

NUTANIX™

**DATABASE
SOLUTIONS
POCKET BOOK**

Given the fast pace of modern business, traditional enterprise infrastructure is ill-suited to meet the growing demands of databases like Microsoft SQL Server, Oracle, SAP HANA, PostgreSQL, MySQL, and others. Over the last few years, hyperconverged, web-scale infrastructure has emerged as a better alternative. Hyperconverged infrastructure (HCI) combines compute, storage, virtualization, and networking resources with intelligent software to create flexible building blocks that eliminate many of the pain points of deploying and managing IT infrastructure to support databases.

As an HCI pioneer and leading provider, Nutanix combines the benefits of hyperconvergence and public cloud, making infrastructure invisible and levating IT to focus on the applications and services that power business. Businesses the world over rely on Nutanix solutions to run critical databases alongside other important applications and services.

This guide describes how Nutanix Enterprise Cloud delivers superior performance, availability, scalability, and management while accelerating application development, facilitating cloud integration, and decreasing the overall cost of your database operations.



DATABASE CHALLENGES

Your business relies on important databases such as Oracle, SAP HANA, Microsoft SQL Server, IBM DB2 and others. Although these databases and the infrastructure they run on are well understood by IT teams, in today's business environment it's imperative to run databases and associated applications more efficiently and minimize management overhead without sacrificing performance or availability. The challenges of running relational database software in traditional IT environments include:



SILOS AND LOW UTILIZATION

The silos of IT infrastructure that are often in place to address unique database and application demands drive up direct capital costs and operating costs. It's not uncommon to see servers operating at just 20% CPU utilization much of the time, translating to more hardware to get the job done and higher licensing costs. Operating expenses are high because of the complexity of deploying and managing traditional IT infrastructure, not to mention the power, space, and cooling required by all that "extra" equipment.



HIGH AVAILABILITY

Despite the known impact of application unavailability and data loss, the majority of business-critical applications are under protected. Legacy data protection and DR solutions have failed to adapt to the needs of modern virtualized applications and infrastructure, requiring too much downtime.



MULTI-HYPERVISOR ENVIRONMENTS

The overall IT landscape isn't getting any simpler. Enterprise IT environments increasingly depend on multiple hypervisors. This adds to infrastructure complexity and overhead.



CLOUD

Many enterprises want to use the cloud to run traditional enterprise applications in addition to cloud native apps. To take full advantage of hybrid and multi-cloud environments, you'll need infrastructure that can span both worlds.

In the face of these pressures, enterprises are discovering that traditional IT infrastructure is simply not flexible or scalable enough.

HOW COMPLEXITY AFFECTS YOUR DATABASE OPERATIONS

| INFRASTRUCTURE | PROCESSES | PEOPLE |
|---|---|--|
| <ul style="list-style-type: none">• Slow provisioning• High upfront capital costs• Inconsistent performance | <ul style="list-style-type: none">• Difficulty scaling• Lengthy upgrades | <ul style="list-style-type: none">• Little time to innovate• IT specialists needed• Low productivity |

Nutanix Enterprise Cloud leverages web-scale engineering and consumer-grade design, converging compute, virtualization, and storage into a resilient, software-defined solution. The result is predictable performance, exceptional availability, cloud-like infrastructure consumption, robust security, and seamless application mobility to support a broad range of databases and their associated applications.

Nutanix complements its infrastructure solutions with advanced software and cloud capabilities including:

- **Nutanix Era** for simplifying and automating database operations
- **Nutanix Calm** for application management and orchestration
- **Nutanix Xi Cloud Services** to further extend your operations

This pocket book describes the advantages of the full set of Nutanix solutions for database environments.

WHAT TO DO ABOUT DATABASES ON LEGACY UNIX?

If you're still hosting Oracle or DB2 on servers running Unix, you probably know that it's past time to think about changing. Not only is this combination expensive and difficult to manage, these solutions face an uncertain future.

The hyperconverged design of the Nutanix Enterprise Cloud offers the ideal alternative for enterprises transitioning from legacy Unix environments. Nutanix can help you deliver the performance, data protection, and availability your operations need while accelerating new deployments, facilitating application development, simplifying management, and increasing security.

DATABASE PERFORMANCE

Performance is one of your biggest concerns when moving any database to new infrastructure, especially if you're virtualizing for the first time. Today the majority of database instances are virtualized. Hypervisor designers have worked hard to minimize overhead to the point that a virtual machine delivers performance very close to that of a similarly configured physical server. In some cases, **virtualized environments have even been shown to deliver better performance than physical servers.**

Business-critical databases. The infrastructure needs of databases supporting your most business-critical applications are the most stringent. Backend databases, middleware, and application servers must provide maximum performance.

These applications require high total performance as measured in transactions per minute (TPM), storage I/O in terms of I/O operations per second (IOPS), and the lowest latency possible. This means active data must be on flash media.

Other database applications. You may have a number of database applications that, while less critical, are still important to your business. For these applications, database performance may still be measured in TPM, but there are also application-specific metrics.

