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Cloud service providers of all types face significant infrastructure challenges. To succeed in the face of intense competition and growing cost pressures, service providers need a more agile approach to infrastructure that evolves quickly and provides the ability to rapidly pilot and scale new, well-differentiated service offerings.

Service providers can increase agility and minimize costs by focusing on standardized, commodity hardware and eliminating silos of specialty equipment. By combining web-scale hyperconverged infrastructure (HCI) technology with enterprise and cloud capabilities, Nutanix Enterprise Cloud solutions provide the performance and agility that service providers need while lowering total infrastructure costs by 39% on average. Nutanix Service Providers spend up to 61% less time on infrastructure operations and realize a five-year return on investment of 534%. The Nutanix AHV hypervisor can reduce or eliminate virtualization licensing costs that can be a significant part of operating budgets.

Building on the web-scale architectural foundation, advanced VM-centric features and comprehensive REST APIs give service providers the ability to offer a variety of new and enhanced services from their datacenters, while also offering multi-cloud capabilities to extend operations and services even further:

- **Nutanix Calm** provides multi-cloud application automation and orchestration
- **Nutanix Xi Beam** delivers multi-cloud optimization and management

Several additional Nutanix features facilitate application-level services:

- **Nutanix Xi Epoch** for application-level observability and monitoring
- **Nutanix Era** for database copy data management

Service Providers choose Nutanix for these advanced features plus its security-first design, support for hardware from leading server vendors, and a distributed architecture that supports any application including Tier 1 workloads.

Linear, pay-as-you-grow scaling matches costs more closely to demand, while cloud integration ensures that Nutanix will continue to meet evolving service needs. With Nutanix, service providers get full-stack support from a single vendor—a company whose Net Promoter Score (NPS) has averaged over 90 for the past four years.

**Managed Cloud Service Providers** focus less attention on infrastructure and more on customer needs.

**Private Cloud and Infrastructure as a Service** providers gain enterprise features that public clouds lack such as data reduction, snapshots, cloning, and support for multiple hypervisors.

**Desktop as a Service** providers eliminate scaling challenges—and can even support other services on the same infrastructure.

**Software as a Service** providers focus on managing and optimizing applications rather than constantly tuning and troubleshooting infrastructure.

**Disaster Recovery/Data Protection as a Service** providers efficiently ingest large amounts of customer data with the compute capacity to quickly bring up customer applications during a failover.

This paper details the distinct advantages that Nutanix delivers for X-Powered Service Providers. Nutanix helps you stay ahead of the pack with superior service differentiation, continuous innovation, and improved cost control.
Service providers of all types play an important role in delivering IT services in an increasingly dynamic world. By cultivating a deep understanding of the IT challenges faced by customers, service providers help their customers control costs, increase agility, and focus more attention on business needs and less on IT. To be successful, service providers must create well-differentiated and profitable offerings. However, they face significant infrastructure challenges. It can be difficult to onboard customers quickly without significantly overprovisioning resources upfront and either driving up costs or driving down return on investment. Many service providers still spend too much time managing infrastructure and dealing with the complexity and inherent limitations of conventional IT architectures.

Service provider operating environments may still rely on silos of infrastructure managed by teams of administrators, each with specialized skillsets ranging from networking to storage to virtualization. As a result, troubleshooting customer issues can require substantial effort and time, affecting customer SLAs. Given the number of vendors that can be involved, finger pointing is almost inevitable when a problem arises.

Nutanix dramatically simplifies infrastructure for service providers, making it possible to build new services with far less effort. Nutanix simplifies the process of creating customized portals and adding customized code to optimize existing services. Using Nutanix APIs, service providers can create differentiated offerings that add value.

By combining hyperconverged infrastructure (HCI) technology with enterprise and cloud capabilities, Nutanix Enterprise Cloud solutions provide the high performance that service providers need while lowering total infrastructure costs by 39% on average. Nutanix is a clear HCI leader on both the Gartner Magic Quadrant for Hyperconverged Infrastructure and the Forrester Wave: Hyperconverged Infrastructure. With Nutanix, IT teams spend up to 61% less time on infrastructure operations and realize a five-year return on investment of 534%.

This white paper describes the challenges that service providers face, explains how Nutanix addresses those challenges, and examines the unique advantages of Nutanix Enterprise Cloud. The second part of the paper provides specifics and resources for some of the more popular services being deployed on Nutanix:

- Managed Cloud Service Provider (MSP)
- Private Cloud and Infrastructure as a Service (IaaS)
- Desktop as a Service (DaaS)
- Software as a Service (SaaS)
- Disaster Recovery/Data Protection as a Service (DR/DPaaS)
INFRASTRUCTURE CHALLENGES
Most of the infrastructure challenges that service providers face are a function of competition or cost. This section examines some of the most common challenges experienced by service providers of all types.

