NUTANIX

NUTANIX PRIVATE CLOUD DESIGN GUIDE:

Data Protection and Disaster Recovery

Designing for **Data Protection and Disaster Recovery** in a Nutanix Private Cloud

To deliver on business needs and accelerate digital transformation, enterprises need private cloud infrastructure that offers the simplicity and scalability of public clouds and the security and control of on-premises datacenters. However, many private cloud deployments on traditional IT infrastructure have deficiencies in key areas, resulting in:

- Unexpected high costs and lack of cost control
- Insufficient business continuity
- Cumbersome or brittle automation
- Complex, siloed storage infrastructure
- Inability to connect with public clouds

Built on the industry's leading hyperconverged infrastructure (HCI) software, Nutanix private cloud solutions address these limitations and extend easily to encompass hybrid cloud deployments.

This guide explains how to utilize the data protection (DP) and disaster recovery (DR) features of a Nutanix private cloud to satisfy your business continuity requirements.

Nutanix Private Cloud Design Guide:
Data Protection and Disaster Recovery

Advanced capabilities for data protection and disaster recovery reduce complexity, increase levels of protection, and simplify self-service.

Data Protection Challenges

High costs

Slow recoveries

Complex management

Slow backups

Scalability

Siloed technology

A Nutanix private cloud provides:
- Best-in-class infrastructure resiliency and self-healing
- Integrated, cross-hypervisor backup DP and DR
- Local, remote, and cloud backups with one-click
- Simplified secondary storage
- Synchronous, near-synchronous, and asynchronous replication for DR
- Flexible, cloud-based DR-as-a-Service

Why Business Continuity is Critical for Private Cloud

Many enterprises are deploying a private cloud with the intention of migrating more and more applications to it in order to gain agility and improve operational efficiencies. Your private cloud may need to support everything from traditional enterprise applications to the latest cloud native apps—beginning with business critical applications. When you build a private cloud the correct way, getting to hybrid and multicloud can be much easier.

It can be difficult to create business continuity services to meet your service level agreements (SLAs) —especially if you incorporate diverse third-party tools on an ad hoc basis. Doing so adds cost and complexity and makes integration and automation more difficult. A private cloud requires a flexible set of integrated capabilities to ensure DP and DR and support your business continuity needs.

Your goal should be to design a private cloud that satisfies the majority of data pro-tection and disaster recovery needs without a lot of additional effort—either on the part of IT or the cloud user. Infrastructure services should provide a base level of protection, flexible protection policies to address a range of application needs.
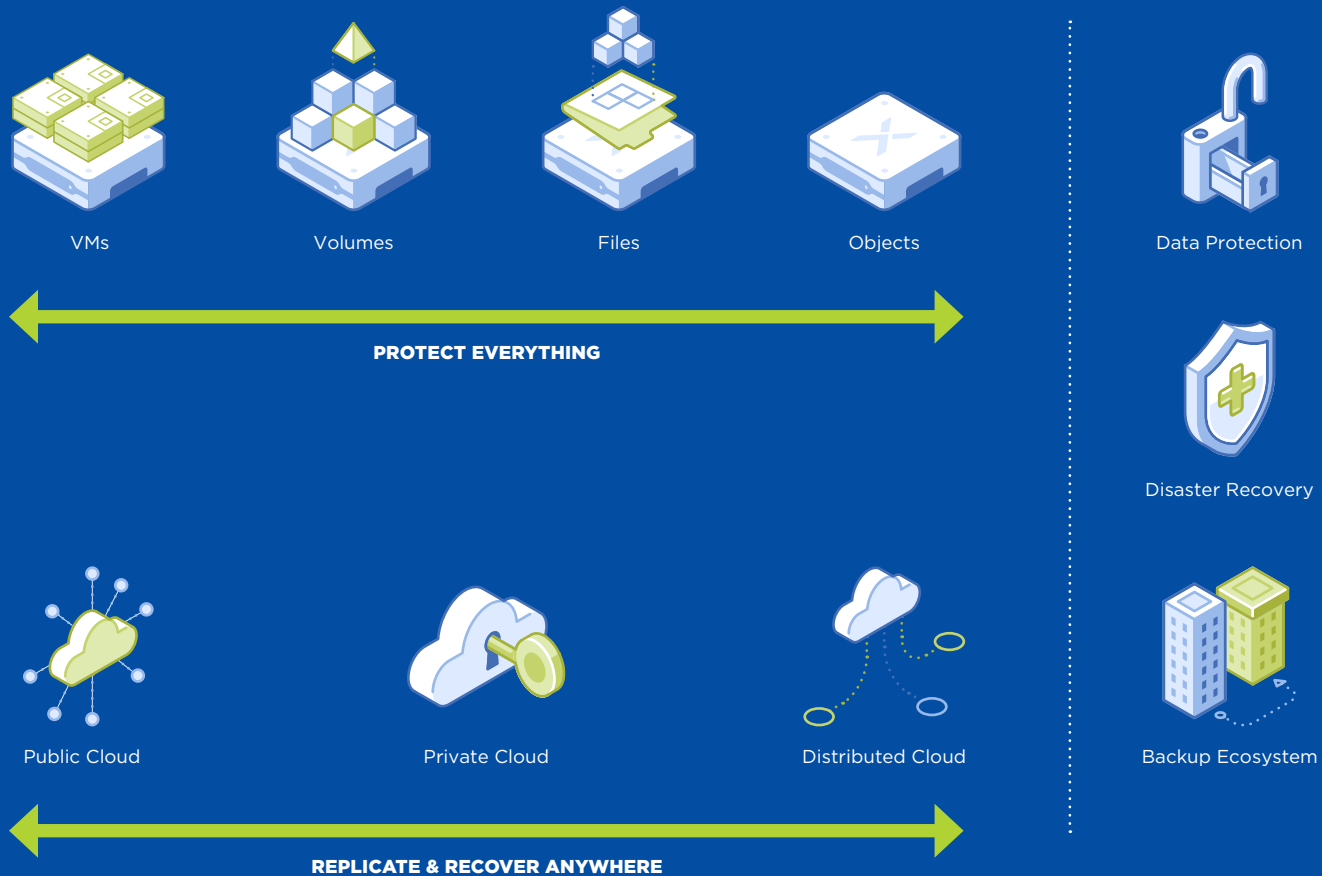
Nutanix Cloud Platform Integrates DP and DR

