December 2023 | Guide

VMware to Nutanix Migration Guide

NUTANIX

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Introduction

For businesses that rely on VMware for virtualization technologies—including VMware Cloud Foundation, vSphere, vSAN, and VMC—Nutanix offers a better alternative with one platform to run apps and manage data across multiple endpoints. Our cloud platform provides flexibility and choice, without vendor lock-in, and supports existing VMware environments with unified management.

Nutanix offers VMware customers a range of migration strategies, whether they want to shift existing VMware operations to vSphere running on the Nutanix Cloud Platform, or to migrate all workloads from VMware technologies to equivalent Nutanix technologies.

Who This Guide is For

This guide is intended to acquaint technical decision makers with Nutanix technology so that they can better understand the migration options hat are available from VMware to Nutanix and make more informed planning decisions.

Section 2 introduces the Nutanix Cloud Platform and its various components, illustrates how Nutanix solutions map to various VMware products, and discusses migration paths.

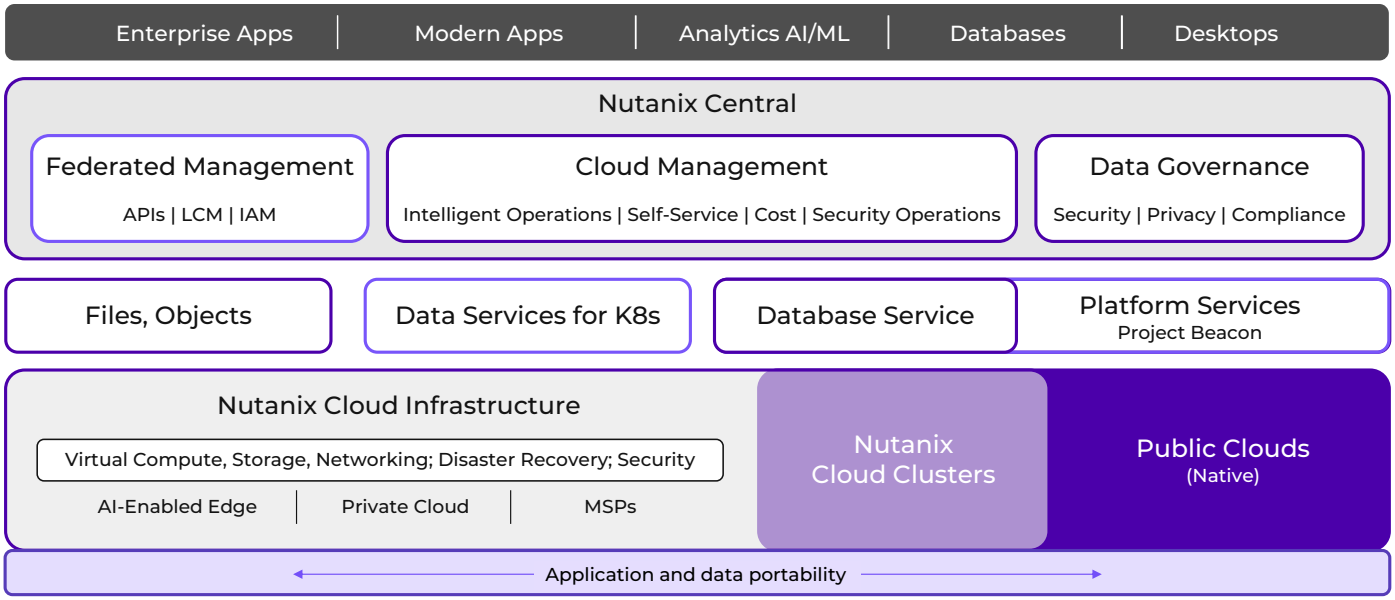
Sections 3 through 7 discuss migration considerations for the main components of the Nutanix Cloud Platform introduced in Section 2: Nutanix Cloud Infrastructure, Nutanix Cloud Clusters, Nutanix Cloud Manager, Nutanix Unified Storage, and Nutanix Move.

Section 8 discusses other aspects of VMware to Nutanix migration including available tools to assist with planning and migration as well as Nutanix services. It also introduces Nutanix technology partners and GSI partners that can help with migration needs.

While this guide is not intended to be a “how-to” guide, wherever possible it includes links to more in-depth resources to aid with in-depth migration planning and execution.

Section 2: Planning Your Migration to Nutanix

Nutanix Cloud Platform offers simplicity and scalability, allowing you to operate critical virtualized and containerized workloads more easily and more successfully across on-premises, public cloud, edge, and service provider environments.



Before you can plan an effective migration strategy, it's essential to understand the major elements that make up the Nutanix Cloud Platform and how those capabilities map to the VMware products you are already familiar with.

When it comes to migrating from VMware to Nutanix, there are four elements of the Nutanix Cloud Platform you should know about:

- **Nutanix Cloud Infrastructure (NCI).** A distributed infrastructure platform combining compute, storage, and networking resources into a single logical pool with integrated resiliency, security, performance, and simplified administration. NCI lets you efficiently deploy and manage data and applications across datacenter, edge, and cloud environments

  NCI provides the infrastructure foundation for all VMware migrations—whether you intend to continue running VMware vSphere or switch to Nutanix AHV, our native hypervisor.

- **Nutanix Cloud Clusters (NC2).** An important component of NCI, NC2 brings the full functionality of Nutanix Cloud Platform to AWS and Azure, dramatically reducing the operational complexity associated with migrating, extending, or bursting your applications and data between on-premises and cloud environments. NC2 simplifies hybrid multicloud deployments by providing the same Nutanix software capabilities and tools everywhere.

NC2 enables migration of existing VMware cloud workloads as well as the migration of on-premises VMware workloads to Nutanix environments running in the public cloud.

- **Nutanix Cloud Manager (NCM).** A unified solution for intelligent operations, self-service and orchestration, security compliance and visibility, and cost control. Build and manage multicloud deployments simply and quickly by automating routine operational tasks and leveraging tools for orchestration and security compliance.