Competition
The cloud service provider market is fiercely competitive due to the number and size of competitors as well as the increasing breadth of services. Public cloud providers such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) have become increasingly agile. To succeed in the face of this competition, service providers need:

• A more agile infrastructure. To compete with public cloud, service providers need infrastructure that provides a similarly high level of agility with easy-to-use, customized portals for customers.

• Well-differentiated service offerings. For service providers, the ability to offer services that competitors either can't deliver or can't provide at a competitive price is important. Conventional server and storage infrastructure fails to deliver this differentiation.

• The ability to rapidly pilot and scale new offerings. To stay ahead of the competition, service providers need to quickly pilot new services and scale the ones that prove successful. IT infrastructure that works well during a pilot project with a few customers may not scale, resulting in delays due to time-consuming re-architecting.

• Flexibility to evolve quickly. A service provider’s core business three years from now could be very different than it is today. Existing services may need to evolve or may be replaced with new ones. It can be difficult to update conventional IT infrastructure fast enough to keep pace with the rate of change, creating disruptions and adding costs. Infrastructure must be software-defined and programmable through well-defined APIs.

• Multi-cloud support. It's increasingly a multi-cloud world. Many companies are already using cloud services from multiple providers. Multi-cloud orchestration and cross-cloud visibility are becoming essential. Service providers are increasingly offering services built on public cloud, perhaps adding value in terms of customization, ease-of-management, or expertise in a particular industry.

Capital and Operating Expenses
Service providers often face significant capital expense (CapEx) and operating expense (OpEx) challenges. IT Infrastructure costs are typically the largest capital expense. The floor for infrastructure costs is being set by public cloud providers with huge economies of scale. While most service providers aren’t in a position to adopt the public cloud infrastructure model entirely, they can minimize costs by focusing on standardized, commodity hardware and eliminating silos of specialty hardware. Improving hardware utilization and efficiency can minimize infrastructure expenditures. Some needs may be satisfied using externally hosted private and public cloud services instead of adding on-premises infrastructure. For instance, a service provider might want to “overflow” to public cloud to meet peak loads or unexpected needs.
Two important elements of OpEx for service providers are staff costs and indirect infrastructure costs. Increasing hardware utilization and efficiency can drive down power, space, and cooling requirements. Simplifying IT infrastructure reduces the need for expensive and sometimes hard-to-find storage and networking specialists, making it possible for each administrator to manage more infrastructure and support more customers. Spending less time on basic management tasks results in more focus on adding services and satisfying customer needs.

The cost of hardware and software upgrades is also important. Having to rip and replace infrastructure every three to five years is expensive and disruptive. Some infrastructure solutions may necessitate expensive professional services for planning and implementing software upgrades.

**NUTANIX ENTERPRISE CLOUD**

Nutanix Enterprise Cloud streamlines service provider infrastructure. Nutanix delivers a single software OS that runs across clouds, making the boundaries between private, public and distributed clouds invisible. It scales easily, offers maximum flexibility and agility, and supports a wide range of workloads including the most demanding Tier 1 applications. Advanced Nutanix Enterprise Cloud features provide a foundation to create a variety of differentiated and cost-effective services. These features include:

- High performance
- Advanced storage tiering
- Global data reduction
- VM-centric and space-efficient snapshots and clones
- Complete REST APIs
- Nutanix AHV hypervisor
- Nutanix Calm for application orchestration
- Nutanix Era for database copy data management

And SaaS-based offerings including:
- Nutanix Xi Beam for multi-cloud management
- Nutanix Xi Epoch for application-level observability and monitoring
- Nutanix Files and Buckets for unstructured file data and object storage
- Nutanix Volumes for block storage

One-click, non-disruptive upgrades take the pain out of software upgrade planning and eliminate the need for planned downtime; Nutanix eliminates the need for forklift hardware upgrades with incremental scaling and infrastructure that can be easily reused.

