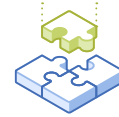


NUTANIX EBOOK

The Definitive Guide to Business Continuity with Nutanix Enterprise Cloud

1. WHAT THIS BOOK COVERS.....	3
2. THE STATE OF DATA PROTECTION AND DISASTER RECOVERY.....	4
3. NUTANIX DATA PROTECTION AND DISASTER RECOVERY PORTFOLIO.....	8
4. BUILT-IN INFRASTRUCTURE RESILIENCE.....	13
5. BACKUP AND RECOVERY.....	17
6. NUTANIX MINE.....	21
7. DISASTER RECOVERY.....	23
8. DR-AS-A-SERVICE WITH XI LEAP.....	29
9. BUSINESS CONTINUITY FOR ENTERPRISE APPLICATIONS.....	33
10. SIMPLIFY DATABASE PROTECTION WITH NUTANIX ERA.....	37
11. INTEGRATION AND PARTNERSHIPS.....	39
12. GETTING STARTED.....	41



1. What This Book Covers

Many companies have failed to modernize data protection and disaster recovery to keep pace with digital transformation. Nutanix Enterprise Cloud delivers hyperconverged infrastructure that simplifies your IT stack, eliminates bottlenecks, streamlines management, and reduces costs. Nutanix includes native tools for backup and disaster recovery (DR) that reduce complexity, increase levels of protection, and make it faster and easier to recover from disaster. Integration with third-party vendors also makes it easy for you to continue to use those solutions.

This book examines important challenges and trends in availability and data protection, and explains how the simpler, more cost-effective approach taken by Nutanix Enterprise Cloud can close the gap between where your business continuity plan is today, and where you want it to be. Details of the full portfolio of Nutanix business continuity solutions are provided. Nutanix has created cutting-edge technologies—like Nutanix Xi Leap for DR-as-a-Service, Nutanix Mine for secondary storage, and Nutanix Era for database operations—to address the most pressing enterprise needs.



2. The State of Data Protection and Disaster Recovery

Businesses of all sizes are modernizing IT to increase productivity, reduce costs, and address digital transformation needs. Unfortunately, many businesses have not paid enough attention to changing requirements for business continuity and have not made the same investments to modernize data protection and DR as they have in other areas of IT. With the uptime and availability of critical applications and services becoming increasingly important, the result is a widening gap between the level of protection being delivered and the level of protection needed.

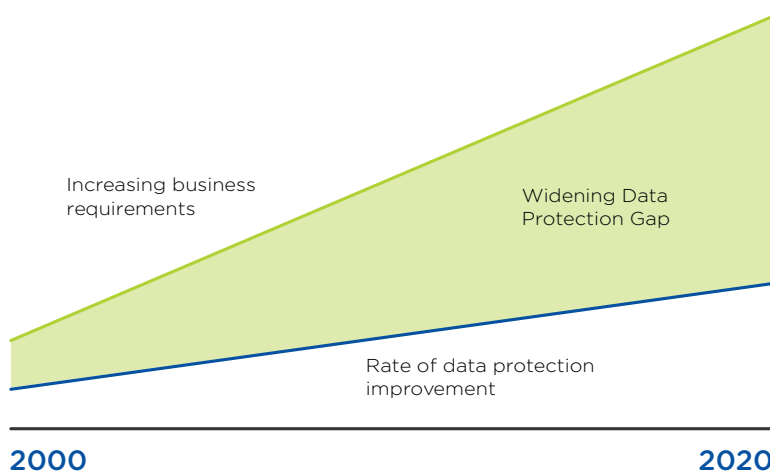


Figure 1: Enterprises see a widening gap between the level of data protection and DR provided and the level of protection required

Disaster risks are growing on many fronts. Over the last several years, there has been a steady increase in both natural and manmade disasters. In 2018 alone, U.S. climate disasters cost the nation around \$91B dollars.

And, unplanned outages due to system failure, cybercrime, and simple human error are also on the rise. In March 2019, Facebook had a massive daylong meltdown caused by a routine maintenance operation that triggered a bug. No company is immune.

It is extremely important for IT teams to be cognizant of the cost associated with downtime. According to Gartner, the average cost that businesses incur due to downtime is \$300,000 per hour. If you haven't reviewed your business continuity practices recently, it is past time.

Businesses of all sizes are discovering that Nutanix Enterprise Cloud—built with predictable web-scale engineering and simple consumer-grade design—simplifies IT, increases availability, and accelerates the entire IT environment—including data protection and DR. This book examines business continuity capabilities in Nutanix Enterprise Cloud.

DATA PROTECTION TRENDS

A number of factors make data protection and DR more challenging than ever:

- **The amounts and types of stored data continue to grow.** And the diversity of places data is being stored—on servers, on desktops, on SAN, NAS, and object storage, in multiple clouds—is growing with it. Nontraditional data types like NoSQL databases (MongoDB, Cassandra, etc.) and Hadoop require appropriate levels of protection.
- **Businesses are demanding a higher level of protection.** Applications and services of all types have rising expectations for service level agreements (SLAs). This translates to shrinking recovery time objectives (RTOs) and aggressive recovery point objectives (RPOs).
- **There is no longer time for traditional backups.** While the amount of data is increasing, the time available for backup tasks is more and more limited. For many applications, the backup window has effectively shrunk to zero.
- **The widespread adoption of hybrid cloud is changing data protection and DR.** For many enterprises, the cloud is becoming a preferred target for backup and DR. Backup as a Service (BaaS) and DR as a Service (DRaaS), with easy failover to the cloud, are attractive alternatives to traditional approaches.

A number of additional factors are further muddling the data protection/DR landscape:

- **Complexity.** Many enterprises rely on multiple solutions, backup servers, appliances, and a variety of media to address data protection and DR needs, often with unique solutions for each type of workload.
- **Cost.** More data, longer retention periods, and complex data protection hardware and software add up to significant and growing costs.
- **Proliferating copies.** Copies of data are needed for backup, archival, DR, analytics, development and test, and other purposes. Proliferation of copies leads to higher costs and inevitable challenges regarding what to keep and what to protect.
- **Regulatory compliance and governance.** New regulations such as GDPR in Europe as well as stricter corporate governance make it necessary to re-examine current approaches to data protection and DR.

Many of the recent trends in data protection and DR are in response to the challenges described above. Modernization is closely tied to the following trends:

- **Application-centric protection.** Applications often have their own data protection and DR methods. While this can be attractive in terms of level of protection for a given application, it can also result in additional silos of software and hardware that add to overall complexity.
- **Automation.** Because of the complexity and importance of data protection and DR workflows, significant efforts have been made to automate tasks and simplify orchestration of custom workflows to reduce administrative overhead, accelerate recovery, and eliminate the chance of operator error.
- **Copy data management.** A final trend is the rapidly proliferating number of full data copies that must be stored and managed for backup, replication, development, and other needs. Solutions are emerging to control and manage this growth.

BACKUP AND DR TERMINOLOGY

Not everyone defines every term in the same way. This list defines terms as they are used in this book.

- **Business continuity**
An organization's ability to ensure operations and core business functions are not severely impacted by planned or unplanned incidents that take critical systems offline. Nutanix business continuity encompasses data protection and disaster recovery.
- **Data Protection**
The process of safeguarding important information from corruption, compromise or loss. Nutanix data protection includes local cluster resiliency (RF, snapshot, cloning, self-healing) and integrated backup following the rule of 3-2-1: at least three copies of data in two different locations, at least one offsite.
- **Disaster Recovery**
The ability to restore mission-critical IT functionality through the implementation of tools, policies, and procedures, re-establishing vital business operations. Orchestration may require several layers of automation in order to ensure success in a timely manner (e.g. recovery planning and runbook automation). Nutanix DR solutions offer natively integrated services as an extension of the Nutanix Enterprise Cloud that are simple, affordable, and secure.
- **Backup**
The process of creating a copy of data. Traditionally, this consists of occasional full backups (all data copied) with regular, often nightly, incremental backups that copy only data that has changed since the previous backup.

- **Recovery time objective (RTO)**

The time allowed to restore normal operations when an IT failure occurs. An RTO of one hour means an application or a data set will be back online within one hour after a failure.

- **Recovery point objective (RPO)**

The maximum amount of data you are willing to lose. An RPO of one hour means you will be able to restore an application or data set to a point no more than one hour prior to the outage or failure. The backup/replication interval typically has to match the RPO.

- **Copy data management**

The process of minimizing and managing the number of copies of each data object. Data protection and other activities can result in the creation of huge numbers of data copies and consumption of excessive storage capacity. Technologies such as snapshots and clones can greatly reduce the number of full copies.

SECURITY FOR IT ENVIRONMENTS WITH STRINGENT COMPLIANCE REQUIREMENTS

Organizations that manage sensitive information—such as government agencies, healthcare facilities, and financial services companies—benefit from the built-in security features of the Nutanix architecture.

Nutanix software is hardened by default. It utilizes the principle of least privilege and delivers a true defense-in-depth model. Its custom security baseline exceeds the requirements of the U.S. Department of Defense. Nutanix data protection and DR solutions incorporate the latest safeguards to protect data privacy and ensure security.

Our entire business is built on trust. We have established robust security, data protection, and privacy programs to ensure you can trust Nutanix to keep your data safe. Our Trust framework is comprised of security, privacy, compliance, and transparency capabilities.

To learn more about Nutanix security visit: www.nutanix.com/trust



3. Nutanix Data Protection and Disaster Recovery Portfolio

Nutanix is a hyperconverged infrastructure (HCI) pioneer, combining compute, storage, virtualization, data protection, and more in a single infrastructure stack. Nutanix Enterprise Cloud replaces complex and expensive IT infrastructure with simple appliances that scale out one node at a time.