  NCM integrates with the Nutanix Prism management interface, providing advanced management functions that simplify building and managing hybrid multicloud environments and delivering faster time to value. NCM capabilities take the place of the VMware Aria (formerly VMware vRealize) suite.

- **Nutanix Unified Storage (NUS).** Software-defined storage that consolidates seamless access and management of block, file, and object data in a single platform. Nutanix Unified Storage is designed to address the scale, performance, and integrated data security requirements of modern applications with easy access to structured and unstructured data, consistent high performance, seamless scale, and security against ransomware attacks.

  Nutanix Cloud Platform addresses the storage needs of VMs using the built-in capabilities of AOS storage. NUS enables a Nutanix cluster to flexibly provide additional file, object, and block services, eliminating the need for separate storage systems with siloed management. For vSAN customers, Nutanix Files Storage provides a superior replacement for vSAN File Service.

Each of these elements is discussed in more detail in later sections.

The Nutanix Cloud Platform also includes optional support for the Nutanix Database Service and End User Computing (including VMware Horizon). These capabilities are not discussed further in this guide.

Mapping VMware Products to Nutanix

The following table should help you map from the VMware products you currently use to the corresponding functionality in the Nutanix ecosystem. Note that in most cases, the corresponding Nutanix functionality is not licensed separately, simplifying procurement.

VMware Product	Nutanix Product	Notes & Considerations
VMware Cloud Foundation	Nutanix Cloud Platform	Nutanix Cloud Platform supports hybrid and multicloud deployments utilizing NCI and NC2
vSphere	Nutanix AHV	You can continue to run vSphere in all on-premises deployments. AHV, the native Nutanix hypervisor, is included as part of a Nutanix subscription and is the only supported hypervisor for NC2 deployments
vSAN	AOS Storage	AOS Storage functionality is included as part of NCI and NC2. It does not have to be licensed separately
NSX	Flow Virtual Networking	FVN is included with NCI Pro and NCI Ultimate licensing
VMware Cloud on AWS	Nutanix Cloud Clusters on AWS	NC^2 utilizes NCI licenses which can be flexibly moved between on-prem and cloud locations without requiring re-licensing
Azure VMware Cloud	Nutanix Cloud Clusters on Azure	
vCenter	Nutanix Prism Central	Nutanix Prism provides infrastructure and virtualization management for Nutanix. It is included with NCI and NC2
VMware Aria Suite	Nutanix Cloud Manager	Depending on licensing level, NCM encompasses the capabilities of the VMware Aria Suite (vRealize Suite), and CloudHealth
VMware Aria Operations	NCM Intelligent Operations	Included with all NCM licenses
VMware Aria Automation	NCM Self-Service	Included with NCM Pro and Ultimate licenses
VMware Aria Cost powered by CloudHealth	NCM Cost Governance	
VMware Aria Operations for Networks	Nutanix Security Central	Included with NCM Ultimate license, NCI Pro license with security add-on, and NCI Ultimate license

Nutanix Software Licensing

Nutanix uses a simple subscription-based software licensing model. Recognizing that complex licensing and high licensing costs can be significant pain points for VMware customers. Nutanix makes every effort to keep both our product structure and licensing simple and flexible.

Licensing is discussed further in the following sections. You can also find licensing details on the Nutanix Cloud Platform Software Options page.

Migration Pathways

This guide addresses the following migration pathways:

On-Premises Migration Pathways

- From VMware software running on traditional three-tier infrastructure (separate servers, storage, and networking) to Nutanix
- From a VMware vSAN environment to Nutanix
- From another HCI environment running VMware (Cisco, HPE) to Nutanix
- If you are considering one of these migration paths, familiarize yourself with the following sections:

  Section 3: Migrating to NCI

  Section 5: Migrating to NCM

  Section 6: Migrating to NUS (especially if you're using vSAN File Service or operating an EUC environment)

  Section 7: Migrating from VMware to Nutanix with Move

Cloud Migration Pathways

- From VMware Cloud on AWS to Nutanix Cloud Clusters
- From Azure VMware Cloud to Nutanix Cloud Clusters
- From VMware on-prem to Nutanix Cloud Clusters
- If you are considering one of these migration paths, review the following sections:

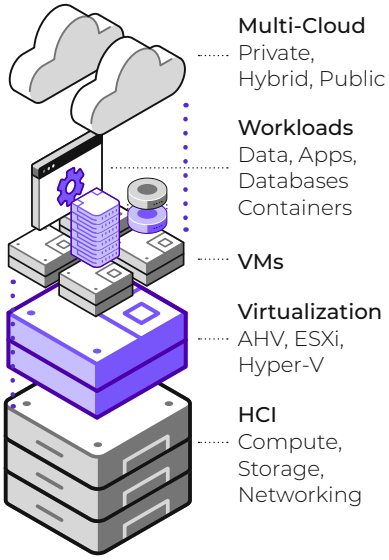
  Section 4: Migrating to NC2

  Section 5: Migrating to NCM

  Section 7: Migrating from VMware to Nutanix with Move

Section 3: Migrating from VMware to Nutanix Cloud Infrastructure

Many customers considering a migration from VMware to Nutanix primarily need to satisfy on-premises virtualized and containerized infrastructure needs. With its flexible infrastructure options, simplified management, and compact footprint, Nutanix Cloud Infrastructure offers the perfect solution to address datacenter, private cloud, remote office, and edge computing requirements. NCI runs on hardware from multiple vendors, eliminating lock-in, and is also supported by leading service providers such as Equinix, OVHCloud, and Cyxtera.



NCI Overview

Nutanix Cloud Infrastructure provides a complete software stack. Nutanix has developed and refined an efficient hyperconverged infrastructure (HCI) design that includes compute, storage, and networking. NCI features built-in resilience, self-healing, and security along with enterprise data services, data protection and disaster recovery, native virtualization, and container management.

The primary design goal of NCI is to dramatically reduce operational complexity. Our powerful, secure, virtualized environment is suitable for any workload. With Nutanix, you can deploy just the infrastructure you need to get started and scale easily as your needs grow, avoiding upfront over-provisioning.

