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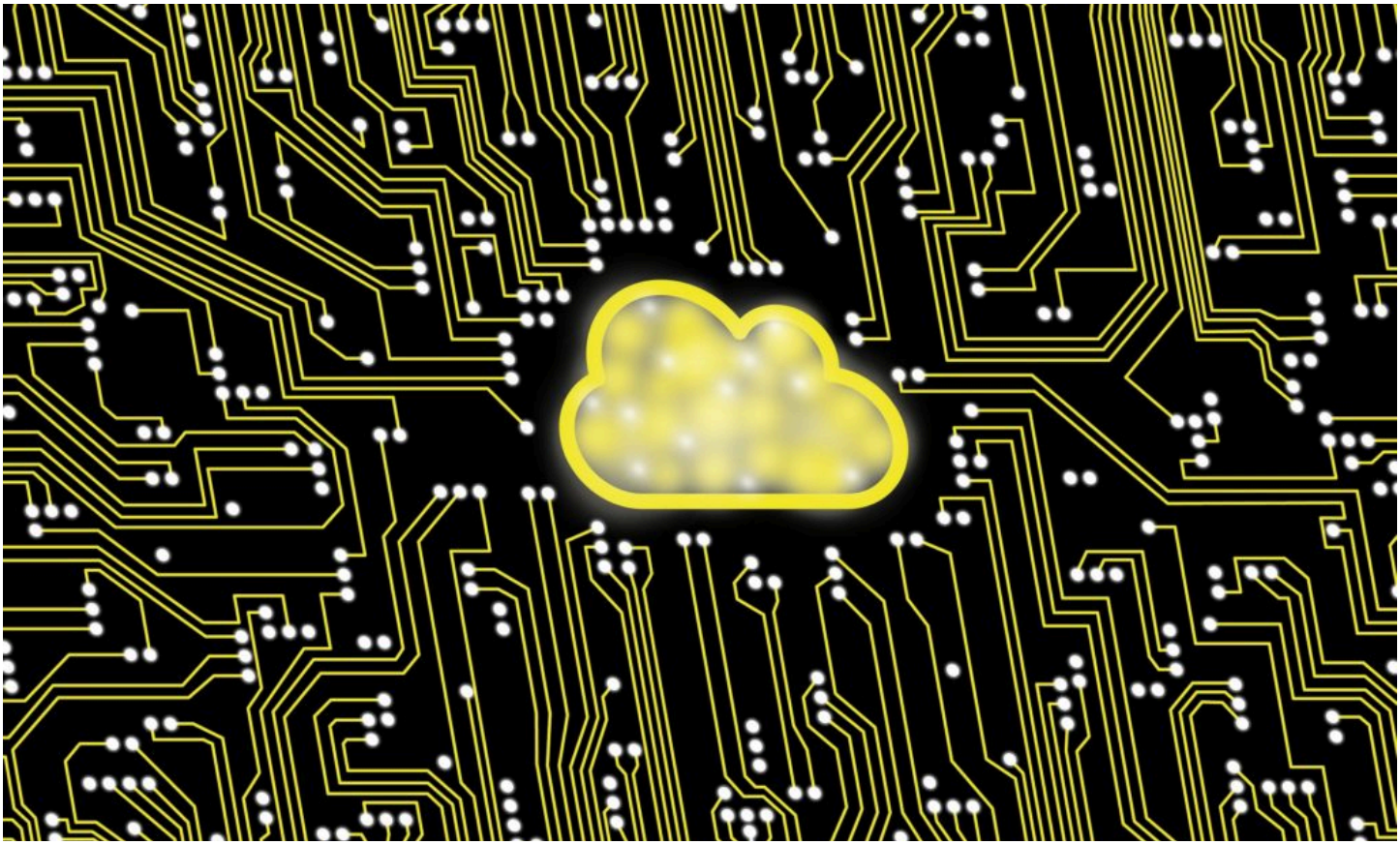

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Storage as a Service Consumption Models

v1.0

An Emerging Solution Insight Report

Cloud Storage, Data Storage, Storage

Storage as a Service Consumption Models

An Emerging Solution Insight Report

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1. Summary

In contrast with traditional purchasing models, in which users acquire hardware, software, and services, and manage the infrastructure on their own, Storage-as-a-Service (STaaS) is a subscription-based purchasing mechanism that enables users to enjoy a cloud-like experience in terms of flexibility, system management, and provisioning for their on-premises infrastructure. **Table 1** shows the advantages of STaaS over the traditional consumption model.

Table 1. Comparison Between Traditional and STaaS Consumption Model (Higher is Better)

	CONSUMPTION MODEL	
	Traditional/CapEx	STaaS/OpEx
Capacity Planning	+	+++
Flexibility	+	+++
Capacity Burst Management	+	+++
Initial Commitment	+	+++
$/GB	+++	+
Overall TCO	++	+++

+++ Exceptional: Outstanding focus and execution
++ Capable: Good but with room for improvement
+ Limited: Lacking in execution and use cases
– Not applicable or absent

Source: GigaOm 2021

Enterprise organizations are now very familiar with cloud consumption models, and they are always looking for new ways to replicate the advantages of the cloud to on-premises infrastructures.

