ITBRAND PULSE

The Network Made Easy!

Storage as-a-Service for NOOBS

PURESTORAGE®

Special Edition

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New Technology Reference Guides For NOOBs

What we have witnessed over the years is that early in the life of new data center IT, it is difficult to find the information needed to quickly assess the situation.

New Technology Reference Guides for Noobs are designed to capture the things we think IT pros need to know about an emerging technology.

We crowd-source information in these guides, which means we get a lot of it from people like you. If you think we missed something or simply have something you would like to contribute, we welcome your input, and if we use it, we'll attribute the input to you.

Frankie Berry
Managing Partner & Senior Analyst
IT Brand Pulse
Where IT perceptions are reality

STaaS for Noobs

Introduction

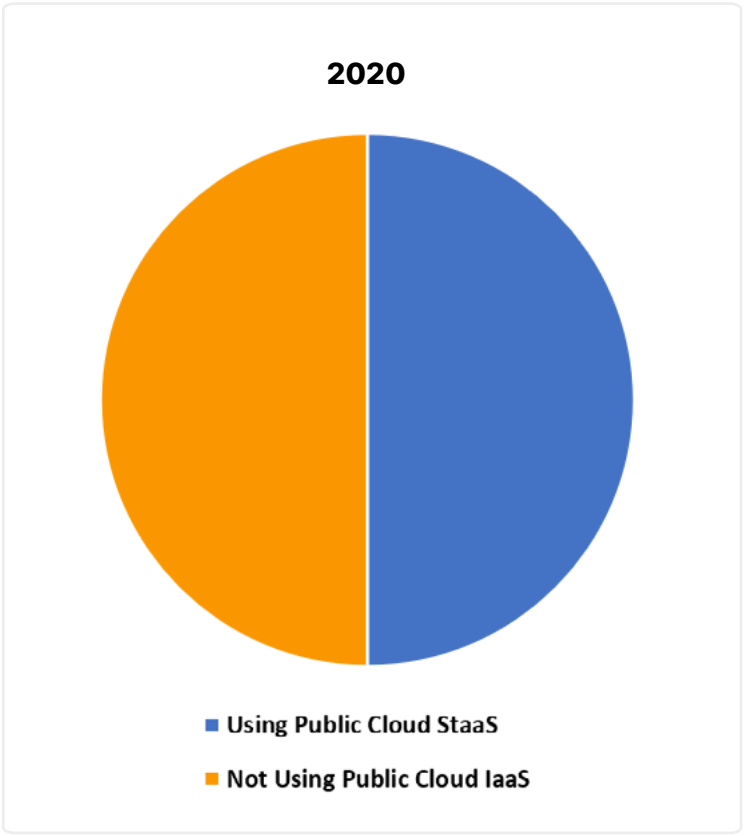
While users at nearly 100% of businesses use some type of cloud-based Software-as-as-Service, IT Brand Pulse estimates that in 2020 the industry reached a half-way mark with 50% of IT organizations using enterprise-class Storage-as-a-Service.

That means, by definition, there are a lot of STaaS noobs out there.

Knowing there are so many noobs walking the aisles of data centers, we designed this book to provide IT pros and non-experts with a history of how the industry got to STaaS, and an easy-to-understand overview of the dizzying array of options now available.

Even STaaS experts might find some new and interesting information from our coverage of On-Prem Storage-as-a-Service, a new class of enterprise storage that we believe is about to blossom.

Thank you in advance for reading this publication and for any feedback you send to frankie.berry@itbrandpulse.com.



History of Cloud Storage

From Caves to Buying and Leasing HDDs

The dawn of data storage was 40,000 years ago when our ancestors saved images of dramatic events like buffalo hunts and tribal battles on cave walls. In the 1960s, the invention of hard disk drives (HDDs) sparked a new era of abundant and affordable digital storage capacity that we live in today.

Since the invention of HDDs in the 1960s until 2006, a global community of storage architects and administrators emerged. Hundreds of thousands of these storage experts built and managed enterprise storage environments fined-tuned to fit the performance and availability needs of their business.

For over 40 years, enterprise storage systems were deployed with planned obsolesce. The elaborate and complex ritual of evaluating new enterprise storage systems, forklifting out old systems and deploying new storage was repeated every 3-5 years.

The capital expenditures (CapEx) required for an enterprise storage refresh ran into tens of thousands of dollars for a small enterprise, to millions for large enterprises. Leasing companies started financing data center infrastructure to help customers spread out their cash flow over the life of the equipment. Unfortunately, leasing never eliminated the 3-5 year cycle of designing, evaluating and replacing the complex systems.

