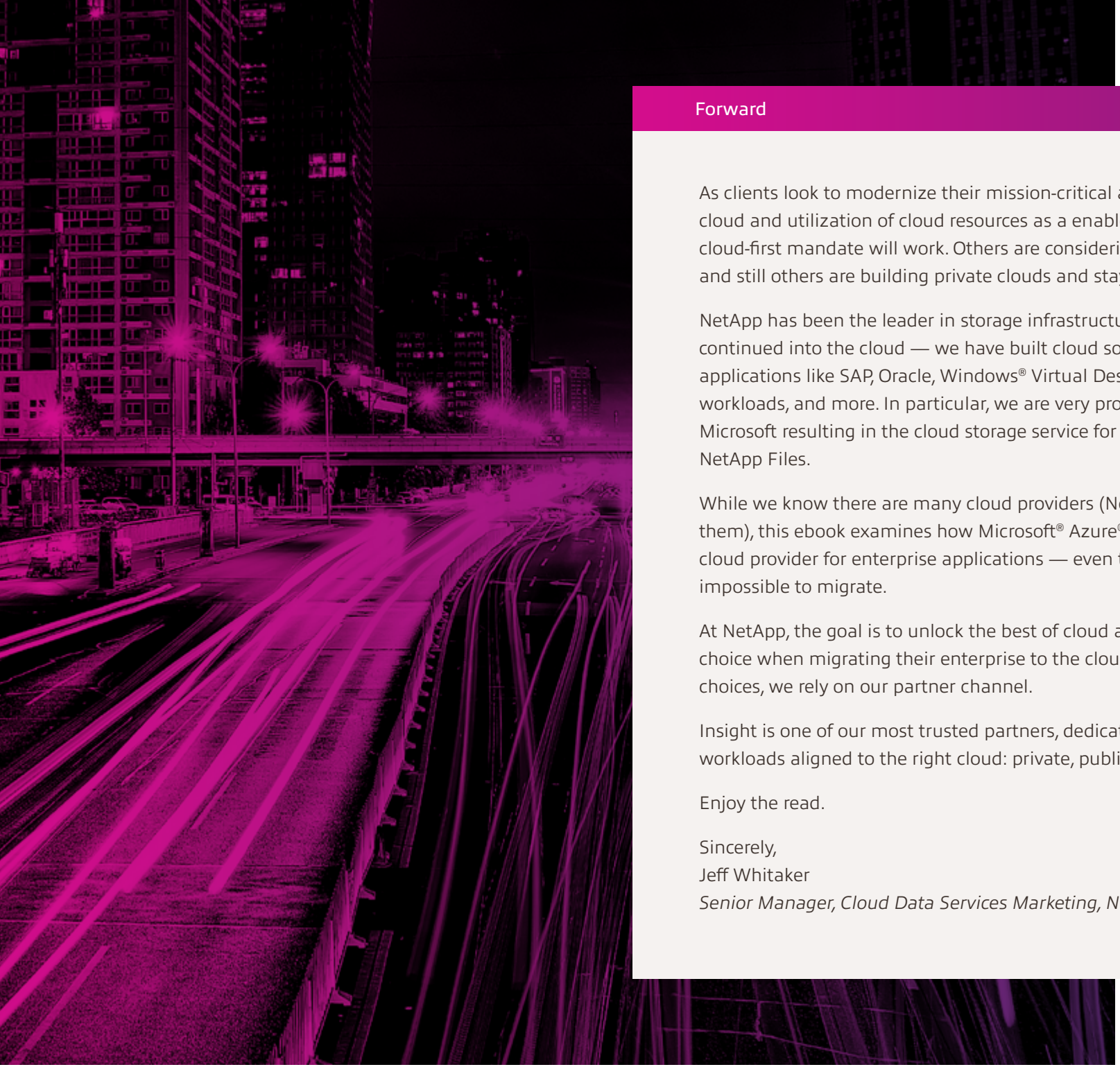
Should I Move My Enterprise Applications to the Cloud?

Get the fast facts about cloud capabilities with Azure NetApp® Files and why you should always start with your own business requirements before determining next steps.

Insight®



Forward

As clients look to modernize their mission-critical applications, many consider the cloud and utilization of cloud resources as a enabler. For many organizations, a cloud-first mandate will work. Others are considering a full-scale move to the cloud, and still others are building private clouds and staying with on-premises solutions.