Nutanix enterprise cloud solutions yield major benefits versus traditional infrastructure as detailed in a recent IDC study:\[1\]

- 61% more efficient to deploy, manage, and support
- 60% reduction in five-year operating costs
- 97% fewer unplanned outages

Service providers need agility, simplicity, pay-as-you-grow economics, and security and control in their infrastructure solutions. Nutanix Enterprise Cloud delivers the agility of public cloud infrastructure, including fast provisioning and flexible resource consumption, without sacrificing the ability to satisfy demanding SLAs or deliver tightly enforced security. Important customer data can be secured and protected using software-based Nutanix data at rest encryption. User and application data are encrypted to a level of FIPS 140-2 Level 1 compliance using standard drives and software-based encryption that meets HIPAA, PCI DSS and SOX standards.

\[1\] http://go.nutanix.com/nutanix-pricing-vs-traditional-infrastructure-tco-roi-report.html
Nutanix Enterprise Cloud is designed to support multi-cloud environments, enabling service providers to architect services that include public clouds. Hybrid applications that span across service provider data centers, customer premises, and public cloud environments are possible.

An enterprise cloud built on Nutanix has a number of key elements:

- **Hyperconverged infrastructure.** 100% software-defined, resilient, and distributed, delivering predictable performance for a wide range of enterprise and cloud native applications

- **Control fabric.** Consumer-grade design leverages machine intelligence, extensive automation, and rich analytics

- **Multi-cloud orchestration.** Nutanix simplifies the deployment and management of complex applications by incorporating all elements of an application into an easy-to-use blueprint with Nutanix Calm.

- **Agile development for reduced time to market.** Nutanix Enterprise Cloud provides complete REST APIs, enabling service providers to leverage Nutanix features to enhance services and deliver self-service. Common workflows for development and production are repeatable and easily automated.

- **Mobility.** Applications deployed on a variety of virtual and cloud infrastructure can be moved between environments as needs change.

- **Security-first design.** Security is not bolted on, but an integral part of the architecture.

Nutanix Enterprise Cloud creates a turnkey foundation for delivering profitable cloud services at an unprecedented pace, reducing the time needed for service providers to achieve profitability from new and existing services.

CUSTOMER SUCCESS: UNIFIED COMMUNICATIONS PROVIDER STREAMLINES OPERATIONS WITH NUTANIX

A Nutanix customer since 2013, this unified communication as a service (UCaaS) provider chose Nutanix to support three cloud services it was bringing online: IaaS, DaaS, and hosted Microsoft Exchange. Primary selection criteria were scalability, availability, and management. In addition, the infrastructure team had an objective to move away from its existing Fibre Channel SAN. Among the many benefits are:

- **Reduced datacenter footprint.** Total footprint was reduced 25%, reflecting a direct reduction in capital expenses and follow-on savings for co-location costs, power, and cooling.

- **More granular scaling.** Nutanix infrastructure scales incrementally through the addition of single nodes, lowering incremental scaling costs and enabling just-in-time purchasing.

- **100% availability.** The provider has never had a Nutanix hardware failure that impacted a customer. Non-disruptive operations including software upgrades eliminate the need for planned downtime.

- **Simplified capacity planning.** Because compute and storage scale together, capacity planning is much simpler, and the team spends less time balancing workloads.
## Reasons Service Providers Choose Nutanix

Nutanix has many service provider customers delivering X-Powered services, and the number is growing rapidly. When asked their reasons for choosing Nutanix, a few consistent themes emerge:

- **Simplified architecture and operations.** Hyperconverged infrastructure significantly reduces the number and variety of components and vendors in service provider datacenters and on-premises at customer locations, resulting in more streamlined operations, less time spent troubleshooting, and much easier upgrades.

- **Flexible platform choices.** Nutanix Enterprise Cloud runs on multiple platforms including: Nutanix NX Series, Dell EMC XC Series, Lenovo HX Series, and IBM Power-based CX Series. Software options are available for Cisco UCS, HPE ProLiant, Fujitsu, Hitachi, and more. Both all-flash and hybrid options are supported. Platforms can be chosen based on the needs of the service without re-architecting or creating a new silo.

- **Granular and linear scalability.** Start small and grow resources incrementally to align infrastructure costs with actual needs. A service can start small and scale out easily as customers are added. Nutanix accommodates almost any application without tuning and eliminates the “noisy neighbor” problems that plague conventional infrastructure.

- **Reduce TCO.** Nutanix offers significant savings in both OpEx and CapEx. Because different types and generations of nodes can be mixed in the same cluster, service providers can always buy and deploy the latest technology. The alternative model results in upfront overprovisioning, which is expensive and leaves service providers managing older technology over a longer period. Nutanix clusters stay current without costly and disruptive forklift upgrades every three to five years.