In the context of a VMware migration, you can start with a small proof of concept (POC) or pilot project and grow to encompass more workloads as you build confidence—and your team gains operational experience.

Benefits of Migrating to NCI

The Nutanix HCI architecture that underpins NCI offers significant benefits for existing VMware customers:

- **Hypervisor choice**. Continue to run ESXi or use Nutanix Move to migrate to AHV to reduce risk and cost.
- **Dynamically distributed storage.** Nutanix AOS storage automates provisioning, scaling, and self-healing with lower cost and improved failure tolerance vs a static cache drive or RAID.
- **Automated app-aware data management.** Nutanix uses data locality and tuning to deliver higher resiliency, app-centric optimization, and more consistent read performance.
- **Granular and efficient snapshots.** Integrated per-VM snapshots speed clone creation and restore times.

- **Enterprise-grade DR.** DR is implemented at the storage layer for optimized performance and efficiency, with per-VM DR policies that range from relaxed RPOs for less critical workloads to synchronous clustering across metro distances to address the most rigorous uptime requirements.
- **License portability from on-premises to cloud.** Easily move licenses between environments and fine-tune deployments as requirements change.
- **VM-level storage policies.** NCI storage policies include encryption, data protection, compression, and quality-of-service (QoS).

A recent blog series describes these and several additional Nutanix benefits in depth.

NCI Hardware Platforms

Nutanix software is designed to operate on a variety of hardware platforms, ensuring that you aren't locked into a single hardware vendor, and that you can continue your relationship with a preferred vendor. A broad variety of compute, GPU, and storage options are available to address diverse infrastructure needs. Storage options include hybrid (HDD + SSD), all-flash, and all-NVMe. Nodes with a variety of storage configurations can be mixed within clusters, providing greater flexibility and risk reduction.

Supported platforms:

- Nutanix NX Appliances
- Nutanix OEM Platforms including:
  - Dell
  - HPE
  - Lenovo
  - Fujitsu
  - Supermicro
- Third-Party Server Vendors including:
  - Cisco
  - Hitachi
  - NEC

For more details, visit the Nutanix Hardware Platforms page. To see details of the available platforms, visit our Hardware Platform Spec Sheets page.

NCI Licensing

NCI software is licensed in three editions: Starter, Pro, and Ultimate. Functionality is organized into seven areas:

Enterprise Data Services	Starter is limited to clusters with a maximum of 12 nodes and has limited resiliency and data reduction features relative to Pro and Ultimate.
Consolidated Storage Services	All editions include up to 1 TiB of file/object storage capacity. (Additional file/object capacity requires a NUS license.) Pro and Ultimate enable IP-SAN functionality with external access to Volume Groups.
Data Protection and DR	Starter includes Snapshots and Async Replication. Pro and Ultimate add multi-site DR, sync and NearSync replication*, and Runbook Automation.*
Security	Pro and Ultimate support data-at-rest encryption with native key management and out-of-the-box platform hardening.*
Enterprise Compute	All editions include AHV support and use of Nutanix Kubernetes Engine (NKE). Pro and Ultimate add vGPU and vGPU Passthrough, HA Guaranteed Failover, and Cross-Cluster Live Migration*.
Networking and Network Security	Pro and Ultimate support software-defined networking leveraging overlay networks and VPCs with Flow Virtual Networking, workload microsegmentation*, and Nutanix Security Central* which unifies application security operations by providing automated incident response, intelligent analysis, and regulatory compliance.
Management and Analytics	All editions include cluster and multi-cluster management, monitoring, authentication, REST APIs and other basic management functionality.

*Pro edition requires an add-on license for this functionality.

NCI can also be purchased together with Nutanix Cloud Manager in three bundles. (See Section 5 for details of NCM licensing)

NCP Starter	NCP Pro	NCP Ultimate
Combines: NCI Pro + NCM Pro	Combines: NCI Ultimate + NCM Pro	Combines: NCI Ultimate + NCM Ultimate

NCI Migration Considerations

NCI offers a very compelling stack that includes a lot of functionality that is licensed separately by VMware, simplifying procurement and deployment while reducing costs. For example, software-defined networking is included with NCI Pro and Ultimate editions versus NSX which is an expensive add-on for VMware. Large enterprises, including the Global 2000, increasingly ask for software-defined networking capabilities across clouds.

For VMware customers using or considering vSAN, NCI benefits from a single, optimized and flexible storage architecture. vSAN 8 introduced Express Storage Architecture or ESA to use the latest fast storage devices more efficiently, but lacks many features of the Original Storage Architecture (OSA). As a result, customers moving to vSAN 8 are forced to choose between OSA and ESA, often on a workload-by-workload basis.

All NCI editions include Kubernetes support, and Nutanix also has a partnership with Red Hat to offer OpenShift on Nutanix. Containers run well in the Nutanix environment and their unique storage needs are well supported by Nutanix Unified Storage (See Section 6). Once you've completed your migration to NCI, Nutanix APIs simplify automation for teams that have been struggling to automate.

Migration Paths

There are two common migration paths for VMware customers moving to NCI:

- VMware on three-tier infrastructure to NCI
- VMware with vSAN to NCI

From a planning and execution standpoint, there isn't much difference between these two migration paths. If you're using vSAN File Services (no longer supported in vSAN 8), you may want to read section 6 on Nutanix Unified Storage.

Infrastructure Sizing

Sizing is a big challenge in any infrastructure migration. Nutanix provides the Nutanix Sizer Configuration Estimator and Nutanix Collector to simplify sizing for migrations and deployments of all types. These tools take the pain out of properly sizing your migration for all supported NCI hardware platforms as well as cloud. These tools are described in more detail in Section 8. Both Nutanix customers and Nutanix employees rely on and trust Sizer to deliver good results while minimizing the effort needed.