BETTER PERFORMANCE WITHOUT CONSTANT TUNING

Nutanix Enterprise Cloud is designed to deliver excellent database performance without the constant performance tuning required with traditional infrastructure. A Nutanix cluster adapts to deliver excellent random read/write performance (IOPS) for transactional workloads such as OLTP and excellent sequential read/write performance (bandwidth) for streaming workloads such as data warehouses and OLAP.

Intelligent tiering. Intelligent tiering provides automatic performance optimization. Nutanix continually monitors data access patterns and optimizes data placement, achieving the best performance without administrator intervention.

Data locality. As much of the data used by a database as possible is stored on the node where the VM containing the database is running. Data locality minimizes latency, optimizes performance, and reduces network congestion. Local flash devices are always the highest priority for I/O generated on a node, but all of the cluster's storage resources are available to all nodes.

MEASURED NUTANIX PERFORMANCE

Nutanix has demonstrated tremendous real-world performance for a variety of popular databases. With Nutanix, you can:

- Improve performance by as much as 3x over existing deployments
- Accelerate provisioning for dev/test by up to 10x.
- Deploy infrastructure and databases in minutes to hours versus days to weeks
- Nutanix demonstrates linear scaling and high transaction rates with an extremely low average response time as database instances are added as measured by Enterprise Strategy Group.
- For SAP, Nutanix delivers almost 3.5 times the performance density of a popular converged infrastructure platform

QUESTIONS TO CONSIDER

- How many databases are you running on dedicated infrastructure?
- Would virtualizing databases and associated applications simplify your IT environment and improve overall manageability?
- How much time are you spending managing infrastructure for critical databases?

INVESTMENT COMPANY IMPROVES PERFORMANCE WITH ENTERPRISE CLOUD

When its existing legacy infrastructure reached end of life, a busy investment bank needed a virtualization solution that could encompass everything, including its core banking application hosted on Oracle and AIX. By virtualizing on Nutanix, database performance went up substantially, cutting end-of-business processing time from 3.5 hours to just 18 minutes (a 91% reduction) while delivering:

- 66% reduction in rack space
- Significant reductions in both capital and operating expenses
- Single pane of management for all compute and storage

NOT ALL DATABASE APPLICATIONS ARE CREATED EQUAL

Different database applications create significantly different I/O patterns that have a direct impact on storage and storage performance. When thinking about database storage requirements, it is important to understand what metrics will be most important for your applications. There are three measures of storage performance:

IOPS. Transaction-oriented applications such as databases, OLTP, and email rely on a series of small, random reads and writes. Storage performance for these applications is usually measured in I/O Operations Per Second or IOPS. In order for IOPS comparisons to be meaningful, it is important to understand the size of the operation (4KB and 8KB are common) as well as the mix of read and write operations.

Latency. Latency is a measure of how long it takes an I/O to complete from an application's point of view. For applications that measure performance in IOPS, latency can be extremely important. Real-time trading, OLTP, and other time-critical applications can be extremely latency sensitive. The perception of 1,000 IOPS at 1ms latency will be a lot different than 1,000 IOPS at 20ms latency and could mean the difference between online purchases being completed or abandoned.

Throughput. Throughput (or bandwidth) is a measure of the amount of data being moved in and out of storage. Applications such as data warehouses and OLAP rely on sequential, streaming access to large blocks of data. I/O performance for these applications is usually reported in MB/sec or GB/sec.

SCALEABILITY

Database application workloads can grow rapidly in terms of total data, size of the active data set, and the compute needed to satisfy growing transaction requirements. No matter the resource being scaled, it is often critical to do so without downtime.

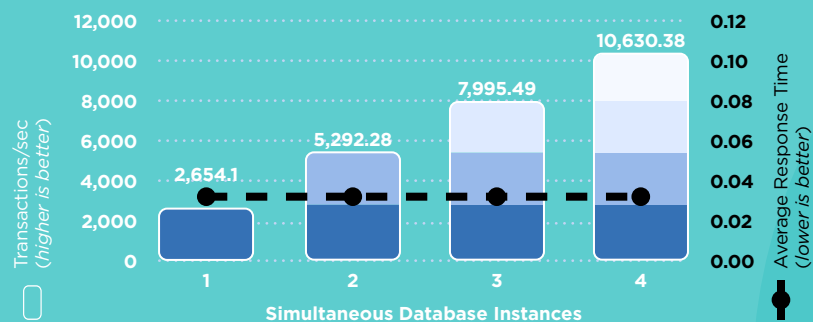
Legacy servers and conventional x86 infrastructures are complex and difficult to scale efficiently. Storage and storage area networks (SANs) can reach hard limits that require expensive forklift upgrades

SIMPLE, NONDISRUPTIVE SCALING

Some applications scale up resources (CPU, capacity) while others scale out, adding additional VMs. Nutanix Enterprise Cloud addresses these diverse scaling needs; allowing all resources to be scaled without downtime.