- **Create new services quickly.** Service providers can deploy new services quickly on Nutanix. Complete and well-documented REST APIs make it simple to leverage Nutanix value-add capabilities.

- **Self-service enabled.** Nutanix makes it simple to design and deploy self-service capabilities accessible to customers.

- **Easily repurpose and move equipment.** Service provider businesses are dynamic by nature. Nutanix provides the flexibility to repurpose infrastructure for a different service or to remove nodes from a cluster and move them to another location as business needs dictate.

- **Eliminate downtime.** A Nutanix enterprise cloud is resilient by design and can be configured to withstand multiple drive and node failures. Should a failure occur, a Nutanix cluster automatically self-heals, restoring resiliency quickly, without operator intervention and without requiring hot spares sitting idle. This decreases risk and also reduces the urgency of replacing failed hardware. Nutanix one-click upgrades eliminate the need for planned downtime.

- **Easily extensible to public cloud.** Many service providers leverage public cloud resources in addition to on-premises infrastructure. Nutanix Enterprise Cloud makes it simple to integrate with public cloud including a range of cloud and platform services from Nutanix.

- **Partnerships and reference architectures.** Detailed designs combined with close partnerships with leading infrastructure and application vendors simplify the deployment of common services and applications.

- **Service and support from a single vendor.** Nutanix has award-winning support, comprehensive global services, and innovative education solutions. Service providers receive support for servers, storage, and virtualization all from a single source with no finger pointing.
Hyperconverged Design Simplifies Scaling

Nutanix eliminates the guesswork and removes the constraints created by conventional IT infrastructure, enabling service providers to get started quickly and scale without disruption. Nutanix combines compute and storage resources with intelligent software, eliminating the pain points associated with conventional infrastructure. Service providers spend less time wrangling infrastructure and more time adding customer value.

Nutanix Enterprise Cloud converges the datacenter stack including servers, storage networking, storage, virtualization, application orchestration, and data protection. Purchase Nutanix Enterprise Cloud plus your hardware of choice from one of our supported platforms, or choose easy-to-deploy Nutanix NX appliances. Either way, you’ll be able to scale out one node at a time as your needs grow. Each added node supports a predictable number of virtual machines, allowing service providers to adopt a pay-as-you-grow model.

With Nutanix, service providers can closely match infrastructure costs to growth in demand, avoiding the large initial capital investments and stair-step scaling of traditional solutions.

Figure 1. Nutanix converges compute, storage, virtualization, and data protection functions in simple, scalable building blocks

Figure 2. Nutanix Enterprise Cloud scales in small increments, avoiding the large initial investments and stair-step upgrades that are necessary with traditional infrastructure approaches.
Because each hyperconverged node includes both compute and storage, scaling is linear, and the network impact of adding nodes is low because most I/O is local.

**Distributed Data Services Streamline Storage Management**

Nutanix Enterprise Cloud eliminates the need for traditional SAN and NAS solutions by employing a highly distributed infrastructure fabric. It delivers a rich set of software-defined services that are VM, containers, application, and end-user centric, including snapshots, high availability, disaster recovery, deduplication and more. Nutanix provides all the data services necessary to support both traditional enterprise applications and next-generation applications on the same platform and enables service providers to offer value-added block, file, and object storage services without adding separate infrastructure that increases complexity:

- **Volumes.** A native scale-out block storage service that provides direct block-level access via the iSCSI protocol.
- **Files.** A software-defined scale-out service for unstructured file data, providing a highly available and massively scalable data repository. Files eliminates the need for separate NAS appliances.
- **Buckets.** A software-defined object storage service designed with an S3-compatible REST API interface to handle terabytes to petabytes of unstructured object data.

Distributed storage is at the heart of the Nutanix architecture. All the storage including flash and hard disk drive storage devices across a Nutanix Enterprise Cloud platform (i.e. the cluster) are pooled and exported to the virtualization layer using industry-standard protocols. Nutanix provides all the capabilities expected from an enterprise storage solution while eliminating the complexity. This includes snapshots, replication, cloning, and data tiering as well as data efficiency technologies such as compression, deduplication, and erasure coding. A single storage pool can span an entire cluster. Nutanix Enterprise Cloud also provides advanced features that are only available by combining storage and compute into a single platform, including data locality and deep integration into the hypervisor.

