THE 3-STAGE JOURNEY TO THE ALL-FLASH CLOUD

CIOs and other leading IT decision makers are striving to deliver cloud economics and agility from their on-premises infrastructures. Using all-flash storage is a key step in building a modern cloud data center. Find out how to evolve to the all-flash cloud — and how your organization can benefit at every stage in the journey.

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INTRODUCTION

Enterprise IT leaders are facing critical decisions on how to best deploy data center and cloud resources to enable digital transformation. The advantages of cloud models are beyond compelling — they are fundamental to delivering the agility, cost efficiencies and simplified operations necessary for modern IT workloads and applications at scale. It is no surprise that IDC calls "cloud first" the new mantra for enterprise IT. In fact, it predicts that spending on cloud hardware, software and related services will exceed $500 billion by 2020, more than three times what it is today.[1]
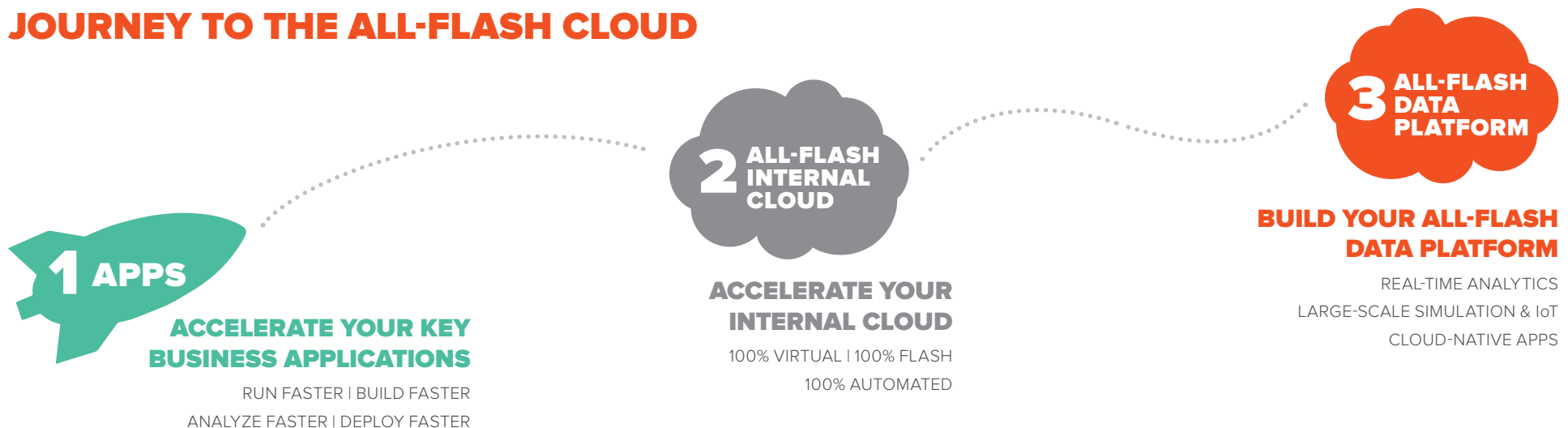
Yet, the path a company should take to a cloud-first strategy is not always easy to define. If you are an enterprise IT decision maker, you need a clear purpose behind each of your cloud initiatives, since one specialized model is unlikely to fit every need. As attractive as it may be to view the public cloud as a quick route to services-based IT, relying on it alone is not a viable option for most enterprises. Private, public and hybrid clouds, in conjunction with software-as-a-service (SaaS) offerings, will deliver different benefits as part of a successful enterprise cloud strategy.

The truth is, even in today's cloud era, enterprise IT leaders continue to require the power, control, security and peace of mind afforded by owning their own infrastructure. But to achieve digital transformation, data centers must deliver the benefits offered by the most innovative and compelling public cloud services.

That means today's data centers — and those in the future — must support new models for resource pooling, self-service delivery, metering, elastic scalability and automatic chargebacks. They must deliver performance and agility that go beyond the capabilities of legacy infrastructures. They must conquer complexity by leveraging technologies and architectures that are simple to deploy and manage. They must achieve levels of automation, orchestration and scalability that are not possible within today's silo-structured data centers. They must support easy integration with leading public cloud services.

But while considering the overall architecture and future of your cloud, there is one key step you should take: standardize on all-flash storage.

