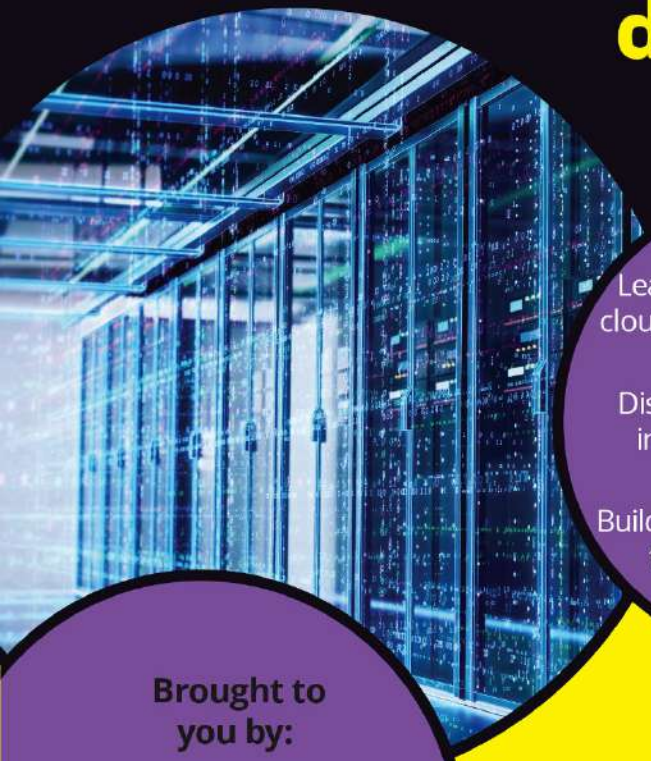
LEARNING MADE EASY

Nutanix
Special Edition

# Next-Gen IT Amidst Vendor Change

for dummies®
A Wiley Brand



- Learn about hybrid multi-cloud and cloud-native apps
- Discover hyperconverged infrastructure benefits
- Build a future-ready platform for cloud-native apps

Brought to you by:

NUTANIX

Lawrence Miller

## About Nutanix

Nutanix offers a flexible, future-ready platform with a scale-out, server-based, software-defined architecture that provides true choice and control over your IT strategy. Nutanix enables workload mobility and unified management across data center, public cloud, and edge environments — all from a single management plane. With Nutanix, customers can manage existing virtualized applications with ease while advancing to cloud native and AI workloads, gaining the freedom to modernize at their own pace with lower risk, reduced costs, and the flexibility to adapt to evolving business demands. Nutanix delivers one platform to run apps and data across hybrid multicloud environments, the ideal architecture for modern business.

# Next-Gen IT Amidst Vendor Change

Nutanix Special Edition

**by Lawrence Miller**

for dummies®
A Wiley Brand

# Next-Gen IT Amidst Vendor Change For Dummies®, Nutanix Special Edition

Published by
**John Wiley & Sons, Inc.**
111 River St.
Hoboken, NJ 07030-5774
www.wiley.com



ISBN 978-1-394-32936-6 (pbk); ISBN 978-1-394-32937-3 (ePDF); ISBN 978-1-394-32938-0 (ePub)

## Publisher's Acknowledgments

**Editor:** Elizabeth Kuball
**Acquisitions Editor:** Traci Martin
**Senior Managing Editor:** Rev Mengle
**Client Account Manager:** Jeremith Coward
**Cover image:** © Connect world/ stock.adobe.com
**Production Editor:** Umeshkumar Rajasekhar
**Special Help:** Harsha Kotikela, Steve Carter, Jeff Kelly, Sam Welden, and Pierre Golde

# Table of Contents

# Introduction

There is one constant in IT: change. Technology changes constantly and so, too, do technology vendors. In the constant pursuit of new growth opportunities, technology companies — large and small — are often the targets of mergers and acquisitions (M&A).

Although M&A activity can be exciting for shareholders, it often causes consternation for customers. Did a vendor acquire your vendor to kill off a competing product line that you're heavily invested in? If not, will the new vendor be as committed to innovation and a robust product road map, or will they simply scavenge the acquired technology for their own product line? Will your licensing and maintenance costs increase? Will the quality of your service and support change?

In this highly dynamic environment, IT leaders must reevaluate their technology stacks, application portfolios, and cloud strategies to reduce risk and maximize business agility. Next-generation IT begins with modernizing your infrastructure, applications, and cloud strategies to position your organization for success in an uncertain future.

## About This Book

*Next-Gen IT Amidst Vendor Change For Dummies*, Nutanix Special Edition, consists of five chapters that explore the following:

- The evolution of enterprise data centers, modern applications, and cloud computing (Chapter 1)
- The role of hyperconverged infrastructure (HCI) in the modern data center (Chapter 2)
- Why a unified platform is essential for enterprise and cloud-native applications (Chapter 3)
- The rise of hybrid and multicloud strategies in next-gen IT (Chapter 4)
- Ten reasons to trust Nutanix for your next-gen IT environment (Chapter 5)

Each chapter is written to stand on its own, so if you see a topic that piques your interest, feel free to jump ahead to that chapter. You can read this book in any order that suits you.

## Foolish Assumptions

Most assumptions may be outdated, but I make a few nonetheless. I assume you're an IT leader or professional with a solid grasp of data center infrastructure, cloud computing, and IT operations — and you're seeking a next-gen, future-ready solution.

If that sounds like you, this book is for you. If not, read on anyway — you'll gain valuable insights into the future of IT.

## Icons Used in This Book

Throughout this book, I use special icons to call attention to important information. Here's what to expect:

REMEMBER

This icon points out important information you should commit to your nonvolatile memory, your gray matter, or your noggin.