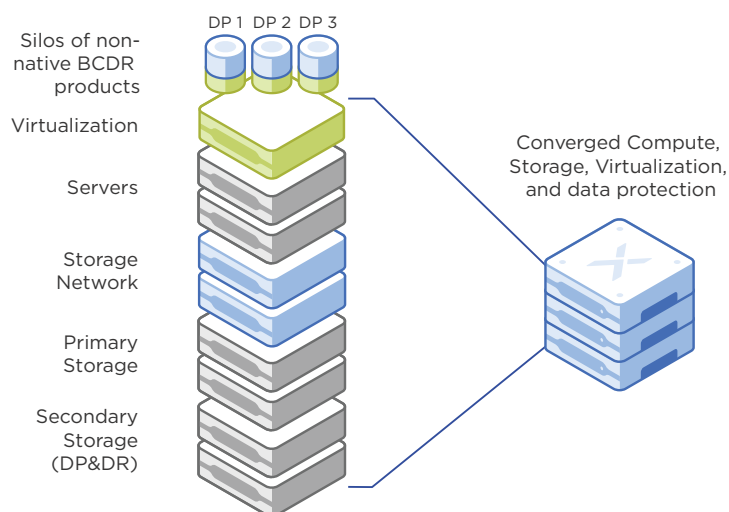


Figure 2: Nutanix converges compute, storage, virtualization, data protection, and DR functions in simple, scalable building blocks

Software innovation is what makes Nutanix systems unique. Nutanix software has two components: Acropolis and Prism. Nutanix Acropolis provides a distributed data plane with enterprise storage and virtualization services and the ability for applications to move seamlessly across hypervisors and cloud providers. Nutanix Prism provides a distributed management plane that uses advanced data analytics and heuristics to simplify and streamline common workflows, eliminating the need for separate management solutions for servers, storage networks, storage, virtualization, data protection, and DR.

Nutanix Enterprise Cloud integrates a variety of data services that can eliminate the need for separate NAS, SAN, and object storage hardware and further simplify your IT stack:

- **Nutanix Files** is a software-defined, scale-out file storage solution that supports both SMB and NFS, eliminating the need for NAS systems or dedicated file servers.
- **Nutanix Volumes** provides native, scale-out block storage with direct block-level access that replaces the cost and complexity of managing legacy SAN architectures.
- **Nutanix Objects** is a software-defined object storage solution that non-disruptively scales out while lowering overall costs. Objects can handle terabytes to petabytes of unstructured data and supports WORM functionality for immutability and chain of custody control. Fully S3 compatible, Nutanix Objects can be used as a target for backup and archiving needs.

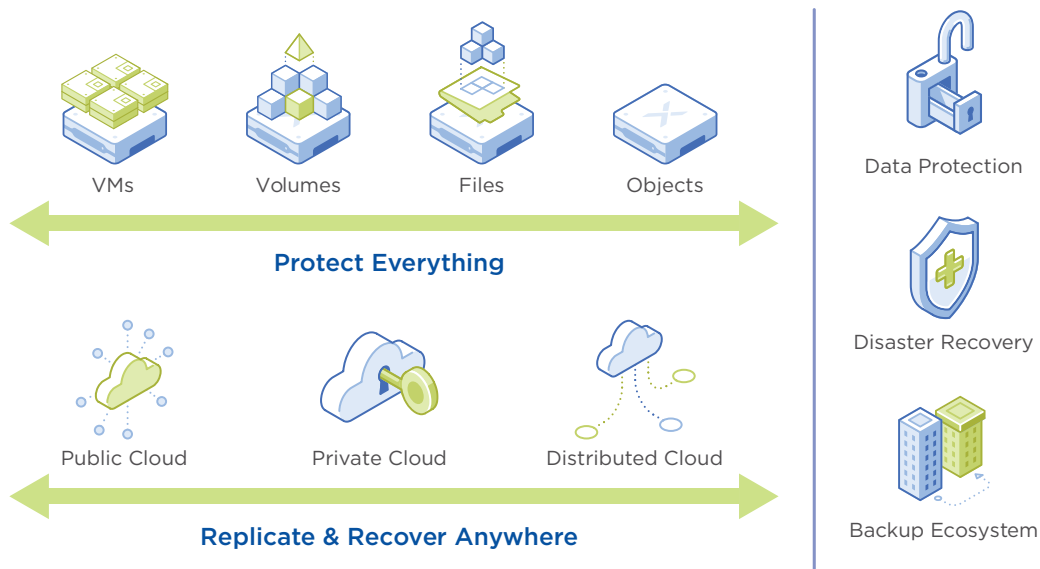


Figure 3: Nutanix makes it simpler to provide backup and disaster recovery for your entire operation.

Nutanix software distributes all operating functions—including data protection—across a cluster. System resilience and overall performance increase as servers are added to a cluster, keeping pace with application and data growth.

Because a Nutanix system provides backup and DR without requiring separate dedicated hardware or appliances, Nutanix Enterprise Cloud greatly simplifies your infrastructure, eliminates bottlenecks, streamlines management, and reduces costs.

Nutanix Enterprise Cloud provides:

- Best-in-class infrastructure resiliency with self-healing architecture that keeps applications running should failures occur
- Integrated, cross-hypervisor replication with centralized policy-based management
- One-click data protection and simplified secondary storage with Nutanix Mine
- An ecosystem of leading third-party backup solutions integrated via Nutanix APIs
- DR with asynchronous, near-synchronous, or synchronous replication
 - NearSync for near synchronous replication with an RPO as low as 1 minute
 - Metro Availability for synchronous replication across metropolitan distances and an RPO of zero
- Flexible, cloud-based DR-as-a-Service with Xi Leap

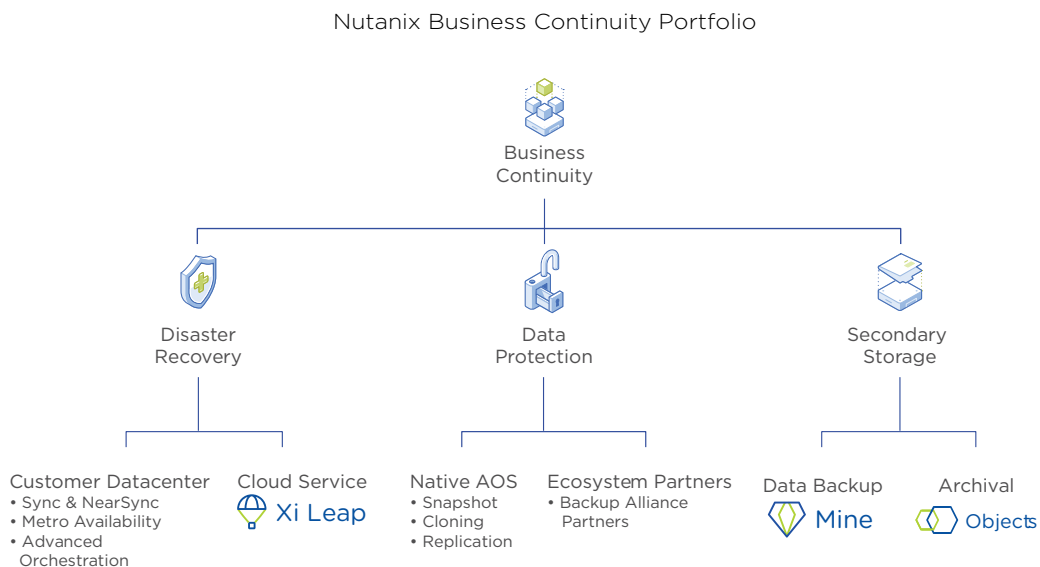


Figure 4: Nutanix offers a complete portfolio of solutions to ensure business continuity.

CONVERGING DATA PROTECTION AND INFRASTRUCTURE

With Nutanix Enterprise Cloud, many customers find that they can reduce or eliminate reliance on third-party backup and DR solutions. Nutanix combines a highly resilient, scale-out infrastructure with efficient snapshot, cloning, and replication technologies and intelligent software to provide a higher level of protection with less complexity and lower cost.

All Nutanix data protection and DR functions are an integral part of the solution and are designed to be:

- **Application-centric.** Nutanix makes it simple to group application VMs and protect them together as a set.
- **Multi-hypervisor and cross-hypervisor.** Nutanix provides native support for VMware vSphere, Microsoft Hyper-V, and Nutanix AHV (included with purchase). Not only can you use data protection functionality with all three hypervisors, you can perform cross-hypervisor replication between AHV and vSphere to optimize costs.
- **Simple to manage.** The complexity of data protection—with multiple solutions, devices, and interfaces—is a huge problem. Prism can be used to manage all Nutanix data protection and DR functionality. A single consumer-grade interface can manage everything in a Nutanix environment.
- **Policy-based.** Data protection and DR are based on policies you define up front, allowing you to deliver the right protections for every application and workload with ease.
- **Accessible via APIs.** Nutanix provides full REST APIs that facilitate automation. Every action that can be performed from the Prism UI can be performed from PowerShell, scripts, or application programs.
- **Copy-efficient.** Nutanix data protection and data reduction help you minimize the number of full data copies and the bandwidth needed for replication. This saves on space and cost, providing complete data protection while allowing you to quickly provision clones for analytics, dev/test, and other functions.

