



NUTANIX DESIGN GUIDE:

Hybrid and Multicloud Use Cases

Designing a hybrid or multicloud environment for the key uses cases of Business Continuity, On-Demand Elasticity, and Lift-and-Shift

Tackling Hybrid and Multicloud Use Cases with Nutanix

Implementing a hybrid or multicloud environment that operates at scale can be fraught with challenges. Large expenditures of time and money are often required for refactoring or re-platforming applications before migration can even start. Complex cloud management and uncontrolled resource consumption often lead to runaway cloud costs. Many organizations end up dissatisfied with the value gained from cloud efforts.

Building a successful hybrid cloud doesn't have to be difficult or expensive and you don't need to dive into the deep end to get started. Nutanix hybrid and multicloud solutions make it simple for your organization to get started by tackling the most important use cases. A logical progression from one use case to the next allows you to quickly establish a hybrid or multicloud presence, building on the knowledge gained to progress to the next use case.

Use Cases

This guide explores the three most popular use cases for enterprises looking to better leverage the public cloud:

- **Business Continuity.** You may have an existing disaster recovery (DR) gap, or you may be looking for a less-expensive DR solution. Get started with DR to the cloud in a matter of hours.
- **On-demand Elasticity.** Scale important workloads in the cloud to address seasonal or other temporary resource needs quickly with less overhead. Automate bursting based on triggers.
- **Lift and Shift.** Run any workload on any cloud, or across clouds, wherever makes the most sense for your business.

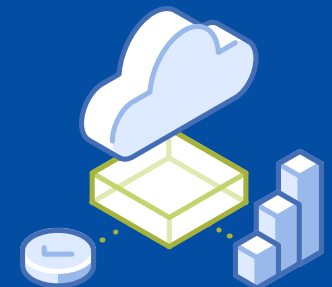


The Nutanix [Hybrid Cloud Design Guide](#) explains the essential elements of a Nutanix hybrid or multicloud environment. This design guide discusses how to plan and implement specific use cases as you build out your cloud operations, progressing from one use case to the next according to your needs. Topics covered include:

- Controlling your entire environment with Nutanix Prism
- Running any application on any cloud without re-platforming or refactoring
- Using existing cloud accounts and credits
- Nutanix licensing can follow along with your workload regardless of where it runs.

[Additional Hybrid Cloud Resources](#)

- [Nutanix Private Cloud Design Guide](#)
- [What is a Hybrid Cloud?](#)
- [Nutanix Hybrid Cloud Solutions](#)
- [Designing and Building a Hybrid Cloud \(O'Reilly eBook\)](#)
- [Hybrid and MultiCloud Management: Five strategies to increase agility and efficiency](#)



Use Case 1: **Ensuring Business Continuity**

For many enterprises, ensuring business continuity for datacenter applications with disaster recovery in the cloud is the first and most compelling hybrid cloud use case. A well-architected DR-to-the-cloud solution can satisfy geographical distancing requirements, help achieve SLAs, and simplify operations.

DR to the cloud can eliminate the need for a dedicated secondary datacenter and may reduce DR costs and complexity. If your business has a DR gap due to lack of a suitable geographically separated data center, Nutanix allows you to quickly close that gap, ensuring your business is fully protected. The Nutanix approach to DR minimizes downtime and reduces the overall impact of a disaster on your business. Predictable, automated service restoration minimizes downtime and revenue losses. The ability to host DR operations on a public cloud—or multiple public clouds—allows you to avoid extended downtime due to localized disasters.

Nutanix replaces multi-vendor, patchwork solutions with native services that are easy to implement, easy to operate, and highly cost effective. This section describes two options:

- Nutanix Clusters for DR to the public cloud
- Xi Leap for DR as a Service (DRaaS)



Nutanix Clusters as a Public Cloud DR Target

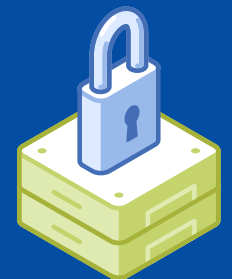
Nutanix Clusters extends the simplicity and ease of use of Nutanix hyperconverged infrastructure (HCI) software and the full Nutanix stack to public clouds like AWS and Azure, simplifying hybrid and multicloud operations. By providing the same platform across private and public clouds, Nutanix dramatically reduces the complexity of implementing cloud-based disaster recovery. You can continue to use the Nutanix capabilities you are already familiar with and simply replicate your VMs and data to the cloud while maintaining full control over your DR environment. You can use either asynchronous replication or NearSync (depending on the proximity of the cloud target to your datacenter). NearSync provides near synchronous replication and can achieve a recovery point objective (RPO) as low as 1 minute.