TECHNICAL STUFF

This icon explains the jargon beneath the jargon and is the stuff legends — well, legendary nerds — are made of.

TIP

Tips are appreciated, but never expected, and I sure hope you'll appreciate these useful nuggets of information.

WARNING

Watch out! The points highlighted by this icon have implications if not given careful consideration.

## Beyond the Book

I can only cover so much in this short book, so if you find yourself at the end of it wondering, "Where can I learn more?" go to `www.nutanix.com`.

IN THIS CHAPTER

- Transforming the data center
- Supporting different applications and workloads
- Adopting a hybrid multicloud strategy

# Chapter 1
# The Evolution of IT Infrastructure, Applications, and the Cloud

Enterprise IT organizations are increasingly being asked to spend less time (and budget) on infrastructure and more on application services that add business value. Despite a continuous stream of IT hardware and software enhancements, the infrastructure challenges IT teams face continue to rise. The traditional IT infrastructure and virtualization software required to meet the needs of modern businesses can be complex and expensive, and data center management has become painful. Far too much time and effort are focused on just keeping the lights on, and not enough time is spent on innovation.

This chapter looks at the evolution of IT infrastructure and applications, and the role of hybrid and multicloud strategies in next-gen IT.

# Reimagining the Enterprise Data Center

Legacy data center infrastructure — consisting of separate servers, storage, and storage networks — is poorly suited to meet the growing demands of enterprise and cloud-native applications and the fast pace of modern business. The silos created by legacy data center infrastructure have become a barrier to change and innovation, adding complexity at every step, from procurement to deployment to management. New business initiatives require buy-in from multiple teams, and IT needs must be predicted years in advance. As most IT teams know, this involves a substantial amount of guesswork and is almost impossible to achieve effectively. In addition, vendor lock-in and increasing licensing costs risk stretching budgets to the breaking point.

Hyperconverged infrastructure (HCI), discussed in Chapter 2, combines commodity server hardware using locally attached storage devices with intelligent software to eliminate common pain points associated with legacy data center infrastructure (see Figure 1-1).

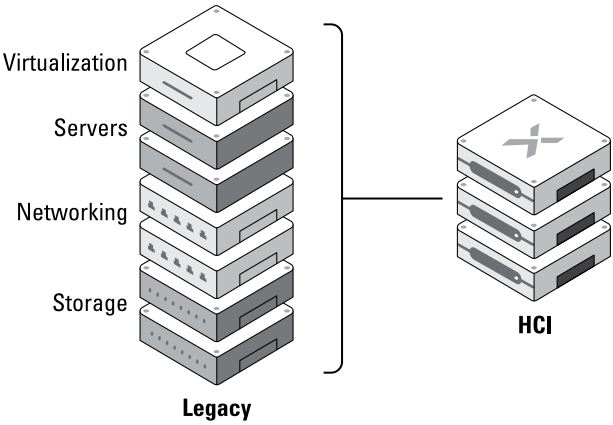



**FIGURE 1-1:** HCI combines compute, storage, and virtualization in simple, scalable building blocks.

The components of HCI include a distributed infrastructure plane and a distributed management plane.

The distributed infrastructure plane of an HCI system runs across a cluster of nodes delivering storage, virtualization, and networking services for guest applications — whether they're virtual machines (VMs) or container-based apps.

The management plane lets you easily administer your global HCI resources from one place and one view. It eliminates the need for separate management solutions for servers, storage networks, storage, and virtualization. Moreover, legacy data center designs depend on proprietary storage and storage network hardware, leading to vendor lock-in. HCI solutions are software-defined and typically allow for a wide range of appliance and server options from multiple vendors.


Whereas traditional server and storage hardware can scale vertically (scale up) by adding processors, memory, and storage capacity, HCI can scale both vertically *and* horizontally (scale out). Although each node in an HCI environment is self-contained, nodes are combined to produce clusters across standard Ethernet networks. The entire system is controlled using a distributed software layer in the servers. This combines all the resources of the cluster into a single pool so users can treat it as one logical entity.

## Managing Cloud-Native and Enterprise Apps and Workloads

Modern data center infrastructure must support cloud-native applications built on a microservices architecture, and traditional enterprise applications built on a monolithic architecture.


In a monolithic architecture, every component and function of an application is developed and tightly integrated as a single program (see Figure 1-2). Although monolithic applications are relatively easy to develop and are well-suited for smaller applications, they become increasingly difficult to maintain as the size and complexity of the application grows because any changes or updates require the entire application to be modified and redeployed. In a microservices architecture, an application consists of many (sometimes hundreds or thousands) of discrete functions (services) that can be independently developed, updated, deployed, and scaled.

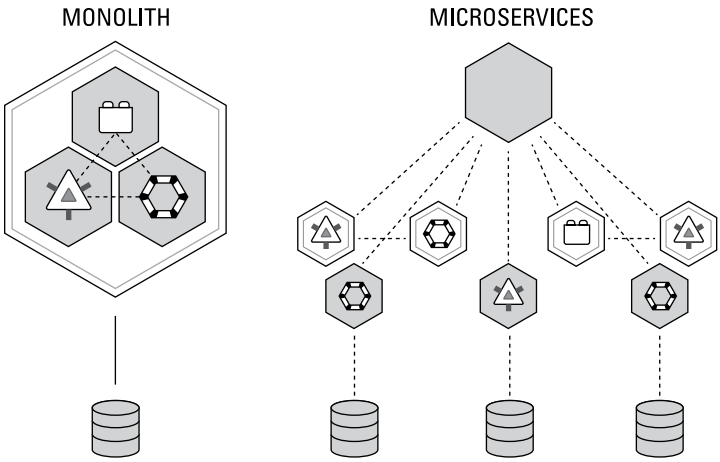



**FIGURE 1-2:** Monolith architecture versus microservices architecture.

As applications have grown more complex, it has become harder to ensure stability and consistency. Updates that run fine in one environment may produce completely different results in another. Unexpected changes to the underlaying operating system (OS) — such as an OS update, an antivirus update, or even a shared library — can frustrate even the most robust tests and verification. What if you could package an update or application along with all its dependencies to ensure that the app you test in development runs the same when deployed to production?

