2022-23 DCIG TOP 5

ENTERPRISE STORAGE AS A SERVICE SOLUTIONS

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Enterprise Storage as a Service Solutions

SOLUTIONS EVALUATED:

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SOLUTION FEATURES EVALUATED:

- *Deployment Options*
- *Licensing and Pricing*
- *Product Features*
- *Technical Support*

Enterprises are on a journey to a cloud operating model for offering and consuming information technology as a service, whether in the public cloud or on-premises. Indeed, IDS estimates that cloud infrastructure spending now exceeds non-cloud spending.[1]

Maturing infrastructure automation tools and the application of artificial intelligence and machine learning to the management of storage has created an opportunity for storage vendors to participate in this enterprise journey to the cloud by offering their storage solutions as a service.

Storage as a Service Defined

DCIG defines storage as a service (STaaS) as a storage consumption model where enterprises purchase storage as a subscription with billing based on storage usage, whether deployed on-premises or in the cloud. Storage vendors bill for usage based on various metrics, generally some combination of capacity and performance.

STaaS offers new acquisition and deployment options that give organizations greater agility and flexibility in deploying storage capacity whenever and wherever needed, without sacrificing the enterprise data services they rely on to store and protect vital corporate data. STaaS solutions offer multiple business benefits.

Benefits of Storage as a Service

Financial. The traditional enterprise storage acquisition process involves estimating storage requirements several years into the future and selecting and purchasing storage based on those estimates. With STaaS, enterprises pay only for the storage they currently need. The vendor monitors usage and adds capacity and performance resources as necessary during the agreement term.

STaaS enables organizations to preserve cash by:

- spending less upfront
- aligning costs more closely with revenue
- eliminating waste due to forecasting errors
- protecting budgets from cost surprises through simple, predictable pricing

While some people look at STaaS primarily as a model for financing infrastructure that aligns cost with actual usage, others see it as a mechanism to bring the cloud operating model to on-premises storage or as a tactical move to enable them to move workloads to the cloud.

Agility and flexibility. A well-executed STaaS deployment should do more than conserve cash. It should also deliver greater agility and flexibility to support changing business requirements, especially unexpected events that fall within the planning horizon. These include events as dramatic as a global pandemic or as mundane as putting a new application into production.

STaaS enhances agility by speeding up the initial deployment of the solution. STaaS reduces the number of hours enterprises must invest upfront in developing detailed forecasts of performance and capacity requirements. Instead, they only need to understand if the STaaS solution fits their current requirements and can scale to meet their likely future requirements.

1. https://www.idc.com/getdoc.jsp?containerId=prUS49426222. Accessed July 5, 2022.

A well-executed STaaS deployment should do more than conserve cash. It should also deliver greater agility and flexibility to support changing business requirements.

STaaS also enhances agility by speeding the implementation of new applications. Solution providers pre-install extra storage beyond the contracted capacity. This buffer capacity is immediately available for allocation. STaaS providers also monitor storage utilization and add capacity and performance resources as the customer's utilization reaches agreed-upon thresholds. Thus, a good STaaS solution ensures that projects move forward without being delayed by the traditional months-long storage acquisition process.

Most STaaS solutions provide self-service and automation capabilities. Giving developers and application owners self-service provisioning of storage resources, self-service data recovery, and automated data protection accelerates application development and deployment by eliminating time-consuming, error-prone manual processes.

Expert management and support. With STaaS, organizations can benefit from storage acceleration and scalability of the latest storage systems without having to become experts in those systems. Most STaaS providers are responsible for keeping their solutions updated and available. Enterprise IT still manages storage volumes for its applications, but the provider manages the underlying storage system(s). Customers benefit from the provider's expertise in managing its solution while reducing the time IT staff must dedicate to maintaining storage systems.

Reduced risk. Traditional storage management requires specialized skills, and the departure of staff with those skills creates business risk. STaaS solutions reduce this staffing risk through vendor-provided expert monitoring, management, and maintenance of the storage infrastructure.

Sustainability. STaaS can also contribute to enterprise sustainability goals. STaaS enables more effective use of energy and materials by avoiding the traditional overprovisioning of storage systems. Some STaaS offerings incorporate complete lifecycle hardware management, including responsible refurbishing or recycling.

Distinguishing Features of TOP 5 Enterprise Storage as a Service Solutions

Deployment flexibility. The TOP 5 Enterprise STaaS solutions offer greater deployment flexibility than the other solutions DCIG evaluated. The TOP 5 vendors partner with more colocation facilities than the other solutions DCIG evaluated. Four of the five can also be deployed as software-defined storage on-premises, in MSP facilities, and in the vendor's own facilities.