Xi Leap

Nutanix Xi Leap is a fully integrated cloud-based disaster recovery service that eliminates the need to purchase and maintain a separate infrastructure stack. Xi Leap is controlled by the same Prism management console as other Nutanix functions. Your recovery environment is automatically configured based on your on-site configuration and then seamlessly deployed. The intuitive onboarding process enables you to set up DR in minutes using intelligent recommendations to configure networking and bandwidth requirements. One click testing and failover ensures you can regularly test the recovery of business-critical apps.

Xi Leap provides instant planning and onboarding with 3 simple steps:

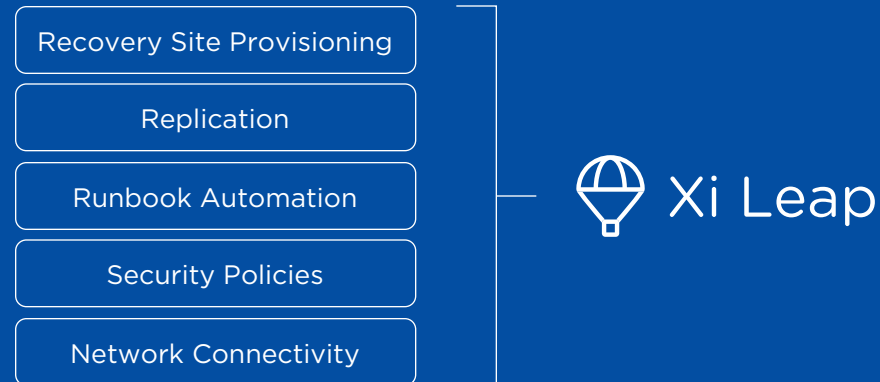
1. Create a Xi Leap account
2. Setup protection policie
3. Create automated plans for recovery including runbook automation and DR testing



Xi Leap provides DR orchestration for reliable execution of failover and failback processes. In addition, it enables partial failover of applications for server maintenance or during rack failures. Network connectivity and common management are preserved, allowing you to manage the source and target sites as a single environment. Runbook automation gives you more flexibility and control over the end-to-end recovery process, with granular control to focus DR resources on targeted applications.

Additional benefits of Xi Leap include:

- Ease of deployment
- Simple replication policies
- Powerful recovery plans
- IP address preservation
- Instant on-boarding
- Non-disruptive testing
- Automated failover and failback
- End-to-end security



Additional Disaster Recovery Resources

- [Nutanix BCDR eBook](#)
- [Nutanix Xi Leap Solution Brief](#)
- [Nutanix Clusters Solution Brief](#)
- [Business Continuity Solution Brief](#)



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 without having to purchase and maintain separate infrastructure.

Key benefits include:

- One-click DR maximizes availability of critical data and applications
- Quick and easy 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

[Read Full Story](#)



Use Case 2: **On-Demand Elasticity**

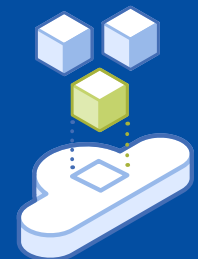
Most IT teams would also like to use the cloud as an extension of their datacenters to support seasonal loads or other periods of increased resource demand. However, bursting to the cloud may come with some significant challenges such as:

- The need for multiple infrastructure management tools
- Time consuming, complex, networking set up and management
- Inability to move applications as is to the cloud

Nutanix addresses these challenges with a consolidated software platform spanning private and public clouds, making hybrid and multicloud environments simple to deploy, use, and adapt. Nutanix Clusters lets you size your datacenter for normal loads and use public cloud on demand to take up the slack. Scale up by bursting workloads to the cloud and scale back down by terminating or repatriating cloud workloads.

Because the Nutanix Clusters environment is identical to Nutanix HCI running in your datacenter, you can move applications—or add application components—and be certain that everything will work without complicated reconfiguration or re-platforming. Nutanix Clusters provides the necessary networking integration, creating a native extension between your datacenters and public cloud accounts.