Containers are designed to solve this problem. By packaging everything an application needs together, you can ensure that the behavior you see in one environment is perfectly replicated in another. Containers allow you to deploy a new application or update an existing one without worrying about what third-party libraries you're using. Instead of upgrading code directly, updates can now be deployed (or rolled back) simply by swapping out one container for another.

As you may suspect, it was a natural evolution for cloud-native apps to deploy microservices in containers. After all, why build an entire VM for a microservice that may only perform a single basic function requiring a few milliseconds of compute? And why pay for a VM to run all the time if it's only needed a fraction of the time that the application is running? True, you can dynamically power VMs up and down, but it takes time to start and shut down a server OS and it just isn't practical.

Kubernetes, discussed in Chapter 3, was developed to handle the management and orchestrations of containers at scale, including microservices containers. By handling all the questions of shared infrastructure for each microservice, Kubernetes allows application components to scale from one to hundreds (or thousands) of copies with full connectivity to all the other services — networking, authentication, storage, and more — it requires, and then to dynamically spin down the containers if or when they're no longer needed, even after only a few milliseconds.

## Hybrid and Multicloud Cloud Enterprise IT Strategies

The launch of Amazon Web Services (AWS) public cloud in 2006, quickly followed by Microsoft Azure and Google Cloud Platform (GCP) clouds in 2008, ushered in the era of cloud computing and unleashed unprecedented opportunities for entire industries to be transformed. Today, cloud usage figures significantly in enterprise IT operations. According to a survey published in the *Flexera 2024 State of the Cloud Report,* more than a quarter of respondents reported spending more than $12 million a year on cloud (29 percent), and nearly a quarter (22 percent) spent that much on software as a service (SaaS).

The genesis of the public cloud was based on shared storage and VMs. The easy self-service and on-demand access to infrastructure resources quickly made the cloud a popular destination for application developers to deploy code, instead of waiting on the slow and complex procurement and deployment processes required to deploy traditional data center infrastructure.

As enterprise cloud strategies have evolved, hybrid multicloud has become the dominant cloud architecture. According to the *6th Annual Nutanix Enterprise Cloud Index,* 80 percent of the surveyed organizations believe hybrid IT environments are most beneficial, 90 percent are taking a cloud-smart approach (strategically selecting the optimal cloud environment for each application or workload) to infrastructure, 95 percent have moved apps from one environment to another in the past year, and 46 percent have implemented a hybrid cloud or hybrid multicloud infrastructure model. The proportion of organizations adopting a hybrid multicloud approach by implementing a cloud operating model in their

own data centers and transforming them into private clouds to complement their public cloud deployments, is forecast to double over the next one to three years.


REMEMBER

*Multicloud* is the use of two or more clouds that are connected/interoperable, whereas *multiple cloud* is the use of two or more clouds in silos. *Hybrid multicloud* is a subset of multicloud in which at least one of the clouds is a private cloud.

Hybrid multicloud is becoming more popular due to its ability to provide organizations with the best of both worlds — the scalability and agility of public cloud and the performance and control of private cloud. This flexibility allows organizations to choose the most appropriate cloud environment for each workload or application, optimizing performance, cost, and security. Cloud repatriation is an increasingly common trend in which organizations are migrating certain workloads back from the public cloud to their private cloud (or data center), typically to improve performance, increase control, and reduce costs. In addition, hybrid cloud allows organizations to easily scale their IT infrastructure to meet changing demands while maintaining control over their applications and data.


REMEMBER

The need for greater agility, innovation, and efficiency is driving the adoption of hybrid multicloud computing among organizations of all sizes and industries, and it's expected to continue to grow in popularity.

IN THIS CHAPTER

- Covering the basics of HCI
- Recognizing the benefits of HCI
- Exploring the Nutanix HCI solution

# Chapter 2
# Introducing Hyperconverged Infrastructure

Enterprise IT teams today are increasingly being asked to deliver on-premises IT services with the speed and operational efficiency of public cloud providers such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP). Hyperconverged infrastructure (HCI) combines common data center server hardware using locally attached storage with intelligent software to eliminate common pain points associated with legacy infrastructure, enabling IT teams to achieve this level of performance and efficiency.

In this chapter, you learn the basics of HCI, its benefits, and how the Nutanix HCI solution can help your organization adopt a cloud operating model for all your environments spanning on-premises data centers, public/private cloud, and edge.

# Understanding HCI

HCI converges the entire data center stack, including compute, storage, storage networking, through virtualization. Complex and expensive legacy infrastructure — consisting of separate servers, storage networks, and storage arrays — is replaced by a distributed platform running on industry-standard commodity servers, enabling enterprises to size their workloads precisely and to scale flexibly as needed. Each server, also known as a *node,* includes x86 processors with solid-state drives (SSDs) and hard disk drives (HDDs). Intelligent software running on each node distributes all operating functions across the cluster for superior performance and resilience.


TECHNICAL STUFF

Hardware platform configurations can fit any workload by independently scaling the various resources (processors, memory, and storage) and can be provisioned with or without graphical processing units (GPUs) for graphics acceleration. Each node includes flash to optimize storage performance, and all-flash nodes deliver maximum input/output (I/O) throughput with minimum latency for enterprise applications.