Nutanix clusters scale out one node at a time, replacing complex and expensive legacy components. Each node combines Intel-powered x86 hardware equipped with flash SSDs to accelerate database performance.

Nutanix software running on each node distributes all operating functions across a cluster for performance, making the system resilient and self-healing. As a cluster scales out, performance grows linearly.



Source: Enterprise Strategy Group, 2017

QUESTIONS TO CONSIDER

- What scaling challenges have you faced or are you facing with your current database infrastructure?
- How satisfied are you with the density (transactions/rack unit) of your current infrastructure?
- Are you having trouble determining when you need to add resources, especially storage performance?
- Can you easily re-allocate resources from one database to another if needed?

ASM ACCELERATES BATCH REPORTING BY 5X

ASM International is a leading supplier of wafer processing equipment for semiconductor manufacturing, headquartered in the Netherlands. ASM needed to replace aging infrastructure in order to eliminate very slow batch processing performance and get its operations team out of constant troubleshooting mode for hardware supporting SAP ERP, CRM, SCM, PI, BW, BOBJ, PLM, SRM, PORTAL, and more. With Nutanix Enterprise Cloud, ASM:

- Improved batch processing performance by 5X to sustain growing market demands
- Reduced hours spent on operations by almost 3X
- Achieved overall system improvement between 50% and 500%
- Consolidated SAP and DB VMs to reduce licensing costs

AVAILABILITY & RESILIENCE


For many database environments, availability is as important as performance. You need the underlying infrastructure to be as resilient as possible so that you can focus on database and application-specific tasks, rather than constantly attending to hardware and software maintenance and upgrades.

NON-DISRUPTIVE UPGRADES AND SCALING

In many database environments, the most common cause of downtime is the need for frequent, disruptive software upgrades and hardware scaling. Nutanix Enterprise Cloud largely eliminates these challenges, enabling infrastructure software and firmware to be upgraded without disruption and allowing additional hardware to be added to a cluster on the fly.

SUPERIOR RESILIENCE REDUCES DOWNTIME OF ALL TYPES

Nutanix exceeds the capabilities of traditional infrastructure with a self-healing architecture that restores full resiliency without operator intervention. Nutanix eliminates both planned and unplanned sources of downtime. Self-healing infrastructure combined with nondisruptive expansion and upgrade capabilities eliminate sources of both planned and unplanned downtime. With Nutanix you can **slash unplanned downtime events by as much as 97%** and enable DR with one-click simplicity.

- 
- Web-scale Engineering
 - Software-defined Everything
 - Self-healing Systems
 - Built for Hybrid
 - Off-the-Shelf Hardware
 - No Single Point of Everything
 - Machine Learning Automation

SELF-HEALING INFRASTRUCTURE

The Nutanix platform is fault resistant with no single points of failure and no bottlenecks. It is built to detect, isolate, and recover from failures including drive and node failures; survive system hardware, software, and hypervisor issues; and maintain 100% data availability. The platform provides N+1 or N+2 redundancy on an application basis.

SECURITY FROM THE GROUND UP

The Nutanix architecture takes a security-first approach; built-in features deliver defense in depth so that your valuable data is always protected. To ensure compliance, the Nutanix platform is certified under a broad set of evaluation programs. The result is a greatly reduced attack surface and safer data.

Nutanix provides:

- Built-in two-factor authentication, cluster lockdown, and software or hardware-based data-at-rest encryption
- Secure installation and simplified security maintenance
- **Nutanix Flow** for microsegmentation and enhanced network visibility
- Deep integration with a broad ecosystem of security partners for SIEM, firewalls, and other security applications

QUESTIONS TO CONSIDER

- How much time do you spend ensuring the availability of your database environment?
- Is planned downtime a challenge to your operations?
- When a minor failure such as a drive occurs, does it create a major fire drill?

SWISS BANK IMPROVES PERFORMANCE OF SQL SERVER

BPS (SUISSE) SA moved to Nutanix Enterprise Cloud to improve the performance of its large Microsoft SQL Server farm. It needed a solution that would make it easier to manage and scale the database environment.

- Accelerated MS SQL performance and reduced query time
- Simplified server, storage, and network management
- Increased IT efficiency

“We immediately loved the main philosophy of Nutanix because it appeared to be very easy to manage, super performing, and it offered high availability—both locally and remotely—all in one hyperconverged system.”