For more high-level guidance on choosing and sizing infrastructure, read the following blogs:

Dynamically Distributed Storage

Seamless Cluster Management for Performance and Capacity

Executing a Migration

If you're migrating to NCI but continuing to run ESXi, you may be able to use familiar VMware tools such as Storage vMotion and vMotion. You can also use Nutanix Move, which is capable of migrating non-Nutanix ESXi environments to ESXi running on Nutanix. If you're migrating from ESXi to Nutanix AHV, you will likely want to use Nutanix Move, which provides cross-hypervisor mobility. Move does much of the heavy lifting for you, taking the pain out of migration. See Section 7 for more information on Move.

For those who prefer to have assistance with critical migrations, Nutanix professional services can help with any and all aspects of your migration. Many Nutanix channel partners are also capable of providing assistance, and Nutanix also partners with leading system integrators and service providers. (For more details on Nutanix services and partnerships, see Section 8.)

Practical Considerations

While the right software tools can greatly simplify migration, there's no replacement for upfront planning and careful thinking about your objectives. Before you undertake migration to NCI—or any migration—it's important to consider your needs and vet anything that could present a problem:

- Which enterprise features do you need? This will determine which licensing level(s) you purchase.
- What are your specific storage and application requirements?
  - How much data will you need to migrate? It's important to properly account for the time data migration will require.
- If you're migrating to AHV, ensure that you can address any unique application requirements.
  - Which applications will you move directly to AHV, and which (if any) will you keep on ESXi?

NCI References

- Why VMware runs Better with Nutanix HCI
- Tech Note 2038: Nutanix AHV Virtualization
- Tech Note 2072: Migrating VMs to Nutanix AHV
- Nutanix Bible: Book of AHV
- Nutanix Bible: Book of vSphere

Section 4: Migrating from VMware to Nutanix Cloud Clusters

As business has become increasingly dependent on digital technology, traditional datacenter operations have expanded to encompass hybrid and multicloud deployments. While operating multiple cloud environments can be an essential element of business success, it comes at the cost of greater complexity for IT teams.

Many organizations now employ a cloud first strategy, but their efforts are being stymied by the limitations of tee-shirt sizing offered by cloud vendors. Nutanix Cloud Clusters is designed to overcome the challenges of hybrid multicloud operations, facilitating your cloud first efforts.

NC2 Overview

Nutanix Cloud Clusters (NC2) is a software-defined hybrid multicloud platform that natively integrates private and public clouds. It provides a consistent cloud management experience with seamless application migration and license portability across all NCI environments. This enables you to run the full Nutanix software stack anywhere, simplifying your operations.

NC2 enables the same applications to run in private and public clouds without expensive refactoring. Your team can operate everything as a single distributed cloud environment and seamlessly manage and migrate VMs, containers, and applications, delivering freedom from cloud lock-in.

NC2 delivers the same capabilities as NCI running on-premises by utilizing bare metal instances in the public cloud. Everything you learned about NCI in the previous section also applies to NC2, with the exception that NC2 environments can only run the AHV hypervisor.

NC2 can share the same Nutanix licenses as on-premises NCI environments, giving you the flexibility to address cloud requirements without repurchasing licenses.

NC2 Hibernation

While it is expensive to leave infrastructure idle or under-utilized in the public cloud, it can also take significant effort to rebuild an environment from scratch every time. NC2 features an innovative hibernation capability, allowing for workload hibernation and restoration, significantly reducing monthly cloud costs for seasonal or ad-hoc application usage. Hibernation moves all cluster VMs and configuration data to more cost-efficient object storage, uninstalls the Nutanix software, and stops bare metal compute instances. These steps are reversed during the restore process.

Full Control Over Infrastructure

NC2 ensures you retain full control over your Nutanix infrastructure running in the cloud, unlike VMware cloud solutions.

> We completed all of the testing for the AWS deployment in one day.
>
> Once we were convinced everything was working properly, we linked up our on-prem data protection cluster with our rapid recovery Nutanix Cloud 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 Cloud 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.
>
> Craig Wiley
> Senior Infrastructure Systems Architect, Penn National Insurance

Use Cases

The most popular use cases for NC2 include:

Disaster Recovery

- Eliminate the need for a dedicated secondary datacenter
- Utilize the same platform across private and public clouds
- Replicate VMs and data to the cloud—with full control over your DR environment

Lift and Shift/Cloud First

- Operational simplicity with a single management plane across clouds
- Migrate applications across clouds with no code changes
- Eliminate error-prone manual tasks with easy-to-use automation

Burst to Cloud

- Scale to the cloud to address seasonal/temporary resource needs
- Automate on-demand scaling with automation playbooks
- Hibernate cloud environments (such as dev/test) when not needed and easily restore them later

VDI

- Host virtual desktops in the cloud to improve service for remote workers
- Provide low cost DR for on-prem VDI deployments
- Facilitate using the same gold image across all sites

Benefits of Migrating to NC2

When we ask Nutanix customers what differentiates NC2, the benefits that come up most often are:

- **License mobility.** Move licenses between datacenters and public clouds to address changing operational needs without having to re-license.
- **Time to value.** Get infrastructure set up, migrate workloads, and be up and running quickly.
- **Accurate sizing.** NC2 environments are simple to size properly, ensuring you aren't paying for underutilized cloud instances.
- **Resiliency.** The resiliency built into Nutanix AOS, including our HA features, are well suited to the public cloud.
- **Full control.** Because NC2 is not a managed service, you retain greater controlover critical infrastructure. For example, upgrades and patches take placewhen you choose, you're not subject to a service provider's timetable.

For those that prefer a more managed service or want to work with a service provider, several Nutanix partners offer services based on Nutanix Cloud Platform.

Seamless App Mobility

Unified Infrastructure Management

Lower Operational Costs

NC2 Cloud Platforms

NC2 is currently offered in the following versions:

- NC2 on AWS
- NC2 on Azure

NC2 Licensing

NC2 utilizes the same licensing as NCI as described in the previous section. Licenses can be moved between on-prem and cloud locations according to your needs, simplifying planning.

NC2 Migration Considerations

While there are VMware customers who are migrating from VMC or AVS to NC2, the typical customer migrates from an on-prem VMware environment, often as the result of a Cloud First strategy. Some customers utilize NC2 to provide DR for an existing VMware environment. NC2 is a low-overhead option for DR because there's no heavyweight management layer that requires extra VMs and increases costs.