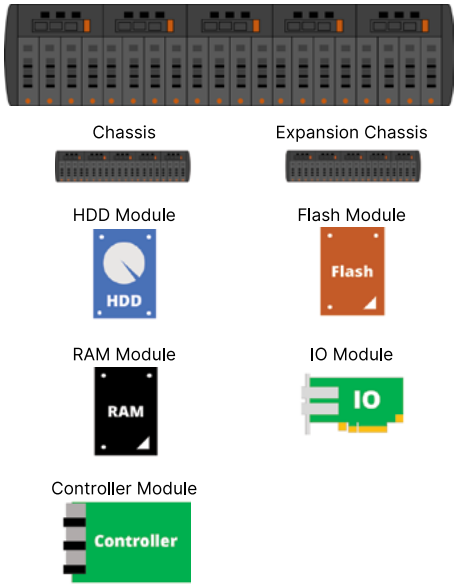
The era ended with IT organizations around the world searching for alternatives. They wanted options to routinely replacing storage systems every 3-5 years and they desperately wanted an alternative to slow and unreliable HDDs.

Infrastructure-as-a-Service is the 5th Utility

The IT industry changed forever with the introduction of cloud computing, including Software-as-a-Service, Infrastructure-as-as-Service and Platform-as-as-Service. S3, a storage offering from Amazon, was the first Infrastructure-as-a-Service (IaaS) provider to go hyperscale.

Legend has it that Enterprise IaaS and STaaS were born shortly after an Amazon executive retreat.

Modern Enterprise Storage System



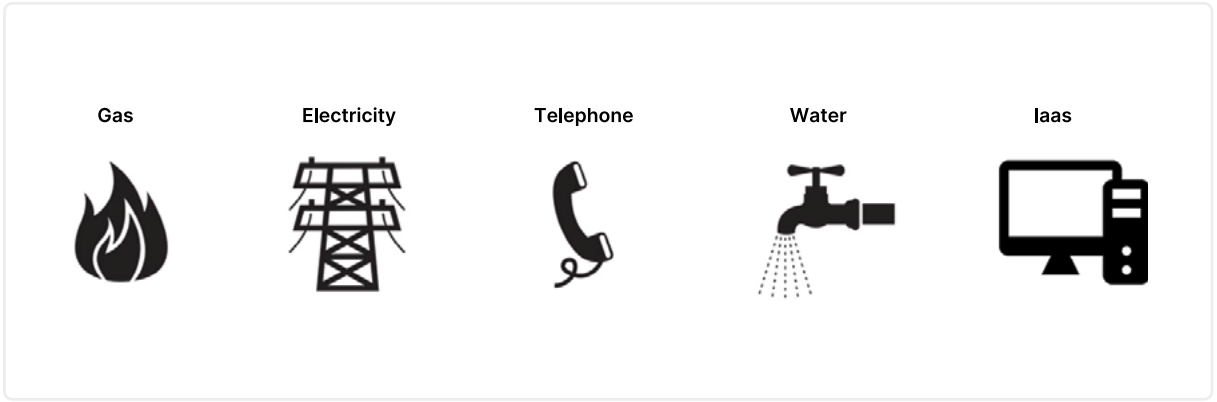
Buying or leasing enterprise storage is a capital expenditure (CapEx) that involves designing, evaluating, and deploying a solution—then repeating the process every 3-5 years. The payoff is on-premises storage that is highly tuned for that customer's applications.

The fateful meeting resulted in the company realizing that one of its core competencies was efficiently deploying and managing data center infrastructure.

AWS and Amazon S3 public cloud storage services were launched in 2006 and took off as they provided instant, risk-free infrastructure with a new twist—It is consumed like a fifth utility alongside electric, gas, telephone and water.

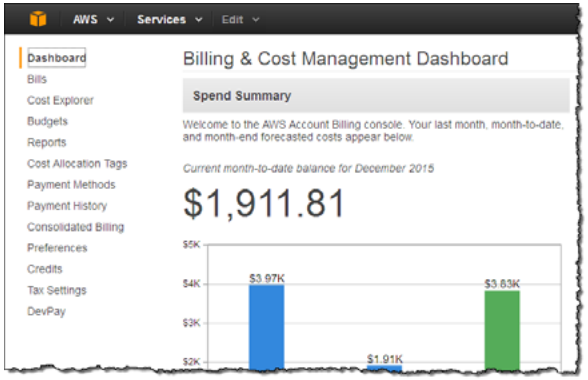
Like your electric and gas infrastructure, customers don't see or touch IaaS. They just plug into the grid, and only need to know about the details of their service agreement. But unlike a lease which also offers monthly payments, customers pay only for the resources used.