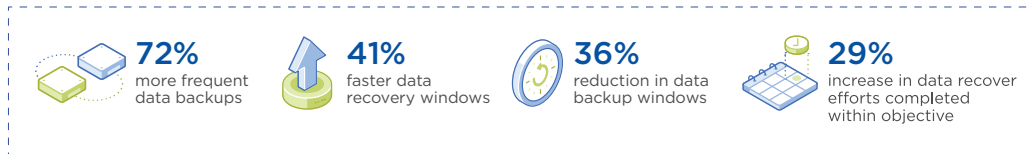
PROTECTION AT EVERY LEVEL

Backup and DR by themselves are not enough. Achieving maximum application availability requires a comprehensive approach that includes resiliency at every level and flexible technologies that can be combined to meet the needs of every workload, from your datacenter to the cloud.

Starting at the platform level and extending to the storage, virtualization, and management stacks, Nutanix has created a highly available, self-healing solution that delivers the right service levels for your applications—while reducing cost and management overhead. In a study of Nutanix customers, IDC found that unplanned downtime was reduced by 85% on average, and management overhead was reduced by 58% versus customers' previous conventional deployments.¹

¹ *Organizations Leverage Nutanix Enterprise Cloud as Scalable, High- Performing, and Cost-Effective Infrastructure Foundation, IDC, January 2020.*

Better Data Protection & Recovery



Source: IDC White Paper, sponsored by Nutanix, Organizations Leverage Nutanix Enterprise Cloud as Scalable, High-Performing, and Cost-Effective Infrastructure Foundation, January 2020

Figure 5: According to a recent IDC study, Nutanix improves backup and recovery versus traditional solutions.

Nutanix offers a range of options that allow you to meet the RPOs and RTOs of different applications. The sections that follow examine the resiliency, availability, data protection, and DR capabilities of Nutanix Enterprise Cloud in detail.

REDUCING DATA COPIES AND STORAGE CONSUMPTION

Nutanix provides a variety of ways to decrease overall storage consumption and reduce the number of data copies. Flexible deduplication and compression policies allow you to optimize the amount of primary storage consumed, and these savings are retained for secondary copies.

Single-Stream Backup and Disaster Recovery

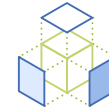
Traditional approaches usually result in separate data copies for backup and DR. Nutanix remote backups provide both backup and DR functionality in a single stream, saving storage space and WAN bandwidth. You can recover from a remote site to a primary site as necessary or fail over to the remote site and restart operations there.

Flexible Cloning

Nutanix administrators can create clones of a base image in a matter of seconds. The result is a writable “copy” that consumes only incremental storage space. You can easily create clones of VMs and data sets for development, testing, analytics, and other uses. Clones replace full copies so that every developer and tester can have his or her own full environment.

This capability can be automated, and Nutanix provides full integration of cloning in popular offload capabilities, including the VMware API for Array Integration (VAAI) and Microsoft Offloaded Data Transfer (ODX), allowing clones to be created in seconds.

Nutanix also provides a complete set of native REST APIs covering backup and other Nutanix capabilities that are hypervisor agnostic. For example, many third-party data protection vendors utilize Nutanix changed region tracking (CRT) for efficient backups.



4. Built-In Infrastructure Resilience

Infrastructure resilience is the first line of defense for your data and applications. One of the things that differentiates Nutanix from conventional infrastructure with separately sourced servers, storage, and storage networks is that the platform is fault resistant, with no single points of failure and no bottlenecks. The system uses a shared-nothing architecture with data, metadata, and services distributed across all nodes within a cluster. It is designed to detect, isolate, and recover from failures; survive system hardware, software, and hypervisor issues; and maintain data availability.

NUTANIX RESILIENCY AND EFFICIENCY

The resiliency of the Nutanix web-scale architecture is the foundation for all Nutanix data protection functions. To learn more about nutanix resiliency and data efficiency, read the following Tech Notes:

- [Nutanix Tech Note 2068: Infrastructure Resiliency](#)
- [Nutanix Tech Note 2032: Data Efficiency](#)

TUNABLE REDUNDANCY

With Nutanix, tunable redundancy and erasure coding replace the HW-centric RAID technologies of traditional storage. Each Nutanix data container—the equivalent of a VM datastore—is configured with a replication factor (RF) of two or three. An RF of 2 ensures that two copies of data are maintained at all times, allowing the cluster to survive the failure of a single node or drive. With an RF of 3, three copies of data are maintained across a cluster, providing resilience to two simultaneous failures. You can dynamically configure data redundancy based on application SLAs and the criticality of each data set.

Tunable redundancy provides continuous data availability for applications. In the event of a drive or node failure, data is automatically read from other nodes in the cluster. If the node does not come back online, all data on the affected node is automatically reconstructed to ensure full redundancy and data protection. Because the workload is spread across the cluster, the performance impact is small; the larger the cluster, the faster data

is reconstructed and the smaller the impact of a failure. The system returns to full redundancy quickly and without intervention.

Tunable redundancy works in conjunction with Nutanix Erasure Coding (EC-X) which provides the same level of resilience but reduces storage capacity overhead.

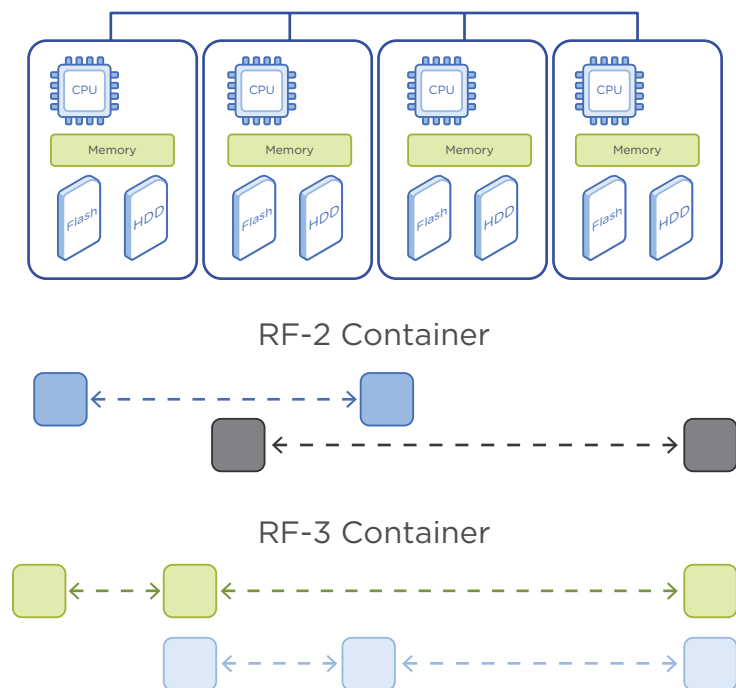


Figure 6: Replication factor (RF) provides data resilience by placing data replicas on separate nodes

EC-X

Nutanix EC-X is an innovative erasure coding technology that provides resilience and increases usable capacity by up to 75%. EC-X reduces the capacity cost of storing two or three copies of data without taking away any of the resiliency benefits and with no impact on write performance. Nutanix systems use tunable redundancy for hot data and erasure coding for cold data.

Since coding and rebuilds are distributed across an entire cluster, EC-X is highly efficient with minimal computational overhead. This reduces vulnerability in the event of failures by speeding up rebuilds. EC-X also maintains data locality for high performance.

EC-X encodes a strip of data blocks on different nodes and calculates parity. In the event of a disk or node failure, parity is used to reconstruct missing data blocks. Each data block in a strip is on a different node and belongs to a different vdisk. The number of data and parity blocks in a strip is configured based on the number of failures a container must withstand.

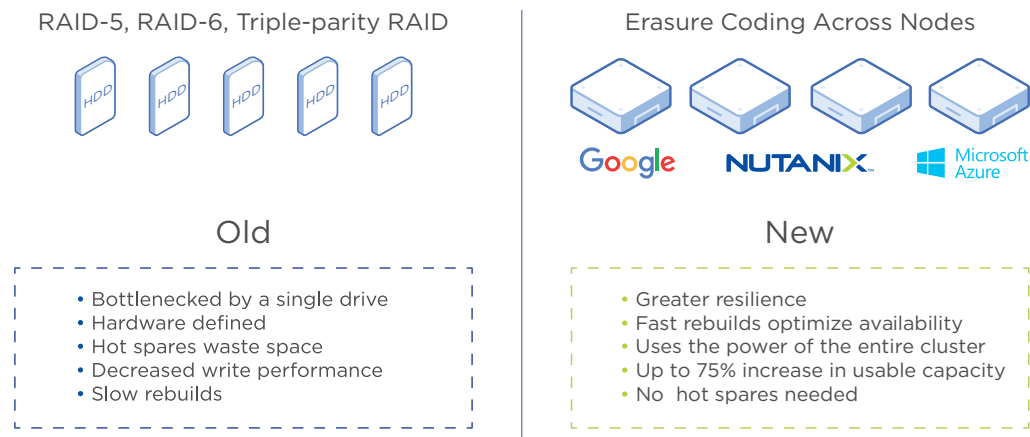


Figure 7: EC-X provides greater resiliency without the limitations of RAID

SUPERIOR SUPPORT AND SERVICES

Nutanix has award-winning support, comprehensive global services, and innovative education solutions to help you run any workload at any scale. Nutanix Services can help you design the right data protection solution to keep your critical applications available and data properly protected.

INTEGRITY CHECKS

Nutanix software includes a variety of features to proactively identify and fix issues related to data consistency and integrity, bit rot failures, and drive corruption.

Detection of silent data corruption and repair of data consistency errors. The system scans data in the background and verifies it against the stored checksums in the distributed metadata store. If an error is detected, the bad data is rewritten using a good copy.

Automatic data integrity checks for every read. A checksum is computed for all data being read and compared with stored checksums.