— Andrea D'Ermo, Head of Service Management, BPS (SUISSE) SA

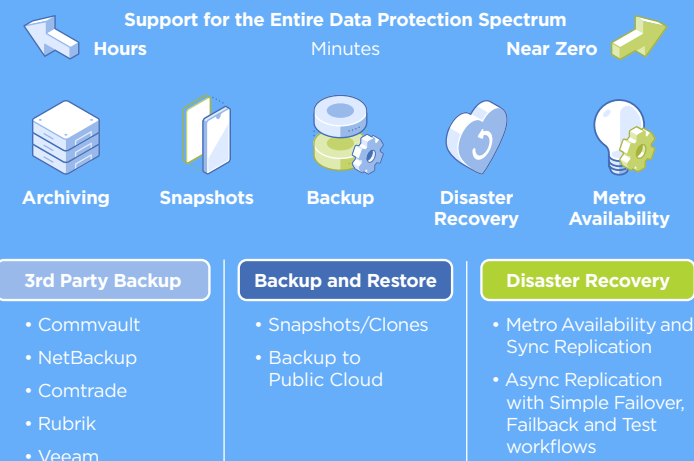
DATA PROTECTION & DISASTER RECOVERY

A compelling advantage that Nutanix offers for database environments is a full range of data protection and DR solutions. Critical services like snapshots; cloning; and asynchronous, near-synchronous, and synchronous replication are built into the architecture so you can solve many of your data protection and DR challenges without the need for additional solutions.

- **Business-critical databases.** Your most business-critical applications require a very high level of data protection and disaster recovery (DR). This may include synchronous replication to ensure you can achieve a recovery point objective (RPO) at or near zero.
- **Other database applications.** Less critical databases and associated applications typically have a one-hour or greater RPO and RTO, making asynchronous replication the appropriate DR option.

BUILT-IN DATA PROTECTION COMPLEMENTS EXISTING TOOLS

With Nutanix Enterprise Cloud, you can continue to use familiar database data protection tools with little or no modification to existing procedures, but one of the compelling advantages that Nutanix offers for database environments is a full range of data protection and DR solutions. Nutanix has automation capabilities and a range of options to meet your RPO and availability needs. Critical services are built into the architecture to solve many of your data protection and DR challenges. Nutanix also partners with leading data protection vendors, ensuring that the solution you currently rely on will work in your Nutanix environment.



- **Time Stream snapshots.** Simple, crash-consistent snapshots provide a first line of data protection with no storage or performance penalty.
- **Multi-site asynchronous and near-synchronous replication.** Advanced replication technology for DR is built on application-granular snapshots.
- **Metro Availability.** Native “stretch clustering” capabilities allow a Nutanix cluster to span multiple sites, expanding the HA domain and providing zero RPO and near-zero RTO.
- **Nutanix Mine.** With **Nutanix Mine** you can unify primary and secondary data protection operations, enabling cloud-like scalability, and one-click simplicity for all of your backup infrastructure.

QUESTIONS TO CONSIDER

- When was the last time you assessed your business needs in terms of time to recover critical applications?
- Are you providing adequate data protection for critical databases? At what cost?
- Are you spending too much time and effort managing data protection and DR?
- Are you able to re-purpose backup/DR copies for other functions like dev/test, data warehousing, etc.?

BRAND LEADER CHOOSES NUTANIX FOR CRITICAL DB APPS

As part of its digital transformation, WD-40 needed to upgrade existing infrastructure, virtualize business-critical apps, and improve performance. Nutanix Enterprise Cloud met WD-40’s requirements, now hosting virtual workloads including Exchange, SharePoint, and SQL Server databases plus development.

Key Results

- Power and cooling reduced up to 41%
- Reduced footprint
- Migration completed in 2 days

“One of the key benefits from my point of view is a much greater insight into what’s going on inside the box. Not that I need to check on it that often – it just works.”

— Jeff Longley, Systems Administrator, WD-40

MANAGEABILITY

One of the biggest challenges you face with your current database infrastructure is the complexity of the environment and the hours of staff time consumed monitoring, maintaining, and updating the environment.

As digital transformation creates new and increased business demands, organizations are seeking infrastructure solutions that can satisfy growing needs while reducing the time spent on routine management tasks across the entire database environment from production to QA to development to test. It shouldn't be a six-month effort to put up new infrastructure, nor should it be necessary to continually optimize performance. Provisioning application data copies for development and reporting must be fast and efficient.

INTEGRATED MANAGEMENT ELIMINATES OVERHEAD

Nutanix Enterprise Cloud incorporates management as an integral part of the solution stack, greatly simplifying infrastructure and virtualization management for your SAP landscapes. The Nutanix Prism management interface delivers consumer-grade simplicity for infrastructure management, making it easy to keep infrastructure up and running.

- Advanced data analytics and heuristics streamline common IT workflows
- Single interface provides server, storage, data protection, security, and virtualization management.
- One-click management reduces the administrative burden and the potential for operator error while eliminating the need for planned downtime.
- One-click Planning includes sophisticated scenario-based modeling, based on X-Fit™ machine intelligence
- The impact of planned changes to the IT environment on application performance and availability can be predicted in advance

ONE-CLICK CONVENIENCE

- **One-click software upgrades.** Intelligent software does all the heavy lifting, eliminating the need for detailed upfront planning to upgrade Nutanix operating software, virtualization, and firmware.
- **One-click remediation.** Prism suggests remediation actions that you can initiate to correct problems quickly. Mean time to repair and restore services is greatly reduced, significantly improving availability.
- **Full REST APIs.** Any task that can be performed via Prism can also be performed using REST APIs or a library of PowerShell cmdlets.