The IT view of data center infrastructure also changes from hardware and software to a user console. The new IT point-of-view is laser focused on the dashboards to set-up and monitor storage services, and dashboards for billing. Customers are completely abstracted from the servers, storage, networks, and software in IaaS data centers.



Amazon's success did not go unnoticed. Since 2006, AWS has since been joined by handful of tier-1 IaaS providers, plus thousands of tier 2 and 3 providers around the world.

IaaS eliminates the ritual of replacing storage systems every 3-5 years and provides a risk-free financial model, but IT organizations around the world are already searching for alternatives. They especially want options that allow them to keep infrastructure on-premises that works seamlessly with IaaS in the public cloud.



Tier 1 IaaS Providers

aws
Microsoft Azure
Google Cloud
IBM Cloud
Alibaba Cloud

What You Need to Know About STaaS

Core Compute and Storage Services

The first thing to know about IaaS and STaaS is that hundreds of services and features are now available from the big 5 public cloud providers, AWS, Microsoft Azure, Google Cloud, Alibaba and IBM Cloud. IaaS and STaaS are also offered by hundreds of tier 2 & 3 providers around the world. For example, AWS announced 497 new features were added to approximately 100 services available on their platform. Below is a short list of the most popular compute and storage services.

Compute Service	Description
Virtual Servers	Virtual servers allow users to deploy, manage, and maintain OS and server software. Instance types provide combinationsof CPU/RAM. Users pay for what they use with the flexibility to change sizes.
Containers	Quickly deploy a production ready Kubernetes, DC/OS, or Docker Swarm cluster.
Serverless	Integrate systems and run backend processes in response to events or schedules without provisioning or managing servers.
Dedicated Servers	Instances that run on server hardware that's dedicated to a single customer.
Auto Scaling	Lets you automatically change the number of instances providing a particular compute workload. You set defined metric and thresholds that determine if the platform adds or removes instances.
Batch Computing	Run large-scale parallel and high-performance computing applications efficiently in the cloud.

Storage Service	Description
Block Storage	Appears as a block storage device (HDD) over the network. STaaS providers allow customers to provision block storage volumes of any size and attach it to their dedicated servers or virtual servers. Block storage provides low latency IO, so it is a good solution for databases.
SSD Storage	SSD storage optimized for I/O intensive read/write operations. For use as high performance Azure virtual machine storage.
File Storage	Provides a simple interface to create and configure file systems quickly and share common files. File level storage is usually accessible using common file level protocols such as SMB/CIFS (Windows) and NFS (Linux, VMware).
Object Storage	The storage and retrieval of unstructured blobs of data and metadata using an HTTP API. Object storage services are for use cases including cloud applications, content distribution, backup, archiving, disaster recovery, and big data analytics. You probably don't want to use object storage services for traditional database transactions due to the high latency.
Cold Storage	Provides a simple interface to create and configure file systems quickly, and share common files. It's shared file storage without the need for a supporting virtual machine, and can be used with traditional protocols that access files over a network.
Backup & Restore	Backup and archival solutions allow files and folders to be backed up and recovered from the cloud, and provide off-site protection against data loss. There are two components of backup—the software service that orchestrates backup/retrieval and the underlying backup storage infrastructure.
Bulk Data Transfer	A data transport solution that uses secure disks and appliances to transfer large amounts of data. Also offers data protection during transit.
Disaster Recovery	Automates protection and replication of virtual machines. Offers health monitoring, recovery plans, and recovery plan testing.

CIOs and CFOs Love STaaS

The next thing to know about STaaS is the reasons why customers love it and why you might too.

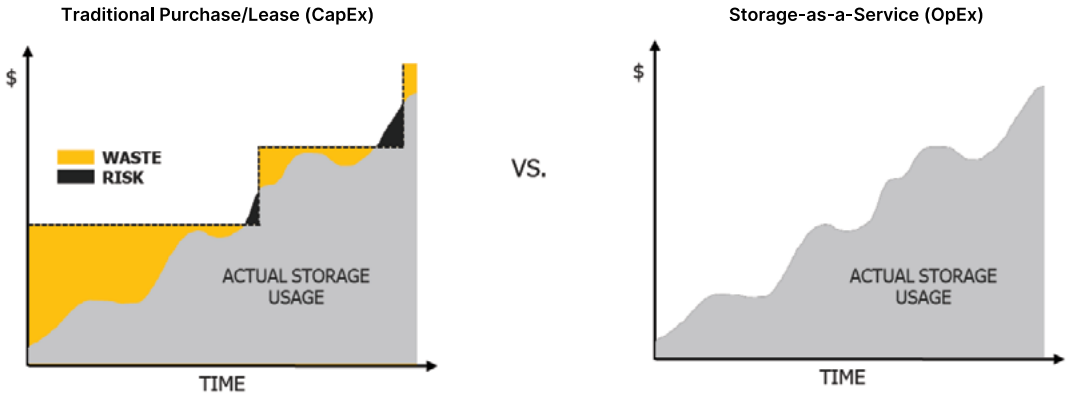
On the technical side of the house, CIOs appreciate the new-found ability to use cloud STaaS to deploy resources almost instantly, instead of in weeks or months. CIOs also like the hundreds of features allowing them to tailor storage capacity, performance and availability for web hosting, databases, HPC, gaming, and just about any other workload that exists.