Multi-protocol storage. In addition to block storage, 4 of the 5 solutions also support NFS and SMB file protocols, bringing the benefits of STaaS to a broader set of workloads and enhancing the opportunity for additional workload consolidation onto the STaaS platform. All TOP 5 solutions also provide container support via CSI drivers.

Quality of service. Most of the TOP 5 solutions offer a richer set of quality-of-service (Q0S) features than their peers. In combination with support for multiple protocols, rich QoS enables confident consolidation and acceleration of more enterprise workloads. Accelerating and consolidating workloads increases production while reducing costs.

Similarities among the TOP 5 Enterprise Storage as a Service Solutions

In addition to the distinguishing features that all DCIG TOP 5 solutions share, the solutions also have the following traits in common.

- All integrate with enterprise authentication mechanisms, including Active Directory/LDAP. This integration helps to ensure that only authorized personnel can access and manage storage resources.
- Pre-built integrations for Ansible provide the foundation for automating infrastructure operations.
- Automated policy-based storage provisioning enables self-service and the adoption of the cloud operating model on-premises.
- Service availability 24x7x365, with service response times of 1 hour or less. Responsive service is critical to success with STaaS.

STaaS offers new acquisition and deployment options that give organizations greater agility and flexibility in deploying storage capacity whenever and wherever needed.

Differences between the TOP 5 Enterprise Storage as a Service Solutions

The TOP 5 solutions differ from one another in the following ways.

- **Capacity and form factor.** The TOP 5 are suitable for a wide range of requirements, nevertheless, they differ in their minimum capacity and form factor. Solutions supporting smaller capacities and form factors, such as Zadara, are a better fit for edge environments. Solutions delivered as a full rack, such as Infinidat, are a better fit for the core enterprise data center.
- **Licensing.** The DCIG TOP 5 solutions all base licensing on a reserved capacity but differ in whether they charge burst capacity at a premium rate or the same rate as the base capacity. Some of the solutions also use throughput or IOPS. These additional pricing elements enable enterprises to fine-tune the solutions to their needs, yet may add more decision points to the purchase and ongoing management of the STaaS solution.
- **Deployment options.** All TOP 5 STaaS solutions are available as pre-integrated appliances on-premises. A subset of these STaaS solutions is also available in the public cloud, enabling more optionality and deployment speed.
- **Ecosystem.** Solution ecosystems matter because they enable greater optionality, speed, and confidence. This is true when deploying new applications or servicing new geographies. Ecosystem specifics vary among the TOP 5 solutions. including enterprise databases and other software applications, data protection, and recovery options. Some also go beyond STaaS to offer other data center infrastructure elements as a service, including compute and networking.

Top 5 Enterprise Storage as a Service Solution Profiles

Each DCIG TOP 5 Enterprise Storage as a Service Solution Profile highlights three notable solution features that make the product attractive to enterprises.

Enterprise Storage as a Service Solutions

Pure Evergreen//One delivers the Pure storage portfolio based on service level agreements (SLAs) and capacity with SLA-based performance guarantees.

Pure Storage Evergreen//One

Pure Storage remains true to its founding focus on transforming the enterprise storage ownership experience. This focus has taken Pure Storage well beyond NVMe-enabled storage performance to include non-disruptive expansion and upgrades, proactive support based on storage analytics, and its Evergreen "subscription to innovation" programs.

Now, Pure Storage Evergreen//One provides a true OPEX-based enterprise storage as a service subscription. Evergreen//One covers FlashArray block storage, FlashBlade unified fast file and object storage, FlashStack converged infrastructure, and Pure Cloud Block Store in AWS and Azure. A single subscription can include storage in on-premises data centers, colocation/hosted facilities, and the public cloud via Pure Cloud Block Store.

Three of the key features that earned Pure Evergreen//One a spot among DCIG TOP 5 Enterprise Storage as a Service Solutions include:

- **Pure1® storage management platform.** Pure1® is Pure Storage's cloud-based AI-assisted, centralized data storage monitoring, management, and reporting system for an enterprise's fleet of installed Pure Storage systems. As part of the Evergreen//One subscription, Pure continuously monitors workload performance and capacity requirements on-premises and in the cloud and provides predictive analysis and fault prevention via Pure1.
- **SLA-based performance guarantees.** An Evergreen//One subscription eliminates storage capacity and storage performance management headaches.

  Pure Evergreen//One delivers the Pure storage portfolio based on service level agreements (SLAs) and capacity. Pure guarantees to meet these workload SLAs across time by providing the components required to meet the SLAs, such as storage controllers and additional storage modules.