If you're using DR to Nutanix Clusters on a public cloud (as described in the previous section) your DR environment provides a convenient foundation for bursting to the cloud since necessary data and VMs are already replicated, and some resources are already available—assuming there's no active failover in progress. For instance, your DR environment can form the foundation of ready to use environment for dev/test without standing up additional resources, gaining maximum utilization from your cloud investments.



Additional benefits include:

- Automate on-demand scaling to the cloud with automation playbooks
- Hibernate cloud environments when they are no longer needed and easily restore them next time

Automation Playbooks

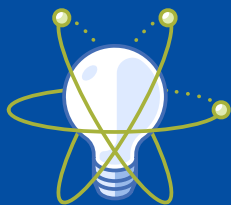
Automation playbooks allow you to automate almost any manual IT task, including scaling infrastructure to meet changing demands. Playbooks are built into Nutanix Prism Pro, providing “codeless” automation. Administrators can set triggers for system-generated alerts, define subsequent actions, and save or enable the “routine” for automated operation.

Unlike other automation solutions that can be complex and hard to learn, Nutanix automation playbooks are simple by design. Anyone familiar with infrastructure operations should be able to create a playbook within a matter of minutes.

X-Play provides a simple-to-use automation engine for administrators managing Nutanix and non-Nutanix infrastructure. As X-Play runs through a Playbook, it initiates a sequence of actions that can be tracked through a corresponding Play.

Six triggers are currently available: alert-based, manual, time-based, alerts matching multiple criteria, event-based, and webhook triggers. There are 27 out-of-box actions provided that can be customized according to your needs and integrated with third-party tools.

For example, you can configure an automation to expand on demand to a preexisting AWS account by creating an automation with just three simple steps:



Set the trigger(s)

Example: Datacenter CPU utilization reaches 80%



Define the action(s) to take

Example: Provision an additional node in your DR cluster on AWS to support overflow workloads



Enable the automation

Once enabled, Prism will execute the specified action(s) anytime the triggering thresholds are met

Hibernation

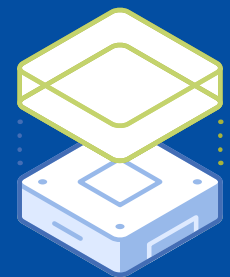
Some cloud workloads may be used only periodically or during peak periods. While it is expensive to leave infrastructure idle in a cloud environment, it can also take significant effort to reconfigure an environment from scratch every time. The Nutanix Clusters hibernation capability allows you to hibernate workloads when they aren't needed and restore them when they are. This can significantly reduce your monthly cloud costs.

With the one-click hibernate and resume feature, you only pay for resources while they are in use. The hibernation feature sends VMs and data to cost-efficient object storage, uninstalls the Nutanix software, and stops the bare metal compute instances to stop incurring costs.

When you are ready to use your cluster again, you can bring it back from hibernation fully configured with just one-click. It's important to bear in mind that, because all data must be copied from object storage and associated instances deployed and re-configured, the process of resuming is not instantaneous. Therefore, hibernation may work best for situations where you have the ability to foresee the need for specific cloud workloads in advance.

Additional Disaster Recovery Resources

- [Nutanix Clusters](#) (blog)
- [X-Play](#) (blog)
- [Automation Playbooks](#) (blog)
- [Nutanix Clusters-Hibernate](#) (video)



Insurance Company Reaps Benefits of Nutanix Clusters for DR and More

Penn National Insurance sells a diverse array of property-casualty insurance solutions, including business insurance, personal auto, homeowners, and umbrella policies. Before Nutanix, the company had been struggling to support its VDI environment and important database workloads with legacy infrastructure and was unable to take effective advantage of public cloud.

“We asked several of our colleagues in the insurance industry what infrastructure they would recommend for our VDI environment, and they all suggested we look at Nutanix,” said Dan Morrison, Director of Infrastructure and Operations at Penn National. “When we found out that Nutanix was also building Clusters on Amazon Web Services (AWS), we knew it would be a perfect fit for us from an HCI standpoint—choosing Nutanix for both our on-prem and cloud workloads was a no-brainer for us.”

