Cool Vendors in Storage and Hybrid Infrastructure — Modernize Legacy, Prepare for Tomorrow

Published 25 May 2021 - ID G00746001 - 11 min read

By Analysts Jerry Rozeman, Arun Chandrasekaran, Julia Palmer, Jeffrey Hewitt, Jeff Vogel

Initiatives: Data Center Infrastructure

The rise of hybrid IT, cloud and multicloud storage presents a challenge for I&O leaders — adopting modernized workloads while also managing unstructured data growth and legacy technology. To address these challenges, I&O leaders should evaluate the cool vendors in this research.

Overview

Key Findings

- Modern storage solutions for Kubernetes-orchestrated workloads enable I&O leaders to improve performance, enhance data portability and facilitate collaboration, while also reducing centralized storage costs.

- I&O leaders can now leverage multicloud storage aggregation to deliver greater storage mobility for both traditional and Kubernetes applications.

- I&O leaders can transform their mainframe tape and backup environments with new cloud storage and data protection management technologies, enabling organizations to reduce storage costs and unlock new business value.

- Computational storage brings processing power directly to the storage device, which dramatically reduces the amount of data travelling between host and storage for compute- and storage-intensive workloads.

Recommendations

Infrastructure and operations (I&O) leaders responsible for data center infrastructure should:

- Adopt new hybrid cloud storage solutions that combine the benefits of both local nonvolatile memory express (NVMe) storage and shared storage solutions to reduce cost and increase performance for stateful applications.

- Create a uniform file storage architecture for modernized workloads that spans across multiple cloud storage solutions to support a global file, object and block storage solution.
Strategic Planning Assumptions

- By 2025, 35% of data center mainframe storage capacity for backup and archive will be deployed on the cloud to reduce costs and improve agility — up from less than 5% in 2020.
- By 2024, large enterprises will triple their unstructured file and object data storage, compared to 2020.
- By 2024, 40% of I&O leaders will implement at least one hybrid cloud storage capability — up from 15% in 2020.

Analysis

This research does not constitute an exhaustive list of vendors in any given technology area, but rather is designed to highlight interesting, new and innovative vendors, products and services. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

What You Need to Know

The storage market is continuously evolving to address new and existing challenges in enterprise IT. I&O leaders must leverage modernized storage solutions to reduce costs, while enabling business innovation at scale. The Cool Vendors in this research enable I&O leaders to address their critical storage needs by:

- Running stateful applications on high-performance local NVME storage while leveraging the benefits of shared storage.
- Aggregating storage across multicloud and on-premises data centers for block, file and object storage and delivering a global file system.
- Delivering the benefits of deduplication and compression everywhere by bringing and running these features directly to the flash drives (to leverage computational storage).
- Leveraging the benefits of cloud storage with mainframe storage requirements.

Many I&O leaders leverage high-performance storage technologies for traditional workloads, including local flash/NVMe storage devices or centralized shared flash/NVMe storage solutions. Each technology delivers benefits and challenges related to performance, cost and data mobility. While local flash/NVMe storage typically provides the best performance and cost-effectiveness, these solutions provide the least flexibility in terms of storage management and data portability (see Figure 1).
I&O leaders can now leverage the cost and performance benefits of local NVMe solutions to run high-performance, containerized, stateful applications while keeping the benefits of shared storage. Vendors like Arrikto are offering container-optimized storage solutions to deliver the benefits of running these applications on local NVMe devices, while also running them on shared cloud storage devices.

The expansive growth of unstructured data and the growing use of cloud-native storage creates challenges for I&O leaders, including:

- Multivendor storage management
- Vendor lock-in
- Data portability
Multicloud storage aggregation is the next step in offering a single storage pool that solves some of these challenges, as these solutions deliver greater storage efficiency by delivering a truly scalable global file system across multicloud and on-premises solutions. Vendors like Hammerspace are offering solutions that deliver these next generation of multicloud storage solutions.

I&O leaders also need storage management functions, such as deduplication and compression, to control the ever-growing demand of storage capacity. However, these functions consume host- or storage-controller processing resources and can negatively impact performance. Furthermore, new workloads like artificial intelligence (AI), machine learning (ML) and edge processing all require high-performance storage. Computational storage addresses these challenges by processing data directly on and by the solid-state drives. Vendors like ScaleFlux are pioneers in delivering computational storage solutions.