Automatic isolation and recovery during drive failure. In the event of a drive failure, the system automatically replicates any data that is no longer redundant in order to ensure fault tolerance. During the failure and recovery process, both data and access to data are preserved.

AVAILABILITY DOMAINS

Availability domains offer even greater protection from hardware failures, allowing a Nutanix cluster to survive the failure of a node or block of nodes. Intelligent data placement combined with tunable redundancy ensures that a cluster can tolerate a node failure without losing access to any of its data. This is sometimes referred to as “node awareness.”

“Block awareness” takes “node awareness” a step further by distributing data replicas across multiple blocks. (A block is a multi-node enclosure that may contain one, two, or four nodes.) If a block fails, there is at least one replica of all data on another block. A minimum of three blocks is needed for block awareness.

THE ADVANTAGE OF NUTANIX SELF-HEALING

If a conventional dual-controller storage system loses a drive, affected volumes run in degraded mode for a long period (possibly days or weeks) until the failed drive is reconstructed. Spare drives sit idle until there is a failure. If a storage system loses a controller, the workload on the other controller doubles. In either case, performance may noticeably suffer and time is of the essence when replacing the failed hardware.

If a drive inside a Nutanix cluster fails, active data is accessed from copies on other nodes, so the performance impact is minor; data redundancy is quickly restored in the background by re-establishing redundant copies of all data.

If a Nutanix node fails, workloads are restarted on other nodes. Data is accessed from copies on other nodes, and data redundancy is restored quickly in the background. The more nodes in a cluster, the more widely distributed the recovery work, and the more resilient the system. Self-healing reduces the urgency of replacing failed hardware.

All Nutanix clusters have drive and node awareness. Larger clusters can also support block and rack awareness for even greater levels of protection. Nutanix uses the term block to refer to a single chassis containing one, two, or four server nodes. A rack is a physical unit containing one or more blocks. Block awareness requires a minimum of three blocks; Nutanix distributes data to tolerate a complete block failure. Rack awareness requires an administrator to define rack boundaries. Once racks are defined, data is distributed in a rack-aware fashion to tolerate rack failures.



5. Backup and Recovery

Regular backups are the second line of defense in data protection (after system resilience), and the only protection against user, administrator, and application errors that result in data being deleted or corrupted.

Nutanix Enterprise Cloud provides three levels of backup and recovery. On-cluster snapshots provide the first line of defense and the fastest and most convenient recovery from application problems or user errors. Remote backup lets you replicate snapshots to a remote location for longer-term retention and site-level resilience.

Using these capabilities, you can easily implement disk-to-disk, disk-to-cloud, or disk-to-disk-to-cloud backup models and tailor the number of backups you retain to your exact needs.

SELF-SERVICE FILE RESTORE

Nutanix backup includes self-service file restore, which allows users to recover individual files from within snapshots without an administrator. Self-service file restore is easy to set up and manage and, in most cases, eliminates the need to recover an entire VM.

CONVERGED LOCAL BACKUPS WITH NUTANIX SNAPSHOT

Backup remains one of the biggest challenges in enterprise IT environments. With Nutanix, you can create unlimited local backups with VM- and application-level consistency and recover data instantly to meet a wide range of backup and data protection requirements.

Nutanix snapshots provide production-level data protection without sacrificing performance. A redirect-on-write (ROW) algorithm dramatically improves system efficiency.

Once a snapshot is created, it can be accessed without affecting production activity. You can back up a snapshot to tape for long-term retention, replicate it to another Nutanix cluster, or replicate it to the cloud.

INTEGRATED REMOTE BACKUP

Nutanix can efficiently replicate snapshots of individual VMs from a primary system to one or more secondary systems at different sites. Replication is flexible and bi-directional, enabling one-to-one, one-to-many, and many-to-one topologies. By supporting fan-out, fan-in, and multi-way replication, Nutanix allows you to create a flexible multi-master virtualization environment. VM snapshots can be asynchronously replicated or backed up to another datacenter on a user-defined schedule.

Only byte-level changes between snapshots of VMs are sent over the network to the remote cluster, and data is compressed to minimize WAN bandwidth consumption. Deduplicating data sent to remote sites can effectively cut the bandwidth required by as much as 75% versus host-based, full-copy backup solutions. Replication, like other system functions, is fully distributed across the nodes in a cluster, ensuring maximum replication performance.

The Prism interface provides a simplified view of all local and remote snapshots, allowing administrators to restore a VM from a snapshot with a single click. In case of disaster, you can fail over using the backup data copy at a secondary datacenter, providing a single replication stream for backup and DR.

IMPORTANT CONCEPTS FOR NUTANIX DATA PROTECTION

Protection domain. A group of VMs and/or files to be replicated together on a desired schedule so that protection policies can be applied on a per-application level. A protection domain can protect a full container or individual VMs and files.

Consistency group. A group of VMs and/or files that need to be protected in a crash-consistent manner so that they are in a consistent state when recovered. Related application or service VMs are typically collected in a consistency group.

Replication schedule. Defines the frequency of replication. For VMs, the snapshot schedule should be equal to the desired RPO.

Retention policy. Defines the number of local and remote snapshots to retain.

MULTI-HYPERVISOR AND CROSS-HYPERVISOR FLEXIBILITY

For environments running VMware vSphere and Nutanix AHV, VMs can be replicated across hypervisor boundaries. For example, you can run VMware in your production environment and Nutanix AHV in your DR/backup environment. Since your Nutanix solution includes AHV at no additional charge, this approach can significantly reduce total virtualization licensing costs. You are free to choose the best hypervisor for each environment.

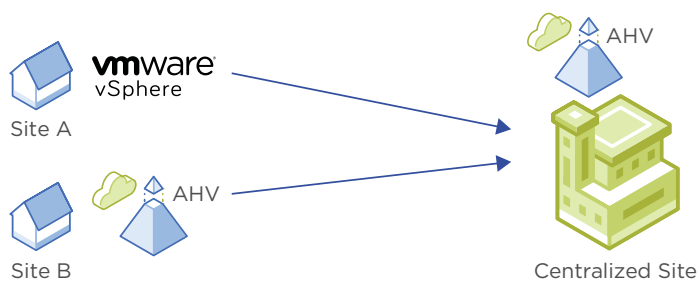


Figure 8: Cross-hypervisor replication allows you to use different hypervisors at different sites

CLOUD BACKUPS

Nutanix allows you to use public cloud services, such as Amazon Web Services (AWS), as a backup destination for all types of workloads, making the public cloud a logical extension of your own datacenter(s).

You can back up to and recover from the public cloud with a few clicks, just as you would with a remote Nutanix cluster. You can snapshot an individual VM or a collection of VMs to multiple geographically dispersed regions utilizing Nutanix Xi Leap cloud services. Recovery is the same as from a remote Nutanix site. Data transfer is WAN optimized, reducing the storage footprint and network bandwidth by over 75%.

AIRLINE STREAMLINES DATA PROTECTION WITH NUTANIX

The IT department for a major airline had a mixture of traditional hardware solutions that made data center management a nightmare. Multiple backup solutions added complexity; resource contention and unexpected downtime were a regular occurrence.

The airline turned to Nutanix Enterprise Cloud to solve its infrastructure and backup challenges. Veeam is now the sole backup solution for the company, backing up applications and data to traditional infrastructure in an offsite location.

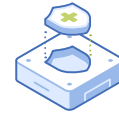
Because most of the on-premises applications have an 8-hour RPO and RTO, there is ample time for the IT team to recover from these off-site backups. While unplanned downtime under the legacy hardware was a fact of life for the IT team, they have yet to experience any unplanned downtime in the 2.5 years since migrating to Nutanix.

IT can now focus on implementing new strategic initiatives that benefit the business, with DR high on the list of planned enhancements.

Benefits of Nutanix:

- Improved performance and decreased latency, while minimizing downtime
- Enabled standardization on a single backup solution

[Read Full Story](#)



6. Integrated Backup with Nutanix Mine

For most enterprise IT teams, data protection is a constant challenge, requiring a confusing array of software and hardware solutions, dedicated personnel, and almost constant attention.

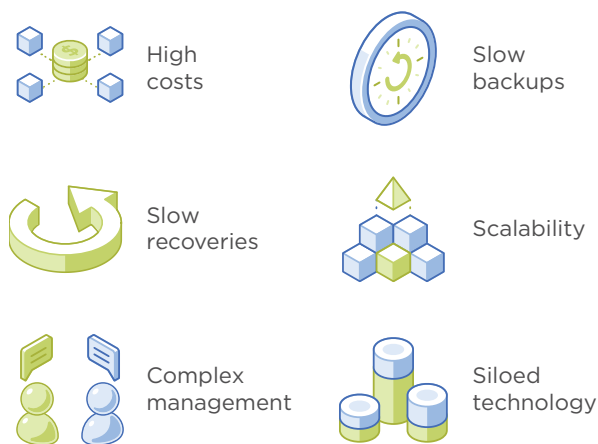


Figure 9: Nutanix helps you overcome these data protection challenges with Nutanix Mine

Nutanix Mine unifies your primary and secondary data protection operations, enabling cloud-like scalability and one-click simplicity to address all your backup needs with a single solution.

Mine takes the place of legacy backup approaches that suffer from performance issues, security gaps, and endless complexity. With Mine, you can:

- **Unify IT Operations.** Fully-integrated data management eliminates silos and overhead.
- **Deploy Effortlessly.** Mine offers a cloud-like “drop-in” solution that includes hypervisor, hardware, OS, management, and storage.
- **Get Faster Time to Value.** Take advantage of streamlined sizing, ordering, management, scaling, and support.