Moving to a hybrid cloud with Nutanix Clusters enabled the company to take advantage of AWS for DR and other needs, with benefits that included:

- Unified management across environments
- VDI upgrades in hours vs months
- Improved network security with Nutanix Flow
- Simplified hybrid cloud database management with Nutanix Era
- Reduced CapEx and OpEx
- Financial accountability and governance with Xi Beam



“We completed all of the testing for the AWS deployment in one day,” reported Craig Wiley, Senior Infrastructure Systems Architect. “Once we were convinced everything was working properly, we linked up our on-prem data protection cluster with our rapid recovery Nutanix Clusters on AWS. In less than two hours, the desktops were on AWS, we turned them on, they came up, we reconfigured Citrix to connect to the desktops in the cloud, and our employees were immediately able to log into their virtual desktops off-network. The Nutanix Clusters were very easy to deploy, even on bare metal, and being able to use our existing VPNs and subnets made it simple to use and more secure.”

“The Covid pandemic has been a great illustrator of how beneficial choosing the right technology is,” added Morrison. “We were fortunate that we had just executed our business continuity plan right before the pandemic hit. We were able to easily transition to a 100% work-from-home environment in just one day since we were already running our virtual desktops on Nutanix.”

[Read the full story](#)



Use Case 3: **Lift and Shift**

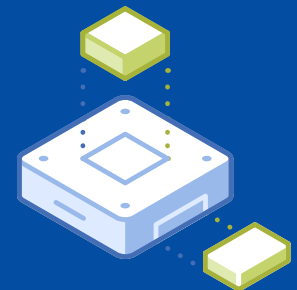
There are a variety of reasons you may want to “lift and shift” applications between your datacenters and the public cloud. You may be looking to free up resources in an overcrowded datacenter or take advantage of cloud services. The cloud is also often the best way to move services “closer” to users in different geographic regions.

Move Any Application to the Cloud

Until now, app migration has been complicated and risky. Migration to a public cloud requires specialized knowledge, skillsets, and unique tools for each cloud. Many applications have to be re-platformed or re-architected to run efficiently on a public cloud—a time-consuming, costly process. As a result, such applications can’t really be lifted and shifted at all.

Because Nutanix Clusters runs the same Nutanix software stack as on-premises datacenters, you can move applications to the cloud of your choice with no changes. Nutanix Clusters makes lift and shift a reality providing:

- Flexibility to run in any cloud
- Easy, automated migrations
- Comprehensive cost governance



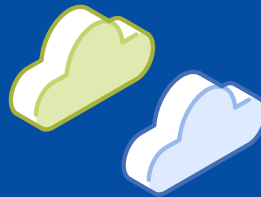
Flexibility

Nutanix Clusters provides built-in integration with public cloud networking and creates a seamless extension between your private cloud and public cloud that dramatically simplifies app migration. This lets you migrate VMs and applications between your private and public cloud without complex networking changes.

For example, workloads running on a Nutanix Cluster on AWS get direct access to all AWS services without needing any network overlay layer because of built-in networking integration. User VMs running on Nutanix live in the native IP address space of AWS and are therefore able to directly access all AWS services like any other AWS-native VM.



Operational Simplicity
Single infrastructure
management plane across
all clouds



Seamless App Mobility
App migration across
clouds with no code
changes needed



Cost Efficiency
License portability and
cost optimization features
maximize investment

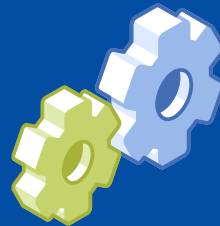
Nutanix licenses also move with your applications, allowing you to effectively utilize your business investments in any location. This gives you the freedom to choose the best cloud for each application without the risk of being locked into a single vendor. A single, unified management console allows you to manage infrastructure on-premises and across multiple zones and multiple clouds with far less complexity. You maintain visibility and control of your entire hybrid or multicloud environment through a single console.

Automated Migrations

Nutanix Move automates lift and shift VM migrations and adjusts configurations for optimal VM performance, saving time and money. Move simplifies lift and shift with infrastructure-level single and bulk VM migrations, removing the difficulty of onboarding new infrastructure, and enabling you to quickly leverage the full potential of hybrid and multicloud, with near-zero VM or application service outage during migrations.



One-Click Migrations
Easily move from ESX,
Hyper-V* and AWS*



Simplify Operations
Eliminate manual and
error-prone repetitive tasks



Minimize Downtime
Near-zero service outage,
with full cutover control

Cross-Platform Migrations

While Move is great for migrating VMs and data between Nutanix environments, it also supports migration of VMs from other environments including ESXi (running on Nutanix or non-Nutanix infrastructure), Hyper-V, and AWS. As a result, Nutanix Move provides an easy way to migrate workloads on other platforms into your Nutanix environment in order to get the full benefits of Nutanix described in this design Guide. This includes migrating VMs running in AWS to a Nutanix cluster running in your datacenter—effectively repatriating them and bringing them under Nutanix control.