A Nutanix cluster delivers optimum performance for every workload and adapts automatically to workload changes, so service providers don’t have to spend valuable time tuning performance. Integrated tiering and information lifecycle management automatically places the data in the best tier and node based on the access pattern, providing optimal performance automatically. Data is initially stored in the SSD tier and moves to the HDD tier as it gets cold. Access patterns are continually monitored and data is automatically moved back to the SSD tier as it is accessed. As much of a VM’s data as possible is stored on the node where the VM is running, but all of a cluster’s storage resources are available to all nodes. When a VM is moved from one node to another, its data automatically follows the VM in the background.
Intuitive 1-Click Management and Full API Integration

Hyperconverged infrastructure is nothing without a simple-to-use interface backed by a rich set of REST APIs and PowerShell commandlets. Nutanix delivers simplicity, agility, and predictable scale to service provider datacenters. All operating functions are distributed across a cluster for the highest level of performance and extremely high resilience. Since any node can assume any cluster role as needed, there is no single point of failure and management isn’t affected.

Nutanix Prism provides an integrated platform for one-click management of all components of the stack with accelerated provisioning. Powered by advanced data analytics and heuristics, Prism streamlines common datacenter workflows, providing a single interface from which to manage and upgrade servers, storage, and virtualization.

Prism provides an intuitive user interface to simplify and streamline common datacenter workflows, eliminating the need to have disparate management solutions for different tasks. A majority of the platform’s management functionality is accessible through REST APIs and PowerShell commandlets, facilitating automation.

**NUTANIX AHV VIRTUALIZATION**

Nutanix Enterprise Cloud supports VMware vSphere, Microsoft Hyper-V, and Nutanix AHV. For price-sensitive services, virtualization can present a significant opportunity for cost savings. By bundling the Nutanix AHV hypervisor with Nutanix Enterprise Cloud, Nutanix minimizes the well-known virtualization stack tax.

AHV is the preferred hypervisor choice for Nutanix Enterprise Cloud because native management integration with Nutanix Prism. Traditional hypervisors were designed for a world of monolithic non-VM-aware storage arrays and switch fabrics; they were built to accommodate thousands of combinations of servers, NICs, and drivers. They require multi-pathing policies and complex designs to mitigate issues such as storage congestion and application resource contention while still accommodating high availability and scalability. Acceptable performance often requires segregating workloads.

AHV virtualization was designed from the ground up to provide a much simpler and more scalable hypervisor and associated management platform by leveraging the software intelligence of Nutanix Enterprise Cloud. AHV liberates virtualization from the domain of specialists, making it easier to deploy and manage.
AHV is based on the proven open source hypervisor to ensure support for all popular workloads and is hardened to meet the most stringent enterprise security requirements. It is fully supported by Nutanix, which means that service providers get full infrastructure and virtualization capabilities from a single vendor with no hidden costs.

**AUTOMATION, ORCHESTRATION, AND LIFECYCLE MANAGEMENT**

Nutanix Enterprise Cloud provides a single point of control for managing infrastructure and applications across a service provider’s entire operational footprint. Nutanix Calm is designed to address the challenges of automation in dynamic environments, adding native application orchestration and lifecycle management to Nutanix Enterprise Cloud.

By approaching applications as complete entities, Calm orchestrates how applications are created, consumed, and governed. It delivers simple, repeatable, and automated management of applications across a variety of environments, including private and public clouds. Calm provides a foundation for managed cloud service providers, SaaS providers, or any cloud service provider developing and deploying customer-facing applications and services.

Calm simplifies the set-up and management of custom applications by incorporating all elements of each application, including relevant VMs, configurations, and related binaries, into an easy-to-use blueprint, making the deployment and lifecycle management of common applications automated and repeatable. This result in a value-added service that service providers can offer to their customers, enabling those customers to level up their IT sophistication.

A unified application language provides a single flexible construct to improve collaboration between teams and avoid errors between development and operations disciplines.

![Figure 4. Calm blueprints incorporate all the elements needed to deploy and manage a custom application.](image-url)
MULTI-CLOUD SECURITY AND OPTIMIZATION

Service provider operations are becoming increasingly complex and multi-cloud. In addition to their own data centers, many service providers are now managing resources across one or more public cloud environments. This not only adds management complexity it raises concerns with both security and resource optimization. How can service providers ensure they are using public cloud resources optimally and not paying for idle or orphaned resources? How can service providers ensure that security is maintained across different environments? And how can service providers enable their customers to make better multi-cloud decisions?

Nutanix Beam addresses these challenges with multi-cloud visibility, continuous cloud security and compliance, and one-click remediation of vulnerabilities. Beam provides organizations with deep visibility and rich analytics detailing cloud consumption patterns along with one-click cost optimization across cloud environments.