In addition to the distributed storage and compute platform, HCI solutions include a management plane to simplify the administration of HCI resources from a single interface. This eliminates the need for separate server, storage, storage network, and virtualization management interfaces. The unified management plane streamlines complex provisioning processes, eliminates siloed operations, and automates dynamic scaling.

# Realizing the Benefits of HCI

HCI eliminates siloed systems by providing a single unified software layer across an entire IT ecosystem. This seamless integration allows organizations to easily manage system performance, scale with agility, and achieve resiliency objectives. Other benefits of hyperconvergence include the following:

- **Reduced complexity and simplified management:** Legacy infrastructure typically consists of a convoluted mix of siloed systems added piecemeal over many years. With HCI, IT

manages and maintains a single unified system that's easy to size, easy to scale, easy to purchase (single vendor), easy to manage (single platform rather than multiple interfaces for different layers), easy to configure for optimal performance, and easy to troubleshoot, in addition to spanning multiple environments. The simple, distributed architecture of HCI frees the business to focus on building and innovating.

- **Eliminating waste and avoiding risk:** With HCI, you can buy what you need today or for the next couple of quarters, and then quickly and easily add new nodes to make space for growing workloads as resources are used up. With traditional infrastructure, you must either make a large upfront purchase based on growth assumptions or make more big purchases as you run out of capacity (or more likely, performance).
- **Optimized infrastructure and resource utilization:** Through its distributed software layer, HCI helps organizations use their compute, storage, and networking resources thoroughly and efficiently.
- **Fast, efficient scalability:** Organizations can grow and shrink workloads as their needs change.

# Nutanix Cloud Platform: The Hyperconverged Foundation for Your IT Transformation

Nutanix Cloud Platform (NCP) can seamlessly run workloads and manage data across on-premises, public and private cloud, and edge environments. NCP consists of an infrastructure plane, Nutanix Cloud Infrastructure (NCI), and a management plane, Nutanix Cloud Manager (NCM).

## Nutanix Cloud Infrastructure

NCI is a distributed infrastructure plane for virtual machines (VMs) and containerized applications that runs across a cluster of nodes delivering enterprise storage and virtualization services.

NCI is the foundation of NCP. The main components of NCI include the following:

- **Nutanix Acropolis Operating System (AOS) Storage:** The AOS Storage fabric simplifies storage and data management for virtual environments. AOS Storage pools flash and HDD storage across a Nutanix cluster and presents it to the virtualization layer as a data store, eliminating the need for storage area networks (SANs) and network-attached storage (NAS) appliances. Key capabilities include the following:
  - *Data management and protection:* A comprehensive set of capabilities for performance acceleration, data reduction, data protection, and more
  - *Broad hypervisor support:* Support for VMware vSphere, Microsoft Hyper-V, and Nutanix Acropolis Hypervisor (AHV)
- **Nutanix Data Services for Kubernetes (NDK):** NDK simplifies and unifies the process of provisioning and operating applications by extending enterprise data services to containerized applications. As a result, NDK delivers a fast time to value and reduces operational headaches for administrators, allowing a cloud operating model for developers while also promoting cost efficiency for business owners.
- **Nutanix Acropolis Hypervisor (AHV):** Nutanix AHV is a modern and secure, virtualization platform that powers VMs and containers for enterprise applications and cloud-native workloads with simple and intuitive provisioning and management. This enables a consistent hybrid cloud operating model across data centers, public clouds, and the edge. Key capabilities include the following:
  - *Ease of management:* One-click installs, upgrades, and unified management across the full stack with the Nutanix Prism management console
  - *Resiliency:* High availability (HA), Live Migration and Dynamic Scheduling, workload and host affinity and anti-affinity, seamlessly integrated storage snapshots and disaster recovery (DR), and Metro Clustering
  - *Cloud-native services:* Kubernetes support with Nutanix Kubernetes Platform (NKP), plus storage and database services and virtual private clouds (VPCs) for seamless workload migration and multi-tenancy
  - *Robust ecosystem:* More than 1,100 validated solutions from numerous vendors

- **Nutanix Database Service (NDB):** NDB is a database as a service (DBaaS) platform for managing diverse database environments across on-premises data centers, private and public clouds, and the edge. NDB automates database lifecycle management — including provisioning, patching, cloning, backup and recovery, high availability, and security.
- **Nutanix Flow:** Nutanix Flow delivers advanced network security, providing visibility into the virtual network, application-centric protection from network threats, malware, and ransomware, as well as security and compliance monitoring. Key capabilities include the following:
  - *Application and network visualization:* Nutanix Flow provides a detailed visualization of communications between VMs along with assistance in categorizing and grouping workloads, making it simple and straightforward to set policies for the environment.
  - *VPC:* VPCs are essentially virtual networks that overlay the physical network underneath and can extend between data centers, including from on-premises to the cloud.
  - *Network isolation and microsegmentation:* Microsegmentation provides granular control and governance of all traffic into and out of a VM, or groups of VMs, allowing permitted traffic between application tiers or other logical boundaries is allowed while protecting against advanced threats.
  - *Service insertion and chaining:* Nutanix Flow functionality can be extended to leverage virtualized network functions from third-party software such as virtual firewalls, load balancers, threat detection, and application performance monitoring.
  - *Monitoring, compliance audit, and reporting:* Flow Network Security provides a security operations portal for your Nutanix infrastructure, adding visibility and control of network traffic and security configurations along with out-of-the-box audit and reporting for common security and compliance regulations.
- **Nutanix Prism:** Nutanix Prism is the single-pane-of-glass interface for NCP and provides an easy way to manage Nutanix environments end-to-end. It combines multiple management aspects into one. Just as NCI creates an infrastructure (compute and data) plane that spans the entire cluster for performance and resiliency, Nutanix Prism creates a control plane for centrally managing, monitoring, and orchestrating the compute, storage, and virtualization

resources across one or more Nutanix clusters. Depending on their infrastructure requirements, customers can choose Prism Element for basic single-cluster management or the more feature-rich Prism Central for single- or multi-cluster management.