How Move Works

Using Move is a simple process. Move runs as a VM in the target Nutanix cluster.

With Move running, you:

- Register the source (ESXi, Hyper-V, or AWS) and target clusters (on-prem or Nutanix Clusters in the cloud)
- Create a migration plan

Migration plans allow you to group multiple VMs into a single plan and migrate them in batches. Plans can be scheduled to run immediately or at a set time. Move checks to ensure that the target environment has enough compute and storage resources to support the VMs in the plan. You can also specify network mappings to match the source and destination networks for the VMs. The migration process creates snapshots for each VM, then replicates the virtual disks from the source VMs to the chosen AHV container.

Move stores the files for migrating VMs in a temporary folder and uses changed-block tracking (CBT) APIs and additional snapshots to keep files up to date. When it is time to cut over and complete the migration, Move powers off the source VMs and disconnects the networks. Incremental data then synchronizes to the Nutanix cluster. Once data replication is complete, Move uses the AHV image service to convert the files to the native format used by AHV as necessary.

Cost Governance

Hybrid and multicloud environments compound the complexity of cost governance. There is a need for cost governance tools that centralize visibility across all clouds and apply policies to keep overall IT spending within budget. Public clouds come with an itemized monthly bill but given the ease of grabbing new resources—and creating entirely new deployments—it can be difficult to track and control consumption and optimize purchasing.

Nutanix gives cloud operators complete visibility into hybrid cloud costs. [Xi Beam](#) provides a unified solution for cost governance of on-premises and public cloud workloads. Machine intelligence continuously assesses cloud usage and provides recommendations. Beam's built-in Total Cost of Ownership (TCO) model calculates all direct and indirect costs for on-premises IT infrastructure, providing immediate visibility into the true cost of VMs and workloads in your Nutanix private cloud. Beam also imports data from public clouds including AWS, Azure, and Google Cloud. Cost centers are inherently multicloud, allowing you to see private cloud and public cloud costs in the same view with high granularity. By accurately identifying resource consumption for each cost center you define, Beam helps you more accurately track spending across your operations while delivering 35% or more in public cloud cost savings.

Beam gives you the ability to automate resource cost allocation to cost centers spanning public and private clouds and create cloud consumption reports. With Beam you can automatically detect anomalous spending patterns and take proactive cost control actions, create automation policies to eliminate unused resources, and right-size underutilized resources, to ensure optimal consumption.



Visibility

Unified visibility into public and private cloud spending to simplify cost governance and multi-cloud management



Optimization

Drive deep cloud savings with automated scheduling tasks, right-sizing cloud resources and intelligent RI purchases



Control

Easily allocate resource costs according to business consumption and drive governance with multi-cloud chargeback

Additional Lift and Shift Resources

- [Nutanix Lift and Shift Solution Brief](#)
- [Nutanix Move](#)
- [Xi Beam](#)
- [Nutanix Beam – Multi-Cloud Governance](#) (blog)

Getting Started with Nutanix

Adopting the Nutanix hybrid and multicloud use cases in the order presented in this design guide is a smart way to begin your hybrid cloud implementation. Because Nutanix provides the tools to run your workloads on any cloud with no application rearchitecting from a single control plane, it enables your cloud to be more agile, more scalable, and—ultimately—more efficient and cost effective. Nutanix reduces the cost of deploying and operating a hybrid or multicloud, while increasing the productivity of your IT team.

To begin designing your hybrid or multicloud environment, you can start by answering a few simple questions:

What are your biggest organizational pain points?

- Infrastructure control
- Complex hybrid/multicloud operations
- Lack of DR for important apps/DR cost
- Inability to utilize public cloud resources effectively on an as-needed basis?
- Shortage of datacenter space
- Cost optimization and cloud spending

Do your cloud services suffer from:

- Operational silos?
- Complex life cycle management?
- Lack of application portability?
- Security vulnerabilities?
- Inadequate cost governance?

Using the information discussed in this guide, you can begin thinking about and planning a hybrid cloud that meets your needs for cost-effective DR to the cloud and on-demand elasticity while making it possible to lift and shift applications to the public cloud without re-platforming. Use the links provided in each section to dig deeper into specific topics.

To learn more about how Nutanix can help you transform your hybrid cloud visit nutanix.com/hybrid. You can contact Nutanix 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.