Migrating from VMware to NC2 is very similar to migrating from VMware to NCI. As with NCI, Nutanix Sizer can appropriately size your NC2 environment for both AWS and Azure. Nutanix Move can be used to move VMs to NC2 with minimal disruption. (See the Move section.)

For NC2, the use of microsegmentation (available with NCI Pro and NCI Ultimate licenses) is highly recommended to control east-west traffic and increase security.

NC2 References

- NC2 on AWS: Deployment and User Guide
- NC2 on Azure: Deployment and User Guide

Section 5: Migrating from VMware to Nutanix Cloud Manager (NCM)

As the demands on IT teams continue to grow—exacerbated by the difficulty hiring experienced IT experts—identifying the best management tools has become critical to success. Our goal with Nutanix Cloud Manager is to deliver the functionality you need, while making it simpler to manage hybrid multicloud environments and simpler to license exactly what you need.

NCM helps your organization build and manage multicloud deployments more easily by automating routine tasks and providing tools for orchestration and security compliance.

For organizations migrating from VMware to Nutanix, NCM takes the place of the VMware Aria Suite (formerly the VMware vRealize Suite). NCM replaces the sometimes frustrating complexity of VMware Aria with a powerful suite of capabilities that offers a simple transition from Aria tools while delivering much faster time to value.

VMware Product	Nutanix Product
VMware Aria Operations	NCM Intelligent Operations
VMware Aria Automation	NCM Self-Service
VMware Aria Cost powered by CloudHealth	NCM Cost Governance
VMware Aria Operations for Networks	Nutanix Security Central

NCM Overview

Nutanix Cloud Manager adds intelligent operations, self-service and orchestration, cost governance, and security compliance and visibility capabilities that complement the management functionality of Nutanix Prism. Underlying NCM services include:

- **NCM Intelligent Operations.** An end-to-end management and operations solution for virtualized datacenter environments. Through task automation, machine learning algorithms, and predictive analytics, the solution allows your team to automate operations, optimize resources, forecast capacity needs, and proactively detect performance anomalies. Also provides ticketing system integration and constant system monitoring.

  NCM Intelligent Operations overlaps with the functionality provided by VMware Aria Operations (formerly vRealize Operations).

> Nutanix makes it easy to watch all clusters and quickly reconfigure things as needed. Clear metrics on oversubscription and utilization enable us to proactively manage capacity.
>
> Kevin Priest
> Senior Director, The Home Depot

- **NCM Self-Service and Orchestration.** A multicloud application management framework that helps your teams streamline the way they provision, scale, and manage new or existing applications across multiple environments. The solution includes tools for consumption and governance management, as well as blueprint creation, lifecycle automation, and management from a single control plane.

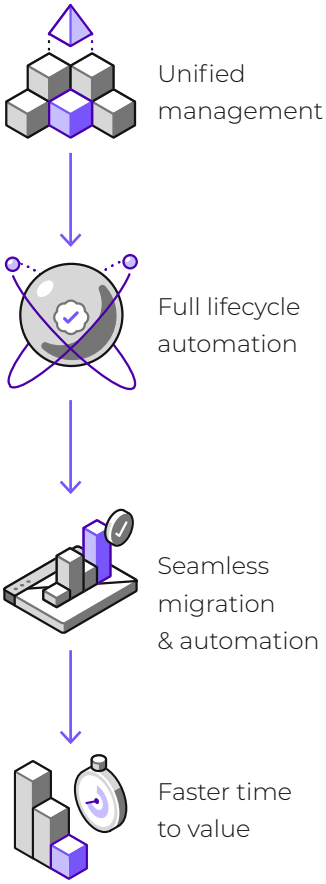
  NCM Self-Service replaces VMware Aria Automation (formerly vRealize Automation) with an easy-to-use automation solution that enables you to deliver meaningful automation and self-service with less effort in far less time. For example, NCM makes it simple to automate routine infrastructure tasks (IaaS) such as provisioning a single virtual machine.

- **NCM Cost Governance.** Provides visibility across hybrid cloud environments from a single console, with tools for optimization and cost control. The solution uses advanced machine learning algorithms to automatically detect cost anomalies, then takes fast, proactive measures to right-size resources and help you keep costs under control.

  NCM Cost Governance takes the place of VRealize Aria powered by CloudHealth, providing powerful and simple-to-use cost management for Nutanix environments.

- **Nutanix Security Central.** Provides a single dashboard to plan for, manage, and govern workload security on any cloud type without the need for deep cybersecurity training or additional personnel. The solution also uses intelligent analysis to automate incident response and aid regulatory compliance for strategic initiatives such as zero trust.

  Nutanix Security Central replaces the functionality of VMware Aria Operations for Networks.



Benefits of NCM

Because of its complexity, the VMware Aria suite of products is difficult to procure, learn, and utilize. Benefits of NCM include:

- **Unified management.** Manage AHV, ESXi, and vCenter/vSphere from a single console.
- **Full lifecycle automation.** Automate and manage the entire application lifecycle with less effort.
- **Seamless migration and automation.** Avoid the disruptive migrations that have accompanied some VMware Aria upgrades (like vRealize Automation 8.0). Migrate existing automations to NCM and simplify the path for future automations.
- **Faster time to value.** Achieve greater value in much less time with NCM's intuitive tools.

NCM Licensing

Similar to NCI, NCM is licensed in three editions: Starter, Pro, and Ultimate.

All Editions offer the following Intelligent Operations capabilities:

- Reporting
- Capacity planning
- Inefficiency detection and rightsizing
- Support for ESXi in non-Nutanix environments
- Operations automation

Pro Edition adds advanced Intelligent Operations functions (application discovery, self-tuning with ML), Cost Governance, and basic

Self-Service functionality:

- Marketplace
- VM blueprints
- Runbooks

Ultimate Edition adds Security Central and advanced Self-Service functionality:

- Application blueprints
- Governance

NCM licensing is summarized in the following table:

	NCM Starter	NCM Pro	NCM Ultimate
Intelligent Operations	X*	X	X
Self-Service		X*	X
Cost Governance		X	X
Security Central			X

*Does not include some advanced features

NCM can also be purchased together with NCI in three bundles. (See Section 3 for details of NCI licensing).