Beam provides insights into cloud compliance and security in real time so that service providers can resolve potential threats before they turn into business problems. Having a single tool to manage security across both public and on-premises environments simplifies security management and decreases the chance of costly errors. Service providers can also allow customers to use Beam to make better decisions on siting workloads. This can allow service providers to better understand customer workloads and guide them to the optimal cloud architecture.

APPLICATION CENTRIC NETWORK SECURITY

Ensuring logical separation and security in multi-tenant service provider environments is a critical concern. Nutanix Flow simplifies network and policy management, enabling applications and environments to be governed independent of the physical infrastructure. Flow delivers advanced networking and security services that allow service providers to gain visibility and granular control leading to a better security posture.

Microsegmentation protects against advanced threats that are capable of propagating from machine to machine by segmenting virtual networks and applications to permit only necessary communications between application tiers or other logical boundaries via a native stateful VM firewall.
Guidance for Selected Services

The following pages provide specific guidance for five services: managed cloud service provider (MSP), Private Cloud/IaaS, Desktops as a Service, Software as a Service, and DR/Data Protection as a Service. To utilize this section:

• Review the content for each service of interest including the questions at the end of the section
• Be sure to download and read additional resources

In addition:
• Review Service Provider case studies and blogs on Nutanix.com
• Download the following IDC report: IDC TCO study
• Learn about Nutanix security: Information Security with Nutanix
• Connect with Nutanix for a complementary session
• Connect with Nutanix and Nutanix customers on next.nutanix.com
• Follow Nutanix on Twitter @nutanix

When you are ready to talk to Nutanix directly:
• Email info@nutanix.com for more information
• Call Nutanix directly at (855)-Nutanix
• Find more ways to contact Nutanix at our contact page
MANAGED CLOUD SERVICES PROVIDERS
Managed services companies provide day-to-day IT management for their customers. In the past, many MSPs focused solely on delivering services on customer-owned infrastructure. MSPs today may offer cloud services similar to what customers expect from the public cloud along with traditional MSP offerings. By providing a simple, scalable, and highly available enterprise cloud platform, Nutanix makes it simpler for MSPs to offer cloud services, freeing them to focus more time and effort on customer needs.

Reasons MSPs Choose Nutanix
• **Any application, any cluster.** A Nutanix enterprise cloud can support both enterprise and cloud native applications and deliver high performance without constant infrastructure tuning and load balancing.
• **OpEx savings.** Reducing administrative overhead and hitting SLAs saves costs. MSPs benefit from:
  • Rapid provisioning and self-healing.
  • Application orchestration with Nutanix Calm.
  • One-click upgrades.
  • Ability to identify problems proactively rather than reactively.
• **Ability to focus on customers not infrastructure.** The key to success in managed services is focusing on the customer and customer needs.

Resources for MSPs
**Reference Architectures and Best Practices**
• Best Practices for AHV
• Nutanix Calm Reference Architecture
• Best Practices for Microsoft Exchange on AHV, SQL Server, Oracle
• Technical Notes for SAP, Oracle, SQL Server
• Three Ways Nutanix Infrastructure Can Benefit Your MSP Practice
• VMware vRealize Automation Reference Architecture

**eBooks**
• The Definitive Guide to Enterprise Apps on Hyperconverged Infrastructure
• The Definitive Guide to SAP on the Enterprise Cloud
• The Definitive Guide to Microsoft SQL Server on Nutanix Enterprise Cloud

**Case Studies**
• IDC Buyer’s Case Study: iCore Networks
• UCS Solutions deploys invisible infrastructure

**Questions for MSPs to Consider**
• How many different management interfaces does your team use every day (for virtualization, network, storage, data protection, etc.)?
• How many times have you ended up in the wrong tool for the task you needed to accomplish?
• How long does it take to upgrade capacity?
• How long does it take to upgrade software?
• How efficiently can you orchestrate application deployments and lifecycle events?
PRIVATE CLOUD/INFRASTRUCTURE AS A SERVICE

Private Cloud/IaaS providers offer virtualized computing resources for their customers, putting them into direct competition with public cloud providers. As a result, the ability to offer flexible, agile, and reliable services is critical. Nutanix allows providers to offer enterprise features that public providers may lack, such as data reduction, snapshots, cloning, and support for multiple hypervisors.