By partnering with leading data protection vendors, Nutanix ensures you can drop Mine into your operations quickly and easily. Mine enables you to choose the best software for your organization and eliminates the time and expense of configuring stand-alone secondary storage solutions.

TURNKEY BACKUP PLATFORM

Nutanix Mine is a hyperconverged backup solution built on Nutanix HCI. Mine is highly available and highly scalable—it arrives optimized for backup and preloaded with backup software.

Native integration with leading backup solutions allows Nutanix Mine to remove the management disconnect between primary infrastructure and secondary storage environments. Nutanix Mine can be easily deployed, managed, and scaled to meet your data protection requirements.

The following table lists the basic ports that must be open to establish connectivity between Xi and your on-premises firewall. Depending your specific scenario, you may need to open additional ports.

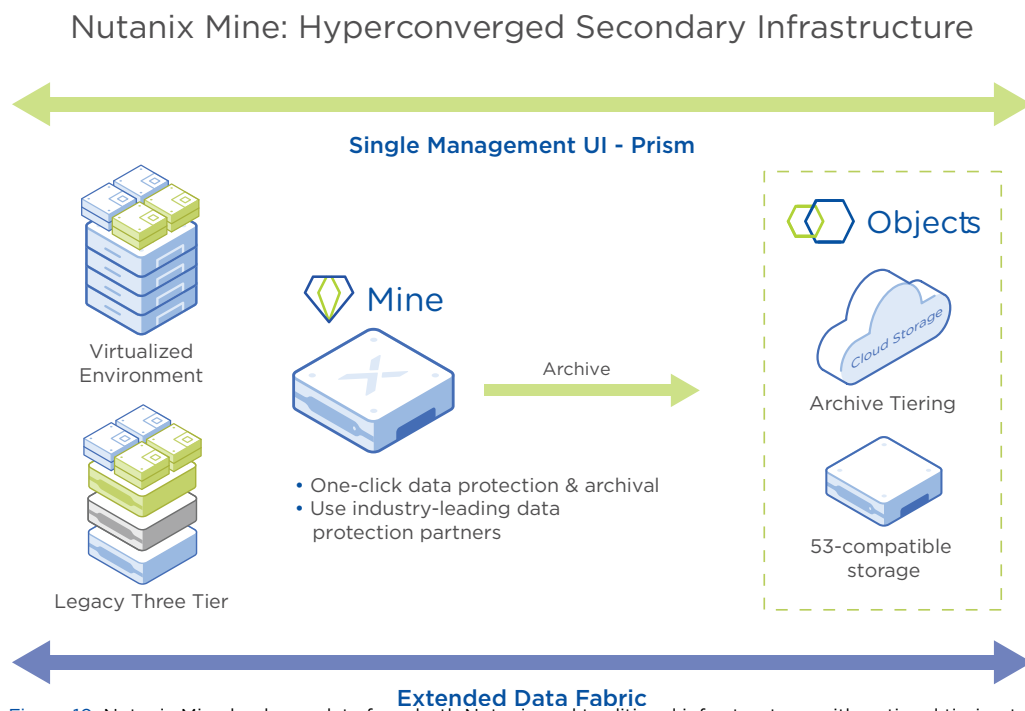


Figure 10: Nutanix Mine backs up data from both Nutanix and traditional infrastructure, with optional tiering to object storage for long-term retention and archiving.

Nutanix Mine simplifies the full lifecycle of data backup operations, including initial sizing, product procurement, deployment, management, and product support.

You can back up any workload onto the Mine appliance with easy and fast access to the backups you created. Leverage vendor functionality to recover data in a matter of seconds. If your company has regulatory requirements to keep periodic backups for a longer period of time, you can migrate them to another tier of storage. The backup software converts the backups into objects and stores them on S3-compatible storage. This can either be a cloud-based offering like AWS S3 or object storage such as Nutanix Objects, a fully tested and certified target for archival.



7. Disaster Recovery

Nutanix provides asynchronous, near-synchronous, and synchronous replication options to support different recovery SLAs as part of a complete business continuity plan. With these integrated and simple-to-use capabilities, many Nutanix customers find they are able to provide DR for many more applications than they could in the past.

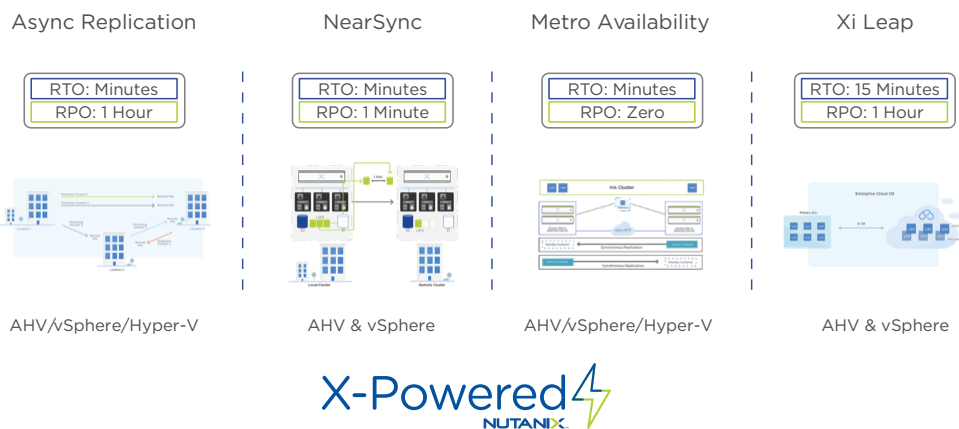


Figure 11: Nutanix offers a range of DR solutions to satisfy diverse needs.

Nutanix Xi Leap (described in the next chapter) simplifies DR even further with DR-as-a-Service.

All Nutanix DR solutions can be deployed using infrastructure from [Nutanix X-Powered Service Providers](#) if desired. X-Powered Service Providers support native Nutanix services to support Nutanix customers.

ASYNCHRONOUS REPLICATION FOR DISASTER RECOVERY

Nutanix asynchronous replication makes it possible to create an affordable DR solution. Groups of related VMs can be replicated together, and a group of VMs can be brought up on the secondary site with a single command if the primary site is down.

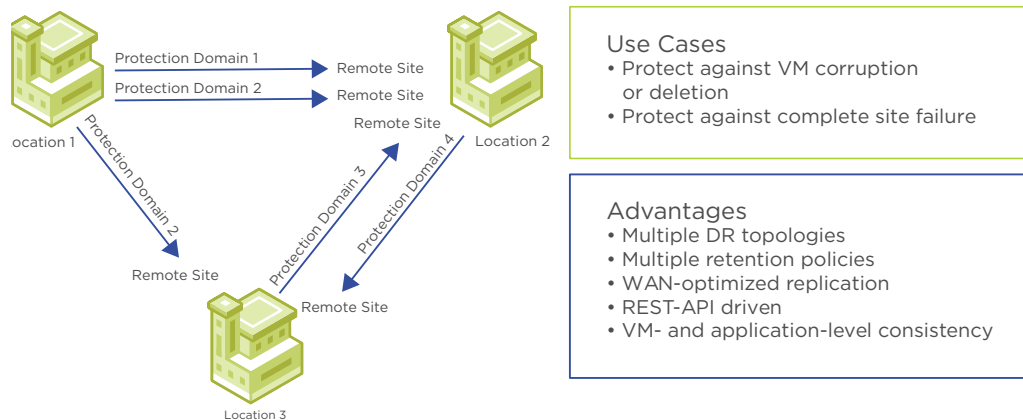


Figure 12: Asynchronous replication provides remote backup and DR capabilities

NEAR-SYNCHRONOUS REPLICATION WITH NUTANIX NEARSYNC

Nutanix NearSync builds on the asynchronous replication capabilities just described to create a solution that can achieve an RPO lower than traditional asynchronous replication and very fast RTO. RPO can be as low as 20 seconds without the distance limitations.

NearSync uses a Nutanix technology called light-weight snapshot (LWS) to deliver:

- Zero impact to primary I/O latency
- Very low RPO (20 seconds minimum)
- No geographical limits

When you configure a snapshot frequency of 15 minutes or less, NearSync is automatically enabled.

NUTANIX NEARSYNC SIMPLIFIES DR FOR MANUFACTURER

Janus International Group is a rapidly growing manufacturer of turnkey self-storage building solutions. Due to outdated IT infrastructure, failovers could only be accomplished using a slow and error-prone manual process. By moving to Nutanix Enterprise Cloud, Janus was able to significantly improve disaster recovery.

Janus relies on Nutanix NearSync to reduce its RPO to one minute. NearSync ensures minimal data loss in case of a disaster and provides more granular control during the restore process.

“We actually had to test failover with NearSync before we were ready. Due to an unexpected fiber cut in our headquarters, we were forced to fail over to the co-lo before the test. Luckily, it worked beautifully! We didn’t have to do anything; it just came up on its own without any issues. Once the fiber was restored, it automatically failed back.”

– Greg Smith, Operations and Infrastructure Manager, Janus International Group

[Read Full Story](#)

METRO AVAILABILITY AND SYNCHRONOUS REPLICATION

For critical applications requiring zero RPO and near-zero RTO, Nutanix provides Metro Availability. Synchronous replication ensures continuous data availability across separate sites in a Metro Availability installation.

One of the main complaints with traditional synchronous replication solutions is the complexity of deploying, monitoring, and managing them. Metro Availability is simple to set up and manage, and, because it doesn’t rely on secondary solutions, it significantly simplifies DR.

Metro Availability can be set up bi-directionally between two sites connected over an IP-based metro area network. The only network requirement is a round-trip latency of less than five milliseconds, driven by guest OS requirements for acknowledging storage writes. Data is written synchronously to both sites, so it is always available to applications in the event a site fails or needs maintenance. You can non-disruptively migrate VMs between sites for planned maintenance events or other needs.