NCM Starter	NCM Pro	NCM Ultimate
Combines: NCI Pro + NCM Pro	Combines: NCI Ultimate + NCM Pro	Combines: NCI Ultimate + NCM Ultimate

NCM Migration Considerations

The first thing to recognize about an NCM migration is that it's not all or nothing. For example, you can migrate VMs to Nutanix running ESXi, register your existing vCenter with Nutanix Prism, and utilize the cloud management features of NCM. You can also use NCM for VMware clusters that aren't running on Nutanix. The NCM software runs on Nutanix and must have access to the vCenter managing the non-Nutanix clusters.

If you have licensed NCM, as you migrate VMs from VMware to Nutanix many NCM capabilities begin to function automatically regardless of target hypervisor, taking the place of their Aria (vRealize) counterparts according to the capabilities you have licensed.

This applies to the following:

- **VMware Aria Operations (vRealize Operations) to NCM Intelligent Operations**
  - As VMs are migrated, Intelligent Operations capabilities (based on the Edition you've chosen) automatically become active, such as capacity planning and inefficiency detection and rightsizing. You can also immediately begin creating playbooks for task automation.
- **VMware Aria Cost (CloudHealth) to NCM Cost Governance**
  - When Nutanix Move is used to migrate a VM, it maps any VMware tags to Nutanix categories so they can be automatically ingested for use by NCM Cost Governance.
- **VMware Aria Operations for Networks to Nutanix Security Central**
  - As VMs are migrated, traffic flows start to appear automatically on the Nutanix console.

The exception to this rule is the migration from VMware Aria Automation (vRealize Automation) to NCM Self-Service. The level of difficulty for this migration will depend on how much custom automation you have:

- Simple self-service operations such as deploying VMs through a marketplace with no third-party integrations are a lift-and-shift to Nutanix.
- Integrations created using vRealize Orchestrator are based on JavaScript, while NCM Self-Service uses Python so those automation will have to be refactored.
- PowerShell and other shell scripts can be copied from VMware into NCM Self-Service and used as is.

Therefore, migration to NCM Self-Service will require some additional discovery to determine how much effort the migration will require.

NCM References

NOTE: The various components that make up Nutanix Cloud Manager have all undergone name changes. You may encounter blogs, videos, and other reference material that refer to these products by their previous names:

Current Name	Previous Name
NCM Intelligent Operations	Prism Pro / Prism Ultimate
NCM Cost Governance	Nutanix Beam
NCM Self-Service	Nutanix Calm
Nutanix Security Central	Flow Security Central

Best Practices for Choosing a Cloud Management Solution

The Economic Benefits of Intelligent IT Automation with Nutanix

TN-2094: Flow Network Security

NCM Cost Governance Adoption (Webinar)

Section 6: Migrating to Nutanix Unified Storage

Storage has become a growing pain point for IT. In addition to storage to support virtual environments, companies typically need file storage as well as separate block storage systems to support databases and other high-performance applications. And, increasingly, object storage is coming into play to support cloud native applications and long-term archival needs.

The result is often a bewildering array of file, block, and object storage, requiring separate procurement, maintenance, management, and capacity planning. These silos of storage add to datacenter complexity and cost.

Nutanix Unified Storage addresses these challenges, allowing all storage needs to be satisfied by a single platform—the same platform that runs your virtualized and containerized workloads.

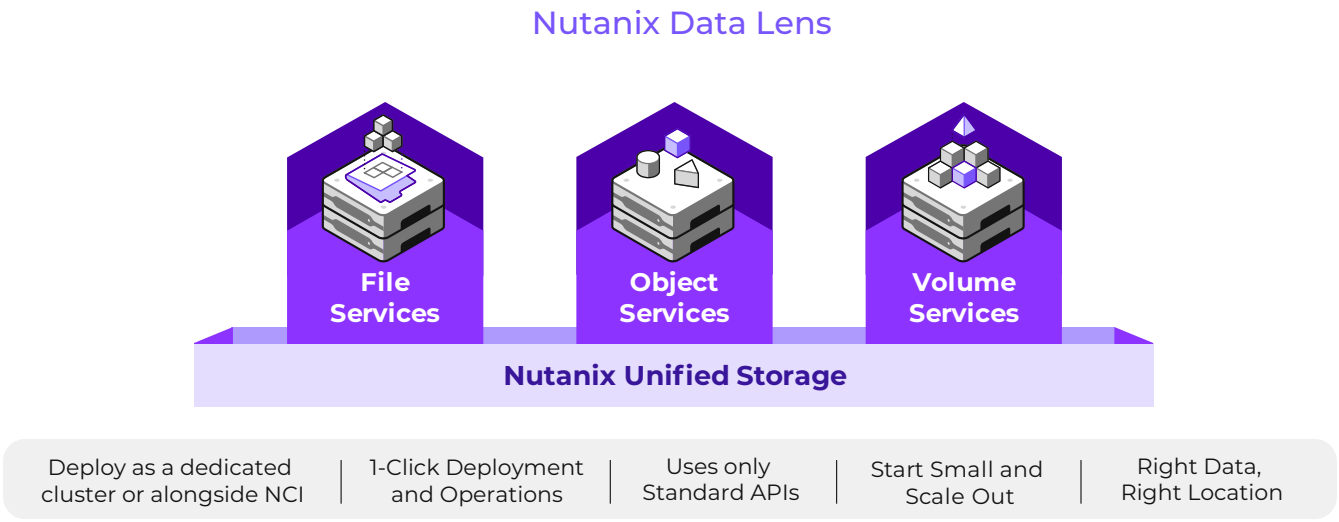
NUS Overview

Nutanix Unified Storage (NUS) is a software-defined storage solution that offers data services for simple data management and integrated ransomware protection to manage and secure structured and unstructured data.