On the business side, CFOs welcome how STaaS helps them improve cash management by replacing huge capital outlays with monthly payments. It's why two thirds of cars and IT equipment are leased. This is made possible by reducing the footprint of IT functions that require CapEx. CFOs also enjoy how service payments are not liabilities on their balance sheets like lease payments.

Think All Flash STaaS for IO Intensive Applications

HDDs may have started a new era of abundant and affordable storage, but their performance and reliability were a major roadblock to data center efficiency and scalability. IO-intensive applications need thousands of HDDs because a single HDD is capable of providing only a

CIOs Love STaaS Because It Meets Service Levels Quickly and Without Waste



CFOs Love STaaS Because it Reduces the CapEx Footprint

few hundred IOPS. Making matters worse, with hundreds of moving parts that wear, HDDs in large environments are constantly failing.

3,000 HDDS REQUIRED TO PROVIDE 450,000 IOPS TO AN IO-INTENSIVE APPLICATION.

450,000 IOPs =
150 IOPs/HDD x 3,000 HDDs

For decades, IT organizations wished that fast, solid-state RAM memory could be used for mass storage, but the volatile media loses all data when power is shut down, and it's prohibitively expensive.

Flash memory, the cousin of RAM memory, bridged the gap. Non-volatile flash storage holds data when the power is turned-off, a single all-flash array can deliver hundreds of thousands of IOPs, and the cost is now as low as high-RPM HDDs.

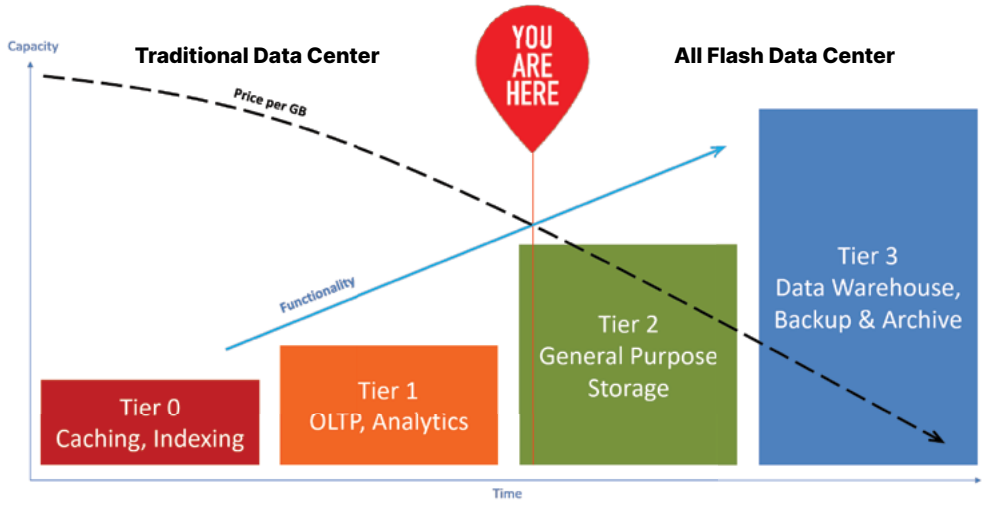
All-flash array pioneers led by Pure Storage beat hyperscale cloud STaaS providers to market with this technology. They introduced all-flash arrays in enterprises, displaced slow and unreliable HDDs in a large percentage of IO-intensive applications, and changed the storage game forever.

All-flash arrays continue to make inroads into many other workloads because they are more compact, don't need constant performance tuning, and are infinitely more reliable than HDD-based storage systems.

Today, all-flash, enterprise-class storage is available from every major cloud STaaS provider as an "SSD" storage service. It is a premium-priced offering for IO-intensive applications, and available in the public cloud from the hyperscale service providers and their partners such as Pure Storage.