JOURNEY TO THE ALL-FLASH CLOUD

1 APPS

ACCELERATE YOUR KEY BUSINESS APPLICATIONS

RUN FASTER | BUILD FASTER
ANALYZE FASTER | DEPLOY FASTER

2 ALL-FLASH INTERNAL CLOUD

ACCELERATE YOUR INTERNAL CLOUD

100% VIRTUAL | 100% FLASH
100% AUTOMATED

3 ALL-FLASH DATA PLATFORM

BUILD YOUR ALL-FLASH DATA PLATFORM

REAL-TIME ANALYTICS
LARGE-SCALE SIMULATION & IoT
CLOUD-NATIVE APPS

Using all-flash storage is the single most important physical change you will need to make to successfully build your cloud infrastructure. Without all-flash storage — in fact, without a flexible and scalable all-flash architecture — the cloud falls apart. The performance, cost efficiencies, simplicity, agility and scalability you need cannot be achieved without all-flash storage as the infrastructure foundation for your modern, service-centric, next-generation cloud data center. The embrace of all-flash storage is reflected in accelerating market growth, with IDC increasing its projected sales for all-flash storage for 2015 to $2.24 billion from $1.8 billion, fueled by lower prices, performance benefits and reduced administrative costs.[2]

So how do you get there from here? How do you leverage the benefits of all-flash storage to build the service-centric cloud infrastructure required for modern enterprise applications? What are some of the innovations in pricing models and all-flash storage architectures that will help you create a cost-efficient, scalable, resilient and reliable cloud infrastructure?

The first thing to recognize is that moving to the all-flash cloud is not a one-step, "rip everything out and start all over again" endeavor. Rather, it is a process that will take place over time, in three distinct stages:

1. **OPTIMIZING** a specific application or workload on all-flash storage, usually to achieve greater speed or density

2. **USING** consolidation and virtualization capabilities to put more applications together on all-flash storage

3. **BUILDING** your next-generation cloud infrastructure on an all-flash storage foundation

This white paper will guide you through the steps required to make this journey successfully. We discuss the benefits of all-flash storage, how to get started, which workloads to focus on, and how to move from putting your first applications on all-flash storage through consolidation and eventually to an all-flash cloud. We also provide links to additional resources to ensure that your move to the all-flash cloud is smooth, safe and successful.

1 PUTTING YOUR FIRST APPLICATIONS ON ALL-FLASH STORAGE

If you are an enterprise IT decision maker, you no doubt realize that your organization has spent a small fortune and a tremendous amount of effort to make sure your business-critical applications are supported by an underlying infrastructure that is reliable, robust and resilient. You are probably beginning to experience performance challenges with a range of applications, particularly those that require high levels of IOPS. But applications and workloads that might see incremental improvements through faster, more responsive storage aren't likely to be the first place you will deploy all-flash systems.

Instead, you are likely to have specific applications and workloads where the performance challenges of spinning disk storage are so difficult to overcome that you must modernize the underlying storage infrastructure to avoid putting your business at risk. Typical applications and workloads at this stage include databases supporting online transaction processing solutions for e-commerce, infrastructures supporting DevOps teams, and applications that are specific to a particular industry, such as electronic health records systems in healthcare, which require levels of performance that spinning disks simply cannot deliver.

In addition to existing applications that may already be causing you pain, there are newer workloads that perhaps do not have an established infrastructure and demand the performance, resiliency, scalability and management simplicity of all-flash storage. Virtual desktop infrastructure is a perfect example of this type of workload: Because of the "bursty" nature of VDI and the pressure it places on storage performance, spinning disks are not a viable option for such deployments.

To understand which application(s) should go on all-flash storage first, it is important to do these three things:

1. Take stock of your own requirements, applications and budget considerations, and identify those workloads that are causing the most pain or providing the best opportunity to use all-flash storage to drive measurable business improvements.

2. Take the time to understand the benefits of all-flash storage solutions and how they can be applied to enhance and strengthen these particular applications and workloads.

3. Evaluate leading all-flash solutions and determine which features, functions and pricing models will maximize your ability to modernize these workloads and begin your journey to the all-flash cloud.

In evaluating the benefits of all flash storage, consider these critical factors:

PERFORMANCE: All-flash storage will deliver performance that is at least 10 times greater than that of spinning disks. When you think about performance, do not focus solely on IOPS; it is also about consistent performance at low latency. Make sure you deploy an all-flash architecture that delivers consistent performance across all workloads and I/O sizes, particularly if you are starting with multiple workloads. A Pure Storage® FlashArray delivers consistent sub-millisecond latency at 100,000s of IOPS, regardless of size, even in mixed workload environments.

