded capacity over time.

Finally, Nexenta's OpenZFS pedigree was important to Peak 10. Although Peak 10 briefly looked at another SDS product before selecting NexentaStor, the alternative product was ruled out based on foundational requirements. In the high-growth, high-capacity cloud provider world, it had been Peak 10's experience that scale is more of a challenge than functionality, and the company had repeatedly run into scale issues with other vendors' products. NexentaStor uses OpenZFS as its core file system technology, and Peak 10 was confident that this proven, mature enterprise technology would meet the company's scale and availability requirements.

Results

Peak 10 initially implemented a 768TB InfiniFlash AFA platform for the company's colocation DRaaS customers. When moving data across networks, Peak 10 uses its DRaaS platform software for its heterogeneous virtual machine replication capabilities — this single product allows Peak 10 to replicate

to/from a variety of storage devices from different vendors. To hit the company's administrative span of control goals and help keep operational budgets low, Peak 10 uses Chef, an open source datacenter automation platform. As Peak 10 brought the NexentaStor/InfiniFlash system online, it immediately noticed how much easier it was to integrate into the preexisting workflows the company used for pool creation (NFS exports), naming conventions, SNMP and Syslog settings, time settings, snapshot creation, and other operations important to delivering on recovery point objective (RPO) and recovery time objective (RTO) SLAs for its customers. Even with Peak 10's Chef expertise, the company typically took at least several days to successfully integrate legacy storage platforms into relevant workflows, but with the NexentaStor/InfiniFlash system, it took less than a day.

The performance and efficiency advantages of the new solution were clear. In deploying the NexentaStor/InfiniFlash combination, Peak 10 went from storage latencies that varied from 5ms to 20ms with the company's spinning disk-based legacy infrastructure to consistently delivering on both reads and writes in the 1-2ms range. Peak 10 also noticed that the performance remained consistent even as the company migrated its entire colocation DRaaS workload over to it; in the past, Peak 10 clearly had a problem with spinning disk technology in that performance tended to slowly degrade over time as capacity grew. Peak 10 also reduced its rack space requirements by over 90% and its energy consumption by 75%. The deployment allowed Peak 10 to continue to deliver to expected SLAs for its customers, but to do so more efficiently and less expensively. Based on what Peak 10 has seen in its first 6 months with the new system, the company expects that it will achieve a 3-year TCO that is roughly 35% less than before while providing better performance, significantly higher storage density, lower power consumption, and administrative savings in terms of both time and cost.

Peak 10 has also been pleased with the reliability and recovery aspects of the flash-optimized system. Individual flash devices (the InfiniFlash platform uses 8TB custom flash modules rather than solid state disks) have no moving parts and are much more reliable than mechanical hard disk drives. At Peak 10's multipetabyte capacities, the company was replacing failed HDDs more than it liked and noticed that as these devices aged, the failure rates increased. Peak 10's use of RAID technology shielded its customers from any downtime, but rebuild times were a concern for Peak 10 as the company considered the use of larger-capacity HDDs to help lower storage costs. Flash performance cut rebuild times, flash density promised to outstrip HDD densities going forward, and the ability of flash to quickly move large amounts of data also helped on other data protection metrics (RTO).

The capabilities of the system are also helping Peak 10 meet some other goals. Although initially deployed for file-based workloads (NFS shares), Peak 10 has since brought some dedicated block-based Microsoft SQL Server workloads online for select customers. The system's ability to support iSCSI is helping Peak 10 service high-performance workloads while moving away from its legacy FC infrastructure (which is very expensive). Peak 10's goal is to ultimately run most storage workloads across Ethernet, using FC only where it is an absolute requirement.

FUTURE OUTLOOK

The NexentaStor/InfiniFlash platform has been a good fit with Peak 10's environment, and the company recently purchased an additional 1PB of capacity for this NexentaStor-based environment. Given the success the company has had with its colocation DRaaS customers, Peak 10 plans to move its noncolocation customers to NexentaStor/InfiniFlash as the company retires other legacy storage capacity. Given what Peak 10 has seen with flash, the company plans to move more workloads to it

over time, only deploying HDDs in its cloud infrastructure when it can't justify flash based on performance, cost, ease of use, or efficiency.