Failover can be done through Prism or can be automated using CLI, REST APIs, or PowerShell commandlets. Also, failover can be performed at a storage container level, which means all VMs within a container will fail over to the secondary site. Nutanix and authorized partners can be engaged to create custom monitoring and failover scripts for specific situations.

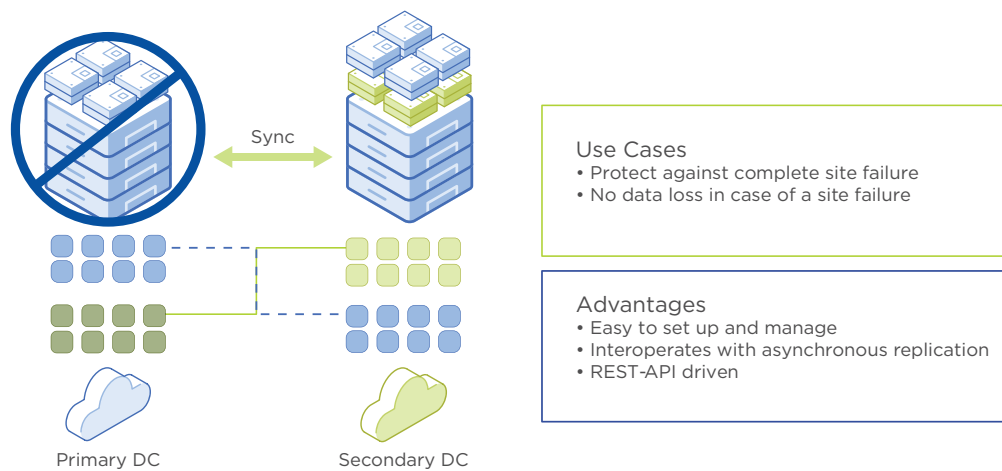


Figure 13: Metro Availability provides synchronous replication between two data centers for DR with zero data loss

ADDING A WITNESS

You can add a Witness to a vSphere-based Metro Availability configuration, a special VM that monitors Metro Availability health. The Witness resides in a separate failure domain and provides an outside view that can distinguish a site failure from a network interruption. The goal of the Witness is to automate failovers in case of site failures or inter-site network failures. The main functions of a Witness include:

- Making a failover decision in the event of a network failure
- Avoiding a split-brain condition
- Handling situations where a single storage or network domain fails

MULTI-SITE DISASTER RECOVERY

Some enterprises may need to maintain multiple independent copies of data for disaster recovery in different physical locations. This is often the case in regulated industries such as financial services. Multi-Site DR combines Nutanix Metro Availability, NearSync, and asynchronous replication abilities to enable flexible multi-site designs, where acceptable sites may share the same room, be in separate buildings on the same campus, or be thousands of miles apart.

Multi-Site DR addresses a variety of uses cases such as zero data loss DR, DR testing, datacenter migration, and data corruption restore, and the solution is designed to overcome the limitations of current approaches designed for SAN environments, including complex installation and administration and vendor and hypervisor lock-in.

Figure 14 shows an example Multi-Site DR scenario with four sites. This is the gold standard for protection of business-critical workloads.

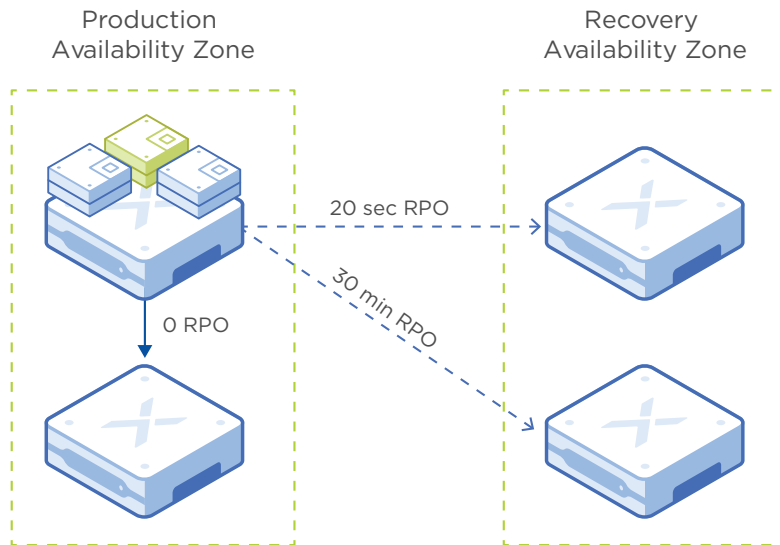


Figure 14: Nutanix Multi-Site DR combines the capabilities of Metro Availability, NearSync, and asynchronous replication to enable more flexible, multi-copy DR configurations.

This configuration provides a zero data loss environment for customers with the most stringent requirements:

- The Production Availability Zone utilizes Metro Availability to achieve RPO=0.
- The two sites in the zone must be within 400km or less than 5ms latency.
- The Recovery Availability Zone utilizes NearSync and async replication.
- A NearSync recovery site offers RPO=20sec with no distance limitation.
- An async replication recovery site offers RPO=30min with no distance limitation.
- DR orchestration can be handled by VMware SRM or scripts.

With this approach, a site failure within the Production Availability Zone results in recovery with zero data loss. Should the entire production zone fail, then the Recovery Availability Zone becomes the production zone, and synchronous replication is initiated between the two sites as shown in Figure 15.

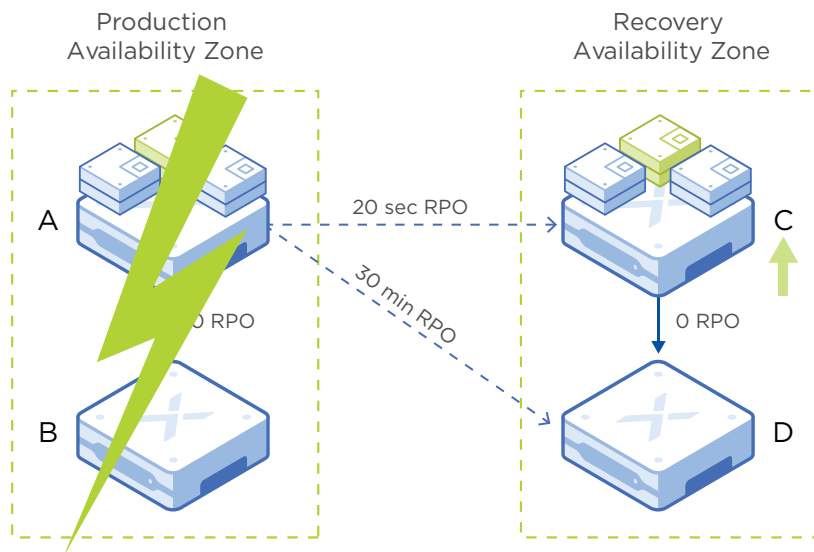


Figure 15: With Nutanix Multi-Site DR, if the Production Availability Zone fails, the Recovery Availability Zone takes over, and synchronous replication is initiated in the Recovery Availability Zone

METRO AVAILABILITY SUPPORT FOR VSPHERE AND AHV

Nutanix Metro Availability will be available for both vSphere and AHV. Both options require a maximum round-trip time (RT) less than 5 milliseconds for synchronous replication. There are some configuration and functionality differences between the two versions.

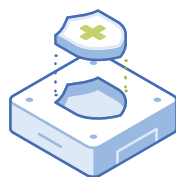
Metro Availability for AHV is managed entirely from Prism Central. It supports asynchronous and NearSync replication in addition to synchronous replication. Nutanix AHV also provides native high availability for VMs. VM-HA works in conjunction with the resiliency built into the Nutanix platform. Out of the box, a Nutanix cluster running AHV is pre-configured to provide “best-effort high availability.” It automatically responds to node failures by restarting VMs on healthy nodes as long as a cluster has available capacity. When VM-HA is explicitly enabled, the AHV software reserves failover capacity to ensure that HA is available to all powered-on VMs at all times.

Metro Availability for vSphere requires VMware vCenter, and a Witness is recommended for failure handling. It supports asynchronous replication in addition to synchronous.

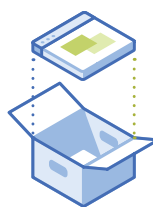


8. DR-as-a-Service with Xi Leap

For most enterprises, whatever form of DR you choose comes with challenges. Deploying a dedicated recovery site and building your own solution is obviously complex and CapEx heavy. Some enterprises simply cannot afford to build redundant datacenters, so an OpEx model suits them better. With Nutanix Xi Leap DRaaS, even the smallest businesses can take advantage of the same DR benefits as larger enterprises, including simplified automation, orchestration, and failover/failback testing.



Built-In



Instant Onboarding



One Click Test/Fallover

NUTANIX LEAP FOR AUTOMATED DR TO A SECONDARY SITE

For sites that prefer to maintain their own DR site(s), Nutanix Leap offers almost identical functionality to Xi Leap. The primary difference is data is replicated to infrastructure you own in a secondary data center or colocation facility rather than the cloud. Otherwise, the discussion in this section applies equally to both Leap and Xi Leap.

Nutanix Xi Leap offers a fully integrated DR-to-cloud solution that protects business-critical applications, data, and services in your Nutanix environment without the need to purchase and maintain a separate infrastructure stack. Infrastructure, power, rent, networking, and hypervisor licensing—among other traditional brick and mortar costs—are rolled into a single DR subscription service with guaranteed SLAs.