NUTANIX ERA

For enterprises that need to take database operations to the next level, Nutanix has created Era, a unique management solution available for leading database providers.

QUESTIONS TO CONSIDER

- How much time does your team spend managing infrastructure hardware and software for your database environment?
- Would virtualizing business-critical apps simplify your IT environment and improve overall manageability?
- Are you struggling to identify and manage compatible firmware levels across many devices?
- Can you manage infrastructure remotely when necessary?
- How would it change your operations if you could reduce management by 70% versus traditional infrastructure?

VALPAK ACCELERATES BOTH TRADITIONAL AND ONLINE BUSINESS

After **Valpak** acquired Savings.com, it needed simpler, more cost-effective infrastructure to support workloads including SAP, Oracle, and SQL Server. The company needed to keep IT staff lean and become more agile without sacrificing resiliency—all while increasing performance. By adopting Nutanix Enterprise Cloud, Valpak:

- Accelerated deployments by 10x
- Achieved 8x improvement in performance
- Cut management time from 180 hours per month to just 2 hours
- Experienced a 10x reduction in CapEx through a pay-as-you-grow approach

NUTANIX: ONE-CLICK OPERATIONS

Nutanix provides a universal control plane spanning private and public cloud, eliminating management complexity. An intuitive interface and comprehensive REST APIs cover the entire stack: VM operations, virtualization, compute, storage, backup, applications, and disaster recovery (DR) across a single site, multiple sites, and cloud.

Machine intelligence and self-learning capabilities drive end-to-end automation—the platform becomes smarter over time. Management is built on the principle of consumer-grade design, minimizing time to productivity. Automatic infrastructure optimization and remediation takes the place of many routine tasks *with the goal of eliminating the need for daily operator involvement.*

AUTOMATE & SIMPLIFY DATABASE OPERATIONS WITH NUTANIX ERA

Database complexity hurts your business. Hard to maintain SLAs require specialized IT resources and careful attention to manually applied best practices. Slow database spin up times, time-consuming recoveries, and complex lifecycle management, decrease business agility, and storing hundreds of database copies adds to your costs.

Many organizations are moving to a database as a service (DBaaS) model for managing and operating databases, because DBaaS or cloud-based models are efficient, agile, cost-effective, and scalable. Nutanix Era makes Nutanix Enterprise Cloud the ideal database platform, automating and simplifying database administration, bringing one-click simplicity and invisible operations to database provisioning and lifecycle management.

Nutanix Era enables DBAs to provision, clone, and refresh databases to any point in time. The API-first Nutanix Era architecture can easily integrate with your preferred self-service tools, and every operation can be fully audited.

One-Click Provisioning. Create a standardized catalog for database services and standardize compute, network, and database parameter sizing. Era makes databases cloud-ready, provides mobility, and offers the ability to create instant clone copies.

One-Click Backup. Consumer-grade database operations for backing up any size database in a full database-consistent manner within a matter of minutes.

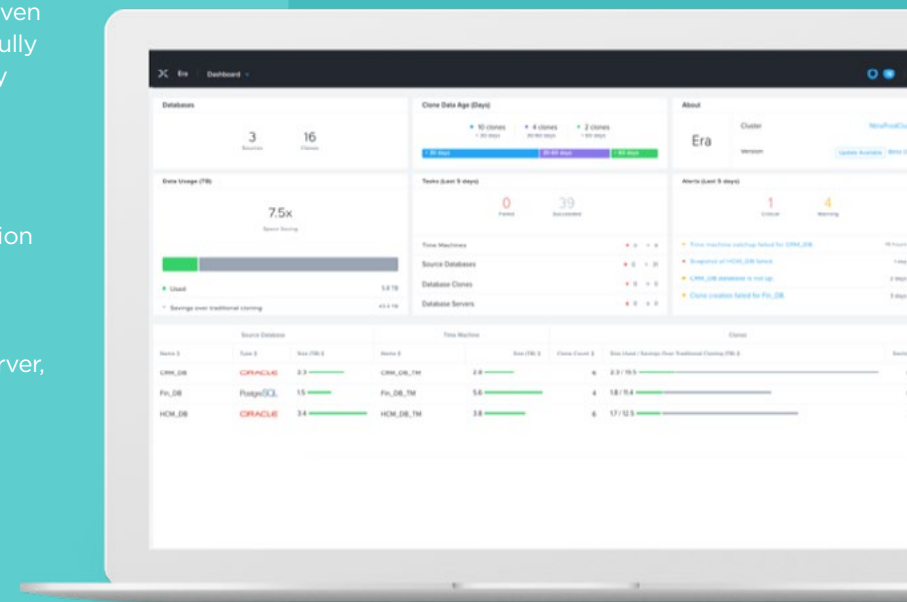
One-Click Patching. Simplify software maintenance with immediate or scheduled updates for all provisioned database servers.

Copy Data Management. This marquee feature of Era uses its core “Time Machine” capability to capture all database states for any given service-level agreement (SLA). Create fully functional database copies, and quickly refresh existing copies.