For most users, flexibility is becoming increasingly important to their IT strategy and budget. The COVID pandemic accelerated a general transformation in IT processes that was already happening, making IT more flexible and agile, ready to respond to sudden changes required by business owners. The ultimate goal is to align IT spending to actual business needs.

From a technical perspective, it is now clear that hybrid cloud is quickly becoming the preferred approach for most organizations, and there is an accompanying need to rationalize and standardize as many processes as possible to enable a seamless user experience. In some cases, IT organizations can't adopt a full hybrid-cloud approach, perhaps because of specific industry regulations, particular infrastructure needs, or just company policy. For these organizations, it is becoming more important than ever to have cloud-like options to minimize the differences with their competition and maintain

the same level of agility. In this respect, STaaS, or more generally, on-premises infrastructure as a service (OIaaS), is an option that should increasingly be considered.

STaaS, or OIaaS, is one of the many purchasing options available now. Users can adopt it as their principal way to acquire IT infrastructure, but it is more likely that most organizations will opt for a balanced approach depending on use cases and specific business needs. In **Table 2**, we take a quick look at the differences between the major purchasing approaches, with the win clearly going to StaaS.

The STaaS model is also attractive for local service providers and MSPs who can quickly adapt their infrastructure and spending to the number of customers and projects under management in a timely manner.

Table 2. Purchasing Options

	KEY CRITERIA OF PURCHASING OPTIONS					
	Initial Commitment	Final Cost	Cost Control	Vendor Managed	Flexibility	Channel Friendly
Traditional Purchase	+	+++	+	+	+	+++
Leasing / Rental	++	++	++	+	++	+++
STaaS Model	+++	+	+++	+++	+++	++

+++ Exceptional: Outstanding focus and execution
++ Capable: Good but with room for improvement
+ Limited: Lacking in execution and use cases
– Not applicable or absent

Source: GigaOm 2021

How We Got Here

Over the past few years, many organizations have tried a cloud-only approach only to discover that cloud isn't going to cover all their needs, especially when the infrastructure is complex and legacy applications that pre-date cloud paradigms are involved. The upshot is that the vast majority of enterprises are targeting a hybrid approach that can give them the best of the two worlds: flexibility and cost savings. In fact, public cloud is flexible but expensive, while on-premises infrastructures are usually rigid but with lower and more predictable costs. To meet users' needs, cloud providers have introduced a series of on-premises/hybrid cloud solutions to bring their services directly into the customer's data center.

While the cloud industry was trying to come up with on-premises solutions and answers to users'

needs, storage vendors reacted to make their solutions easier to manage and consume. Financial tools like leasing and renting were no longer enough to cover all the possible scenarios—and are actually quite rigid when changes must be made to the infrastructure. For example, they allow you to expand the infrastructure and add new hardware on the financial plan, but there is no simple way to return unused hardware. Additionally, it's hard to manage hardware purchased at various times in terms of warranty, services, support, and system lifespan.

The storage industry came up with a series of improvements. Many vendors started to improve support plans by adding free hardware updates, which also helped to eliminate end-of-life issues with their hardware. This has been aided by the huge amount of data that vendors are collecting from systems in the field. The benefit to the user is evident, removing a number of complexities in system lifecycle management. With better control over system lifespan, proactive support made possible by analytics, and users becoming more confident about vendors taking more control over their storage system, the introduction of STaaS has been a natural evolution.

About the GigaOm Emerging Technology Impact Report

This GigaOm report is focused on emerging technologies and market segments. It helps organizations of all sizes to understand a technology, its strengths and weaknesses, and its fit within an overall IT strategy. The report is organized into four sections:

- **Overview:** An outline of the technology, its major benefits, possible use cases, and the relevant characteristics of different product implementations.
- **Considerations for adoption:** An analysis of the potential risks and benefits of introducing products based on this technology into an enterprise IT scenario, including table stakes and key differentiating features, as well as consideration of how to integrate the new product into the existing environment.
- **GigaOm Sonar:** A graphical representation of the market and its most important players focused on their value proposition and their roadmaps for the future. This section also includes a breakdown of each vendor's offering in the sector.
- **Near-term roadmap:** A 12-18 month forecast of the future development of the technology, its ecosystem, and major players in this market segment.

2. Report Methodology

A GigaOm Emerging Technology Insight report analyzes new technology trends and aims to provide decision makers with the information to build forward-looking, and potentially highly rewarding, IT strategies while taking into account the risks of adopting products that are not yet fully validated by the market or available from established players.

This report discusses bleeding edge technology, and clear categorizations of the market players simply don't exist. It aims to eliminate hype and educate readers on the technology, then help them navigate through different product implementations. Our analysis focuses on highlighting core technology, use cases, and differentiating features, rather than drawing feature comparisons. This approach is taken mostly because the technology area is new and the overlap between solutions is minimal at this point. In fact, even if the core technology is based on the same principles, the product implementations are still differentiated and focused on particular use cases.

The idea is to define the basic features the user should expect from products that correctly implement the technology, while noting the characteristics that will have a role in building the differentiating value over time.