NetApp has been the leader in storage infrastructure for decades and this has continued into the cloud — we have built cloud solutions that support enterprise applications like SAP, Oracle, Windows® Virtual Desktop (WVD), high-performance workloads, and more. In particular, we are very proud of our collaboration with Microsoft resulting in the cloud storage service for enterprise applications: Azure NetApp Files.

While we know there are many cloud providers (NetApp partners with most of them), this ebook examines how Microsoft® Azure® has focused itself as a public cloud provider for enterprise applications — even the tough ones you thought impossible to migrate.

At NetApp, the goal is to unlock the best of cloud and provide our clients with choice when migrating their enterprise to the cloud. To help clients make the right choices, we rely on our partner channel.

Insight is one of our most trusted partners, dedicated to getting the right workloads aligned to the right cloud: private, public, or hybrid.

Enjoy the read.

Sincerely,
Jeff Whitaker
Senior Manager, Cloud Data Services Marketing, NetApp

Kent leads the virtualization and cloud infrastructure practice at Insight, directing the selection and adoption of virtualization hardware and software technologies and services. He also consults with organizations on storage consolidation, virtualization, and cloud strategies. He has previous experience directing intelligent virtualization strategy and appliance-based virtualization and was a software engineer for various storage manufacturers. He loves cool technology but will only recommend something if it is right for you.

Introduction

Thank you for taking the time to review this ebook. Generally, we don't start speaking to a client about a specific technology. Instead, we focus on its organizational goals and objectives, including application workloads, and recommend solutions to address those real-world issues.

We do see a significant number of organizations strategizing about how to best take advantage of the opportunities presented by the cloud. That can be a daunting task, because we believe there is no "one cloud," and that most successful solutions will involve some sort of hybrid cloud strategy.

There are serious challenges integrating big data with the cloud, and that is where NetApp excels. Storing data on cloud platforms can be expensive and often lacks the service levels clients have grown to expect from NetApp in their on-premises data centers. The complexity, potential cost, and performance challenges of cloud-based data can present difficulties for enterprise applications attempting to take advantage of public cloud platforms without significant refactoring.

With that in mind, it makes sense for clients to understand Azure NetApp Files. As you will read, NetApp took cloud seriously and created file data services that are simple to leverage, scalable, and offer the service levels these critical applications require.

That is why we are providing a focused overview of Azure NetApp Files: to impart a better understanding of how it can support an overall and rewarding cloud strategy.

Cheers,
Kent Christensen
Virtualization Practice Director for Insight

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The path to modern enterprise applications lies in your data center

Global enterprises are increasingly looking to build new agile and on-demand architectures to help reduce costs, become more agile, and respond to market pressures with greater innovation. These new infrastructures typically revolve around cloud-first or hybrid cloud models. The IDG 2020 Cloud Computing Survey revealed that 92% of respondents have at least some of their IT environments in the cloud, leaving only 8% with all of their IT environments on-premises.[1]

Organizations are embracing a cloud-first strategy for multiple reasons, including:

- Maintaining or increasing performance
- Increasing agility and scalability
- Enhancing reliability and security
- Reducing costs and eliminating expensive infrastructure
- Saving time

Unfortunately, many applications were never designed to be run in the cloud, so blindly adopting a cloud-first mandate often leaves a complex trail of ambitious plans and timelines, leading to nowhere. This is particularly true when it comes to complex enterprise application workloads, such as:

- Billing systems
- Point-of-Sale (POS) and order entry systems
- Financial analysis and ERP planning
- High-performance design applications used for engineering and manufacturing
- Modern applications that rely on Artificial Intelligence/Machine Learning (AI/ML), facial recognition, edge computing, etc.
- Customer-facing applications with sub-zero latency demands
- Supply chain systems

The challenges of an all-cloud strategy

According to the 2020 Flexera Software State of the Cloud Report, 70% of organizations face challenges moving their enterprise applications to the cloud.[2] Some of the most complex enterprise migrations include SAP, High-Performance Computing (HPC) applications, databases such as Oracle, and Linux® file-based applications in general.

