

Pac-12 Networks

Top sports network expands video content archive with SwiftStack

About Pac-12

Pac-12 Networks is the media and TV company of the Pac-12 Conference, broadcasting the sporting activities of 12 of the most prestigious universities in the country. Pac-12 Networks is one of the top live sports producers in the country. It incorporates one national and six regional TV networks along with an extensive digital content presence. Its content is available in 60 million homes in the US and 33 other countries, and it provides live coverage of over 850 sporting events each year as part of a 12 year \$3B television deal with Fox and ESPN.



Pac-12 could have doubled the number of disks in the existing SAN holding the tier 1 and 2 storage but the cost was prohibitive and it would only delay hitting inevitable scaling limits. Something else was needed.

Pac-12 had an initial list of four key criteria for the next storage tier: speed, durability, scalability, and affordability. Their existing SAN hardware only met the speed criteria. LTO tape options met three of the criteria but fell short in durability. Public cloud storage using either Amazon S3's or Glacier's public cloud failed to meet the affordability and speed criteria, respectively.

Object-based storage, especially in the form of software-defined storage, met all four of these initial criteria. But they found not all object storage was created equal. Faced with several object storage choices, Pac-12 added two more criteria to their list: openness and enterprise-grade.

Being open meant avoiding vendor lock-in and being free to select storage hardware from multiple vendors. Being enterprise-grade meant it had to be simple to manage and integrated easily with existing systems, like their legacy media asset management tools, and existing services, like directories for authentication. The IT group managing and maintaining the new storage tier consisted of just four staff members. Whatever they selected had to efficiently automate deployment and management tasks, and do proactive monitoring of the storage hardware and media.

Challenge

For every hour of live athletic events covered by Pac-12, about 8 hours of video content is captured. This content needs to be immediately available for broadcast and secondary uses, as well as being part of a permanent archival record that is securely stored and archived.

Pac-12 initially deployed a traditional SAN back when it started operations in 2012. The SAN consisted of two storage tiers – tier 1 was 100 TB of usable capacity on fast 15K rpm SAS drives, while tier 2 had 200 TB of slower SATA drives. Unfortunately, while the initial capacity of the SAN held about 9,000 hours of recording, it became clear that it was too small within six months.

SPOTLIGHT

USE CASES

- Cost effective online archiving of video content from other storage tiers
- Support for existing file-based media asset management tools

RESULTS

- Very low \$120/TB purchase cost
- Easy to manage and scale with limited staff
- No vendor or hardware lock-in for existing file-based media asset management tools

HARDWARE

- 10 storage nodes with 360 3TB drives
- 10 JBOD chassis to add 450 3TB drives
- Supermicro server and JBOD chassis
- Seagate Constellation CS SATA drives

STORAGE

- Currently 2.43PB raw, 810TB usable
- Adding 12TB of content every weekend
- Planning new storage region in China

CASE STUDY

Solution

Pac-12's final two criteria — openness and enterprise-grade — eliminated all of the object storage choices except one. Looking for a solution that fulfilled their openness criteria led them to OpenStack Swift, which they initially tried to deploy on their own. When that proved challenging they looked for tools that could automate deployment and management tasks for Swift. That need, plus the desire for an enterprise-grade solution for easy integration, led them to SwiftStack.

Pac-12 deployed their SwiftStack storage in two phases in their San Francisco data center. Phase 1 had 1.1PB of raw capacity, providing 360TB of usable space after replication overhead. This phase included ten storage nodes, each with thirty-six 3TB Seagate Constellation CS SATA hard drives. The storage nodes were built on Supermicro chassis with thirty-six 3.5" drive slots and a SAS expansion card for Phase 2.

The second phase added 1.33PB more raw capacity to bring the total usable capacity in SwiftStack up to 810 TB. This phase involved adding ten 4U Supermicro JBOD enclosures, each with forty-five 3TB drives, connected to the ten storage nodes deployed earlier.

Adding the new capacity to the existing storage cluster only involved plugging in a couple of mini-SAS cables and clicking on a few buttons in the SwiftStack Controller management interface. With SwiftStack capacity is gradually added to the cluster to minimize bandwidth requirements.

Savings

A key factor in favor of SwiftStack was its much lower cost compared to expanding the existing SAN or other hardware-based options. Phase 1 of the SwiftStack deployment had a total cost of only \$161 per TB of raw capacity. This was just 10% of the \$1,600 per TB cost to expand the capacity of their existing SAN.

The Phase 2 expansion made SwiftStack storage even more economical as it cost only \$88 per TB, dropping the overall cost of all of the SwiftStack storage to just \$120 per TB. Unlike with traditional hardware-based storage, when Pac-12 scaled out SwiftStack's software-defined storage it made capacity less expensive. The more they added, the cheaper it was per TB.

In addition to the cost savings provided by selecting SwiftStack, Pac-12 saw an immediate benefit when their tier 2 DDN SAN failed early one morning. Not only did they lose days of access to the data while the hardware

"SwiftStack's technology is stable, trustworthy and ready for production. It has saved our butts more than once already and I don't doubt it will save us again. Trust these guys, they know what they're doing!"

—Scott Adametz, Director, System Architecture & Technology, Pac-12 Networks

vendor repeatedly tried to replace a faulty controller but when a drive subsequent failed in the SAN, 174TB of video content instantly disappeared. With the SwiftStack archive already online and populated, it was a simple matter to restore the lost content from it once the SAN was working again.

Future Plans

Pac-12 is planning to expand its SwiftStack deployment to China where it has a growing fan base. Putting a SwiftStack storage region within China will improve access to content staging for video-on-demand distribution and simplify live-streaming in the country.

Moving from the current 2K to 4K and 8K content resolutions is also driving future capacity requirements. Higher resolution video makes zooming into the captured content for instant replays and game highlights easier in post-production. However, it also means that an hour of captured content may require up to four times more storage capacity.

Find Out More

For more information on SwiftStack's features, support, pricing and product documentation, visit swiftstack.com.