Database Patching. Key Benefits

- Increase business agility and innovation
- Simplify database operations
- Integrate easily with existing tools
- Gain full operational visibility
- Support for Oracle, Microsoft SQL Server, PostgreSQL, and MySQL

[Learn More](#)



DEVELOPMENT & TEST

With digital transformation pressures and the increasing pace of business, enterprises today have to deliver application updates and new applications more quickly with higher quality.

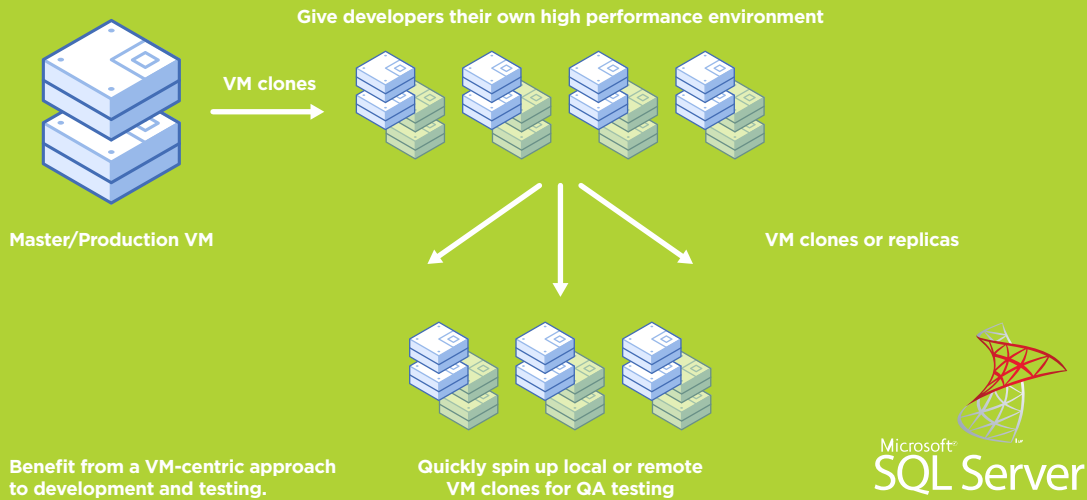
Successful database application development depends on the ability to set up and tear down development and test environments rapidly using automated processes. Provisioning in a traditional infrastructure environment is a complicated and heavy-weight process that consumes too much time and too much storage to scale efficiently.

Production data copies used in development and test processes must be as up-to-date as possible to ensure code quality. Relying on test data sets that are many months out of date is risky.

ELIMINATE BARRIERS THAT SLOW DEVELOPMENT

Nutanix Enterprise Cloud offers substantial benefits for your development and test teams including:

- **Rapid provisioning of development and test environments.** Set up test environments and create space-efficient production data copies using space-efficient cloning.
- **Complete application life cycle management.** Nutanix Calm decouples application management from the underlying infrastructure, enabling database applications to be easily deployed into both private and public cloud environments. Calm turns common tasks into repeatable automations.
- **Ready for DevOps.** Infrastructure agility is essential for DevOps. Nutanix simplifies your DevOps journey, ensuring infrastructure has the required agility and flexibility at all layers.



QUESTIONS TO CONSIDER

- What are the bottlenecks slowing down your development efforts?
- Are you having trouble automating processes because of infrastructure complexity?
- How many copies of production data do you need for efficient development and test? How many copies do you actually have and how old are they?
- What tools do you need to accelerate application deployment?

LENOIR CITY UTILITIES ACHIEVES SIGNIFICANT PERFORMANCE IMPROVEMENTS FOR PRODUCTION SQL

The [Lenoir City Utilities](#) Board provides water, electrical, wastewater, and gas services to residents with millions of dollars invested in infrastructure. To achieve the level of performance needed for its production SQL Server environment, LCUB deployed Nutanix Enterprise Cloud, enabling:

- A 20x performance increase for production SQL databases
- Replication to a remote site for business continuity
- A 2/3 reduction in operational expenses

APPLICATION-CENTRIC IT AUTOMATION WITH NUTANIX CALM

Nutanix Calm adds native application orchestration and life cycle management to Nutanix Enterprise Cloud. Calm decouples application management from the underlying infrastructure, enabling database applications to be easily deployed into both private and public cloud environments and turning common tasks into repeatable automations. A common framework for modeling both applications and infrastructure accelerates time to production. Nutanix Calm enables developers to access the resources they need at any time by consuming custom blueprints from the Nutanix marketplace.

Unique capabilities of Calm include:

- **Life cycle management.** Calm simplifies the setup and management of custom database applications by incorporating all elements of each app, including relevant VMs, configurations, and related binaries, into an easy-to-use-blueprint, making the deployment and life cycle management of common applications automated and repeatable.
- **Self-service provisioning.** Blueprints can be published directly for end user consumption through the Nutanix Marketplace, giving administrators, application owners, and developers the ability to request IT services and have them provisioned instantly.
- **Role-based governance.** User operations are limited based on assigned permissions. All activities and changes are centrally logged for end-to-end traceability and debugging.
- **Hybrid cloud management.** Provisioning of hybrid cloud architectures is automated. Both multi-tiered and distributed applications can be scaled across different cloud environments. Policy-based reporting shows the overall utilization and true cost of your public cloud consumption at a glance.