In this regard, readers will find similarities with the Key Criteria and Radar reports published by GigaOm. The Sonar report can be considered an early assessment of recently introduced technologies and market segments. Our evaluation method for emerging technology is based on:

- **Core technology:** Emerging table stakes
- **Differentiating features:** Potential value and key criteria

Over the years, depending on technology maturation and user adoption, an emerging technology may remain a niche or may evolve to become mainstream, as shown in **Figure 1**. The objective of this report is to intercept new technology trends before they become mainstream and provide the tools to understand their value for potential early adoption and the highest ROI.

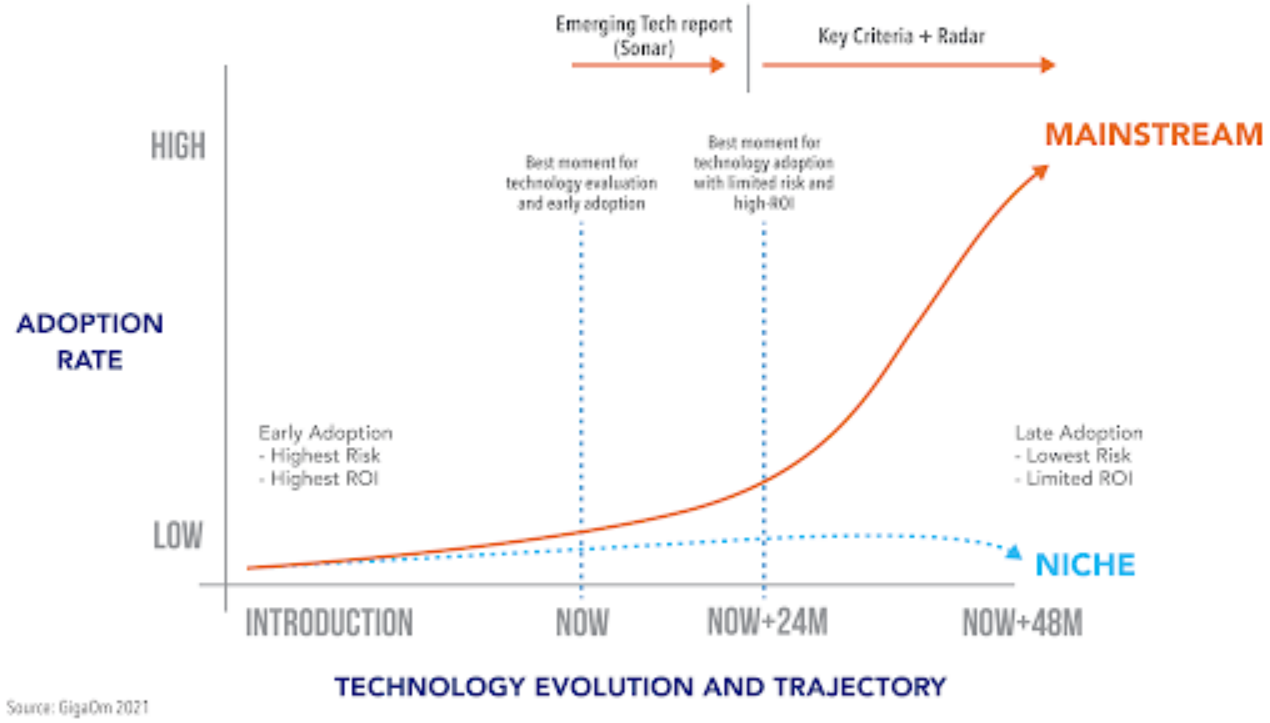

Figure 1. Evolution of Technology

3. Overview

STaaS is now possible due to a number of innovations introduced in the last few years:

- **Analytics:** Systems are much more reliable than in the past, thanks to the data collected and analyzed by vendors. They know failure rates, anomalies, capacity growth, performance figures, and so on. This helps users to plan in advance most maintenance operations, improve system SLAs, and minimize capacity planning issues. Lately, the introduction of AI and ML further enhanced the user experience and simplified tuning operations on systems.
- **Hardware:** Flash memory is much more predictable, durable, and resilient than hard drives. At the same time, keeping all the systems always updated and aligned with the latest technology improves overall reliability, simplifies operations at scale, and makes the entire installed base more predictable.
- **Software:** Users have gotten used to getting new software releases and patches often, sometimes on a biweekly basis. This also minimizes risks and improves system stability. Again, users are now more confident about giving more control over the system maintenance to the vendor.

STaaS is quickly becoming a big differentiator for on-premises storage. Not only does it simplify the purchasing process, it also makes the infrastructure elastic. And though it is more expensive than traditional purchasing options, users don't have to pay upfront for an infrastructure that will only use a portion of its potential at the beginning. Critical elements of the STaaS model are:

- **Analytics:** Again, analytics is mandatory for understanding real storage consumption, capacity and performance trends, workloads needs, and so on. This aspect of the storage infrastructure is more important than ever, from both a technical and financial point of view.
- **STaaS management console:** The management console offered by the vendor, in association with the analytics tool, is the main UI for the STaaS service. It should include all significant options, from resource provisioning and deallocation to reporting and billing.
- **Management services:** Depending on the level of service provided by the vendor or selected by the customer, the user experience may differ. Some vendors offer the hardware as is, with just basic support services, leaving most of the management operations to the users. Other vendors push the level of service further and give the user less control over the physical infrastructure with an experience that is closer to cloud storage.