Major challenges include achieving the levels of performance, latency, scalability, availability, and reliability needed by enterprises. At the same time, we also know that many legacy systems are nearing the end of their lifetimes and cannot be relied upon indefinitely.

Understanding the right action to take is much more than a "lift and shift" exercise. Before any organization can unequivocally decide to move specific workloads to the cloud, it must first examine application mapping, future functionality, financial planning, compliance and governance needs, talent and skills acquisition, and much more.

The case for Azure cloud

Public cloud providers are consistently working to make the cloud more attractive for the enterprise. Microsoft, in particular, has been working to strengthen its Azure offerings. Azure supports a wide range of programming languages, frameworks, operating systems, databases, and devices, providing enterprises with the flexibility to use the familiar tools and technologies they trust.

The four pillars of moving your enterprise applications to the cloud

"Enterprise applications are designed to integrate computer systems that run all phases of an enterprise's operations to facilitate cooperation and coordination of work across the enterprise. The intent is to integrate core business processes (e.g., sales, accounting, finance, human resources, inventory and manufacturing). The ideal enterprise system could control all major business processes in real time via a single software architecture on a client/server platform. Enterprise software is expanding its scope to link the enterprise with suppliers, business partners and customers."

Gartner IT Glossary[3]

In the next pages, we will outline four pillars necessary for successful enterprise applications and identify how Microsoft and NetApp have worked together to provide an advantage for each pillar. The four pillars are:

1. Performance
2. Security
3. Business continuity
4. Scale

We will conclude with an alternative hybrid cloud option.

Modernize for performance

According to IDC, 45% of the external storage systems for mission-critical applications are file-based.[4] A large percentage of those are high-performance Linux shared file services, which are both performance-intensive and latency-sensitive. They have also been some of the most challenging workloads to migrate to the cloud.

Most enterprise mission-critical applications rely on performance. For example, in financial services, you need sub-second latency to process financial transactions in real time; in oil and gas, you need to be able to collect and share edge computing data collected from devices in the field, such as pipeline capacity, asset health, logistics, and transportation; in genomics and other healthcare research, you need to be able to run simulations against petabytes of data gathered from geo-diverse locations; in automotive, you need to amass data from sensors on automobiles to improve safety measures. The list is endless and evolving, as industries continue to transform and increasingly rely on data to thrive and compete.

Performance in the cloud

Microsoft and NetApp teamed up to solve the challenges of migrating core business-critical, file-based enterprise applications to Azure, and Azure NetApp Files is the result. Azure NetApp Files is a native Microsoft Azure service, available in the Azure portal, that combines the benefits of the Azure cloud with the storage expertise NetApp is known for.

As an Azure service, Azure NetApp Files is backed by Microsoft's 99.99% uptime guarantee. This built-in feature eliminates the need to custom build additional environments to meet your availability targets.

Equivalent to on-premises performance

Azure NetApp Files is designed to provide the performance that enterprise applications need, delivering ultra-high throughput that matches or exceeds on-premises performance, along with sub-millisecond latency and integrated data management. Enterprises do not need to give up throughput to move to the cloud.

Clients can choose between three performance tiers: standard, premium, and ultra. Each service level allocates a different amount of bandwidth per terabyte (TB) of provisioned capacity. This has been an ideal differentiator because it aligns performance to need on demand, reducing the high cost of overprovisioning to meet peak performance requirements.

- The standard tier is best suited to file share use cases with lower performance requirements, such as static websites, infrequently accessed file shares, or shared locations used to store backups/archives. Standard is perfect for use cases when capacity is the primary requirement.
- The premium tier is well-suited for Input/Output Operations Per Second (IOPS)-intensive databases such as Oracle and SQL, as well as enterprise applications and big data analytics. To obtain more throughput, you can adjust the volume quota.
- The ultra tier is best suited to file share use cases with high performance requirements and lower capacity requirements, such as HPC, SAP® workloads, and high-throughput, low-latency production databases.

Another reason enterprises have been reluctant to migrate mission-critical workloads to the cloud has been the risk of crippling latency. Higher latency results in lower IOPS/throughput. Azure NetApp Files provides <1ms latency, putting those worries to rest, which is important for applications with intensive throughput and performance requirements.

With dynamic volume service levels, it is simple to switch between performance tiers to meet a range of business scenarios quickly, easily, and as frequently as required. This flexibility enables organizations to maximize performance and maintain cost controls.