  Pure maintains 25% headroom (up to 100TiB) beyond the committed or "reserve" capacity. This reserve enables enterprises to non-disruptively handle temporary spikes in demand and incremental storage growth without resetting the contract's ongoing cost basis. Any on-demand usage is billed monthly based on that month's daily average capacity utilization.
- **Deploys rapidly in the public cloud.** As part of Pure Evergreen//One, enterprises may deploy Pure Cloud Block Store natively in the public cloud via the AWS and Azure marketplaces. The unified subscription of Evergreen//One allows capacity on-premises to be seamlessly moved to the cloud or back in the same subscription. Because of these "in the public cloud" deployment options, enterprises may deploy Pure immediately, and potentially completely deploy within ten (10) business days.

IBM Storage as a Service

IBM bases its Storage as a Service offering on IBM FlashSystem all-flash array technology. IBM offers multiple options within its STaaS offerings based on performance, capacity, and duration with a minimum commitment of 12 months. IBM bills for base capacity annually and flexible capacity quarterly.

Customers can choose one of three FlashSystem performance tiers, with options for 100% guaranteed or 99.9999% availability:

- Tier 1 minimum capacity is 25 TB at 4,500 IOPS per TB
- Tier 2 minimum capacity is 50 TB at 2,250 IOPS per TB
- Tier 3 minimum is 100 TB at 600 IOPS per TB

IBM installs whatever FlashSystems are necessary to meet the STaaS contract commitment, plus 50% additional storage beyond the committed capacity to enable instant capacity growth or workload bursting. IBM Storage as a Service further reduces the management overhead and risk associated with storage capacity planning and procurement by proactively installing additional storage if provisioned capacity reaches 75% of installed capacity.

IBM Storage as a Service can extend into the IBM Cloud® via Spectrum Virtualize in the IBM Cloud, plus the big three public clouds via Spectrum Virtualize for Public Cloud.

Three of the key features that earned IBM Storage as a Service a spot among DCIG TOP 5 Enterprise Storage as a Service Solutions include:

- **Comprehensive support with complete lifecycle management.** IBM Storage as a Service includes Expert Care Premium as part of complete lifecycle management, and an IBM Technical Account Manager is assigned to each STaaS customer. IBM's STaaS also includes remote software installation and same-day on-site hardware support. IBM monitors utilization and adds capacity or refreshes technology as needed, including properly recycling old equipment.
- **Broad colocation and cloud partnerships.** IBM has the broadest range of partnerships with colocation providers, including China Telecom/Unicom and Global Switch. IBM has partnered with Equinix® to provide a dedicated interconnection to the IBM Cloud®, as well as to other major cloud providers.

  IBM Storage as a Service can extend into the IBM Cloud® via Spectrum Virtualize in the IBM Cloud, plus the big three public clouds via Spectrum Virtualize for Public Cloud.

  These partnerships allow enterprises to manage hybrid cloud data consistently while making data available to cloud-based workloads.
- **Part of a comprehensive "as a service" catalog.** IBM offers a comprehensive and unique enterprise infrastructure "as a service" catalog. The catalog includes IBM Z, IBM Power, and the full range of services available in the IBM Cloud, such as IBM Watson, IBM Cloud Paks, and the IBM Blockchain Platform.

Infinidat Storage as a Service

Infinidat offers two different STaaS consumption and deployment models for its InfiniBox®, InfiniBox™ SSA, and InfiniGuard® enterprise storage platforms. Infinidat's STaaS offerings include a complete set of enterprise data services, including remote replication (synchronous and asynchronous), Infinidat's InfiniSafe® cyber resilience software, and a 100% availability guarantee.

Infinidat ships a fully-configured storage rack. As the enterprise needs more storage, it simply adds additional capacity from the already installed array, making expansion instantaneous.

Elastic Pricing (formerly called "Capacity on Demand (COD)") is a hybrid CAPEX/OPEX approach where the enterprise purchases a percentage of the storage appliance up-front. Expansion can either be purchased or burst month-to-month.

Infinidat FLX is a true cloud-like OPEX-based all-inclusive enterprise STaaS subscription. FLX provides pay-as-you-go scalability (up or down), with support and hardware included for the life of the term.

In both scenarios, Infinidat ships a fully-configured storage rack. As the enterprise needs more storage, it simply adds additional capacity from the already installed array, making expansion instantaneous.