TOTAL COST OF OWNERSHIP (TCO): The price of flash storage has come down dramatically. If you looked at flash several years ago and were scared off by the price tag, it is time to look again. Pure Storage now offers a fully featured all-flash array with 25 TB of effective capacity at a price point less than $50,000 (USD). But TCO is about more than the initial price tag when evaluating flash storage solutions. With Pure Storage all-flash arrays, you improve TCO in a variety of other ways, such as:

REDUCED SOFTWARE-LICENSING FEES, particularly for enterprise databases such as Oracle, because you need fewer servers to drive the performance needed.

LOWER ENERGY AND FLOOR SPACE CONSUMPTION.

A SMALLER STORAGE FOOTPRINT through inline deduplication and compression, along with thin provisioning, space-efficient snapshots and clones. Pure Storage FlashArrays can reduce the storage footprint by a ratio of 5:1 and more, depending upon the application and workload.

LOWER OPERATIONAL OVERHEAD through fast and simple deployments, provisioning and scaling.

COST SAVINGS THROUGH THE EVERGREEN™ STORAGE pricing and maintenance model (further detailed in the Stage 2 section).

HIGH AVAILABILITY AND RESILIENCY: Pure Storage all-flash arrays utilize a stateless controller architecture that separates the I/O processing plane from the persistent data storage plane. This architecture provides high availability (greater than 99.999%) and non-disruptive operations. You can update hardware and software and expand capacity without reconfiguring applications, hosts or I/O networks, and without disrupting applications or sacrificing performance.

OPERATIONAL SIMPLICITY: Pure Storage all-flash arrays are virtually plug and play — so simple that they can be installed in less than hour. And storage administrators typically do not have to worry about configuration tuning and tweaking, saving hours or days of effort and associated expenses.

> "Legacy storage solutions, designed more than twenty years ago, are being rendered obsolete by the dual disruptors of flash memory and the cloud."

SCOTT DIETZEN, CEO
PURE STORAGE

Source: Pure blog post dated February 25, 2016 »

FOR MORE INFORMATION ON PUTTING YOUR FIRST APPLICATIONS ON ALL-FLASH STORAGE:

Flash Buyer's Guide »

The Next Big Game Changer: Democratization of All-Flash Storage »

Once you have put your first applications on an all-flash storage array, things will never be the same. The performance gains, simplified management, scalability, application uptime increases and availability are benefits that will change not only your business, but also your thinking about what you can accomplish with your IT infrastructure.

If you are like most IT leaders, you will want to expand these benefits to additional applications and workloads across your data center. As you expand your all-flash storage solution to additional applications, you will find that TCO benefits increase substantially. Because all-flash storage supports mixed workloads, you can consolidate more applications on fewer devices, thus reducing capital expenditures.

By consolidating, you also maximize many of the cost savings mentioned in the previous section: lower energy consumption and less floor space use, reduced software licensing fees, and further savings through deduplication and compression over more applications and workloads. In dense mixed workload applications, the TCO of using a Pure Storage FlashArray will typically be 50% to 80% lower than a comparably configured spinning disk solution. (For a more thorough analysis of TCO, see the link below to the IDC White Paper on Evergreen Storage.)

Beyond the specific cost savings, the performance gains across more applications will drive significant business improvements and new opportunities. Your infrastructure will be much more agile. Your applications will be more highly available with less downtime. You will be more efficient in using flash storage to develop new applications and business services and support cloud-like capabilities such as pooled resources, self-service provisioning and elastic scalability.

The enhanced agility will also be critical in supporting many of the important technology initiatives that are defining next-generation businesses, including initiatives such as big data analytics and the Internet of Things. With all-flash storage, you will be able to process and analyze more data — and more data types — faster than ever before.

In addition, the right all-flash storage architecture will help you future-proof your storage infrastructure, so that the investments you are making today will continue to provide value as you expand the use of all-flash storage across your enterprise. As mentioned, Evergreen Storage is a unique model for purchasing storage, a model designed to fit the specific challenges of the cloud era.

The benefits of Evergreen Storage

Evergreen Storage leverages the modular and stateless design of Pure Storage all-flash arrays. With this model, you purchase a maintenance contract that includes upgraded controllers with every three years renewal. You can also upgrade at any point in the lifecycle, with a trade-in credit for existing controllers. With Evergreen Storage, Pure Storage replaces any failed components at no additional charge during the life of the array.

This enables customers to always stay current with the latest technology at a fraction of what it would cost to purchase new equipment every three or four years, a typical storage lifecycle. As you consolidate applications across all-flash arrays, you can simply and easily perform technology refreshes leveraging Evergreen Storage, without impacting application services. With the Evergreen model, capital costs are one-half to one-third that of a traditional upgrade model, according to a conservative estimate by IDC. Maintenance costs are reduced by about 50%.