## Nutanix Cloud Manager

Nutanix Cloud Manager (NCM) is a holistic hybrid multicloud management solution that makes it easier for enterprises to build, operate, and govern their applications and IT infrastructure. It offers intelligent operations, including monitoring, insights, and automated remediation. Self-service and orchestration streamline team tasks for scaling applications in hybrid multiclouds. Further, NCM enhances financial accountability, offering cost governance, resource optimization, and clear cloud metering and chargeback visibility. It also unifies security operations across clouds by helping maintain regulatory compliance and automating incident response through intelligent insights.

## OLAM IMPROVES THE QUALITY OF PRODUCE AND THE SUSTAINABILITY OF FARMING

To create safer, more efficient and sustainable ways of operating, Olam chose an NCI, unifying management across hybrid clouds and gaining the performance and reliability for its mission-critical workloads. The company, which has successfully scaled the platform to support 95 percent of applications, is now driving its end-to-end digital transformation strategy using Nutanix.

Key benefits:

- Achieved 99.999 percent availability and reduced IT incidents by 85 percent.
- Enabled rapid scaling of virtual desktop infrastructure (VDI) to 1,500 staff in three to four weeks.
- Server utilization improved to 70 percent from 30 percent; infrastructure costs were lowered by 30 percent.

Read the full customer success story at `www.nutanix.com/company/customers/olam`.

IN THIS CHAPTER

- Exploring the need for a hybrid multicloud platform for Kubernetes and cloud-native apps
- Understanding the infrastructure implications of AI
- Running cloud-native and containerized apps on NCP and Nutanix application solutions

# Chapter 3
# Leveraging a Unified Platform for Enterprise and Cloud-Native Apps

Digital transformation has enabled enterprises to become app development factories. IDC predicts that more than 1 billion new logical apps will be delivered to the market by 2028 (`https://my.idc.com/getdoc.jsp?containerId=US51953724`). This explosion will result in most enterprises running a growing portfolio of apps, including artificial intelligence (AI) apps, that are a mix of enterprise apps and cloud-native apps. Simultaneously, many organizations are adopting a hybrid multicloud strategy, with applications and databases running in on-premises data centers, public clouds, and the edge based on performance requirements, cost-effectiveness, access to specific cloud services, and data sovereignty and compliance needs.

In this chapter, you find out about the challenges of managing cloud-native and traditional enterprise applications, the infrastructure challenges associated with AI initiatives, and how Nutanix Cloud Platform (NCP) and its suite of application solutions help enterprises support a diverse portfolio of applications in a hybrid multicloud environment.

# Modern, Cloud-Native Apps Require Modern Infrastructure

Enterprises have often relied on three-tier data center infrastructure, discussed in Chapter 1, and storage area networks (SANs) to run their applications, including business-critical applications and their associated databases. For many years, this approach was enough to support traditional, small, medium, large, and gigantic enterprise applications.

However, legacy three-tier infrastructure can be expensive, with high operating expenses (OPEX) due to complex management requirements and the need for frequent forklift upgrades. More important, flexibility can be limited due to manual provisioning, having to manage each tier separately, data silos, and so on, and three-tier infrastructure can't be easily extended to the public cloud. Legacy infrastructure also tends to lack the agility to meet the rapidly changing requirements of more complex, larger-scale enterprise applications, as well as cloud-native applications and AI workloads. As ever, operational complexity robs valuable time from IT staff.

Modern infrastructure is needed that can support all business-critical applications, both cloud-native and enterprise, spanning on-premises data centers, public clouds, and the edge.


TECHNICAL STUFF

Traditional enterprise applications are developed as a single integrated software package that contains all required functionality. These applications are often referred to as *monolithic*. They're typically created for a specific platform or operating system, and improving or updating these apps can be difficult and time-consuming. Cloud-native apps, on the other hand, are modular. Rather than a large integrated software package, they're designed as a collection of packages that work together but can be deployed, scaled, and upgraded independently of each other. As a result, cloud-native apps are more flexible, scalable, and resilient than traditional enterprise applications.

Cloud-native apps typically include the following components:

- **Microservices (discussed in Chapter 1):** Instead of a single large block of code used in traditional enterprise applications, cloud-native apps use *microservices,* which are tiny

packages of code, each providing a single, specific capability or function.

- **Containers (discussed in Chapter 1):** These are lightweight, isolated runtime environments that may contain individual microservices (or an entire application), along with system tools, libraries, and other dependencies.
- **Application programming interfaces (APIs):** APIs enable communication between containerized microservices within an application or between different applications themselves.
- **Orchestration:** Containerized microservices and APIs are all managed dynamically via orchestration tools, such as Kubernetes, which manage the often-complex lifecycles of containers and microservices. They also optimize the allocation of resources, balance loads as needed, restart containers when they fail, and deploy and provision containerized microservices onto servers.

REMEMBER

Most AI workloads are deployed in containers. You have to be able to effectively run and manage containers if you want to use AI effectively.

## Getting Ready for Enterprise AI

AI and emerging generative AI (GenAI) technologies are disrupting the status quo, prompting enterprises to accelerate their AI initiatives. However, many organizations are not prepared to address the infrastructure and other requirements to support diverse AI use cases.

Infrastructure typically is the largest GenAI expense, with options ranging from build-your-own solutions to public cloud and full-stack offerings. Many enterprises are adopting a hybrid approach, utilizing diverse infrastructures across data centers, the edge, and the cloud to address their AI/GenAI challenges.