Three of the features that earned Infinidat's STaaS a spot among DCIG TOP 5 Enterprise Storage as a Service Solutions include:

- **AI inside and outside the box:** Every InfiniBox benefits from Infinidat's patented Neural Cache: its data distribution and placement engine that leverages machine learning to get the right data on the right media (DRAM, NAND, or rotational) at the right time without tuning. This ensures maximum performance with minimum administrative overhead. Additionally, InfiniVerse® is Infinidat's cloud-based monitoring, AI-based predictive analytics, and support AIOps software. InfiniVerse enables Infinidat support engineers to take preventative actions before the customer is impacted.

  Outside of the box, Infinidat leverages its comprehensive API to integrate with data center AIOps vendors such as ServiceNow and VMware. This allows enterprises to incorporate Infinidat storage platforms into a broader data center view.
- **Multi-petabyte rack-scale infrastructure:** Infinidat designed its platforms for multi-petabyte storage environments. InfiniBox is a rack-based system that ships pre-configured at full capacity of up to 4PB usable storage per rack before compression. This approach facilitates rapid deployment at a customer location and instant capacity expansion for the storage as a service subscriber.
- **Infinidat white glove service:** Infinidat comprehensive service and support includes its AIOps-based support software, 24x7x365 technical support with rapid SLA response times, and its Technical Advisor program. Infinidat assigns a named engineer to each customer for the duration of the storage as a service agreement, as a Technical Advisor. The Technical Advisor is an experienced Storage Systems Engineer who provides a full spectrum of services and acts as a customer advisor.

Nutanix Unified Storage as a Service

Nutanix designed its platform to deliver anything-as-a-service (XaaS) for hybrid multi-cloud environments, including Nutanix Unified Storage.

Nutanix designed its platform to deliver anything-as-a-service (XaaS) for hybrid multi-cloud environments, including Nutanix Unified Storage. Nutanix built Nutanix Unified Storage (NUS) on the foundation of its distributed storage architecture. NUS is available as STaaS through the Nutanix partnership with HPE Greenlake. On Greenlake, several hardware configurations are offered to support the Nutanix environment. It is also available through various managed service providers.

In 2022, Nutanix simplified its product offerings and licensing model in ways that enable greater flexibility in supporting on-premises, hybrid cloud, and multi-cloud enterprise data environments. Licenses are now portable across deployment scenarios.

As its name implies, Nutanix Unified Storage (NUS) supports the full range of protocols. Customers no longer need separate licenses for Nutanix Files, Blocks, and Objects products. Licensing is based on the aggregate amount of usable capability from 1TB to multi-petabyte data stores, with tiered capacity management and what Nutanix calls "temperature-based costing."

Three of the key features that earned Nutanix Unified Storage a spot among DCIG TOP 5 Enterprise Storage as a Service Solutions include:

- **Unified data management.** The product covers the full range of protocols and use cases; all managed via a unified control plane. This unified control plane includes on-premises and cloud deployments, simplifying this challenging management task in an era of explosive data growth.

- **Comprehensive solution.** Nutanix's longtime focus on operational simplicity, expressed in its 1-click approach to operations, brings the cloud operating model to the entire storage infrastructure. It offers rich integrated analytics, lifecycle data management, data governance, ransomware resilience, and disaster recovery.
- **Extensive ecosystem.** Nutanix has developed an extensive ecosystem of enterprise technology companies, from public cloud providers and solution ISVs to data protection vendors. Nutanix claims more than 700 validated solutions, and was recognized as the 2022 HPE GreenLake Ecosystem Partner of the Year.

Zadara zStorage

Zadara's federated edge program enables enterprises to address edge storage requirements across many regions through a single agreement.

Zadara started as a storage-as-a-service company and now offers a complete compute, networking, and storage stack. Zadara zStorage's simple pricing, comprehensive protocol support, robust data services, and fully managed infrastructure make it a very attractive storage as a service offering for the enterprise. It offers a cost-effective OPEX-based approach to storage based on capacity used, with a minimum contract term of twelve months for enterprises and managed service providers (MSPs) deploying zStorage in their own facilities. MSPs may offer zStorage to end-users for much shorter durations, such as monthly or hourly.

zStorage provides all the data services enterprises expect on an all-inclusive basis, with no extra fees for data services. These services include thin provisioning, multi-zone high-availability, remote mirroring, non-disruptive upgrades, at-rest and in-flight data encryption, per-volume quality of service, auto-tiering, erasure coding, and immutable object lock in compliance mode.