Reasons Private Cloud/IaaS Providers Choose Nutanix

• No “noisy neighbor” problems. Providers have little or no visibility of the applications running on their infrastructure. By providing data locality, Nutanix eliminates the problems that occur when using conventional infrastructure with shared storage. At the node level, no single VM is allowed to consume all the controller resources.

• Cluster flexibility. A Nutanix enterprise cloud gives service providers more flexibility and a selection of available platforms so services can be tailored more closely to customer needs:
  • Mix platforms. Nutanix provides a broad range of platforms: compute-heavy, storage-heavy, and storage-only. All types can be mixed in the same cluster if needed.
  • Create all-flash or hybrid (HDD and SSD) clusters.
  • Choose hypervisors: vSphere, Hyper-V, Nutanix AHV (AHV is included with Nutanix purchases, eliminating virtualization license costs).
  • Move VMs between hypervisors.
  • Ability to repurpose equipment. Switch a node from one hypervisor to another. Take nodes offline and move them to other locations.
  • Rapid, automated cluster deployment. New clusters can be up and running in minutes.
  • Less space, power, and cooling. Reduce expenses and reclaim space in crowded datacenters.
  • Self-service. Nutanix provides options for all hypervisors.

Resources for Private Cloud/IaaS

Reference Architectures and Best Practices

• Best Practices for AHV; Docker Containers on AHV Best Practices
• Hyper-V Storage Best Practices; Hyper-V Networking Best Practices
• VMware vSphere Storage Best Practices; VMware vSphere Networking Best Practices
• VMware vRealize Automation Reference Architecture

eBooks

• The Definitive Guide to Private Clouds
• Designing and Building a Hybrid Cloud

Case Studies

• UCS Solutions Deploys Invisible Infrastructure
• Q9 Builds Private Cloud Service on Nutanix
• Micro Logic Launches New Public Cloud Offering on Nutanix

Questions Private Cloud/IaaS Providers Should Consider

• How do you plan for customer growth? How quickly can you scale your infrastructure?
• How quickly can you allocate more resources to a customer if needed?
• How do you plan and manage necessary hardware and software upgrades?
• What tasks are your administrative team doing today that should be automated?
DESKTOP AS A SERVICE

DaaS providers host virtual desktop infrastructure (VDI) and virtualized application deployments for customers. With DaaS, the greatest challenge is scaling infrastructure to accommodate growth. A traditional infrastructure solution that works well for a pilot project may not scale, resulting in unexpected expenses. By converging compute and storage on the same node, Nutanix eliminates these scaling difficulties, allowing DaaS offerings to scale without surprises. The same infrastructure that hosts DaaS can also host IaaS or other services.

Reasons DaaS Providers Choose Nutanix

- **Take advantage of predictable costs and growth.** Eliminate guesswork and simplify capacity planning.
  - Start small and scale to any size.
  - Each node supports a predictable number of desktops.
  - Choose VM sizes and go.
- **Repurpose nodes.** Downsize if needs change or move nodes between sites to balance load.
- **Adapt to customer needs without affecting the status quo.** Customize VM sizes or add GPU-acceleration on some nodes without changing the overall design.
- **Leverage validated solutions.** Nutanix has reference architectures for Horizon View, XenDesktop, and XenApp, simplifying deployment and reducing risk. Citrix solutions are validated on AHV, eliminating hypervisor licensing costs.
- **Nutanix InstantOn for Citrix Cloud.** Combines the power of the Nutanix scale-as-you-grow architecture with the simplicity of XenApp and XenDesktop Cloud Service to deliver fast and secure digital workspaces.

Resources for DaaS

**Reference Architectures and Best Practices**

- Reference Architecture: Citrix XenDesktop on Nutanix AHV
- Citrix on Nutanix AHV from Login VSI
- Reference Architecture: VMware Horizon DaaS 6.1
- Reference architecture: VMware Horizon 7 on Nutanix

**White Paper**

- 6 Benefits of a Modern Secure Digital Workplace

**Case Studies**

- TBConsulting Partners with Nutanix for Rapidly Expanding VDI Environment

**Questions DaaS Providers Should Consider**

- How flexible is your current infrastructure solution?
- When you expand are you worried about capacity and performance?
- Are you dedicating infrastructure specifically for special requests?
SOFTWARE AS A SERVICE

SaaS providers deliver internet access to hosted software. SaaS providers need to focus on delivering value in terms of differentiated software features, not managing infrastructure. By greatly simplifying IT infrastructure while providing superior scalability and availability, Nutanix frees SaaS providers to focus on software. A number of Nutanix features support ongoing software development.