Azure NetApp Files is also certified for SAP HANA®.[5] Our unrivaled file performance and <1ms latency meets its stringent performance indicators — for the first time ever in the cloud.

Modernize for security

Incursion attempts targeting any computer with internet access are now nearly constant, with attacks occurring an average of once every 39 seconds, according to a University of Maryland study.[6]

Yet very often the blame lies at the feet of people who simply let their guard down: human error. According to a recent study, 53% of companies had more than 1,000 sensitive files available to every employee, and 15% of companies had more than one million folders accessible to all employees.[7]

Security in the cloud

Recognizing the dangers associated with human error and malicious hackers, Microsoft is committed to ensuring that Azure is secure. To this end, it provides multilayered security to meet international government requirements, employs 3,500 cybersecurity experts, and invests $1 billion every year on cybersecurity research and development.[8]

Azure NetApp Files is protected by multiple security layers. Role-Based Access Control (RBAC) can be implemented at the Azure portal to limit volume creation, management, and deletion to authorized personnel. Volumes are encrypted using the FIPS 140-2 standard, with keys managed by the Azure NetApp Files service. Data traffic between NFSv4.1 clients and Azure NetApp Files volumes can also be encrypted, and although traffic between NFSv3 or SMBv3 clients and Azure NetApp Files volumes is not encrypted, the traffic from an Azure Virtual Machine (VM) running an NFS or SMB client to Azure NetApp Files is as secure as any other Azure-VM-to-VM traffic because it is local to the Azure data center network.

Azure NetApp Files complies with leading industry certifications, such as the Health Insurance Portability and Accountability Act (HIPAA), as well as data protection and privacy regulations, such as Europe's General Data Protection Regulation (GDPR) and Canada's data sovereignty regulations.

Trusted by governments, Azure NetApp Files is launching several new government data centers and has been FedRAMP-approved for High Impact Level in both government and commercial. Government agencies now gain the performance, scalability, and low latency of Azure NetApp Files.

Modernize for business continuity

Business continuity has been highlighted more in 2020 than perhaps during any previous time in recent history, with many businesses experiencing negative impacts from the pandemic.

Until this year, most organizations were more focused on hackers, hurricanes, and ransomware rather than on the dangers presented by a pandemic.

But pandemic-related threats of business interruption are real and costly. According to a recent IDG cloud computing study, 58% of organizations are migrating to the cloud specifically to help enable business continuity.[9]

In addition to maintaining essential functions during a disaster, it is important for businesses to recover with the least amount of downtime possible. Downtime costs can be astronomical: According to a 2019 survey by Information Technology Intelligence Consulting, 45% of enterprises reported that they lose from $500,000 to $5,000,000+ for every *hour* of downtime.[10]

With those kinds of costs at stake, organizations are seeking the resilience and reliability of the cloud to reduce downtime, recover quickly, and minimize impact to the business.

99.99% uptime guarantee

Mission-critical applications demand constant availability, making infrastructure reliability paramount. Clients cannot move to the cloud without the protection and Service-Level Agreements (SLAs) that are built into their own data centers.

How Microsoft has met business continuity in the cloud

Azure's 99.99% uptime guarantee extends to cloud storage with Azure NetApp Files, enabling organizations to exceed the 99.95% application availability targets.

Cross-Region Replication (CRR)

CRR operates as protection in the event of a regional disruption, whether an outage, cyberattack, or natural disaster. With CRR, data in one region is replicated in a secondary region, providing built-in multi-region support to enable business continuity.

Organizations have an integrated solution enabling failover from their primary region to their secondary region, reducing risk by providing necessary redundancy in case of a primary data center event/disaster. CRR provides clients with the confidence of having their data in two distinct locations, meeting their Recovery Point Objectives (RPO).

Snapshots

The NetApp Snapshot™ technology built into Azure NetApp Files protects data with fast, reliable backup and recovery. Snapshots — point-in-time copies of data — can be instrumental in building a database protection and recovery plan for your applications with no additional data footprint and no impact on application performance.