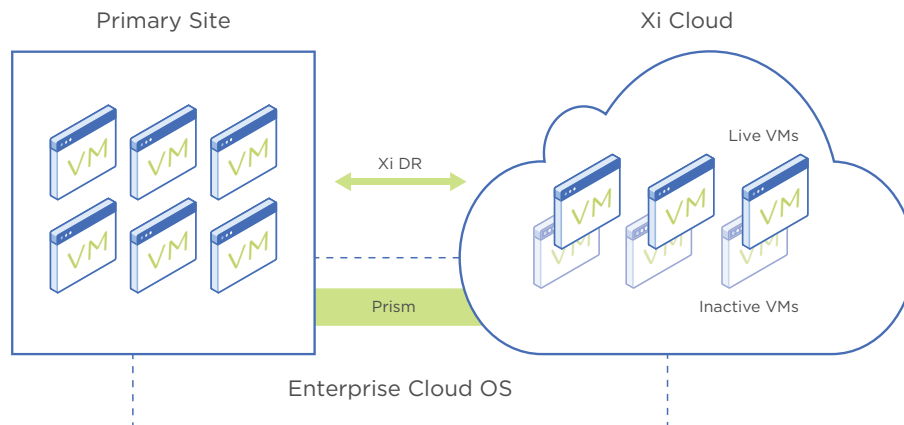


Figure 16: Nutanix Xi Leap disaster recovery service

Xi Leap is built into Nutanix Enterprise Cloud, eliminating the need to fuse multiple products in order to protect your datacenter environment. DR planning, setup, and monitoring are managed from Nutanix Prism Central; its single management plane spans the entire stack, so there is no new interface to learn. Benefits of Xi Leap include:

- **Easy to deploy.** Leap includes automated discovery capabilities that simplify initial deployment and make it easy to protect new applications.
- **Simple replication policies.** Rule-based protection policies protect targeted workloads based on your BCDR plan.
- **Powerful recovery plans.** Automated plans for application recovery control boot sequencing of the virtual machines associated with each application. Custom scripts can be included in recovery plans to automate actions such as VM customization or firewall configuration.
- **IP address preservation.** Xi Leap eliminates the need for complex IP address reconfiguration by preserving network topology and workload IP addresses during recovery.
- **Instant onboarding.** Xi Leap simplifies the onboarding process by porting workload profiles to the Xi Cloud. Leap applies VM, networking and security configuration to the recovery site, reducing upfront setup time and streamlining failover processes
- **Non-disruptive testing.** Leap facilitates non-disruptive testing, enabling the company to routinely test DR readiness and ensure regulatory compliance.

- [Automated failover and failback](#). Leap orchestration provides reliable execution of failover and failback processes, and Leap enables partial failover of applications for server maintenance or during rack failures.
- [End-to-end security](#): Xi Leap provides end-to-end security using strong encryption for data at-rest and built-in encrypted connections between sites for data in-flight.

Utilizing Xi Leap eliminates the need for dedicated infrastructure and ongoing CapEx expenditures. Xi Leap modernizes your DR footprint and enables you to include applications that may currently only be protected with backups.

XI LEAP PROTECTION POLICIES AND RECOVERY PLANS

Protection Policies

Xi Leap protection policies automate the creation and replication of snapshots. For creating local snapshots, you specify the RPO, retention policy, and the entities that you want to protect. To replicate to a remote location, you also specify the remote location. Protection plans are synchronized to one or more availability zones. After a failover, snapshot replication automatically begins in the reverse direction.

Recovery Plans

A recovery plan orchestrates the recovery of protected VMs at a recovery location. Recovery plans are essentially runbooks that use stages to enforce a power-on sequence. Recovery plans are capable of creating the required networks during failover and can assign public-facing IP addresses to VMs. Recovery plans operate bidirectionally between paired sites. Script execution and IP mapping after failover are also supported by Xi Leap Recovery Plans.

SCHOOL DISTRICT RELIES ON XI LEAP FOR DR

The Avon Grove School District's previous cloud-based DR solution was expensive, hard to configure, and required frequent fixes, taking up valuable time and hampering the productivity of IT staffers.

A key requirement for the replacement solution was that it include a native DR platform for the District's critical applications and data.

Nutanix Xi Leap provided an integrated, turnkey service, enabling Avon Grove to intelligently protect applications in its Nutanix environment without having to purchase and maintain separate infrastructure.

Key benefits include:

- One-click DR to maximize availability of critical data and applications
- Easy and quick setup, configuration, and protection
- Ability to retain snapshots from previous years

With Xi Leap, Avon Grove's IT team has not only simplified operations they have increased peace of mind.

"Nutanix did a great job in extending one-click disaster recovery to the cloud. It's now much easier than our previous experience that was extremely time consuming and complicated."

– Gary Mattei, Director Technology for Avon Grove School District

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9. Business Continuity for Enterprise Applications

As you now know, a Nutanix Enterprise Cloud delivers native data protection and DR and continuous availability, making it possible to meet the RPO and RTO of every application in your portfolio.

While data protection requirements are trending up across the board, different applications still have significantly different needs. This section provides guidance for common enterprise applications and infrastructure solutions. However, there are situations where you may need a higher degree of data protection to address operational requirements that others running the same application don't have. Consider these guidelines to be a starting point for thinking about your business requirements.

	REPLICATION FACTOR (RF)	SNAPSHOT INTERVAL	REPLICATION
Mission Critical	RF2 or RF3	1 hour	Synchronous (Nutanix) or application-based
Business Critical	RF2 or RF3	1-2 hours	NearSync, Asynchronous (Nutanix), or application-based
General Virtualization	RF2	Daily	Asynchronous, 2-4 hours
End-User Computing	RF2	Nutanix Files with user data, infrastructure VMs: 1-2 hours	Nutanix Files with user data, infrastructure VMs: 1-2 hours Golden image: daily

Table 1: Nutanix general data protection guidelines

ENTERPRISE APPLICATIONS

Tier 0 and Tier 1 Databases and Applications

These are the databases and associated applications that are mission critical to your organization.

Backup/restore. Mission-critical applications require regular backup (the more frequent the better) in addition to replication. Having regular backups allows you to quickly recover operations in the face of human errors or software bugs that corrupt data or take an application offline.

Disaster recovery. Whether you need synchronous replication or asynchronous replication depends on your RPO and RTO. For an RPO equal to zero, choose synchronous replication.

Tier 2 Databases and Applications

The applications in this class—developed in Java, .NET, and other languages—are considered important and are typically backed by relational database management solutions such as Microsoft SQL Server, MySQL, and PostgreSQL databases.

Backup/restore. These apps require regular backup. Taking snapshots every few hours is typical.

Disaster recovery. These applications are business critical with RPO and RTO of one hour or greater, making asynchronous replication the appropriate DR option.

Messaging and Collaboration

This class of apps includes Microsoft Exchange and SharePoint, Avaya, and others.

Backup/restore. Apps such as Microsoft Exchange are business critical; the ability to recover individual mailboxes is highly desirable.

Disaster recovery. Resiliency is often built into the application. The Database Availability Groups (DAG) used by Exchange are one example. Snapshots can be important in other cases, such as reseeding DAG copies.

Next-Generation Web-Based Applications

Enterprises are focusing efforts on Web-based application frameworks for development, often using NoSQL databases such as MongoDB and Cassandra. REST APIs may be used to integrate Nutanix data protection functions with an application.

Backup/restore. Backup and restore is an important defense against human errors and software bugs. For organizations doing continuous delivery (CD), snapshots and clones can provide a convenient way of rolling back changes if things don't go as expected.

Disaster recovery. Resiliency is often built into the application. Multiple instances of each application service are spread across a cluster and across locations.

End User Computing (EUC) Environments

In organizations moving to application and desktop virtualization (VDI or DaaS), the tendency is to continue providing the same level of data protection that was provided in the traditional desktop environment; organizations that don't back up physical desktops tend not to back up VDI.

An important caveat is that a failure in an EUC environment could idle a large number of employees; therefore, whether you protect user data or not, it's important to make sure the environment itself is recoverable by backing up and possibly replicating databases, master images, etc.

Backup/restore. At a minimum, you should protect the databases that store the configuration information for the VDI environment. You may also wish to periodically back up persistent user VMs and the file servers handling home directories and user files.

Disaster recovery. Many IT organizations configure application and desktop virtualization environments in two separate datacenters. They replicate infrastructure VMs and file servers with user data between sites to ensure the environment is resilient to failure.

PROTECTING FILE DATA STORED IN NUTANIX FILES

Nutanix Files is extremely popular in EUC environments because it can run on the same Nutanix infrastructure as your virtual desktops, eliminating the need for a separate NAS device, reducing complexity.

Nutanix provides data protection to protect the complete Nutanix Files instance from site failures. When a Nutanix Files "file server" is created, a protection domain is automatically established that includes all associated VMs and volume groups. All an administrator has to do is set the desired snapshot, replication, and retention parameters.

General Virtualization

Virtual machines that host less important business applications or management and infrastructure services can be protected cost-effectively using a combination of regular snapshots and replication as needed.

Backup/restore. As a first line of defense, snapshot infrastructure VMs daily or as needed.

Disaster recovery. Configure asynchronous replication, if needed, on a per-VM basis. Typically, the replication interval should be less than or equal to the RPO.

GLOBAL MANUFACTURER GOES NATIVE WITH NUTANIX BACKUP AND DR

A large manufacturing company moved from traditional blade servers to Nutanix Enterprise Cloud to simplify and consolidate ERP, supply chain logistics, and other virtualized applications.