Use Cases

STaaS is a consumption model, and as such, there isn't a specific use case for when it is indicated. In fact, it actually makes more sense to talk about business cases where STaaS can make a difference:

- **Cloud-like experience:** Organizations of all types want IT to be more aligned with their business needs and cloud consumption models. They want to replicate the benefits of the public cloud while maintaining their on-premises advantages, such as fast resource provisioning and limited commitment in case of sudden expansion or compression of the existing infrastructure. It also allows users to limit the commitment to a specific vendor or technology.
- **Cost control:** This consumption model enables IT managers to move their budget from CapEx to OpEx and reduce financial risk. A cloud-like, pay-as-you-go, subscription model is simple and limits the initial financial commitment. Technology refreshes become irrelevant for the user as does the need for migrations because the system reached its end-of-life support. With the right reporting and internal chargeback/showback mechanisms, it becomes easier to identify centers of cost per application and/or department. Although acquisition cost is higher than for traditional models, the TCO could be lower because of all the benefits associated with this model.
- **Elastic IT and seasonality:** Users with high business seasonality can take advantage of this model to make their infrastructure more elastic and flexible. They can allocate resources and release them depending on business needs. More generally, every organization can experience a sudden growth in demand and need more IT resources to process it, or the exact opposite could happen and they could take advantage of this model to reduce their resource consumption and spending almost immediately.

In general, enterprises want options. From this point of view, STaaS is a new approach that sits perfectly between traditional purchasing, renting or leasing, and cloud.

4. Considerations for Adoption

Before adopting a STaaS consumption model, users should understand the benefits and limitations of current offerings and how the market is evolving to accommodate new business needs.

The concept of STaaS reduces the impact of the products themselves, which becomes something of a commodity. In fact, users don't choose a specific storage system or configuration but instead select performance, availability, and capacity parameters. In other words, a user selects a service level objective (SLO), and it's the vendor that selects the right model and configures it to match the user's request. Capacity planning is also performed by the vendor by looking at resource utilization trends.

The value of the back-end architecture, system scalability, data optimization, and data services is hidden behind the scenes and is no longer relevant to the user. That said, some vendors still prefer to show which storage model is actually delivered and installed at the customer's site, and can provide a certain degree of control over the hardware to advanced users.

The initial deployment of a STaaS infrastructure requires an investment by the storage vendor in terms of hardware, software, and installation services. In order to justify all of this, the vendor usually requires an initial commitment from the customer in the form of a minimum capacity allocated for a period of time. This could be a limiting factor for organizations with small IT infrastructures.

Generally, the STaaS model is more appropriate for large or medium-size organizations that already have large storage infrastructures in place. Vendors are pushing this model to a wider audience, but there are limitations imposed by fixed costs and minimum expansion steps that make it impractical under a certain threshold. Other types of users that are very attracted by STaaS are MSPs and local service providers. These users can benefit from a resource consumption model that is totally aligned with their business models and practices.

This type of solution can be considered as an evolution of leasing and rental in some regard. It is a more advanced option for users who may have already tested a similar purchase model but want something that is more of a turnkey solution: flexible, with no need to deal with asset management during and after the contracts.

In the end, STaaS is more expensive than a direct purchase, or a lease or rental, but in a large organization, the operational and business benefits can dramatically improve TCO and make this solution economically convenient in the medium and long term.

Key Characteristics for Enterprise Adoption

The most important characteristics of StaaS to evaluate before adoption include:

- **Initial commitment:** The initial commitment required by the vendor could be a limiting factor for

adoption. Many vendors ask for a consistent initial capacity deployed for a long period of time, one year in some cases, hampering the adoption of the new consumption model by smaller organizations.

- **Cost and billing granularity:** $/GB and $/IOPS become more important with this model. Basic features are provided by all the vendors, and many aspects of the systems are managed by the vendor, so there's less need for users to check the internals of the system and go deeper into technical details. But how granular the billing is in terms of resource allocated per time and cost of usable resources is becoming more important. Thus, the transparency and simplicity of the billing model is fundamental.
- **Expansion:** Most STaaS solutions leave some system resources available for future expansion without requiring physical intervention to install additional hardware and speed up provisioning operations. Users should always evaluate how much of the system is available for expansion and make sure there is an SLA in place to get the system expanded in a timely manner when resources are not sufficient.
- **Ease of use:** Vendors are working to integrate STaaS tools with the rest of their management software. In particular, besides resource provisioning, reporting and billing are the major features. The tools should also give information about costs for additional resource acquisitions.
- **Breadth of solution:** The vendor should provide STaaS for its entire product line, and for different use cases, whether they are capacity or performance driven. In fact, all the major protocols for block, file, and object storage access should be supported as well as the necessary software options to make the system as compatible as possible with the existing infrastructure.
- **Multitenancy:** STaaS is getting the attention of MSPs and large organizations that are interested in separating different users for chargeback and billing purposes. This separation can also enable self-service options when necessary.
- **Ecosystem:** Some vendors offer additional software and third-party options in their STaaS program. In some cases, STaaS is part of a larger program that encompasses servers and networking as well as other infrastructure components.

Table 3 shows how well the solutions discussed in this report did in each of these areas.