The Unstoppable Migration to All Flash Data Centers

IT Brand Pulse believes that in the next several years, all-flash storage will completely replace HDDs for all enterprise and cloud applications. The transition will occur when the price of flash reaches a tipping point. Our recent IT pro survey indicates enterprise IT organizations will go all-flash when the cost is equivalent to the cost of capacity HDDs.



The storage industry is at the doorstep of all flash data centers, waiting only for an abundant supply of flash memory. When all flash data centers emerge, vendors and IT organizations that invested in all flash architectures will have a competitive advantage.

Does Storage-as-a-Service Cost Less?

Probably yes, if you factor in unused capacity, people, space, power, and cooling

Storage-as-as-Service can be risk-free with zero commitment. You may pay only for what you subscribe to, and you will be rewarded with discounts for committing to more capacity and time. All that being said, does it cost less?

The way to assess the total cost of storage is to account for both "hard" and "soft" costs. That means the hard costs of storage hardware, software, and service, as well as the soft costs of unused capacity, storage IT people, data center space, power and cooling.

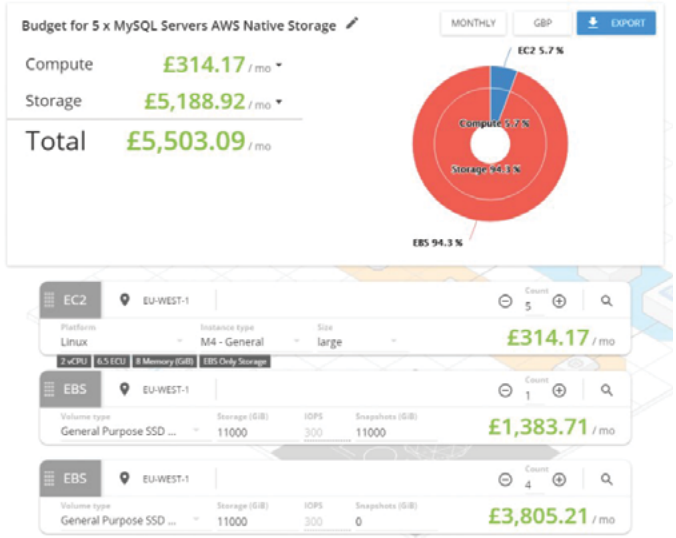
If all these costs are considered, a well-managed STaaS environment should cost approximately the same or less than buying and operating your own storage.

AdRoll is a global leader in digital advertising retargeting products. This AWS case study is one example of many where deploying STaaS resulted in a significant cost savings.

Probably no, if you just compare the price for equivalent terabytes of storage

Actual costs will vary wildly based on many different variables, but a cost analysis published on loudaboutcloud.com shows the AWS budget for 55 terabytes of general purpose SSD for five MySQL servers, each with 11TB of EBS storage, is a little over £5,500 per month. That equates to $7,248 USD per month, or $434,880 USD over five years. Undoubtedly, the purchase price and lease for an all-flash array with 55TB of capacity would be significantly less, but this comparison accounts only the cost of the storage system.

Cost/Month for 55 Terabytes of STaas for 5 My SQL Servers



Source: loudaboutcloud.com

On-Prem STaaS is Now Available!

AWS introduced public cloud storage in 2006. Since then AWS, Google and Azure have implemented strategies with little to offer on-premises. Twelve years later enterprises are still forced to purchase or lease storage that is finely tuned for their applications, or to abandon their infrastructure for public cloud services optimized for risk-free consumption.

Leased infrastructure helped bridge the OpEx gap between public cloud services and on-premises CapEx because it allowed businesses to spread out their cash outlay and keep liabilities off the balance sheet. However FASB rules require businesses to recognize assets and payment liabilities for leases with terms of more than 12 months. This hit on the balance sheet amounts to a strike against on-premises when evaluating the financing of on-premises storage versus cloud services.

On-Premises Storage-as-a-Service is extraordinary because it's like leasing a car, where you take possession of the car (on-premises) - but you only pay for the miles you drive. Additionally, unlike a lease, your car never gets old and you can upgrade features or the entire car as your needs or desires change.

With On-Prem STaaS, IT organizations can take possession of the storage to ensure their data stays on-site, and the on-premises system can be tuned to the specific needs of their different applications. At the same time, the CFO is happy with a utility model that improves cash management and unleashes the business from long-term commitments.