The team now relies on built-in Nutanix tools instead of VMware Site Recovery Manager for disaster recovery. The built-in tools provide them with significant data protection features, such as snapshots and rapid cloning of VMs, cross-data center replication (transferring snapshots between remote sites and their primary data center), and easy system recovery.

The IT team has benefited from better performance, higher availability, and a significant decrease in management complexity since making the switch to Nutanix, giving admins more time to focus on strategic initiatives.

[Read Full Story](#)



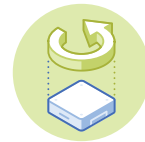
10. Simplify Database Protection with Nutanix Era



Hard to maintain SLAs



High cost of copy data



Decreased business agility

When it comes to business continuity, databases and associated applications take up a large proportion of most IT teams' time and attention. Each database platform has its own data management tools, and silos of infrastructure spring up to ensure performance and availability.

Nutanix Era is a game changer for database operations, enabling Database-as-a-Service on infrastructure you control. Era automates and simplifies database administration, bringing one-click simplicity and invisible operations to database provisioning, protection, and more. Era also offers the ability to create instant clone copies. Two unique capabilities simplify data management in database environments:

- **One-Click Backup.** Consumer-grade database operations for backing up any size database in a full database-consistent manner in minutes.
- **Copy Data Management.** Era Time Machine captures all database states for any given service-level agreement (SLA), allowing you to create fully functional database copies or quickly refresh existing copies.

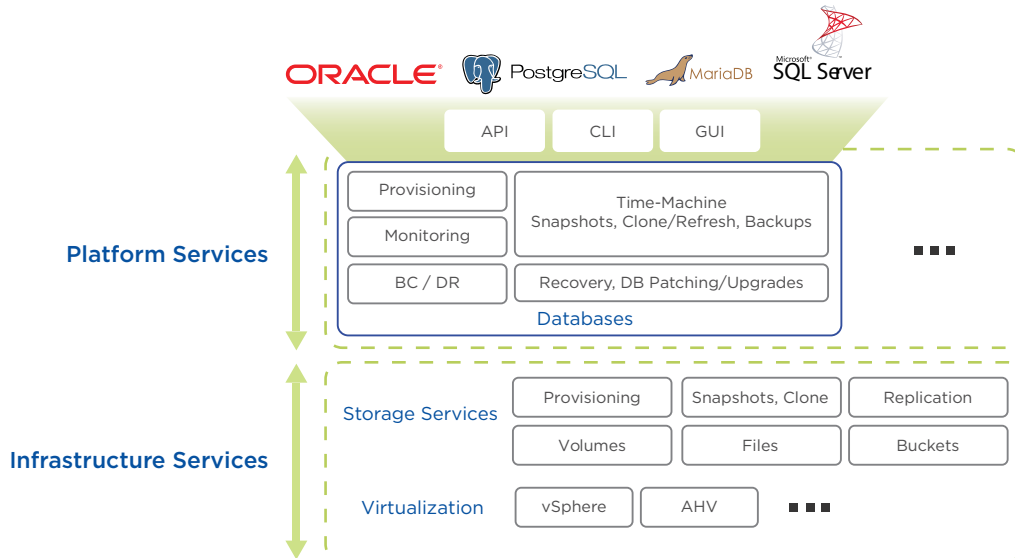


Figure 17: Nutanix Era provides a range of database platform services on top of the built-in capabilities of Nutanix Enterprise Cloud

DATABASE BACKUP

Nutanix Era makes it simple to incorporate Nutanix data protection capabilities into your database environments. For backup and archiving, months' worth of space-efficient snapshots of critical database instances can be stored locally or on a secondary system, eliminating the need for separate backup storage. Policies can be set to efficiently replicate VMs over a WAN to a remote Nutanix system to protect against catastrophes.

By leveraging snapshots, Nutanix Era lowers cost and complexity for enterprises managing many copies of database backups. With Era, you can back up any size database in a database-consistent manner in a matter of minutes. Era Time Machine enables recovery to any point in time to meet the most demanding SLAs.

COPY DATA MANAGEMENT

Provisioning and managing dozens or hundreds of database copies to address developer and other needs has become a huge burden for enterprises, eating up DBA time and consuming valuable storage capacity. Era uses its Time Machine functionality to capture all database states for any given service-level agreement (SLA), allowing you to create fully functional, space-efficient database clones to any point in time and quickly refresh existing clones without convoluted and time-consuming workflows. With Era, your development teams can have as many up-to-date database copies as needed, while consuming far less physical storage.



11. Integrations and Partnerships

Nutanix Enterprise Cloud provides a variety of integrations that allow applications and third-party data protection solutions to integrate with Nutanix capabilities, including:

- Support for established standards
- Changed file tracking
- Partner programs and application validation

STANDARDS SUPPORT

Nutanix has put significant time and effort into supporting standards that allow applications and data protection solutions to integrate with Nutanix solutions:

- [Offload](#). Nutanix software integrates with popular offload capabilities, including VMware API for Array Integration (VAAI) and Microsoft Offloaded Data Transfer (ODX), to create clones in a matter of seconds with minimal overhead.
- [Hypervisor Integration](#). Nutanix provides support for vStorage API for Data Protection (VADP), application-level consistent snapshots using Volume Shadow Services (VSS), and VM-level backup for Hyper-V using VSS for SMB shares.
- [REST APIs](#). All Prism management functionality is accessible through Nutanix REST APIs and a library of PowerShell commandlets, providing easy integration with in-house and 3rd party development. This includes Nutanix functionality such as change region tracking to ensure that data protection processes are as space efficient as possible.

CHANGED FILE TRACKING FOR THIRD-PARTY FILE BACKUP

Most existing file backup solutions rely on outdated NDMP technology, which does not scale to support modern, multi-head backup servers and scale-out file servers such as Nutanix Files.

Nutanix Files provides Changed File Tracking (CFT) technology, which enables parallel and concurrent backup of a Scale-out File Server using our snapshot technology. Some of the key benefits of CFT technology are:

- [Point-in-time backup](#). Enables point-in-time backup of all files and directories, so you don't have to guess when the actual backup of a particular file happened if the whole backup took hours.
- ["In use" files backup](#). With many traditional backup solutions, "files in use" are not backed-up. With CFT, every file or directory, irrespective of its state is backed up.
- [Smart Incremental backup](#). CFT keeps track of all changes to files and directories since the last snapshot and can back up only the incremental changes. This leads to a dramatic reduction in time to backup and the amount of space required.
- [Fast backup](#): CFT enables multiple concurrent streams to every Nutanix Files VM, increasing parallelism and greatly accelerating backups.

PARTNERSHIPS AND APPLICATION VALIDATION

While Nutanix has foundational capabilities, such as snapshots, replication, and intuitive DR workflows, partner integration complements our native functionality and can enable:

- [The 3,2,1 principle](#). Three copies of data, on two different types of media, with one copy offsite.
- [Indexing and cataloging](#). Build a detailed database of data contents during backup.
- [Application awareness](#). Discover applications and leverage application functionality to ensure it gets backed up and restored correctly, consistently, and efficiently.

The [Nutanix Elevate Technology Alliance Partner Program](#) is essential to our mission of supporting the best possible portfolio of business continuity solutions to meet the requirements of our customers.

Data protection partners integrate closely with Nutanix functionality. For example, Commvault provides a deeply integrated solution to protect enterprise applications running on Nutanix. Commvault IntelliSnap technology collapses backup windows and accelerates restores with easy-to-use snapshot management for VMware, Microsoft Hyper-V, and AHV and can ensure application consistency across a wide range of virtualized database applications, including Oracle; SAP; Microsoft SQL Server, Exchange, and SharePoint; and more.

In addition to partnering with all the leading data protection software providers, we have direct alliances with SAP, Microsoft, Citrix, and most other leading application and infrastructure software providers.

Nutanix has invested in validating solutions for critical enterprise applications, including Microsoft SQL Server, Microsoft Exchange, Oracle, SAP NetWeaver, SAP HANA, and many others. This includes best practices for configuring applications to run optimally using both Nutanix and application-centric data protection.

12. Getting Started

Based on a foundation of resilient infrastructure, Nutanix provides native data protection and DR tools to meet diverse needs for backup, replication, and DR. Nutanix helps you provide a higher level of business continuity for important applications while reducing costs.

Ready to learn more about data protection and DR solutions for your organization? Contact us at info@nutanix.com, follow us on Twitter [@nutanix](https://twitter.com/nutanix), or send us a request at www.nutanix.com/demo to set up your own customized briefing and demonstration and see how validated and certified solutions from Nutanix can help your organization get more from enterprise applications.

Stay engaged with Nutanix experts and customers on the Nutanix Next online community (next.nutanix.com).

ABOUT NUTANIX

Nutanix makes infrastructure invisible, elevating IT to focus on the applications and services that power their business. The Nutanix enterprise cloud platform leverages web-scale engineering and consumer-grade design to natively converge compute, virtualization, and storage into a resilient, software-defined solution with rich machine intelligence. The result is predictable performance, cloud-like infrastructure consumption, robust security, and seamless application mobility for a broad range of enterprise applications. Learn more at www.nutanix.com or follow us on Twitter [@nutanix](https://twitter.com/nutanix).



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Nutanix makes infrastructure invisible, elevating IT to focus on the applications and services that power their business. The Nutanix Enterprise Cloud OS leverages web-scale engineering and consumer-grade design to natively converge compute, virtualization, and storage into a resilient, software-defined solution with rich machine intelligence. The result is predictable performance, cloud-like infrastructure consumption, robust security, and seamless application mobility for a broad range of enterprise applications. Learn more at www.nutanix.com or follow us on [Twitter @nutanix](https://twitter.com/nutanix).