"With the all-flash NexentaStor deployment, we've seen a number of performance, ease-of-use, and scalability benefits, and sometimes, these manifest themselves in unexpected ways," said Buzzard. "Many of our customers regularly perform DR tests, and depending on exactly what a customer was testing, concerns around disk performance could arise. With flash's lower latencies and higher throughput, those concerns have gone away." It is Peak 10's view that, by replacing the company's HDD-based infrastructure with NexentaStor and InfiniFlash, Peak 10 is effectively offering its customers improved service in ways that are distinctly noticeable to them at the same price they were paying before.

"As flash media costs continue to plummet, flash has become surprisingly cost effective," added Buzzard. "We'll look to use that wherever we can, minimizing our use of spinning disk technology to deliver better service with less management effort on our part. Flash is faster, denser, more power efficient, more reliable and, when combined with software like NexentaStor, also much easier to scale and manage. We've been extremely happy with our experiences with both Nexenta and Western Digital."

ESSENTIAL GUIDANCE

Peak 10's experience with both AFAs and SDS is being replicated across many enterprises and cloud providers alike. Almost all IT organizations that bring in an enterprise-class AFA very quickly want to move more workloads to it. In a recent IDC survey, 38% of IT organizations are already using an AFA or are currently running a proof of concept, and another 38% of them are looking to bring one in over the next 6–12 months. These data points are from IDC's most recent *Storage User Demand Study* for fall 2016. AFAs are clearly the future of primary storage, and products like InfiniFlash — when running enterprise-class unified storage software platforms like NexentaStor — are bringing the benefits of flash to additional workload types like DR that have traditionally been considered secondary.

SDS is another extremely high-growth new storage technology. In the most recent *Storage User Demand Study*, IDC found that SDS products built around open source technologies like Nexenta are gaining traction in IT organizations of all sizes relative to more proprietary SDS products. 26% of IT organizations are already running SDS in some form, and an additional 18% are currently running a proof of concept. The top 3 benefits these users cite for their SDS deployments are cost savings, ease of use, and agility (no vendor lock-in), and SDS is not just being deployed for secondary storage environments any more. *Software-Defined Storage Appearing in Production Deployments Across Organizations of All Types and Sizes* (IDC #US41655116, September 2016) discusses the findings from more detailed SDS research done by IDC, clearly noting that SDS is becoming an important deployment platform in enterprises and cloud-based environments alike.

Although some vendors are creating appliance-based offerings using SDS solutions, this approach may negate and defray some of the cost savings available when organizations are free to use the hardware platforms of their choice. As a mature cloud infrastructure provider, Peak 10 had access to sophisticated storage integration expertise that small and medium-sized enterprises may not, and Peak 10's decision to choose the hardware and software platforms independently and create the company's own solution required a bit more work on its part but paid off in terms of cost savings. In the cloud provider market where margins are already thin, the cost savings associated with this deployment model are extremely important. As an SDS provider, Nexenta makes its NexentaStor product available through a software-only model as well as through an appliance model (available from

Nexenta channel partners on different hardware platforms), giving IT organizations the flexibility to choose the consumption model that best meets their own requirements.

LEARN MORE

Related Research

- *Software-Defined Storage Appearing in Production Deployments Across Organizations of All Types and Sizes* (IDC #US41655116, September 2016)
- *Wipro Leverages Nexenta for Critical, Massively Scalable Virtual Desktop Project* (IDC #US41199416, May 2016)
- *IDC's Worldwide Software-Defined Storage Taxonomy, 2016* (IDC #US40951716, February 2016)
- *Worldwide Software-Defined Storage, 2014-2019: Forecast Report* (IDC #US40903816, January 2016)
- *IDC FutureScape: Worldwide IT Industry 2016 Predictions – Leading Digital Transformation to Scale* (IDC #259850, November 2015)
- *Software-Defined Storage: Web Survey Report* (IDC #259675, October 2015)
- *Software-Defined Storage: Executive Interview Report* (IDC #259672, October 2015)
- *Software-Defined Storage: Market Background, Trends, and Taxonomy, 2015* (IDC #258777, October 2015)

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