Benchmark studies have shown that Azure NetApp Files can:

- Reduce backup runtime by 99%, with a 2.3TB SAP HANA database backup completed in just two minutes (compared to days with traditional systems)[11]
- Reduce restore and recovery times by 70% when compared to a file-based data backup[11]

Azure NetApp Files also supports an SAP HANA scale-out architecture, allowing organizations to build a landscape that will support a standby mode. In case of any disruption, the environment will failover within five minutes to minimize impact on critical business operations.

Modernize for scale

Scale for the enterprise is about two things: the ability to quickly scale your environment to meet the needs of the business, and the ability to scale in an agile manner to transform how you are operating today. Both scenarios require an enterprise infrastructure that is ready to respond to the business.

The impact of COVID-19 has reinforced the need for organizations to be fast, resilient, and agile. In our experience, enterprises that have an agile infrastructure are prepared to respond quickly to business stakeholders, driving outcomes that can solve customers' problems and deliver meaningful customer experiences.

The speed of business is constantly accelerating, and an inability to scale can impact your ability to compete. In addition, the cost to scale up for intermittent peaks can be prohibitive, and it is equally expensive to let capacity languish unused during non-peak periods. Increasingly, this is a job for the cloud — when done right.

Scale in the cloud

The need to increase operational agility is often the impetus for organizations to move to the cloud. In fact, one of the most common reasons to migrate to the cloud is to take advantage of its unmatched scalability — both up and down — facilitating performance, efficiency, and cost reduction.

Azure NetApp Files provides on-demand scalability. A single volume can be scaled from 100GB to 100TB in seconds, and the maximum size of a capacity pool is 500TB. Scaling up or down can be achieved immediately, with no special skills or advance capacity planning.

For example, developers spin up resources for simulations and spin them back down when the simulations are complete. Next, they can spin up development resources to make edits or adjustments as needed. The cycles of spinning up and down can be repeated as many times as necessary to complete the final product.

With on-demand scalability, Azure NetApp Files is well-suited to HPC applications in a wide range of industries, delivering high throughput, ultra-low latency, and the agility of the cloud, anywhere. Simulations that previously took as long as months can be reduced to just hours.

Unlike any other storage service, Azure NetApp Files allows users to change both the capacity and service level on the fly. Dynamic volume service levels enable clients to switch performance tiers easily, and in seconds, in response to changes in demand. There is no need to copy data, which can potentially cause outages and increase costs.

Examples of how dynamic volume service levels can be used:

- A client can begin with the standard tier and increase performance levels as applications requiring higher levels of performance are added.
- A client can select a higher performance tier for a capacity pool to expedite migration to Azure NetApp Files, and then drop down to a lower tier — and lower cost — after the migration is complete.
- A client can choose a lower performance tier for a Disaster Recovery (DR) destination in a secondary region, while using a higher performance tier for its primary region. It can then increase the performance level of the DR volume in just seconds in the case of a DR event and reduce it again after the DR event is over.

Databases require scalability

Some workloads have proven to be stumbling blocks when it comes to cloud migration, as it has traditionally been thought that the trade-off for agility is reduced performance and increased latency — neither of which can be tolerated in mission-critical workloads.