How to Get Started

Find a Storage Provider With Lots of Choices

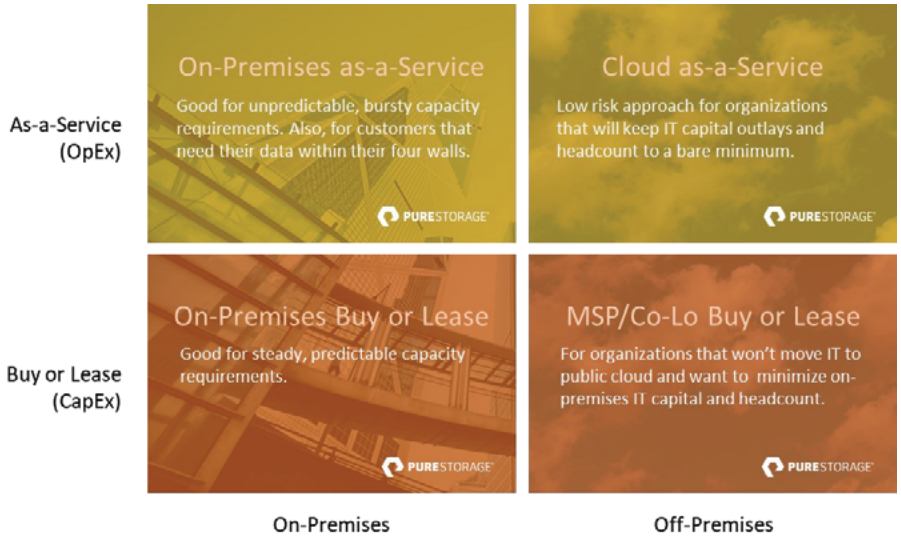
Most IT organizations acquire storage in a variety of ways. This may be due to the fact that the applications they support consume storage differently, changes in management and IT philosophies, or because they inherited a storage environment through a merger, to name just a few.

In any case, a best practice for data center efficiency is to standardize on storage hardware, software and processes. That's impossible when storage providers offer only one type of solution, and it forces IT organizations to evaluate, purchase, deploy and support multiple, disparate environments.

For example, AWS offer only public cloud storage. IT organizations with a need for public cloud and on-premises storage must support AWS EBS or S3 storage in the cloud along with systems on-premises.

Fortunately, a few vendors have identified the need to provide a storage environment that allows IT organizations to buy equipment, lease equipment, or subscribe to a service—as well as support those choices on-premises or off premises.

Most Organizations are Acquiring Storage in Multiple Ways



Vendors like Pure Storage and their partners can help IT organizations build a single environment with storage components that are acquired and consumed in different ways.

Make Sure the STaaS is Ageless

A large group of all flash array vendors rocketed to $50 million in annual revenues simply because they had flash products and the major OEMs did not. A smaller group advanced to hundreds of millions because they added data management features such as dedupe and compression capabilities that were needed for all-flash arrays to compete with comprehensive HDD-based solutions in business-critical application environments. One company—Pure Storage—separated itself from the pack with a radical advancement that profoundly altered the basis for competition. IT Brand Pulse calls the new class of product "Ageless" storage, while Pure calls their specific offering "Evergreen" storage.

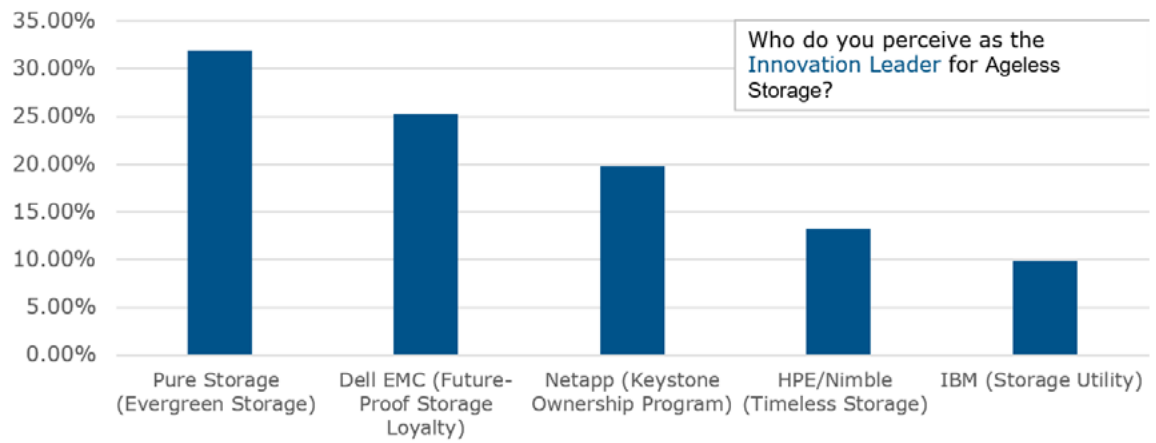
IT Brand Pulse defines Ageless products as offering: 1) Non-disruptive upgrades of storage controllers, memory and media, 2) Upgrades available throughout the life of the product, and 3) Upgrades that are built into the price of the product. In other words, it is more than a warranty contract for spare parts.

