MinIO Solution Profile

2022-23 DCIG TOP 5
MULTI-CLOUD SDS OBJECT STORAGE SOLUTIONS

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Multi-Cloud SDS Object Storage Solutions

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SOLUTION

MinIO

COMPANY

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DISTINGUISHING FEATURES OF MinIO

- Kubernetes-native
- S3 Compatibility
- Wide-deployment flexibility

DISTINGUISHING FEATURES OF TOP 5 SOLUTIONS

- Robust support
- Wide deployment options
- Multiple public clouds
- Directory service integration
- Robust analytics

SOLUTION FEATURES EVALUATED

- Deployment capabilities
- Data protection
- Product and performance management
- Technical support
- Licensing and pricing

Software-Defined Storage—From Edge to Multi-Cloud

Enterprise storage used to be only purchased as an appliance, with proprietary software inextricably bound to its hardware. Software-defined storage (SDS) changed this paradigm by separating the software from its underlying hardware. Decoupling the software from its physical storage opens many benefits.

Early applications for software-defined storage were limited, on-premises use-cases, but maturing SDS brought expanded features and deployment options. SDS reached out of the data center to the cloud. Organizations could tier data to cloud storage and even run SDS in the cloud within virtualized server environments.

Today, software-defined storage use-cases and deployments can be found everywhere data is stored, in IoT devices, edge locations, data centers, the public cloud, and multi-cloud storage architectures. These wide options for SDS deployment allow organizations to move and store data where it is needed most for cost, performance, security, and workload priorities.

IT organizations value SDS for its:

Flexibility. Organizations can download, deploy, and configure software-defined storage solutions where and how they want using their preferred server provider, which may differ from their preferred storage software vendor. Expanded deployment options within virtual, container, and cloud platforms eliminate vendor lock-in as SDS frees enterprises from particular hardware vendors and platforms.

Scalability. SDS solutions enable organizations to scale up or out depending on requirements. On-premises, organizations can add to their existing physical storage to expand their virtualized pool. For solutions utilizing public cloud storage, capacity is virtually unlimited. Such scalability helps organizations flex to their growing data and application needs.

Unified data management. Rather than different data silos where IT administrators have disparate views of storage, many SDS solutions enable organizations to view and manage their data holistically across their data center, organization, and even multi-cloud architecture. Global views, including permissions management, capacity utilization, and analytics, enable new opportunities for ensuring optimal performance and cost for managing an organization's data.

Cost efficiencies. SDS-based solutions bring savings and efficiencies compared with legacy storage systems. Using SDS, organizations can tier cold, untouched files to low-cost storage, whether on-premises or in the cloud. As organizations understand their trends in data growth using SDS data management features, they can better plan and budget. SDS solutions are known for supporting off-the-shelf storage devices in place of proprietary storage, which are often priced at a significant premium. Organizations can also reduce their storage expenses by optimizing existing storage for cost and performance.

API Automation. SDS solutions include application programming interfaces (APIs). With APIs organizations can link applications to each other, share data, and automate tasks. And for SDS Object Storage solutions, the S3 API plays a key role in providing a cloud-native environment across an organization's storage infrastructure.

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From Cloud to Multi-Cloud Architectures

There is little question AWS's introduction of Simple Storage Service (S3) in 2006[1] fueled the adoption of cloud-based storage, services, and workloads. One of the great benefits of the cloud is its simple value proposition: with a credit card, scalable compute and storage infrastructure becomes immediately available.

As a result of this cloud value proposition, most enterprises now spread storage, services, and workloads across multiple cloud providers, which may include their own on-premises private cloud. Cloud-native technologies and services have also spread to the edge, where one can argue that the cloud is now everywhere. In fact, 92% of enterprises employ a multi-cloud strategy to some degree.[2]

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Cloud-Native Object Storage

At the heart of cloud-native architectures resides object storage. Object storage has evolved from its modest role serving as backup and archive targets to become an essential part of cloud and enterprise storage in general. Object storage use-cases now abound: in the cloud, on-premises, and at the edge; appliance-based and software-defined; proprietary offerings and open-source solutions.

Technical organizations value object storage for its:

Scalability. There is a reason why all the public cloud providers primarily use object storage. Object storage's flat architecture without folders, hierarchical structures, or built-in limits does away with the scaling limitations of file systems. Plus, object storage scales at a more affordable price per terabyte than contrasting file storage systems.