FOR MORE INFORMATION ON CONSOLIDATING MORE APPLICATIONS ON ALL-FLASH STORAGE:

Introducing Evergreen Storage »

4 Reasons to Use All-Flash Storage to Consolidate Cloud Applications »

Pure Storage Introduces a New Technology Upgrade Model with Evergreen Storage »

3 BUILD YOUR CLOUD ON ALL-FLASH STORAGE

What do enterprise IT departments want and need from their cloud infrastructures? How can you leverage the cost savings and agility of the public cloud model, and marry it to the control, security, data protection and peace of mind you can achieve with an on-premises cloud infrastructure?

You want to be able to provide all the features, functions and flexibility available from the leading public cloud service providers. If you are unable to provide a better alternative, users within the organization will feel the need to go to the public cloud. This creates a fertile ground for shadow IT initiatives that can cause security problems and other risks.

Beyond delivering public cloud-like features and functionality, you may also want to improve in areas where the public cloud may fall short. Performance is a great example: If you want to use cloud services to support high-performance computing or big data analytics or some of the other important next-generation IT initiatives, you will likely pay a premium — if you can even find a public cloud service that can match your requirements. Security is another critical area where building your own cloud infrastructure will give you much greater control and peace of mind, particularly as you begin thinking about supporting your most important business applications and data in the cloud.

As you move from your first all-flash applications through consolidation and toward the all-flash cloud, an important step will be to bridge the virtualization gap between your servers and the rest of your infrastructure, namely storage and networking. Perhaps you embraced storage virtualization when you consolidated your applications during Stage 2 of this journey. If you didn't do it then, you will have to do it now to truly leverage the benefits of the all-flash cloud.

This is another area where your all-flash architecture can play a critical role in providing the flexibility, agility and management simplicity required for a successful cloud deployment. What are you trying to accomplish? If you start with delivering basic cloud-type services, your must-have list would include:

THE ABILITY TO SHARE RESOURCES THROUGH SIMPLE AND AUTOMATED PROCESSES. Users should be able to go straight to your on-premises cloud and choose the storage capacity and performance they need, for as long as they need it.

AUTOMATED METERING AND CHARGEBACKS. Once users have chosen the resources they want, the cloud infrastructure should be able to meter their usage and create an automated chargeback mechanism so they pay for what they actually used.

ELASTIC SCALABILITY. Once resources are used, they go back into the pool and become available to other users and departments. As storage capacity and performance requirements grow, the storage platform should be simple to upgrade, update and scale.

With virtualization across servers, storage and networking, your all-flash storage array becomes the foundation for your cloud infrastructure. The Pure Storage all-flash array not only delivers the performance required to support this t a time when data growth is exploding in all directions. You can stay current with the latest innovations in flash technology through the Evergreen Storage model. In addition, you can leverage consolidation and virtualization to deliver an IT-as-a-service model through the all-flash cloud, with the ability to:

ORCHESTRATE AND AUTOMATE your entire IT environment

BUILD RESILIENT, ELASTIC AND SIMPLE cloud operations levels — both within and beyond the storage level

TRACK AND PREDICT resource consumption

CREATE SELF-SERVICE IT for internal and external customers

FOR MORE INFORMATION ON BUILDING YOUR CLOUD ON ALL-FLASH STORAGE:

Flash Buyer's Guide »

Cloud Computing With Peace of Mind »

Accelerate Your Enterprise Storage for the Cloud Era »

CONCLUSION

Cloud computing and all-flash storage are two of the most important innovations driving next-generation IT initiatives. While it may seem at first that these are parallel trends, in reality they are inextricably intertwined. Without the benefits of all-flash storage — driving new levels of performance, agility and management simplicity — enterprises would not be able to modernize their infrastructures to deliver cloud services. It is no coincidence that the largest hyperscale cloud providers rely on all-flash storage solutions as their storage foundation.

Pure Storage all-flash storage arrays provide enterprise customers with a safe, secure and smooth path to the all-flash cloud. You can take the journey in stages, starting small with a single application or two, and then adding more applications through consolidation and virtualization. You can also implement multiple stages at once.

With all-flash storage, you can do everything you are doing now, only better, faster and simpler, with more agility and more resilience. With Pure Storage as a partner, you don't need to start over to benefit from all-flash storage. You can take the journey at your own pace. You may choose to go slowly, or you can go big — all the way to the cloud.

[1]   "IDC Predicts the Emergence of 'the DX Economy' in a Critical Period of Widespread Digital Transformation and Massive Scale-Up of 3rd Platform Technologies in Every Industry," IDC, Nov. 4, 2015

[2]   "Flash-Based Data Storage Is Growing Faster than Anticipated," Bloomberg, Aug. 12, 2015

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