KEY BENEFITS

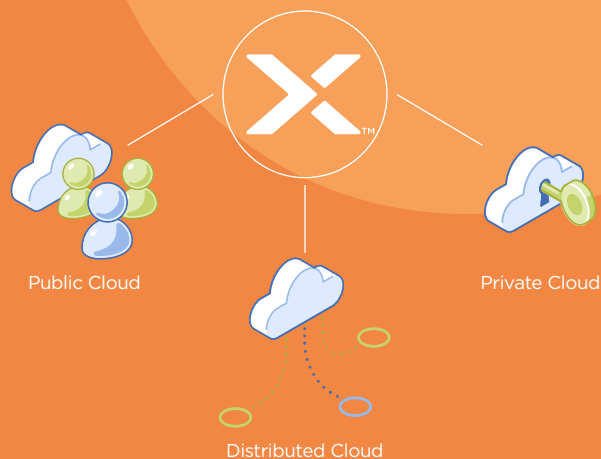
- Nothing to install
- Automate everything
- Nutanix simplicity



CLOUD

The Cloud is transforming every aspect of modern business. Industry leaders are embracing digital transformation and turning to cloud technologies to increase operational efficiency, improve supply chain management, and enable new ways of doing business.

As enterprises embrace hybrid and multi-cloud approaches to IT, the ease of integration between on-premises operations and the cloud becomes a critical success factor. To make the most of the cloud, you'll need on-premises infrastructure that spans both worlds.



NUTANIX ENABLES MULTI-CLOUD SUCCESS

Nutanix enables IT teams to build and operate powerful multi-cloud architectures. Enterprise Cloud OS software melds private, public and distributed cloud operating environments and provides a single point of control to manage IT infrastructure and applications at any scale.

Nutanix does not just integrate a few cloud functions, it helps your organization with its cloud journey, delivering both the public cloud benefits you want and the private cloud control you need.

- Nutanix Enterprise Cloud infrastructure provides the flexibility, security, ease of management, and world-class global service and support that enterprises require to build successful private clouds.
- Nutanix software runs across different cloud environments to harmonize IT operations and bring frictionless mobility to applications.
- Supported clouds include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform
- By seamlessly integrating cloud services, Nutanix Xi solutions enable hybrid IT and accelerate your path to the cloud.
- Services including cloud DR and multi-cloud optimization complement your datacenter and cloud operations.

Nutanix Customer Journey



Multi-Cloud Services for Apps and Data
Unify operations across public and private clouds



Build an Enterprise Cloud
Secure and automate applications, and consolidate storage



Modernize IT with HCI
Deliver enterprise apps and VDI from any site

QUESTIONS TO CONSIDER

- Are you able to deliver cloud services to complement and support your database environment?
- Do you need to move some database applications and services to the cloud?
- Would you like to reduce the expenses associated with data protection and DR?
- Do you need better tools to manage your multi-cloud environment?

NUTANIX XI CLOUD SERVICES

Your business relies on important databases such as Oracle, SAP HANA, Microsoft SQL Server, IBM DB2 and others. Although these databases and the infrastructure they run on are well understood by IT teams, in today's business environment it's imperative to run databases and associated applications more efficiently and minimize management overhead without sacrificing performance or availability. The challenges of running relational database software in traditional IT environments include:



Xi Beam

Optimize the cloud spend and ensure security compliance in multi-cloud environments.



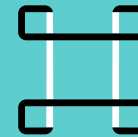
Xi Epoch

Monitor the health of multi-cloud applications and improve reliability by quickly troubleshooting issues.



Xi Frame

Run secure, software-defined virtual desktop workspaces in any cloud environment.



Xi IoT

Build and operate IoT applications and infrastructure.



Xi Leap

Natively integrated cloud based disaster recovery.

Choose the Xi Cloud Services you need, whether it's Xi Leap for cloud-based disaster recovery, Xi IoT to quickly incorporate new IoT sensors as part of your operations, Xi Epoch to increase application observability, or Xi Beam to monitor and optimize increasingly complicated multi-cloud operations.

TOTAL COST OF OWNERSHIP

Total cost of ownership is still critically important to cost-conscious businesses and IT teams with tight budgets. For all the advantages that Nutanix Enterprise Cloud offers for your database operations, it also reduces TCO and delivers a rapid return on investment compared to traditional IT solutions.