NUS enables you to consolidate block, file, and object storage into a single, unified data services platform. It provides easy access to structured and unstructured data and is built for high performance, seamless scale, and security against ransomware attacks—whether data is in the core, cloud, or edge.

NUS enables Nutanix Cloud Platform to satisfy all your storage needs utilizing a solution that offers enterprise-class features including snapshots and replication for DR, WORM support, scale-out capacity and performance, and native analytics.

For customers migrating to Nutanix from VMware, NUS allows a single platform to meet all your storage needs. Since all storage services can share the same capacity pool, capacity planning is greatly simplified.



NUS Component Services:

Nutanix Files Storage is a simple and secure software-defined scale-out file storage solution. It enables organizations to store, manage, and scale unstructured data by consolidating storage silos onto a single platform, while keeping it secure with integrated cybersecurity and ransomware protection.

Nutanix Objects Storage is a simple, scale-out cloud object storage solution that offers secure S3-compatible storage at massive scale. It helps simplify storage operations while offering high performance for cloud-native, big data analytics, and deep archive workloads. Nutanix Objects is flexible and easy to use, with policy-driven data tiering to any S3-compatible cloud provider.

Nutanix Volumes Block Storage is an enterprise-class, software-defined storage solution that exposes storage resources directly to virtualized guest operating systems or physical hosts using the iSCSI protocol.

Nutanix Data Lens is a cloud-based data governance service offering a global view with intelligent insights into unstructured data stored on the NUS platform.

Benefits of Migrating to NUS

Nutanix Unified Storage offers a number of benefits versus the storage solutions typically found in VMware environments:

- **Manage all storage in one place.** Eliminate infrastructure and management silos
- **Greater consolidation.** Migrate multiple file servers and/or object stores onto a common platform to reduce complexity and simplify management.
- **Pay-as-you-grow.** Start small, right size, then scale incrementally as needed
- **Flexible deployment options.** Deploy in NCI-mode (VM workloads and storage workloads on same cluster) or dedicated (storage-only) environments for efficiency
- **Address diverge storage needs.** Well suited for remote and edge sites as well as datacenters
- **Multi-hypervisor support.** Support multi-hypervisor environments including ESXi and AHV
- **Built-in analytics.** Leverage native analytics to understand usage and identify anomalies
- **Enhance security.** Integrated cyber-security and ransomware protection with Data Lens

The Value of Nutanix Unified Storage

The Business Value	IT and Operational Efficiencies	IT Agility and Business Results
 **53%** reduced cost of operations over 5 years	 **82%** less time to deploy new Files storage	 **99%** reduction in unplanned downtime
 **421%** five-year ROI	 **75%** less time to deploy new Object storage	 **41%** improved application performance
 **10 mo.** payback	 **60%** more efficient IT storage management	 **16%** more productive application developers
 **$441K** revenue gained per year	 **56%** more efficient IT security teams	

NUS Hardware Platforms

NUS runs on any of the hardware platforms that support NCI, including: Nutanix NX, OEM platforms, and third-party servers as described in the section NCI Hardware Platforms.

Nutanix NX and most OEMs offer storage-dense options that are well suited for NUS. (Storage-heavy nodes can be mixed with other nodes in the same cluster if desired.)

NUS Licensing

Nutanix Unified Storage and Data Lens are purchased and licensed on a per-TiB usable basis. As noted earlier, all NCI licenses include consolidated storage services including volumes and 1 TiB of free files/objects capacity.

NUS can be deployed either as a dedicated storage cluster or with NCI for further consolidation. Dedicated mode allows for a maximum of 1 VM per node, if more VMs are required, NUS must be run in NCI mode. You can convert between Dedicated and NCI mode.

NUS is available in two editions, Starter and Pro:

- NUS Starter supports object storage only.
- NUS Pro supports file, object, and block storage.
  - Advanced replication and security add-ons are available.

Dedicated mode storage clusters:

- Require a NUS license based on the desired usable capacity for Files, Objects, and Volumes

NCI mode clusters:

- Require an NCI license plus a NUS license for Files and Objects capacity beyond 1TiB
- Volumes is included with NCI Pro and NCI Ultimate licenses and does not require a capacity-based NUS license

NUS Migration Considerations

With the exception of vSAN File Service, NUS is not a direct replacement for any products supplied by VMware. However, NUS can stand in for the diverse storage systems common in VMware environments, greatly reducing complexity, streamlining management, and giving you more flexible storage options to meet future needs. For example, you may not require on-prem object storage today, but if you need it in the future, NUS makes it simple to add the capability to existing Dedicated mode or NCI mode clusters.

Additional NUS migration considerations include:

- NUS supports the CSI and COSI drivers needed for Kubernetes and containerized operations, making it an ideal option for supporting the storage needs of cloud native applications.
- NUS can run on single-node clusters to support the smallest environments; pay-as-you-grow licensing enables you to start small and grow your storage deployment as needed.
- NUS provides very good performance, including high performance object storage suitable for addressing big data use cases. (Object storage is not typically designed for performance.)
- File Analytics and Data Lens provide data insights, auditing, reporting and ransomware protection.

Sizing and Storage Types

Nutanix Sizer can accurately size your NUS environment, helping you to right size total capacity and determine your expected compute needs. NUS customers typically deploy NUS on nodes with hybrid storage (SSD + HDD). Flash provides performance while HDDs provide economical capacity for storing cold data.

Dedicated vs NCI Mode Clusters

NUS can be deployed in a dedicated storage cluster or deployed in NCI mode on the same cluster as application workloads. There's no hard and fast rule for when to choose dedicated vs NCI mode. Overall, the existing customer NUS deployments are about 50:50. Generally, you pick a dedicated cluster when you need a lot of storage capacity and you want the most predictable performance.

Practical Considerations

- Before you migrate from your existing storage, there are a few additional questions that are worth considering: Is your existing backup vendor qualified on Nutanix? If not, will you utilize Nutanix integrated data protection or choose a qualified vendor?
- Is your anti-virus software qualified on Nutanix?
- With Nutanix Files Storage, it's important to think about your data layout and what you're trying to achieve. This is spelled out in the Nutanix Files Migration Guide along with other valuable guidance.