REMEMBER

As AI becomes a core part of enterprise technology stacks, the ability to transition IT resources into AI resources, enable simple AI Day 2 operations (that is, the maintenance, monitoring, and inferencing), and remain adaptable for the next big advances in GenAI is essential.

# Addressing Modern Application Challenges with Nutanix

NCP is the ideal solution for enterprise business-critical apps and databases, as well as cloud-native applications, including AI apps and workloads, in hybrid multicloud environments. It provides consistent performance, enhanced availability, and strong full-stack security, and it enables greater agility to meet dynamic business needs without management complexity. NCP takes the complexity out of running cloud-native apps in an on-premises data center at the edge.


TIP

NCP can prevent unplanned downtime by as much as 97 percent with its resilient distributed architecture, along with integrated data protection capabilities, including snapshots, automated failover, and flexible replication options.

The Nutanix portfolio of cloud-native application solutions that run on NCP includes Nutanix Kubernetes Platform (NKP), Nutanix Data Services for Kubernetes (NDK), and Nutanix Enterprise AI (NAI).

## Nutanix Kubernetes Platform

NKP is a complete, enterprise-grade, production-ready Kubernetes management platform. By leveraging the best of the Cloud Native Computing Foundation (CNCF) ecosystem, and providing it in an integrated and lifecycle-managed package, NKP delivers all the functionality needed in production environments.

NKP simplifies Kubernetes management through automation, leveraging declarative APIs for both cluster and application lifecycle management. Together, NKP and Nutanix AHV (discussed in Chapter 2) provide a unified platform that enables organizations to seamlessly manage traditional virtual machine (VM)–based applications alongside cloud-native applications in hybrid multicloud environments.

TIP

NKP integrates with other Kubernetes runtimes, like Amazon Elastic Kubernetes Service (EKS) and Azure Kubernetes Service (AKS), giving you flexible deployment options rather than locking you into a proprietary integrated full-stack solution.

## Nutanix Data Services for Kubernetes

As the adoption of cloud-native applications continues to grow, there is a pressing need to address the challenge of providing application-aware data services for Kubernetes deployments. Managing data and state with containerized applications is challenging because containers are ephemeral, requiring external storage and coordination to ensure data persistence, consistency, and availability across dynamic environments. NDK simplifies and unifies the process of provisioning and operating applications by extending application-aware data services to Kubernetes. As a result, NDK reduces the operational risk for administrators, allowing a cloud operating model for developers while also providing a modern platform for the future.

## Nutanix Enterprise AI

NAI helps turn your IT team into an AI team, simplifying workflows so you can quickly find, deploy, manage, and test GenAI large language models (LLMs). NAI offers endpoint APIs for LLM providers, including NVIDIA NIM and Hugging Face, making it easy for organizations to deploy a wide range of GenAI models securely, on-premises or in the public cloud. NAI includes an intuitive user interface (UI), role-based access controls (RBAC), and the capability for untethered operations (dark site or air-gapped deployments) to simplify the operation, monitoring, and adaptation of LLMs with enterprise resiliency, Day 2 operations, and compliance.

NAI allows you to quickly adapt to the shifting GenAI landscape, maximizing opportunities for your organization to implement the latest improvements in AI models, Kubernetes architectures, and data center infrastructures. NAI can be deployed on any CNCF-certified Kubernetes environment, including NKP and Nutanix software partners (such as Rancher, OpenShift, and so on), bare metal, or hyperscaler container instances.

# HIGHRADIUS DESIGNS HYBRID MULTICLOUD ROAD MAP WITH NUTANIX

HighRadius is the leading provider of AI-powered order-to-cash and treasury platform solutions for more than 200 Fortune 1000 brands. The company is building a hybrid multicloud architecture. It has partnered with Nutanix to realize its vision of being able to run all its apps and data on any cloud with seamless portability and to accelerate innovation for its customers. With Nutanix, HighRadius improved time to market, slashed recurring cloud costs by 30 percent, created efficiencies for database administrators, and saved resources that could be directed to more value-added areas.

Key benefits:

- Drove the hybrid multicloud strategy, avoiding dependency on a single hyperscaler.
- Reduced recurring cloud costs by 30 percent.
- Faster time to market due to provisioning efficiency.

Read the full customer success story at `www.nutanix.com/company/customers/high-radius`.

IN THIS CHAPTER

- Understanding multicloud challenges
- Addressing multicloud challenges with a hybrid multicloud platform from Nutanix

# Chapter 4
# Hybrid Multicloud Is the Future of IT

Explosive application growth is redefining the modern enterprise and putting extreme pressure on IT organizations. To meet business needs in the face of tremendous growth, many IT organizations recognize the benefits of integrating public cloud resources into their infrastructure strategy, creating a hybrid multicloud environment in which some workloads run in the public cloud and others run on-premises in private data centers and private clouds, depending on the unique requirements — performance, cost, control, data sovereignty, and so on — of each workload.

These are challenging waters to navigate. Simply having operations in multiple clouds is not the same as having a true hybrid multicloud environment. With multiple clouds, applications can quickly become siloed, leaving you unable to deliver the flexibility or portability that dynamic business operations require. A true hybrid multicloud environment allows you to manage multiple environments — including on-premises data centers and the edge — as if they were one, with the same tools and skill sets employed everywhere.

In this chapter, you learn about the challenges of hybrid multicloud and how Nutanix helps enterprises address these challenges.

# Recognizing Hybrid Multicloud Challenges

The *7th Annual Nutanix Enterprise Cloud Index* (`www.nutanix.com/enterprise-cloud-index`) shows that a large percentage of organizations are embracing a hybrid multicloud operating model encompassing data centers, public clouds, service providers, software as a service (SaaS), branch, and edge. Within one to three years, hybrid multicloud is forecast to become the most prevalent operating model (see Figure 4-1).