While mainframe computing is often considered legacy technology, it remains a bedrock of the global economy and provides unmatched transaction-processing capabilities. Nonetheless, open systems’ cloud storage and data protection management have significantly improved during the past few years, bypassing the mainframe. In response, I&O leaders can now integrate and replace their on-premises mainframe backup and tape storage systems with cloud-based data management solutions. These new offerings provide cost savings, increased business value and greater agility. Vendors like Model9 deliver solutions that integrate mainframe solutions with cloud storage resources.

Arrikto
San Mateo, California, U.S. (www.arrikto.com)

Analysis by Arun Chandrasekaran and Julia Palmer

Why Cool: Arrikto enables IT leaders to run machine learning (ML) workloads across hybrid cloud, on-premises and public cloud environments with a machine learning operations (MLOps) platform that is preintegrated with high availability and high-performance data storage. Arrikto allows organizations to build agile, scalable and portable ML pipelines on containers, orchestrated by Kubernetes. It provides tight integration and support for Kubeflow — a fast-growing MLOps open-source project to which Arrikto is a key contributor. Arrikto also provides IT leaders with the ability to snapshot an entire ML model (including its software code and data) and distribute the model efficiently — both across machines in the same cluster and across heterogeneous environments.

Arrikto offers two key enterprise products: Enterprise Kubeflow, a commercially supported MLOps product that simplifies reproducibility, data lineage, model portability and security of ML models; and Rok Data Management, which allows organizations to run stateful containerized machine learning applications over high-performance NVMe storage. The combination of these products enables IT leaders to modernize their workloads faster, enhance data science productivity and reduce the time to operationalize AI projects.
Challenges: While Arrikto delivers a unified product, it faces steep competition from both MLOps vendors — including public cloud providers, data science platform vendors, and other MLOps startups and AI data infrastructure vendors. Several large vendors, including Google and IBM, are commercializing Kubeflow, which complicates Arrikto’s go-to-market strategy (as it must both partner and compete with these vendors). The positioning of the company may also be confusing for clients, given that it tries selling to both data scientists and infrastructure engineers.

Who Should Care: IT, analytics leaders and AI architects looking to operationalize stateful ML projects — particularly projects running on Kubeflow — should evaluate Arrikto as a potential vendor.

Hammerspace
Los Altos, California, U.S. (www.hammerspace.com)

Analysis by Julia Palmer

Why Cool: Hammerspace is cool because it delivers a global file system that spans across on-premises and multiple public cloud providers to deliver all data to every application, no matter where it runs. Hammerspace delivers hybrid cloud storage virtualization and orchestration software for file services and provides multiple data services via virtual machines or bare-metal servers to manage data in a single global namespace. Hammerspace Global File System consists of two main components: MetaData Services, which is deployed and runs as a global back-end service across cloud and on-premises deployments; and Data Services, which provides data abstraction, storage, protection, life cycle management, replication, deduplication and compression, and connectivity to the public cloud. By managing metadata separately from data, Hammerspace’s Global File System enables I&O organizations to present file data globally without copying it. The system can utilize existing storage on-premises — at the edge and on public cloud unstructured data platforms.

Challenges: Hammerspace enters a crowded market of both established storage array vendors and emerging software-defined storage (SDS) companies targeting file workloads. Although Hammerspace Global File System offers unique and innovative global file system service capabilities, customers may be wary of investing in another solution on top of their existing platforms. In addition, Hammerspace’s solution may present more lock-in and be deemed as proprietary and hard to justify. While hybrid cloud storage providers and large enterprises are always seeking web-scale efficiency with scalable performance for unstructured data, Hammerspace will face tough questions about its product roadmap, financial viability and total cost of ownership (TCO), compared to competing on-premises and public cloud solutions.

Who Should Care: Hammerspace will appeal to I&O leaders and enterprise architects who are looking for elastic, scalable global file services that provide hybrid cloud connectivity and advanced global data services. Cloud architects should explore Hammerspace’s potential to deliver unified file services for unstructured data, while leveraging existing storage investments. Given its hardware-agnostic, cloud-ready nature and its pay-as-you-grow consumption model, Hammerspace could provide lower TCO to
large enterprises or service providers. It is particularly well-suited for hybrid cloud storage deployments of unstructured data with embedded unified management, data life cycle management, mobility and Kubernetes support.