Ageless is Integral to Successful STaaS

The concept is simple, but the implementation is not. Products and programs designed from the ground-up for non-disruptive lifetime upgrades are delivered efficiently and have proven to be wildly successful. The Evergreen offering from Pure Storage is a key reason why the company has joined the billion-dollar club and the reason why all major storage vendors are at some stage of offering Ageless storage.

IT Brand Pulse predicts that within 3 years, Ageless storage will become a best-practice and all enterprise storage systems will be designed for non-disruptive upgrades throughout the life of the products.

2020 IT Brand Leader Survey—Ageless Storage

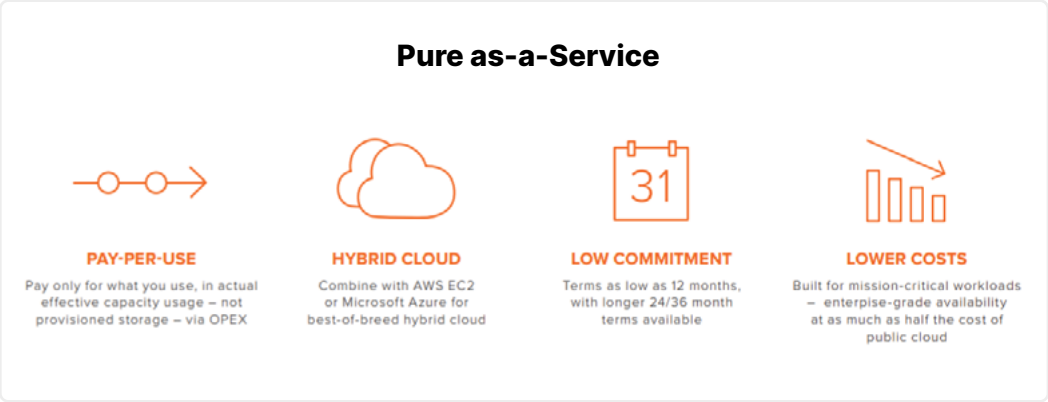


In a 2020 brand leader survey, IT Pros were asked who they perceive as the innovation leader for Ageless Storage. For the third consecutive year, the IT Pros selected Pure Storage

Best-in-Class All-Flash STaaS

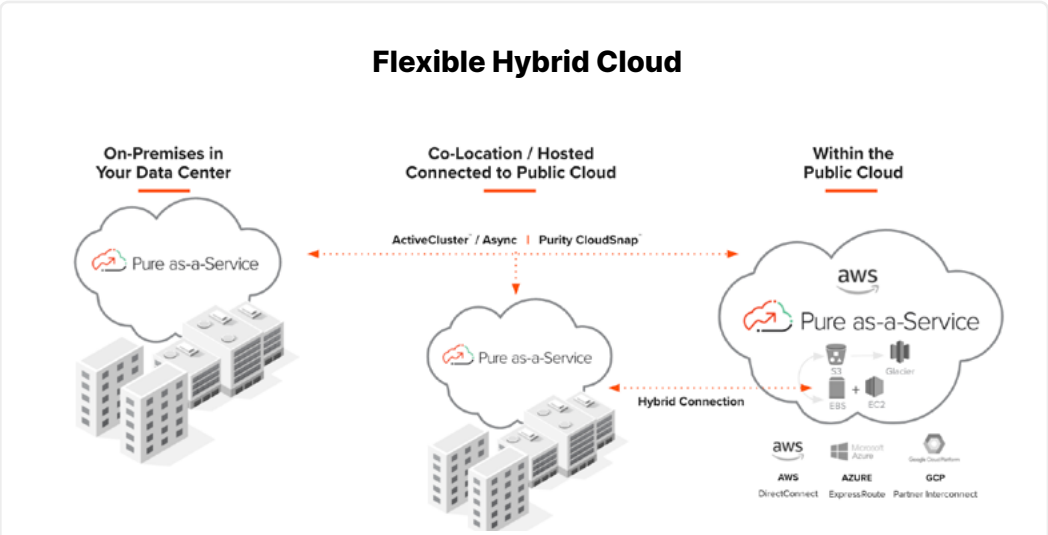
Pure as-a-Service

Pure as-a-Service is a pay-per-use offering that marks the arrival of enterprise-class storage-as-a-service for your block, file, and object workloads. Pure as-a-Service is designed for OPEX storage consumption that delivers the flexibility of public cloud, coupled with the resiliency, security, performance, and cost-effectiveness of enterprise-grade all-flash private cloud infrastructure. Pure as-a-Service flexibly delivers storage capacity on demand – backed by Pure's industry-leading hardware, software, and white-glove support – on a $/GB per month basis for terms starting as low as 12 months.