Nutanix cloud solutions deliver far greater resiliency than private clouds built on traditional infrastructure. It starts by making the transition to hyperconverged infrastructure (HCI). The Nutanix HCI 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. Self-healing allows a cluster to detect, isolate, and recover from failures; survive system hardware, software, and hypervisor issues; and maintain data availability—all without operator intervention.

Built-in DP and DR capabilities simplify infrastructure, eliminate bottle-necks, streamline management, and facilitate automation. Every capability is configurable using Nutanix management interfaces or via a complete set of APIs, making it simple to incorporate these capabilities as part of a service catalog.

Nutanix HCI also provides full integration with third-party backup options, enabling you to continue to use your preferred solutions. Nutanix supports leading industry vendors and offers advanced integration.

VMs

Volumes

Files

Objects

Data Protection

PROTECT EVERYTHING

Public Cloud

Private Cloud

Distributed Cloud

Disaster Recovery

Backup Ecosystem

REPLICATE & RECOVER ANYWHERE

This design guide describes the data protection and disaster recovery capabilities of Nutanix private cloud solutions, including advanced capabilities that you can choose to address specific needs. The final section provides high-level design guidance to help you get started planning your private cloud deployment.

Find Out More:
- nutanix.com/private-cloud
- Private Cloud Demo (video)
- Definitive Guide to Business Continuity with Nutanix

Integrated Data Protection

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 private cloud solutions provide protection at multiple levels:
- On-cluster snapshots provide a first line of defense and the fastest and most convenient recovery from application problems or user errors.

- Remote backup replicates snapshots to a remote Nutanix cluster for longer-term retention, providing and site-level resilience.

- Cloud backup uses a public cloud, such as Amazon Web Services (AWS), as a remote backup target.

Because snapshot and replication schedules are a part of the Nutanix VM provisioning workflow, it's simple to add these capabilities to your service catalog to ensure that data is protected by default: different tiers of service can be created to address a range of application needs.

Integrated Data Protection for your Private Cloud
Nutanix private cloud solutions integrate with Nutanix Mine, creating a complete backup, archival, and recovery solution for your private cloud. Mine unifies primary and secondary data protection, enabling cloud-like scalability and one-click simplicity to address backup needs.

Also built on Nutanix HCI, Mine is highly available and highly scalable—it arrives optimized for backup and preloaded with backup software from your supported backup vendor and can be easily deployed, managed, and scaled to meet your data protection requirements. (See the Nutanix Mine product page for an up-to-date list of backup partners.)