Model9
Tel Aviv, Israel (www.model9.io)

Analysis by Jeff Vogel

Why Cool: Model9’s solution helps I&O leaders eliminate expensive mainframe tape backup systems and the associated perpetual software licenses while offloading backup data management to cloud storage. Model9 delivers a software-only data backup and recovery solution called Cloud Data Manager for Mainframe, as a cost-effective tool for running standard mainframe backup and recovery operations to any IP-enabled storage device eliminating the need for mainframe-specific infrastructure solutions. Cloud Data Manager for Mainframe leverages the IBM z Systems Integrated Information Processor (zIIP), 1 that in combination with Model9’s software also enables I&O leaders to migrate backup data into a hybrid cloud environment to support new use cases for reuse of data. By modernizing their mainframe backup data environment with Model9, I&O leaders can increase agility and optimize price and performance throughout the data life cycle while doing more with mainframe data.

Challenges: Despite its innovative software and favorable impact to mainframe backup costs and value-add cloud analytics, Model9 may find it difficult to convince IT organizations to replace their virtual and tape backup systems. Model9 will need to dedicate substantial effort and resources to educate mainframe users about the need or benefits to migrate their data to the cloud (as opposed to retaining familiar legacy systems). In some cases, I&O leaders may view any path to the cloud as an existential threat to on-premises mainframe operations.

Who Should Care: I&O leaders in banking, financial services and insurance (BFSI), transportation, healthcare, and government sectors who are responsible for mainframe management and infrastructure modernization should evaluate Model9. Its data management capabilities could be a good fit for I&O leaders seeking to modernize their mainframe backup storage environment and leverage cloud benefits, tools and third-party services. I&O leaders with a cloud-first strategy — especially those concerned about a potential mainframe skills gap — will likely find that the Model9 solution cost-effectively addresses their hybrid cloud mainframe storage needs.

ScaleFlux
San Jose, California, U.S. (www.scaleflux.com)

Analysis by Jeffrey Hewitt

Why Cool: Computational storage enables I&O leaders to deliver greater data processing and data storage cost-efficiency by bringing the compute functions to the flash device in the storage (rather than...
moving the data from the storage plane into the compute plane). ScaleFlux is cool because it brings data compression, decompression and data filtering to computational-storage flash drives (CSDs) that offer high capacity with strong performance at appealing prices. The ScaleFlux CSD 2000 Series data path compression/decompression engines enable the drive to store more GBs of data per GB of available flash space, while maintaining predictable high performance regardless of the read/write mix. Unlike other compression solutions that require modifications to the application, ScaleFlux's solution is transparent and does not require application integration. However, data filtering does require application integration, since information about the data format needs to be shared with the drive.

Challenges: To differentiate, ScaleFlux must develop compelling value propositions for optimal use cases. These value propositions either must work transparently or must account for applications that are not written to take advantage of computational storage, as these applications must be recompiled before ScaleFlux can provide value.

Who Should Care: I&O leaders seeking a cost-effective infrastructure solution for IoT edge, hyperconverged infrastructure, latency-sensitive databases and big data/analysis use cases should evaluate ScaleFlux. I&O leaders aspiring to achieve high performance and cost-effectiveness for these use cases do not need to modify their applications to take advantage of ScaleFlux's compression/decompression implementation. Users must be willing to write or recompile their applications to take advantage of additional computational storage capabilities, such as data filtering.

Evidence

1 What is IBM Integrated Information Processor?, IBM

Recommended by the Authors

2020 Strategic Roadmap for Storage
Hype Cycle for Storage and Data Protection Technologies, 2020
Cloud Storage Management Is Transforming Mainframe Data
An I&O Leader's Guide to Storage for Containerized Workloads
The Future of Software-Defined Storage in Data Center, Edge and Hybrid Cloud
4 Must Dos to Shift Storage and Data Management Strategy by Embracing Infrastructure-Led Innovation
Enterprise Storage as a Service Is Transforming IT Operating Models