How it Works

Pure Storage delivers block, file and/or object storage resources to support your workloads and you are then billed only for your effective used capacity. Your bill will go up or down, depending on your usage. You never run out of storage resources because Pure will make sure you always have at least 25% more effective capacity (buffer storage) than your requirement. You aren't billed for the capacity until it is used. It's that simple. that delivers the flexibility of public cloud, coupled with the resiliency, security, performance, and cost-effectiveness of enterprise-grade all-flash private cloud infrastructure. Pure as-a-Service flexibly delivers storage capacity on demand – backed by Pure's industry-leading hardware, software, and white-glove support – on a $/GB per month basis for terms starting as low as 12 months.



Storage can be deployed within your data center, in a colocation facility, attached to a public cloud, or any hybrid combination to support your infrastructure goals.

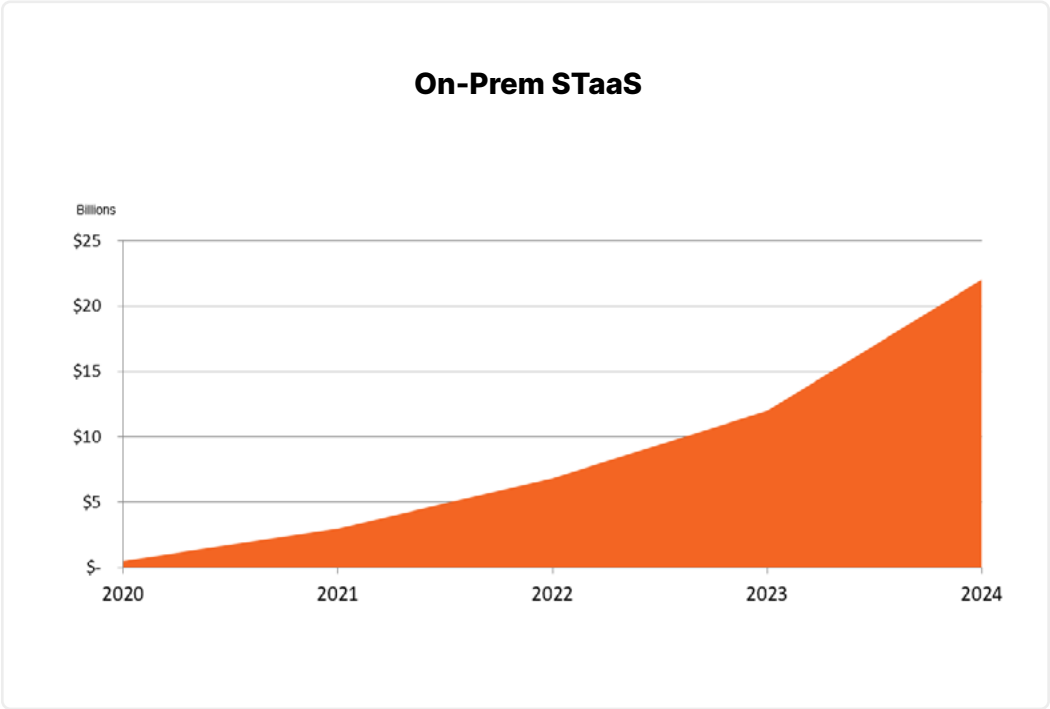
Summary

STaaS is a Matter of “When” Not “If”

Storage-as-a-Service has reached close to 100% of office workers with “personal” storage. Enterprise-class STaaS is not far behind. A third of enterprises have already migrated to public cloud storage-as-a-service but IT Brand Pulse estimates that spending for on-prem STaaS will explode to over $20B in 2024.

When your organization decides to evaluate enterprise STaaS solutions, we recommend you ask for a solution that is Ageless to ensure your technology stays up-to-date in a non-disruptive manner, and that you have the options to subscribe to storage service on-premises for optimum security and performance.

Good luck on your STaaS journey and please remember we crowd-source information in these guides, which means we get a lot of it from people like you. If you think we missed something or simply have something you’d like to contribute, we welcome your input, and if we use it, we’ll attribute the input to you.



Resources

- Pure as-a-Service
- Pure as-a-Service Data Sheet