Reasons SaaS Providers Choose Nutanix

• **Cloud experience without the cost.** Eliminate guesswork
  • No tuning needed. Nutanix infrastructure adapts to the workload.
  • Nutanix sizer determines what infrastructure is needed.
  • Analytics can quickly identify any bottlenecks that arise.
  • One interface covers all infrastructure management needs.
  • Full REST APIs facilitate automation and integration with software.
  • One-click software upgrades simplify management and eliminate downtime.

• **Application automation and orchestration.** Nutanix Calm turns application deployment and lifecycle management into a simple, repeatable automation.

• **Intelligent tiering puts data where it’s needed.** For optimal performance, hot data is automatically stored on flash local to each running VM.

• **Integrated data protection.** Local and remote snapshots, asynchronous or synchronous replication, cross-hypervisor DR to optimize costs.

• **Simplified database management.** Nutanix Era is a suite of software which automates and simplifies database management, bringing one-click simplicity and invisible operations to database provisioning and lifecycle management.

• **Tools to support dev/test and DevOps.** Clones and snapshots facilitate all tasks requiring data copies, reducing cost and decreasing time to market.

  • Combined with integrated data protection, your dev/test environment can run using an exact copy of production data on a different hypervisor, optimizing costs.

Resources for SaaS

Reference Architectures and Best Practices
• Acropolis Hypervisor Best Practices
• Docker Containers on AHV Best Practices
• Nutanix Calm Reference Architecture
• Hyper-V Storage Best Practices
• Hyper-V Networking Best Practices

eBooks
• The Definitive Guide to Enterprise Apps on Hyperconverged Infrastructure
• The Definitive Guide to SAP on the Enterprise Cloud
• The Definitive Guide to Microsoft SQL Server on Nutanix Enterprise Cloud

Case Studies
• IDC Buyer’s Case Study: iCore Networks
• Pi Upgrades to the Acropolis Hypervisor

Questions SaaS Providers Should Consider

• How fast is your business growing?
• What will happen to your infrastructure costs as you grow?
• How much time do you spend managing infrastructure instead of focusing on applications and customers?
DISASTER RECOVERY/DATA PROTECTION AS A SERVICE
Because of the expense of maintaining a disaster recovery (DR) site or secondary site for backup, many enterprises want to take advantage of the cloud for DR and data protection. DRaaS and DPaaS providers fill this need. The challenge is to create an infrastructure that can efficiently ingest large amounts of customer data while also providing the necessary compute capacity to bring up customer applications during a system failover. Nutanix offers flexible platform options to scale compute and storage separately and the ability to repurpose infrastructure quickly to address failover scenarios. The Nutanix platform is adding all the necessary hooks for DRaaS via its APIs. Service providers are a strong complement to Nutanix Xi Leap disaster recovery service.

Reasons DRaaS/DPaaS Providers Choose Nutanix
• Backup from any customer deployment
  • Storage-heavy and storage-only nodes provide capacity.
  • Compute-heavy nodes can be used to support customer VMs during failovers.
  • Compression and deduplication reduce total storage requirements.
  • No tuning needed. Customer applications run well in the Nutanix environment.
  • Support for multiple hypervisors (vSphere, Hyper-V, Nutanix AHV) to match customer needs.
  • Analytics quickly identify any bottlenecks and predict growth rates and needs.
  • A single interface for infrastructure management.
  • Full API integration.

• Get up and running fast. Nutanix environments are simpler to plan, deploy, and configure.

• IaaS and managed services providers can easily add value with data protection and DR as a service. Nutanix software includes innovative and easy to use backup/restore and DR features including local and remote snapshots and asynchronous and synchronous replication.

• Support for native replication. The Nutanix customer base is growing—SPs can offer DR and data protection services using the Nutanix tools customers are familiar with.

Resources for DRaaS/DPaaS
Reference Architectures and Best Practices
• Nutanix AHV Best Practices
• Nutanix and Veeam for Hyper-V
• Nutanix and Veeam for vSphere
• Nutanix and Commvault Data Protection

eBooks
• The Definitive Guide to Data Protection and Disaster Recovery
• Disaster Recovery and Backup as a Service with Nutanix

Case Studies
• Pi Upgrades to the AHV
• Zero Downtime Service Provider Comes Back to Nutanix for More

Questions DRaaS/DPaaS Providers Should Consider
• How do you currently balance compute and storage requirements?
• How can you predict when you'll need more gear?
• How many months do you need to plan for?
• Are your customers asking for data protection and DR services you can't currently provide?