Metadata. When storing large amounts of unstructured data, there is the need to make sense of that data. A key characteristic of object storage is the ability to attach customizable metadata to objects. Meta comes from the Greek word meaning 'with' or 'beside.' Metadata is a small amount of structured data associated with the object itself. User-defined metadata enables applications to perform bulk functions upon objects such as searching, indexing, and analyzing objects.

Self-protecting. Inherent within object storage solutions are protection capabilities to ensure data resiliency and durability. Often as a standard feature, object storage solutions include erasure coding and replication. Erasure coding segments and distributes data across multiple nodes or sites. Replication stores multiple copies of the data. Data may be restored to an original state from erasure-coded segments in the event of storage component failures, preventing data loss.

S3 API. Amazon's S3 API, has become the API standard for object storage. All object storage vendors DCIG evaluated support the S3 API to some extent. With S3, organizations can access their object stores, authenticate data, obtain object properties, and manage permissions. With S3-compatible storage, organizations can move their data between object storage services for cost savings or specialized workloads.

Software-Defined Storage—Smoothing the Edges of Multi-Cloud Data Storage

While multi-cloud deployments bring flexibility to IT organizations, they also bring complexity. For example, administrators must understand different user interfaces and cloud management tools. Further, while all cloud providers offer object storage, the API sets

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between cloud providers often vary. API differences result in issues when moving data between providers, varied performance between cloud providers, and challenges when cloud providers update their APIs.

Software-defined storage smooths the edges of multi-cloud data management. A key way multi-cloud SDS solutions remove complexity is through abstracting the underlying cloud storage infrastructure. Cloud abstraction allows SDS to provide a unified presentation of an organization's object storage across cloud providers and on-premises locations.

Further organizations can use SDS software to:

Organizations can use SDS solutions to move data to the cloud platform for the best capabilities—this may be to cloud providers for cost savings or to cloud-based services for AI/ML workloads.

Orchestrate multi-cloud data movement. Enterprises value multi-cloud SDS solutions for their capabilities to control data movement into, out of, and between cloud storage providers. Container deployments of SDS within cloud platforms remove vendor-dependent APIs, as organizations can use a single, consistent API regardless of the cloud platform.

Expose data to cloud-based workloads. Enterprises teams such as DevOps, can use SDS to expose data to cloud-based workloads. This may be containerized applications or cloud-based services such as analytics or AI/ML workloads. Organizations may also use SDS software to support cloud-based file services, where objects are stored in the cloud but presented as a file infrastructure to users and applications.

Expand data protection. Organizations can backup, replicate, and store distributed copies of their storage and archives across multiple cloud providers and regions. These options expand the possibilities for protecting data from cloud and on-premises outages.

Select best-of-breed cloud capabilities. Organizations can use SDS solutions to move data to the cloud platform for the best capabilities—this may be to cloud providers for cost savings or to cloud-based services for AI/ML workloads. Choosing between cloud providers for best-of-breed helps organizations generate more value from their data.

Enforce data sovereignty. Regulations may require data originating within a country's borders to remain within those borders. Organizations can move and store their data to cloud regions, cloud providers, or on-premises locations to comply with data sovereignty requirements.

Implement multi-cloud data management. Where deployed, multi-cloud SDS object storage solutions provide global visibility of object stores across cloud providers and on-premises locations. Through metadata-driven data management and user-defined policies, SDS automates data movement so that data is on the right media and platform for the right service.

View multi-cloud storage analytics. Multi-cloud SDS object storage solutions combine global visibility with storage analytics. Storage analytics opens insights into performance, usage, capacity, and other key system metrics across individuals, teams, tenants, and departments. Armed with patterns and trends of their data landscape, IT decision-makers can make knowledgeable business and storage decisions across multiple storage types and cloud vendors.

Provide multi-cloud search capabilities. Multi-cloud SDS object storage enables metadata search capabilities across cloud providers for data recovery, retrieval, and orchestration. Organizations can use these capabilities to create new data lakes to extract new business insights.

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In short, multi-cloud SDS simplifies multi-cloud complexity, collapses cloud and on-premise silos, and unifies data management across an organization's object store regardless of the media, location, or platform. As a result, SDS expands opportunities organizations would not otherwise have with their object data. Combine this with enterprise-class performance and features the best SDS solutions also bring to organizations, and the reasons become clear why SDS has become an indispensable tool for managing multi-cloud storage architectures.