Table 3. Comparison of Vendors in Terms of Viability for Enterprise Adoption

	CRITERIA FOR VIABILITY						
	Initial Commitment	Cost and Billing Granularity	Expansion	Ease of Use	Breadth of Solution	Multi-Tenancy	Ecosystem
Pure Storage	++	++	++	+++	+++	+	+++
IBM	+++	++	++	++	++	+	+
Hitachi Vantara	++	++	+++	+++	+++	+++	++
HPE	+++	++	++	++	+++	+++	+++
Infinidat	+++	+++	+++	++	+++	+	++
Dell Technologies	++	+++	++	+	+	+	++
NetApp	+++	+++	++	+++	+++	++	+++
Zadara	+++	+++	+++	+++	+++	+++	+++

+++ Exceptional: Outstanding focus and execution
++ Capable: Good but with room for improvement
+ Limited: Lacking in execution and use cases
– Not applicable or absent

Source: GigaOm 2021

5. GigaOm Sonar

The GigaOm Sonar provides a forward-looking analysis of vendor solutions in a nascent or emerging technology sector, based on each vendor's strategy, technology, and roadmap. The GigaOm Sonar chart plots the current position of each solution against these three criteria across a series of concentric triangles, with those set closer to the center judged to be of higher overall value. The forward-looking progress of vendors is further depicted by arrows that show the expected direction of travel over a period of 12 to 18 months.

The GigaOm Sonar chart (**Figure 2**) is defined by three axes. They are:

- **Roadmap:** When assessing emerging technologies, it is important to take a forward-looking approach and to not only describe the necessary requirements for initial adoption, but also to understand the expected future development of the technology. This is particularly important for organizations that seek to expand beyond an initial targeted use case to maximize employment of the solution in a way that can enhance return on investment (ROI).
- **Execution:** It is critical to understand whether the vendor has developed a solution with the necessary differentiation to stand out in the crowd. Is the product architecture solid and ready to support the growing number of features and capabilities that users will require over time?
- **Strategy:** This metric takes into account the vendor's go-to-market strategy and its ability to create a solution ecosystem around its product. Strategy also reflects the company's ability to articulate its vision and accomplish the goals on its roadmap.

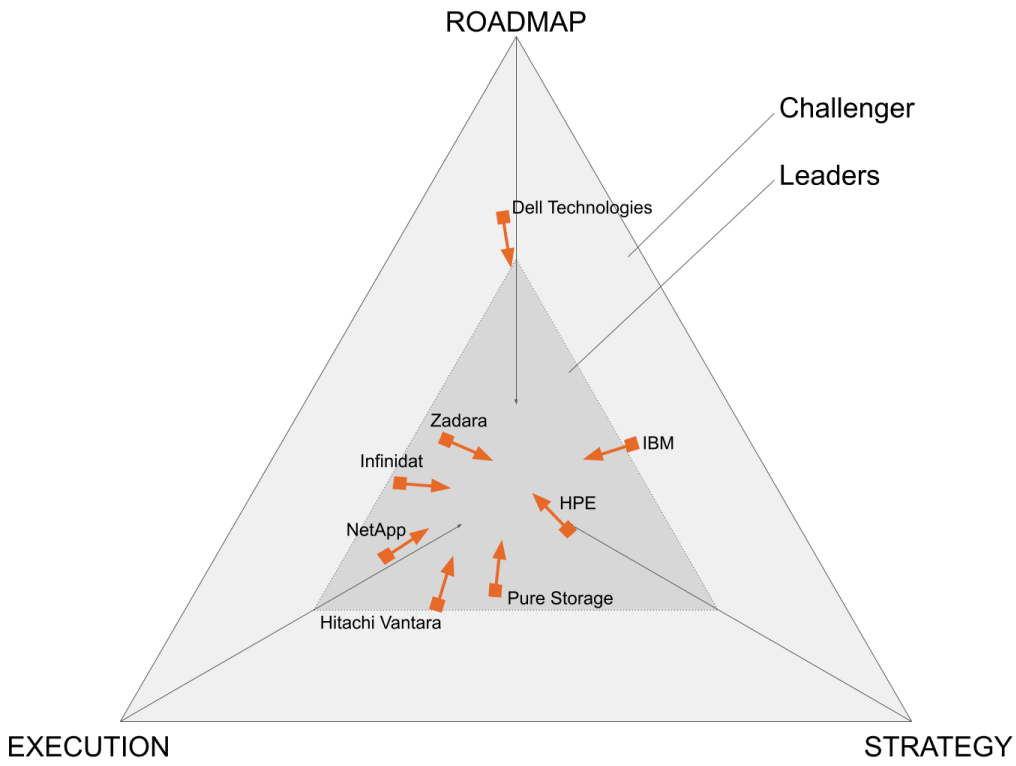

Figure 2. GigaOm Sonar for STaaS Services

The Sonar chart in **Figure 2** offers insight into the vendor's relative position in the sector. Zadara is the leader because its business model and product offering have always been based on this consumption model. The other major storage players are scattered across the chart because they all started from a different initial concept and implementation of the service, with some more focused on infrastructure while others were targeted more toward a cloud-consumption model. HPE enjoys a leading position because of the maturity of its offering, but it still relies on traditional operation models.