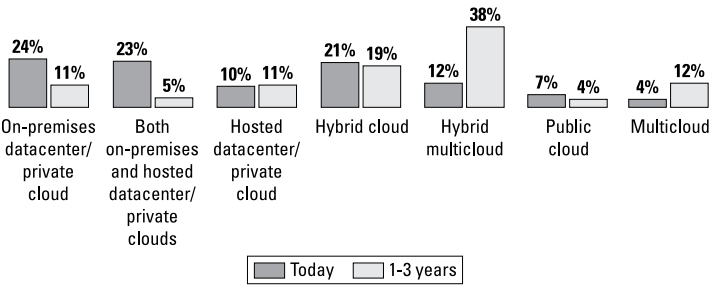



**FIGURE 4-1:** Hybrid multicloud adoption is expected to triple and become the most prevalent operating model in the next one to three years.

However, rapidly expanding the use of different operating environments (data centers, public clouds, edge) without proper planning can lead to a chaotic multiple-cloud environment in which multiple on-premises and cloud locations are siloed, with limited interoperability and no ability to cohesively monitor and manage the entire ecosystem.

WARNING

*Hybrid multicloud* and *multiple cloud* are not the same thing. A hybrid multicloud provides interoperability and seamless management across on-premises, public cloud, and edge environments. A multiple-cloud environment, by contrast, can create many challenges, including the following:

- **Siloed environments and complex management:** Time and specialized expertise are necessary to manage each

environment, and every new environment — whether it's a new public cloud, an edge deployment, or a service provider — adds more complexity.

- **Lack of portability:** In a perfect world, you'd move your apps and data wherever they make the most business sense, with no friction. But the reality is, without a hybrid multicloud platform, every time you move an app to a new location, you have to think about whether it will need to be re-platformed or refactored — a time-consuming process for each app — and whether it will deliver the same performance. Every time you move data or configure a new data service, you have to think carefully about whether it will deliver equivalent performance, data protection, and security, and whether you'll have the data management capabilities you need, such as snapshots and clones.
- **Risk of configuration errors and exposures:** With different tools and controls across your deployment environments, the likelihood of configuration errors increases. Such errors, in turn, increase the risk that systems will be breached, critical data will be exposed, and operations will be threatened.

## Ensuring Hybrid Multicloud Success with Nutanix

Expanding to a multiple-cloud environment creates as many challenges as it solves, including the need to manage complex networking, re-architecting applications, managing multiple infrastructure tools for various clouds, security, and more. That's why organizations need a true hybrid multicloud platform that enables seamless workload portability, unified management, consistent security policies, and optimized performance across all environments without adding operational complexity.

TIP

Nutanix Cloud Platform (NCP; `www.nutanix.com/library/datasheets/nutanix-cloud-platform`) is a true hybrid multicloud platform that delivers the flexibility, simplicity, and efficiency needed to run applications across private clouds, one or more multiple public clouds, service providers and colocation data centers, and the edge (see Figure 4-2).

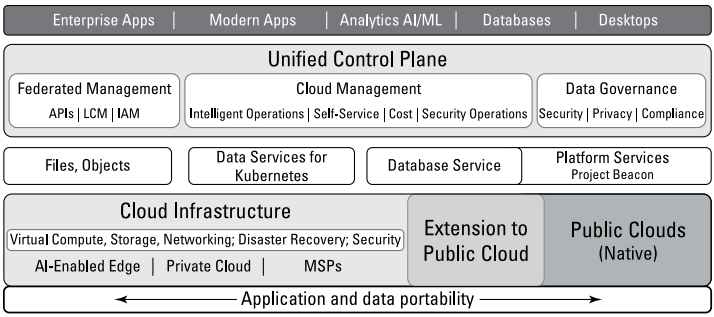



**FIGURE 4-2:** NCP is one platform for hybrid multicloud.

Nutanix extends the simplicity and ease of use of Nutanix hyperconverged infrastructure (HCI) software, as well as the full Nutanix stack, to public clouds. Using the same platform on private and public clouds, Nutanix dramatically reduces the operational complexity of migrating, extending or bursting your applications and data between clouds. Nutanix allows operators to use a single management plane to truly manage both their private and public cloud infrastructure, managed and operated as a single operating environment.

Key components of NCP for hybrid multicloud management include Nutanix Cloud Clusters (NC2), Nutanix Prism, and Nutanix Cloud Manager (NCM).

## Nutanix Cloud Clusters

NC2 delivers a common user interface (UI), operations, and automation for virtual machines (VMs) and containers, along with unified networking and security, across all cloud environments. This approach enables IT operators to leverage their skills regardless of infrastructure location.

As an extension of NCP, NC2 replicates the core Nutanix hyperconverged infrastructure (HCI) software, Nutanix Cloud Infrastructure (NCI), in a public cloud hyperscale environment. This means users benefit from the same operational efficiencies, resiliency, and security advantages in private and public clouds.

With NC2, NCP users can seamlessly move virtualized applications to the public cloud of their choice without retooling, code changes, or new skill sets. It's a simple way to take advantage of

the strengths of private and public clouds for optimum treatment of each application.

Furthermore, NC2 is natively integrated with leading public cloud hyperscale services. The differences and complexities of these platforms are obfuscated from IT operators by an abstraction layer. This layer makes viewing and managing a mix of Nutanix public and private clouds appear as a single, unified cloud, while giving IT administrators control over where applications are deployed.