Three of the key features that earned Zadara zStorage a spot among DCIG TOP 5 Enterprise Storage as a Service Solutions include:

- **All services, one scale-out architecture.** Zadara delivers all its managed edge cloud services, including zCompute, zNetwork, and multi-protocol zStorage, from a single scale-out architecture. This approach reduces the minimum required data center footprint compared to other solutions, making Zadara well-suited for edge deployments.
- **Rapid deployment and comprehensive proactive support increase operational agility.** Zadara provides 24/7/365 proactive support, including hardware and software maintenance and upgrades. According to Zadara, a deployment can be completed within days, typically within a week. Thus, Zadara zStorage enables IT departments to say "Yes" to new workloads and quickly get them into production.
- **Federated edge.** Organizations may deploy Zadara zStorage on-premises, at colocation facilities including Cyxtera and Equinix, and in MSP facilities. These public cloud adjacent, global points of presence provide geographic proximity for low-latency access and data sovereignty compliance, along with a consistent hosting experience.

  Uniquely, Zadara's federated edge program provides MSPs with a fully OPEX-based approach to infrastructure and an opportunity to grow new revenue streams without CAPEX risk. As a result, Zadara's rapidly expanding global partner network of solution providers already offers several hundred edge cloud locations.

  The structure of the federated edge program enables enterprises to address edge storage requirements across many regions through a single agreement. This federation also expands the reach of each participating MSP. As with its enterprise clients, Zadara manages the technical infrastructure of the solution for its MSP partners.

Inclusion and Evaluation Criteria for Enterprise Storage as a Service Solutions

In this report, DCIG specifically focused on *2022-23 DCIG TOP 5 Enterprise Storage as a Service Solutions* possessing the following characteristics. DCIG identified twelve different solutions meeting these inclusion criteria.:

- The STaaS provider must manage the solution on-premises, to include:
  - Upgrading storage software and firmware
  - Monitoring storage system performance
  - Acting on storage system alerts
  - Managing hardware expansions and failed equipment replacement
  - Maintaining adequate storage capacity and performance to meet service level agreements (SLAs)
- The solution provider MAY also offer the solution in public cloud environments, colocation facilities, and its own data center(s)
- The solution must be shipping and available by June 25, 2022
- Sufficient, publicly available information available for DCIG to make an informed decision

DCIG evaluated each of these solutions in the following areas:

1. ***Deployment options.*** Evaluate the capabilities concerning on-premises, colocation, and public cloud deployment options.
2. ***Product features.*** Evaluate options including storage protocols supported, encryption features, quality of service features, auto-tiering capabilities, and directory service integration.
3. ***Technical support.*** Evaluate the availability and technical support options of the solution provider. Examples include support availability, response time commitments, options to open cases, escalation support, and proactive problem resolution.
4. ***Licensing and pricing.*** Evaluate the relative ease of doing business through flexibility and simplicity in contract lengths, pricing elements, and bundled pricing options.

DCIG Disclosures

Vendors of some of the solutions covered in this DCIG TOP 5 report are or have been DCIG clients. This is not to imply that their solution was given preferential treatment in this report. In that vein, there are some important facts to keep in mind when considering the information contained in this TOP 5 report and its merit.

- No vendor paid DCIG any fee to research this topic or arrive at predetermined conclusions.
- DCIG did not guarantee any vendor that its solution would be included in this TOP 5 report.
- DCIG did not imply or guarantee that a specific solution would receive a TOP 5 designation.
- All research is based upon publicly available information, information provided by the vendor, and the expertise of those evaluating the information.
- DCIG conducted no hands-on testing to validate how or if the features worked as described.
- No negative inferences should be drawn against any vendor or solution not covered in this Top 5 report.
- It is a misuse of this TOP 5 report to compare solutions included in this report against solutions not included in it.

DCIG wants to emphasize that no vendor was privy to how DCIG weighted individual features. In every case, the vendor only found out the rankings of its solution after the analysis was complete. To arrive at the TOP 5 solutions included in this report, DCIG went through a seven-step process to come to the most objective conclusions possible.

1. DCIG established which features would be evaluated.
2. The features were grouped into four general categories.
3. A DCIG analyst internally examined the feature data for each solution and completed a survey for it based upon the analyst's own knowledge of the solution and publicly available information.
4. DCIG identified solutions that met DCIG's definition for an Enterprise Storage as a Service solution.
5. DCIG weighted each feature to establish a scoring rubric.
6. DCIG evaluated each solution based on information gathered in its survey.
7. Software offerings were ranked using standard scoring techniques. ■

About DCIG

The Data Center Intelligence Group (DCIG) empowers the IT industry with actionable analysis. DCIG analysts provide informed third-party analysis of various cloud, data protection, and data storage technologies. DCIG independently develops licensed content in the form of DCIG TOP 5 Reports and Solution Profiles. Please visit **www.dcig.com.**