Further from the center are several vendors that are aggressive and are quickly building strong value propositions. This tier includes NetApp, Pure Storage, IBM, Infinidat, and Hitachi Vantara. Dell Technologies lags behind its direct competitors at the moment, but the service was launched only a few weeks ago, and the roadmap appears to be solid.

6. Market Landscape

Dell Technologies

Dell Technologies recently introduced its APEX program to deliver a wide range of infrastructure solutions as a service, which includes APEX Data Storage Services. The cloud-like experience is based on the APEX console, a self-service portal that enables customers to work in a cloud-like fashion—requesting resources according to SLOs and not products, with a pay-as-you-go experience that includes reporting and billing.

The service aims to provide a fully customizable experience, from the UI to a complete set of APIs for automation. The user selects the type of storage (block or file, with object storage coming in the future), performance and capacity tier, as well as subscription terms and location. In fact, APEX can also provide the service in selected Equinix colocation facilities. New systems and upgrades are usually delivered within two weeks from order, and every system is shipped with a buffer to sustain temporary capacity bursts. Note that users won't be charged a premium for on-demand usage (above the base commitment). Unlike many of its competitors, Dell charges the same rate for both base commitment and on demand. Initial commitment and subscription terms for customers are aligned to similar offers from competition.

Dell Technologies APEX Data Storage Services includes a Customer Success Manager to advise and help customers with the onboarding process, and anticipate and proactively solve potential issues with the infrastructure. The APEX console is integrated with CloudIQ, which provides cloud-based proactive monitoring and predictive analytics so that customers can reduce risk, plan ahead, and improve productivity. APEX is a single-tenant solution and is available only in the US at the moment, but global availability and partner enablement is coming soon.

Strengths: Dell Technologies is building a complete cloud-like user experience for its entire product portfolio. Its APEX Data Storage Services includes SLO-based resource provisioning and management.

Challenges: The service was launched only recently and lacks some important features. The roadmap is promising, though, and Dell is working hard to close the gap.

Hitachi Vantara

Hitachi Vantara Virtual STaaS was launched a few months ago to complete a full portfolio of solutions that encompass traditional as well as new consumption models for its storage systems. The solution is based on a self-service customer portal where the user can select the required SLOs and receive a fully managed system, with expansion features, within 14 days. Once the system is installed, the user can perform all storage and business operations from the same UI in a cloud-like fashion. Hitachi's Virtual STaaS management portal offers APIs to enable automation and integration with other products and services. Integration with Hitachi Ops Center and its AI-based analytics tools is not yet

available but is expected in the near future.

The minimum user commitment is similar to what other vendors demand, starting at 100TB for one year, but Hitachi Vantara also has the flexibility to mix different consumption models and convert existing storage systems to STaaS if the customer asks for it. Hitachi partners are fully involved in Virtual STaaS, which adds more flexibility and services options for customers. Virtual STaaS is now available in major countries, with plans to expand its reach even more.

Virtual STaaS is multi-tenant and provides a role-based access control (RBAC) mechanism to separate different types of users in the same organization. The service is targeted to medium and large organizations, including service providers, and the roadmap shows a serious commitment to expand the service and its feature set.

Strengths: Hitachi provides a solid cloud-like user experience that hides most of traditional infrastructure operations. The service is flexible, and it offers multi-tenancy features and a partner-friendly program.

Challenges: Even though APIs are already available, lack of integration with Ops Center may slow down adoption for existing Hitachi Vantara customers. This is a limitation that should be addressed in the near future.

HPE

HPE is the leader in on-premises IaaS with its mature Greenlake edge-to-cloud platform. Users can take advantage of a well-designed self-service management portal for most of the operations involving resource acquisition, pay-as-you-go management, and provisioning of practically every data center component, including integrated stacks and third-party solutions, such as Qumulo for scale-out file services, Scality for object storage, and market-leading data protection solutions.

The user experience is at the center of the solution, which is now available in a wide range of geographical locations, with only a few exceptions, and to organizations of practically all sizes directly through HPE and its partners. Users can select HPE storage systems from three major categories—mission-critical, business-critical, and general purpose—based on new HPE Alletra systems. All systems and expansions are usually delivered in as little as 14 days and deployed with additional buffer capacity to quickly manage temporary system expansions. HPE Greenlake also includes cloud services like HPE Cloud Volumes to cover some hybrid-cloud scenarios. Users benefit from HPE Infosight and its predictive analytics, while hardware and software systems are fully managed by HPE. From the user perspective, system management would be considered traditional compared to some of the competitors in the market.

Strengths: HPE offers a mature solution focused on financial aspects and purchasing processes that simplify capacity management ahead of demand, and on infrastructure management, with a large ecosystem encompassing not just storage but all infrastructure components.

Challenges: HPE provides traditional system management and resource provisioning without SLOs involved, which limits the cloud-like experience.

IBM

IBM recently launched its storage-as-a-service for FlashSystems. The service gives customers multiple configuration options, including protocol type (FC or iSCSI), performance tier, capacity, availability guarantee, and more. The initial commitment required, starting at just 25TB for one year of tier 1 performance storage, makes the service appealing even for smaller organizations. Storage systems are fully managed by IBM and the user interface is simple, allowing quick resource provisioning. Furthermore, the user experience is consistent between on-premises and the public cloud, thanks to IBM Spectrum Virtualize software, which simplifies data replication and migrations across different environments.