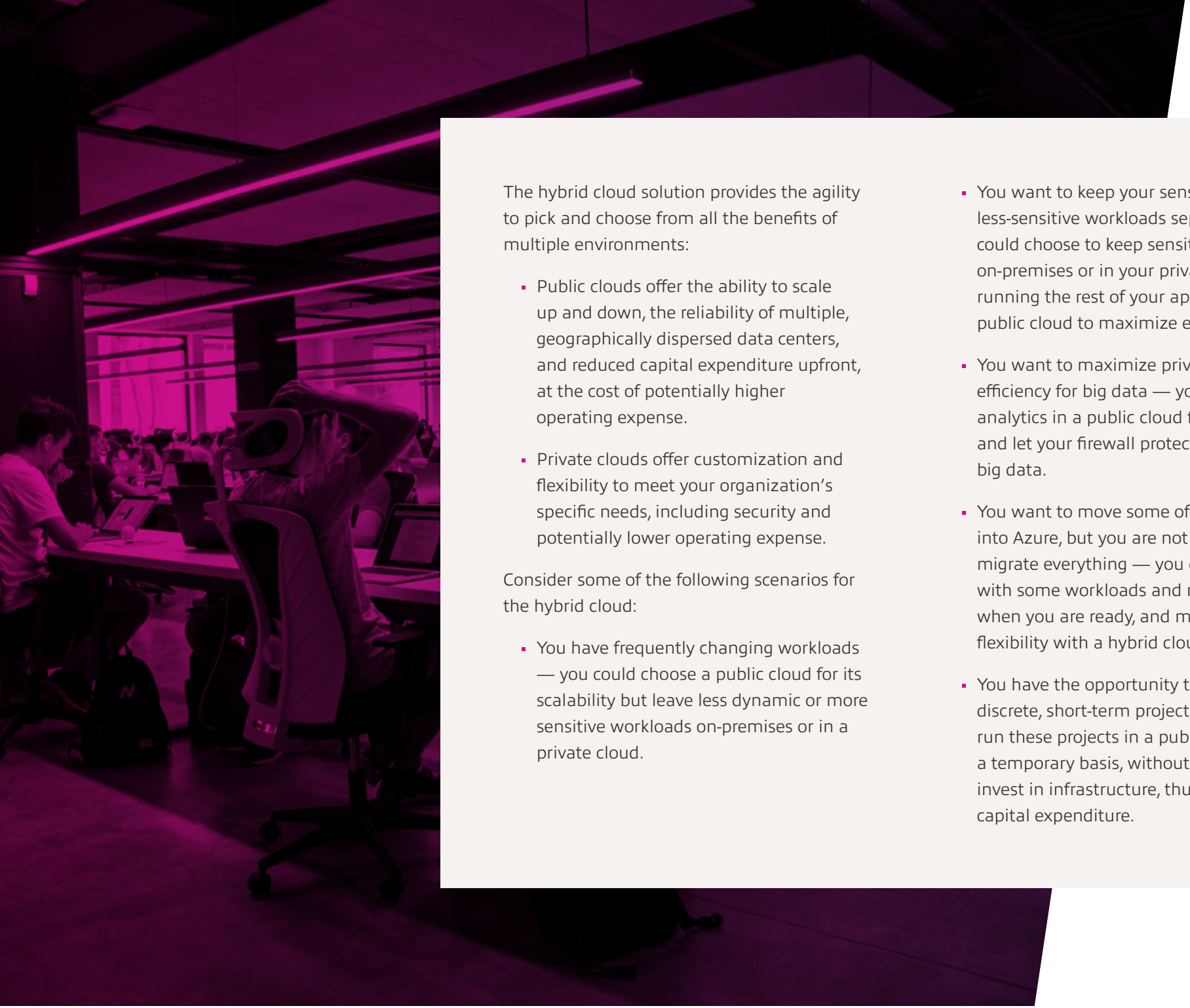
Databases such as Oracle and SQL are good examples. These databases require an agile, flexible, and scalable environment that is also capable of delivering the high performance and low latency required to support their enterprise workloads. In many cases, storage is the weak link, preventing migration entirely, significantly delaying it, or even forcing repatriation to on-premises storage if the performance issues cannot be solved. In the case of the Azure cloud, Azure NetApp Files can be the enabling technology.

Modernize with a hybrid cloud

"A public cloud platform provides enterprises with an agile, scalable, and cost effective IT infrastructure that supports their business processes. However, public cloud is not necessarily an appropriate option for all types of workloads. As such, some enterprises are choosing to keep certain workloads on-premises — using an in-house data center — or on private clouds. This approach helps them achieve better performance, 24/7 availability, enhanced security, and greater compliance with regulations."

Jyoti Lalchandani, IDC Group Vice President & Regional Managing Director for the Middle East, Turkey, and Africa (META)[12]

This ebook has pointed out the work that Microsoft and NetApp have completed together to enable an enterprise cloud-first strategy. But the reality remains that such a strategy is not the right fit for every organization. Often a hybrid cloud solution can offer the best of all worlds, allowing clients to maximize the lifespan of their on-premises infrastructure, maintain certain applications on-premises, and also take advantage of private and public clouds for the applications best suited to them.



The hybrid cloud solution provides the agility to pick and choose from all the benefits of multiple environments:

- Public clouds offer the ability to scale up and down, the reliability of multiple, geographically dispersed data centers, and reduced capital expenditure upfront, at the cost of potentially higher operating expense.
- Private clouds offer customization and flexibility to meet your organization's specific needs, including security and potentially lower operating expense.