Most IT solutions have significant limitations that leave your IT team constrained and increase your total costs. By focusing on software, Nutanix transcends the limitations of other solutions. Only Nutanix offers:

- **Extensive hardware choice.** Including Dell EMC, Lenovo, Cisco, and HPE—in addition to Nutanix-branded NX appliances
- **Support for all popular hypervisors.** Including VMware vSphere, Microsoft Hyper-V, and Citrix XenServer. Nutanix AHV is included with purchase at no added cost, eliminating licensing expenses while delivering all the functionality you expect.
- **Flexible cost models.** Choose traditional CapEx purchasing or OpEx to pay as you grow.
- **Support for public cloud.** Including AWS, Azure, GCP, and Nutanix Xi Cloud Services.



60%
lower TCO



97%
fewer unplanned outages



534%
five-year ROI



7
months to payback



\$10.56M
additional revenue per year

Source: IDC White Paper, sponsored by Nutanix. Nutanix Delivering Strong Value as a Cost-Effective, Efficient, Scalable Platform for Enterprise Applications, August 2017.

MULTINATIONAL FOOD COMPANY MODERNIZES ORACLE

This well-known company was looking for a way to speed the delivery of new business projects. Deployments on its existing three-tier infrastructure—with dedicated servers, storage, and SANs—was too time consuming to satisfy increasingly aggressive business goals. The company also faced space constraints in its datacenters, needed to control ongoing storage costs, and wanted a solution to jump start its cloud strategy.

The IT team converted its “big iron” Unix environment using virtualized Linux servers running on Nutanix Enterprise Cloud, achieving immediate results:

- 40% lower TCO
- Huge reduction in overall footprint
- Elimination of SAN
- Increased agility for new deployments
- Streamlined upgrades
- A compelling cloud roadmap

GAMING LEADER UPDATES E-BUSINESS SUITE

A global gaming company has been using E-Business Suite since 2010. Originally deployed on Oracle RAC with bare metal servers and SAN, the company considered all available options to modernize the infrastructure and reduce costs. Ultimately, the decision to go with Nutanix Enterprise Cloud rested on a number of critical factors:

- Reduced complexity
- Superior density and efficiency
- Flexibility and easy expandability
- A technical vision ensuring solution longevity

Once the decision was made, complete implementation took just five months. By consolidating on Nutanix, the company freed up \$10 million in database licenses, enough to support three years’ worth of new projects.

GETTING STARTED WITH NUTANIX DATABASE SOLUTIONS

The Nutanix Enterprise Cloud can eliminate the infrastructure bottlenecks that constrain your database operations. The following table shows some of the common triggers that can affect database applications. If one or more of these sounds familiar, it may be time to upgrade to Nutanix Enterprise Cloud.

| DATABASE CHALLENGE | IT IS TIME TO TAKE ACTION WHEN: |
|--|--|
| Performance | <ul style="list-style-type: none"> Existing infrastructure fails to deliver the necessary TPS, IOPS, or throughput for your applications. Transaction latency is falling to unacceptable levels. You're spending too much time and energy tuning performance. |
| Availability and Resilience | <ul style="list-style-type: none"> Existing infrastructure requires constant, disruptive hardware and software maintenance and upgrades Planned downtime has risen to unacceptable levels Minor hardware failures result in major fire drills |
| Data Protection and Disaster Recovery | <ul style="list-style-type: none"> Your current data protection and DR are too cumbersome, too expensive, or both You are reliant on a complex combination of third-party solutions You need to be able to repurpose backup or DR copies for other activities You are no longer able to meet your recovery time objectives (RTOs) or recovery point objectives (RPOs) You need to implement synchronous replication |
| Scalability | <ul style="list-style-type: none"> Existing infrastructure is too difficult to scale or won't scale further You have a hard time predicting when you will need to add infrastructure, especially to increase storage performance You're tired of the disruptive cycle of forklift upgrades every 3-5 years |
| Manageability | <ul style="list-style-type: none"> Hours of staff time are consumed monitoring, maintaining, and updating the environment You lack visibility of important infrastructure metrics You need to free up admin time to focus on strategic projects |
| Development and Test | <ul style="list-style-type: none"> You need to accelerate the pace of software delivery It takes too much time/involves too many people to provision dev/test environments You don't have enough copies of production data for dev/test needs. Production data copies are always out of date |
| Cloud Integration | <ul style="list-style-type: none"> Current applications and infrastructure can't connect to the cloud You want to take advantage of cloud services for DR, dev/test, etc. You need to optimize hybrid or multi-cloud operations |
| Total Cost of Ownership | <ul style="list-style-type: none"> CapEx and/or OpEx are too high for your current infrastructures Lack of infrastructure flexibility is driving up costs You need to free up budget for other priorities You want to move from a CapEx to an OpEx model |

To learn more about Nutanix Enterprise Cloud Platform and any of the Nutanix Solutions discussed in this guide, contact us at info@nutanix.com, follow us on [Twitter @nutanix](#), or send us a request at www.nutanix.com/demo to set up your own customized briefing and demonstration to see how validated and certified solutions from Nutanix can help your organization.

- To learn more about a particular solution go to www.nutanix.com/solutions
 - To begin sizing Nutanix systems for your solutions needs, start with the Nutanix sizer (<http://go.nutanix.com/size-your-data-center.html>)
-