When customers receive the storage systems, IBM installs additional buffer capacity to make capacity expansions seamless during temporary performance peak requests. Pricing is transparent and based on usable system capacity, and users can always opt to upgrade to higher performance tiers and capacity when needed.

It's Interesting to note that customers can take advantage of data footprint reduction and pricing for additional capacity will be billed at the same $/GB of the committed capacity without penalty. Moreover, the service includes standard monitoring tools as well as a dedicated technical account manager who can help to speed up support and advise customers regarding system status and any necessary intervention. The initial subscription is available through IBM business partners though the service is delivered directly by IBM, including remote system updates and hardware service.

Unfortunately, the service does not include file and object storage options yet, limiting its applicability to a wider range of applications.

Strengths: IBM's solution offers transparent pricing, flexibility, and a low entry point, with a compelling service that includes multiple performance tier and capacity options.

Challenges: The service is available only for block storage at the moment. The user interface is not as advanced as that of many competitors, but the availability of a technical account manager helps to reduce subscription management challenges.

Infinidat

Infinidat announced its StaaS program a few months ago, although its core business model component, FLX, was released in 2019, and the company has always been able to offer capacity on demand for its systems. This new service was built with inspiration from its accumulated consumption-based business model experience. The architecture of InfiniBox enables Infinidat to deliver a fully populated system that can be consumed in a cloud-like fashion. This new consumption model joins

traditional purchasing and elastic pricing options.

There is no minimum time commitment asked of the customer, but the minimum configuration of the system in terms of capacity can still be considered a limiting factor for small enterprises. Pricing is simple and transparent, based on $/GB per month measured on average daily capacity stored in the system, excluding snapshots. There are no penalties if the data reduction ratio changes. Systems are fully managed by Infinidat and regularly updated without service disruptions. The company also offers a complete system upgrade after three years that includes data migration if necessary. Even though the service was introduced only a few months ago, Infinidat reports that there is a growing interest in this service among its traditional customers, which now base some of their storage infrastructure purchases on this model.

Thanks to a combination of AI-based tools, Infinidat is able to collect system status and resource-consumption trends, which are then analyzed to provide insights and suggestions regarding actions to take, including advising on capacity requirements. The AIOps tools are also available to partners for integration and process simplification in complex environments.

The service is well suited to large organizations and MSPs. For the latter group, STaaS multi-tenancy features are not yet available, but the company is working on it.

Strengths: Infinidat's STaaS program offers simple and consistent pricing with no time commitment for a multi-petabyte system that doesn't need to be expanded in the field. The user experience is simple and straightforward.

Challenges: System characteristics still position the solution on large enterprises. Multi-tenancy will be welcomed by many users when available.

NetApp

NetApp Keystone Flex Subscription is NetApp's answer to STaaS, and it is part of a larger portfolio that includes other consumption, purchasing, and payment options. NetApp was a little bit late in reaching the market with this service, but it is catching up quickly, with an interesting approach that makes the user experience very similar to what is now available from major service providers. Compared to other services, the minimum commitment for the customer is 15TiB of capacity for one year of high-performance storage, setting a low bar for initial adoption. NetApp also includes a 20% burst space that is charged on a daily basis when used, so the customer doesn't have to worry about temporary demand spikes.

Keystone Flex Subscription is already available in seventeen countries, and the systems are fully managed by NetApp and its partners or by the customers themselves. In fact, partners can play a key role in the entire process, and the platform is xSP-friendly, with multi-tenancy features to simplify management. Contracts for committed capacity can be one to five years long and include options for monthly and annual payments with price discounts.

The user experience centers on the Keystone Flex Subscription UI and API interfaces provided by the NetApp Service Engine (NSE). This helps to further separate this service from the traditional infrastructure management, even though the user can ask to have access to the system and manage it in a traditional fashion. Integration with ActiveIQ, NetApp's analytics and monitoring tool, is available but reporting is not fully implemented yet.

Resource provisioning is based on service level objectives, such as performance level, capacity, protocols, and so forth, and resources are made available to users accordingly. In this process, the user doesn't know which NetApp storage system is consumed, making the entire experience similar to public cloud storage. The Keystone Flex Subscription UI can be also used to provision storage in the public cloud (Cloud Volumes ONTAP) with compute resources directly billed by the service providers and licenses invoiced by NetApp. NetApp's automatic tiering features are leveraged in the back end to move data to object stores and further reduce overall $/GiB.

Strengths: NetApp offers a compelling cloud-like user experience, which is aligned with its goal to become a primary hybrid-cloud player. It also has an interesting partner program and entry-level options that will allow smaller enterprises easier access to this service.

Challenges: The roadmap is quite complete and overcomes some of the current product limitations including better reporting capabilities.

Pure Storage

Pure Storage has a comprehensive strategy around new consumption models that started with innovative all-inclusive support plans like Evergreen, later joined by the Pure-as-a-Service program. The company is working hard to simplify the user experience by integrating new cloud-like consumption models into its management platform in a seamless fashion, with tools that help customers select the right hardware for every scenario. Furthermore, users have complete visibility into their storage infrastructure and can quickly verify capacity and performance trends, or simulate workloads to get a clear view of the upcoming needs to plan necessary adjustments, including adding or removing storage resources.