Consider some of the following scenarios for the hybrid cloud:

- You have frequently changing workloads — you could choose a public cloud for its scalability but leave less dynamic or more sensitive workloads on-premises or in a private cloud.
- You want to keep your sensitive and less-sensitive workloads separate — you could choose to keep sensitive information on-premises or in your private cloud while running the rest of your applications in a public cloud to maximize efficiency.
- You want to maximize privacy and efficiency for big data — you could run analytics in a public cloud for scalability and let your firewall protect your sensitive big data.
- You want to move some of your workloads into Azure, but you are not ready to migrate everything — you could start with some workloads and migrate others when you are ready, and maintain future flexibility with a hybrid cloud.
- You have the opportunity to deploy discrete, short-term projects — you could run these projects in a public cloud on a temporary basis, without the need to invest in infrastructure, thus reducing your capital expenditure.

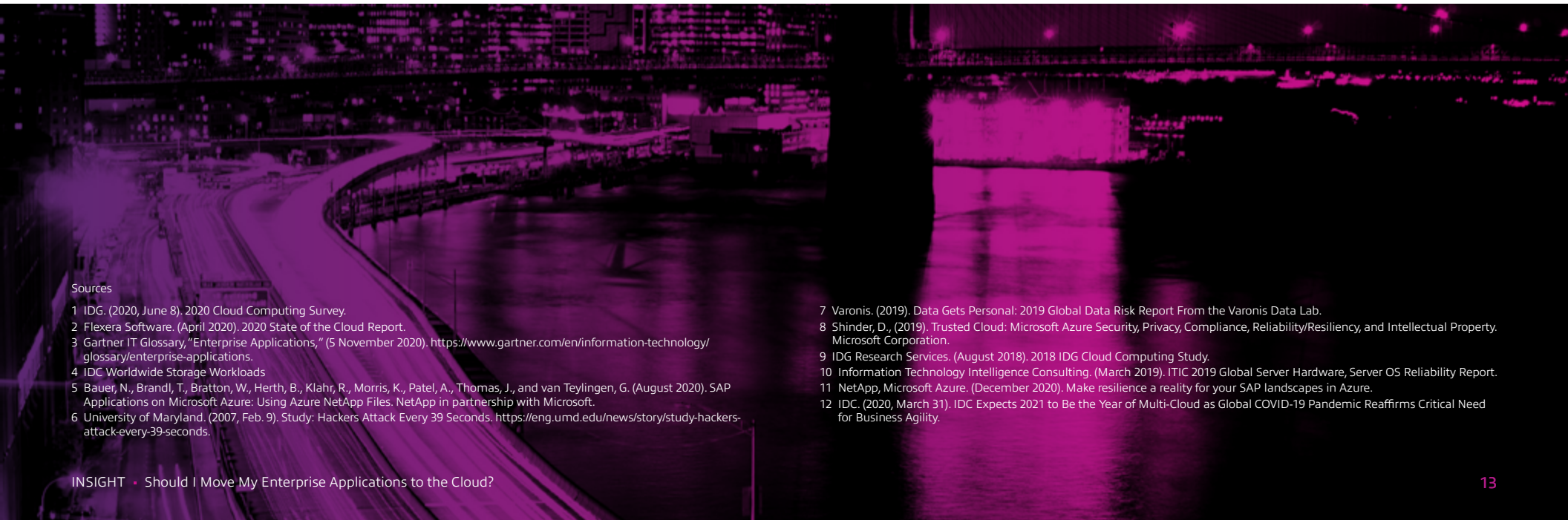
If you have a cloud-first mandate, or if you are looking to migrate some of your mission-critical applications to the cloud, we can help. We are infrastructure and architecture experts, and we are here to help you clarify your objectives while mapping out the safest, most cost-effective, and most reliable migration journey for you, no matter where you are on that journey.

At Insight, we listen to you — we do not take a one-size-fits-all approach to digital transformation. The solution we recommend (and ultimately help you deploy) will be the best solution for you.

Book time with us today

If you're intrigued by Azure NetApp Files, feel free to book a demo with us. Reach out to our team, and we will be happy to set one up (it takes about 10 minutes) or talk to you about any other topic that interests you.

With Insight, everything is just that easy.



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