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Distinguishing Features of DCIG TOP 5 Multi-Cloud SDS Object Storage Solutions

DCIG evaluated eighteen SDS-based solutions for an multi-cloud object storage use case. Using feature-based analysis and comparisons of defensible data derived from publicly available sources, vendors, and DCIG's own experience, DCIG's TOP 5 Multi-Cloud SDS Object Storage Solutions evidence these characteristics in contrast with the other evaluated solutions.

Robust support. DCIG TOP 5 providers display robust support capabilities. All TOP 5 vendors provide 24x7x365 technical support, and at a minimum, one-hour support response times. Each of the TOP 5 solutions supports real-time reporting to the solution vendor for expedited trouble reporting and resolution compared with 69% of the other evaluated solutions. All five vendors offer community support forums and knowledgebases for self-service support. In short, DCIG TOP 5 solutions evidence a greater breadth of support options than the other solutions.

Wide deployment options. DCIG TOP 5 solutions offer ample deployment options compared with the other evaluated solutions. Examples include deployment support on bare metal servers, commodity x86 servers, Linux operating systems, public cloud, and VM environments. Wide deployment options give organizations flexibility for using SDS Object Storage for their specific situations.

Multiple public clouds. Enterprises leverage the public cloud for backup, archiving, disaster recovery, and cloud-based workloads. DCIG TOP 5 solutions support multiple public cloud providers. Such broad support offers flexibility in matching a cloud provider's cost and capabilities with the needs of the business.

Directory services integration. DCIG TOP 5 solutions show broad support for directory service and authentication features. All support AD/LDAP integration, IAM authentication, and object level access control lists for data security. In contrast, only 34% of the other evaluated solutions provide IAM and Object-Level Access Control List support.

Robust analytics. DCIG TOP 5 Solutions deliver extensive analytic capabilities. Analytics give organizations insights into their data patterns and trends. These insights help IT decision-makers plan, budget, and optimize their object storage usage.

MinIO Inc. MinIO

DCIG ranks MinIO as a TOP 5 Multi-Cloud SDS Object Storage solution.

MinIO's founders created MinIO to do one thing very well: serve objects fast. Because MinIO is purpose-built to serve only objects, a single-layer architecture achieves all necessary functionality. MinIO's open source solution deploys across a wide variety of platforms and hardware. Enterprises may manage their MinIO object storage through

Customers can deploy MinIO's object storage solution themselves or simplify cloud deployment by taking advantage of MinIO's native marketplace SDS offerings on AWS, GCP and Azure.

the MinIO Client (command line), MinIO Console (GUI), or MinIO Operator (Kubernetes). MinIO provides straightforward licensing with a no-charge community support plan, a standard plan, and an enterprise plan. Priced on capacity and billed monthly, one license covers the storage suite. Paid licenses include SUBNET, MinIO's subscription network offering of 24x7x365 engineering support, architecture and security reviews, and health diagnostic capabilities.

Notable features that earn MinIO a DCIG TOP 5 award include:

Kubernetes-native object storage. Enterprises will find MinIO available on every Kubernetes distribution. Purpose-built to take full advantage of the Kubernetes architecture, MinIO's lightweight binary efficiently co-locates multiple tenants. Tenants have the full feature set available as with MinIO's bare metal deployments. MinIO's Operator (Kubernetes CLI plugin) and Operator Console (GUI) ease Kubernetes storage deployment and management. MinIO also supports Container Object Storage Interface, which provides a set of APIs for automating the provisioning and management of object storage in Kubernetes.

S3 Compatibility. S3 compatible from inception, MinIO was one of the earliest adopters of Amazon's S3 RESTful API (v2 and v4). In addition to the common commands for S3 file handling, MinIO supports Amazon S3 server-side encryption APIs (SSE-S3, SSE-KMS, SSE-C) for data security and protection. MinIO ensures ongoing S3 compatibility through its extensive group of commercial and community users running diverse hardware, software, and applications. Such wide implementation and testing ensures enterprise applications can leverage MinIO object stored data regardless of the location or cloud in which it resides.

Wide-deployment flexibility. MinIO enables deployment flexibility from edge locations to the cloud. MinIO can also be used in all major public cloud platforms such as Azure, Google Cloud Platform, or Alibaba. Customers can deploy MinIO's object storage solution themselves or simplify cloud deployment by taking advantage of MinIO's native marketplace SDS offerings on AWS, GCP and Azure. Within a few clicks, enterprises can deploy MinIO's object storage solution in the cloud optimized for each cloud based on MinIO's broad experience. ■

Sources - Referenced in April 2022

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