Pure-as-a-Service includes all Pure hardware options, Portworx software, and cloud storage as well. The systems are fully managed by Pure Storage. The procurement process is very simple, and it takes into account local partners. Storage systems can be deployed both on-premises as well as in colocation facilities, depending on the user's needs. The minimum commitment for the customer is 50TB of raw capacity for one year. Pricing is transparent and can vary depending on the actual time and capacity commitment by the customer. The company reports healthy growth in terms of revenues and the number of customers adopting this cloud-like experience.

Multi-tenancy and reporting are areas that need some improvements to make the product more appealing to xSPs and large organizations. The procurement process for the first installation could be further simplified, but once the system is in place, updates are easy to manage, and Pure guarantees fast delivery of additional resources in most countries of the world. This service doesn't provide

reserved capacity to manage unforeseen requests, but the outstanding monitoring and forecasting capabilities help to minimize potential issues.

Strengths: Seamlessly integrated in the existing Pure1 management and analytics system, this service is conceived to simplify the user experience and minimize friction for storage consumption in a cloud-like fashion.

Challenges: The service could be improved for xSP use cases with better reporting, chargeback and self-service capabilities. The user interface is very attractive but lacks an additional level of abstraction for users that don't want to deal with the storage at all.

Zadara

Zadara's business model has always been based on STaaS, and it has already deployed more than 300PB worldwide. The company has added other services to its storage service, including EC2-compatible compute services. Zadara's solution can be accessed on major cloud providers, local managed-service providers (more than 300 partners across the world) as well as on-premises for large enterprise customers. Users can configure dedicated virtual private arrays (VPAs) that do not share storage resources with any other customer and provide full encryption at rest and in transit, as well as data services and more.

Unlike STaaS services from other vendors, there's no minimum commitment, setting Zadara apart from the crowd, and pricing is simple and consistent depending on resource allocation. Storage services include block, file, and object protocols. Upgrades are transparent to the user, and the system is fully managed by Zadara and its partners. The solution is fully multi-tenant also from a management point of view, with chargeback capabilities, as well as good reporting capabilities. Both UI and APIs are well designed and easy to use.

It is interesting to note that Zadara is now federating its partners in a large network that can provide more than 250 different locations across the globe and includes local cloud and managed-services providers, telcos, and colocation facilities. This will further simplify service adoption while enabling customers to implement disaster recovery strategies and deploy applications across the world with a consistent infrastructure, which becomes even more interesting when associated with a compute-as-a-service offer.

Strengths: Zadara offers a solid and true STaaS model with no initial commitment for users of all sizes. It is easy to use, with integrated EC2-compatible services.

Challenges: Even though the concept of partner federation is appealing, this is a new area of development for Zadara, and it will take some time to see if it works as intended.

7. Near-Term Roadmap

The interest in STaaS is growing among users, and most vendors are responding with additional features to simplify the user experience and make it as cloud-like as possible. In particular, multi-tenancy is an area where vendors are working hard to enable resellers and MSPs to take full advantage of this consumption model.

Most of the services analyzed have been launched only recently. They all suffer from some certain issues related to this lack of maturity, but roadmaps are consistent across the board, and vendors are working on similar features to respond to user needs.

One area of particular interest for users is the integration of traditionally operated infrastructure with new storage systems added to this consumption model. On one hand, vendors are working to integrate existing monitoring and other tools with the new service while at the same time, they are trying to make the transition to STaaS as simple as possible from both financial and technical standpoints. Integration efforts involve existing financial programs as well as a strong commitment to APIs for integration and automation.

8. Analyst's Take

The main focus of STaaS is TCO and flexibility. We expect to see a general growth of STaaS in purchasing trends from users of all sizes, especially among mid- to large-size enterprises, but the approach is not likely to quickly become the primary choice. In fact, the added flexibility introduced by this purchasing model also adds costs that are not compatible with some applications.

One of the major challenges for vendors remains adjusting the initial commitment in terms of capacity to make the solution appealing to smaller organizations. In this area, vendors with a larger product portfolio have an advantage, but it is still early to find leaders in this area, and many small organizations are looking at the cloud as their primary infrastructure choice anyway.

In general, STaaS can quickly become a strong differentiator for primary storage acquisition. Vendors offering the best user experience and transparent pricing are likely to become the leaders, while the back-end technology will become less relevant. In this context, it is interesting to note that some vendors are focusing on an SLO-based experience while others are looking to traditional storage infrastructure management to make the migration between the various consumption models seamless. The importance of these differences generally varies by the type of target users—DevOps and cloud operators versus system administrators—and it is highly likely that, over time, we will see a more balanced approach from all the vendors.

9. About Enrico Signoretti

Enrico Signoretti has more than 25 years in technical product strategy and management roles. He has advised mid-market and large enterprises across numerous industries, and worked with a range of software companies from small ISVs to global providers.

Enrico is an internationally renowned expert on data storage—and a visionary, author, blogger, and speaker on the topic. He has tracked the evolution of the storage industry for years, as a Gigaom Research Analyst, an independent analyst, and as a contributor to the Register.

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