NUS References

- NVD-2151: Unified Storage Design
- TN-2016: Nutanix Files Migration Guide
- TN-2041: Nutanix Files
- Objects User Guide
- Exploring the High-Performance Capabilities of Nutanix Objects
- Nutanix Volumes Best Practices
- Data Lens User Guide

Section 7: Migrating from VMware to Nutanix with Move

Migrations remain a pain point for IT organizations, requiring significant time and effort. Nutanix Move is designed to simplify cross-hypervisor VM migrations and reduce risk.

Move Overview

Nutanix Move is a cross-hypervisor mobility solution that migrates VMs with minimal downtime. For VMware migrations, Move supports the following migration paths:

- VMware ESXi to AHV
- VMware ESXi on three-tier infrastructure to VMware ESXi on Nutanix Cloud Platform
- VMware ESXi to Nutanix Cloud Clusters (NC2) on AWS
- VMware ESXi to NC2 on Microsoft Azure

For example, you can migrate ESXi on three-tier infrastructure to ESXi on Nutanix or shift ESXi VMs to AHV VMs on Nutanix to avoid hypervisor licensing costs.

Move provides minimal disruption to operations and requires no manual scripting. It works by seeding data from the running source VM to the target VM in the new environment. Once the seeding process is completed, cutover can be initiated to stop the running VM, transfer any remaining data, and restart the VM in the new environment, minimizing the downtime required for cutover.

Move is managed through the Move User Interface which is accessed by logging into the Move VM.

Benefits of Using Move

Benefits of Nutanix Move include:

- **Fast and simple**. Move is cleaner, simpler, faster, and less error prone than other options.
- **Scalability for large-scale migrations.** Move can migrate an individual VM or scale to migrate thousands of VMs.
- **Reduced risk and cost.** Move is automated, eliminating the problem of rebuilding VMs and applications manually.

Migration Considerations

The key to a successful migration is planning. Initial planning may include identification of the workloads being migrated, file sizes, time frames for the migration, etc.

Break large migrations into phases and verify that each phase completes successfully before proceeding to the next one. Perform backups as each phase completes.

The Nutanix Move User Guide includes migration planning for all VMware to Nutanix migrations including in-depth workflows for each specific source and target.

While Move is suitable for migrating all types of applications, some may require additional consideration and preparation. This includes very large databases, high-performance workloads, and applications with very specific customization requirements that must be maintained.

While Move can migrate a database, it may be preferable to rebuild the database on the target platform and migrate the data. It is up to you to understand your applications and workloads before deciding how to migrate each one.

Move References

- Move User Guide
- Learn how to Migrate an existing ESXi Cluster to an AHV Cluster (video)

Section 8: Nutanix Makes Migrations Simpler

Migrations are always a challenge no matter how many you've been involved in or how skilled your team is. The right partners don't just offer great technology, they offer the tools, partnerships, support, and services necessary to mitigate risks and ensure success. Nutanix is that type of partner.

Nutanix Migration Tools

As you learned in the previous section, Nutanix created Move as a general-purpose migration tool that takes the pain out of migration planning and execution. Nutanix provides several additional tools that can be extremely useful during the migration process:

- Nutanix Sizer. Streamlines on-prem and cloud solution deployments with fast and accurate infrastructure sizing for all types of workloads. With Sizer, you're assured of delivering maximum workload density, performance, and value. Sizer enables you to:
  - Eliminate guesswork
  - Reduce or eliminate infrastructure silos
  - Size infrastructure for AHV and ESXi
  - Obtain a complete bill of materials
  - Leverage data gathered from existing workloads
- Nutanix Collector. Provides a simple means to quickly capture production workload utilization metrics. This information can be imported into Sizer to deliver the most accurate sizing recommendations.
- Native SMB Migration Tool. SMB remains the file sharing protocol of choice in Microsoft environments. Our SMB migration tool simplifies the migration of SMB file shares into Nutanix Files Storage.

Nutanix Partner Ecosystem

The Nutanix partner ecosystem is designed to provide the best possible customer experience, providing end-to-end, fully integrated Nutanix Cloud Platform solutions for any application or workload to create maximum customer value.

Our partner ecosystem consists of:

- Reseller Partners
- Technology Alliances
- System Integrators
- Service Providers
- OEM Partnerships
- Training Partners
- Consulting Partner

Technology Partners

Partnerships are essential in the hybrid multicloud era. The ecosystem of technologies you select to meet your business needs must work together seamlessly to deliver maximum strategic value. Nutanix partners with leaders and innovators across all major technology categories.

Nutanix Elevate Technology Alliance Partners collaborate with us to ensure joint solutions "just work," through Nutanix Ready interoperability validations and unique feature integrations.

System Integrators

To better serve the needs of large enterprises and global organizations, Nutanix partners with the world's leading system integrators. Nutanix Global System Integrators (GSIs) are trained and certified to develop, design, and implement IT strategies for customers migrating from VMware to Nutanix. They can help you develop essential data center practices and will recommend and implement Nutanix technology solutions to improve productivity and efficiency.

Services and Support

The ramp-up period associated with assessing and migrating to Nutanix from VMware can create challenges for your organization. Nutanix Customer Xperience—our education, services, and support team—offers a range of services, including:

- Workshops to help with assessments and planning
- "Fast track" deployment services and support
- Education services

Nutanix has consistently maintained a 90+ NPS (the benchmark of customer satisfaction) in an industry where the average NPS is 56. That's one more reason you can choose Nutanix with confidence.

Finding Out More

To learn more about migrating from VMware to Nutanix, visit nutanix.com/vmaware.

Want more on the practical aspects of deploying Nutanix AHV and other solutions? Visit our mission control page.

Ready to experience the Nutanix technologies mentioned in this guide? Take a test drive and see the Nutanix difference for yourself. Visit nutanix.com/testdrive-vm.

You can also contact Nutanix at info@nutanix.com, follow us on Twitter @nutanix, or send us a request at www.nutanix.com/demo to set up a customized briefing.

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