Convert Your Data Silos Into A Mine

Consolidate backups and manage them as part of your infrastructure

Managed in Prism

Tier for long-term archival

Simplify Data Lifecycle Management

Experience Cloud-like scalability

Insure against Ransomware

If your company has regulatory requirements to keep periodic backups for a longer period of time, Nutanix Mine can store them on S3-compatible storage, either a cloud-based offering like AWS S3 or object storage such as Nutanix Objects, When you choose Objects for long-term storage primary, backup, and archival data all remain part of the Nutanix ecosystem for simplicity. (For more information on Objects see Nutanix Private Cloud Design Guide: Storage Consolidation).

Recovery Time Objective
The time allowed to restore operations when a 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
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.

Self-Service Restore
Nutanix self-service file restore enables cloud users to recover individual files from within snapshots without an administrator.

Find Out More:
- Nutanix DP & DR solutions
- Nutanix Mine: secondary storage
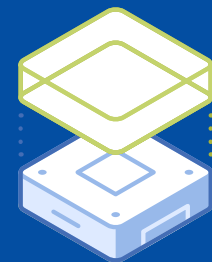
Nutanix provides efficient, convenient snapshot and replication tools to simplify data protection for private cloud

Disaster Recovery

Nutanix Leap DR offers 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, Nutanix customers are able to provide DR for a variety of applications with less complexity and cost.

- Asynchronous replication provides affordable DR options. Groups of related VMs can be replicated together and brought up on the secondary site with a single command to facilitate planned or unplanned failovers.

- Nutanix NearSync can achieve an RPO lower than asynchronous replication with very fast RTO. RPO can be as low as 20 seconds with no distance limitations.

Choose the Right Disaster Recovery Solution

Async Replication	NearSync	Metro Availability	Xi Leap
RTO: Minutes	RTO: Minutes	RTO: Zero	RTO: 15 Minutes
RPO: 1 Hour	RPO: 20 Sec.	RPO: Zero	RPO: 5 Minutes
AHV/vSphere/Hyper-V	AHV & vSphere	AHV/vSphere/Hyper-V	AHV/vSphere
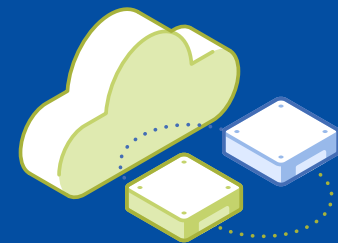
Nutanix private cloud supports async, near-sync, and sync replication plus DR-as-a-Service with recovery to the cloud

Synchronous Replication

Synchronous replication ensures continuous data availability across separate sites for applications requiring zero RPO and RTO.

One of the main complaints with traditional synchronous replication solutions is complexity. Nutanix Leap DR synchronous replication is simple to set up and manage; it can be set up bi-directionally between two sites connected over an IP-based metro area network with a round-trip latency of less than five milliseconds. You can have "live" VMs in both sites and use the opposite site as a failover target, optimizing data-center utilization.

Data is written synchronously to both sites, and you can migrate VMs non-disruptively between sites for planned maintenance events or other needs.

DR-as-a-Service with Xi Leap

Nutanix offers full DR capabilities as a managed service with Xi Leap— including replication and orchestration via runbooks—between primary and secondary sites. Deploying a dedicated recovery site and building your own DR solution is complex and Capex heavy. For some organizations, an OpEx model makes more sense.

Nutanix Xi Leap offers a fully integrated DR-to-cloud solution with simplified auto-mation, orchestration, and failover/failback testing. The solution enables you to configure protection policies in alignment with the prioritization of applications, data, and services in your private cloud environment. Xi Leap eliminates the need to purchase and maintain separate infrastructure just for DR. All costs are rolled into a DR subscription service with guaranteed SLAs.

Ensuring Continuity for End-Users

End-User Computing (EUC) is a critical element of business continuity. An important lesson from the COVID-19 pandemic was that most companies were not adequately prepared. To find out how Nutanix helps address EUC challenges, see:

- nutanix.com/euc
- Nutanix EUC Design Guide

PRIMARY SITE

Xi CLOUD

Live VMs

Inactive VMs

Xi DR

PRISM

ENTERPRISE CLOUD OS
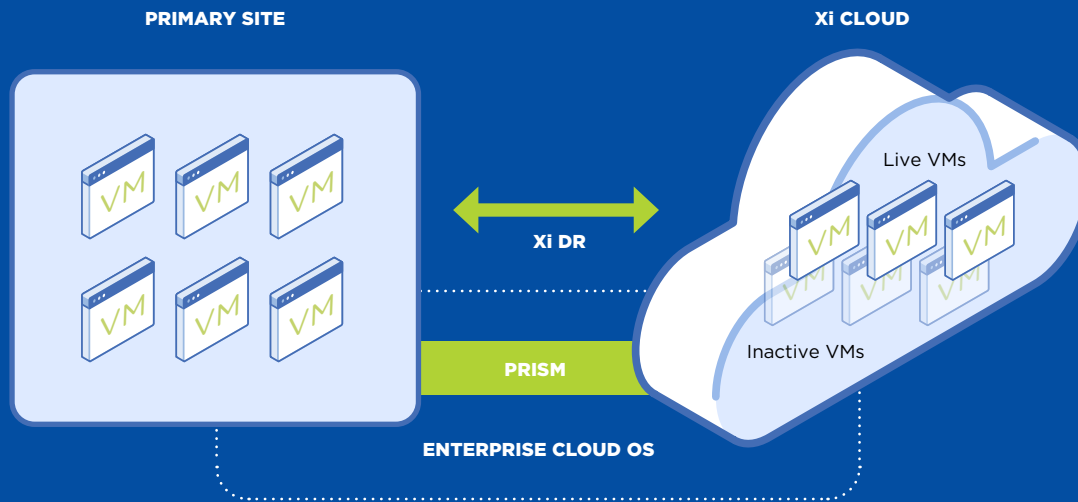
Xi Leap benefits:

- **Easy to deploy.** Xi 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.

- **Powerful recovery plans.** Automated plans for application recovery control boot sequencing of the virtual machines associated with each application.

- **IP address preservation.** Xi Leap eliminates the need for complex IP address reconfiguration by preserving network topology and workload IP addresses.

- **Instant onboarding.** Xi Leap applies VM, networking, and security configuration to the recovery site, reducing upfront setup time and streamlining failover processes.

- **Non-disruptive testing.** Routinely test DR readiness and ensure regulatory compliance.

- **Automated failover and failback.** Reliable execution of failover and failback. Partial failover for server maintenance.

- **End-to-end security.** End-to-end security using data-at-rest encryption and built-in encrypted connections between sites to secure data-in-flight.

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 VMs that you want to protect. To replicate, you specify the remote location. After a failover, snapshot replication automatically begins in the reverse direction.

Recovery Plans

Recovery plans are essentially runbooks that use stages to enforce a power-on sequence for applications. Recovery plans simplify network configuration during failover, allowing you to keep your on-prem IP network topology, and can assign public-facing IP addresses to VMs. Recovery plans are also bidirectionally utilized between paired sites. Script execution and IP mapping after failover are supported, as well.

Find Out More:
- Nutanix data protection & DR solutions
- Metro Availability Best Practices
- nutanix.com/leap
- Xi Leap: The cost of downtime (blog)
- Xi Leap (video)
- nutanix.com/objects

Planning for Business Continuity

Nutanix private cloud solutions are uniquely suited to meet your company's needs. Because Nutanix eliminates IT complexity, simplifies management, integrates data services, and improves data protection and security, it enables a private cloud to be more agile, more scalable, and, ultimately, more effective at ensuring business continuity and work effectively with public clouds. Nutanix reduces the cost of deploying and operating a private cloud, while increasing service levels.

To design DP and DR services for your private cloud, start by answering a few simple questions:

- What are the target RPOs and RTOs for the applications that will run in your private cloud?

- What level(s) of DP and DR are needed, and how will you meet those SLAs?
  - Nutanix-native capabilities
  - Third-party software integration
  - Cloud services

- If using Nutanix capabilities for DP, what will your snapshot schedule(s) and retention schedule(s) be?

- If replicating snapshots for DP or DR, what will your replication schedule(s) and retention schedule(s) be?

- Are you considering or planning on implementing a secondary solution to support data protection?

- For DR, do you intend to replicate to a secondary/DR datacenter or a public cloud?

- How will you perform DR testing?

- Will any of your applications require synchronous replication (RPO=0)?

- Are you considering incorporating DR-as-a-Service?

- Is the use of public cloud for DP and DR a valid option based on your requirements?
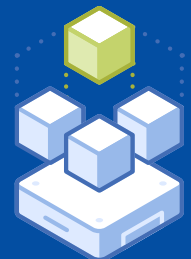
Using the information discussed in this guide, you can begin thinking about and planning a private cloud that addresses these questions. Use the links provided in each section to dig deeper into specific topics.

To learn more about how Nutanix can help you transform your private cloud visit nutanix.com/private-cloud and nutanix.com/hybridcloud. You can contact Nutanix 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.

Take a Test Drive

You can also take a test drive of Nutanix infrastructure with no hardware, setup, or cost. Experience the simplicity and agility of public cloud combined with on-premises performance, security, and control via an easy-to-follow guided tour.

Test Drive

Private Cloud Design Guides in this Series:

- Automation
- Business Continuity
- Cost Governance
- Storage Consolidation
- Security

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