## Nutanix Prism

Nutanix Prism provides central access to configure, monitor, and manage hybrid multicloud environments. Key capabilities and features include the following:

- **Single, unified view:** One pane of glass to manage and monitor compute, storage, and network infrastructure with a few clicks, both on-premises and in public clouds.
- **Secure and reliable multi-cluster management:** A highly available, scalable, and secure management plane for your VMs, storage, and networks across multiple clusters.
- **Enterprise-grade platform services:** Robust platform as a service (PaaS) featuring enhanced role-based access control (RBAC) that defines and enforces granular permissions across your hybrid multicloud environment, with Nutanix v4 application programming interfaces (APIs) that provide a comprehensive and consistent set of APIs for operating NCP, and backup and restore options to safeguard your entire environment.

## Nutanix Cloud Manager

NCM is a multicloud infrastructure as a service (IaaS) framework that creates a self-service portal for consumption of IT resources. NCM provides intelligent operations, self-service, cost governance, and security natively with NCP or through a SaaS subscription. It also provides application automation to provision complex services and lifecycle management with Day 2 operations. With NCM, system administrators and architects can define VMs and applications via simple automation blueprints and control all

aspects of the application lifecycle, such as provisioning, scaling, and cleanup. An automation blueprint can be easily published to end users through the Nutanix Marketplace, instantly transforming a complex provisioning ticket into a simple one-click request.

## APOLLO PHARMACY ADOPTS HYBRID CLOUD FOR SUPPLY CHAIN TRANSFORMATION

Apollo Pharmacy, Asia's largest pharmacy retailer, migrated most of its critical backend systems and ancillary applications to Nutanix on-premises to support a hybrid cloud strategy and free up resources for next-gen applications.

Apollo Pharmacy is switching to a hybrid multicloud strategy. The company moved its Microsoft Dynamics enterprise resource planning (ERP) system to an on-premises NCP solution while continuing to run other workloads in the public cloud. It also launched proof-of-concepts (POCs) for solutions like the NC2 and Nutanix GPT-in-a-Box.

After migrating Microsoft Dynamics to NCP, Apollo Pharmacy saw an improvement in performance speed by 1.7 times. This means that Apollo Pharmacy can now deliver customer service faster and provide more convenient services to its customers. The company has seen savings of up to 40 percent to 50 percent in total cost of ownership. Resources freed up were redirected to drive further innovations.

Key benefits:

- Increased performance of business-critical apps
- Launched hybrid cloud strategy
- Freed up resources for other critical initiatives

Read the full customer success story at `www.nutanix.com/company/customers/apollo-hospitals#`.

IN THIS CHAPTER

- Enabling a consistent cloud operating model with license and app portability in a unified platform
- Leveraging an open and complete cloud-native platform with a robust ecosystem
- Supporting enterprise AI workloads and applications

# Chapter 5
# Ten Reasons Why Nutanix Is the Right Solution for Your Next-Gen IT Environment

Executing a future-ready IT strategy can be complex — Nutanix makes it easier. Here are ten reasons to trust Nutanix as your partner for today and tomorrow:

- **Simplifying infrastructure management:** The Nutanix Cloud Platform (NCP) streamlines complex infrastructure tasks, freeing IT and app teams to focus on innovation rather than troubleshooting.
- **Unifying hybrid multicloud operations:** NCP enables seamless management of on-premises, public/private cloud, and edge environments through a single interface.
- **Delivering a unified platform for virtualized and containerized workloads:** Deploy, manage, and scale virtualized and containerized apps across your hybrid multicloud with one unified platform.

- **Enabling license portability:** By enabling license portability, Nutanix makes it possible to license software across distributed deployments so you can move apps and data across your hybrid multicloud environment as performance, cost, and data sovereignty priorities change.
- **Removing the need to refactor apps:** NCP provides a unified platform between the data center and the cloud, helping you move apps faster by eliminating the need for workload refactoring. Developers can easily move applications across your hybrid multicloud environment.
- **Using an open and complete cloud-native platform:** With NCP, you can run Kubernetes anywhere — in the cloud, on bare metal, or on third-party virtualization platforms. NCP provides comprehensive services across all Kubernetes platforms, including observability, disaster recovery, cost management, server management, and integration with the best open-source developer tools. This ensures true application portability across a distributed infrastructure landscape and consistent operations for platform engineering teams.
- **Delivering proven customer satisfaction:** Nutanix is committed to building long-term customer loyalty by delivering superior customer service and support. Over the past decade, Nutanix has averaged 90+ on the Net Promoter Score (NPS) index.
- **Leveraging a robust ecosystem:** Nutanix offers more than 1,100 validated solutions from hundreds of partners for long-term growth, stability, and trust.
- **Offering enterprise data services:** NCP offers data management with persistent storage with block, file, and object storage, as well as databases management for both virtualized and containerized apps. It also provides advanced data services, such as snapshots, replication, and disaster recovery for containers and virtual machines (VMs) across hybrid multicloud deployments.
- **Creating a simple and secure artificial intelligence (AI) platform:** NCP provides a secure, full-stack enterprise AI platform built on web-scale data services, making it possible to deploy your large language models (LLMs), machine learning operations (MLOps), and generative AI (GenAI) apps on-premises or in the cloud, while maintaining complete control over your data and infrastructure.

NUTANIX

# Optimizing Your IT Costs

**If you're currently a legacy 3-tier customer, adopting the Nutanix platform can help you:**

- Reduce your risk.
- Increase agility.
- Reduce the cost of virtualization.
- Migrate at your own pace.

This white paper provides side-by-side comparisons of legacy 3-tier vs. Nutanix HCI in three scenarios, a breakdown of cost savings, and configuration and deployment options. It also includes projected TCO and ROI results.

You'll learn how we address a variety of deployment sizes and needs and how the Nutanix platform can offer estimated TCO reductions ranging from 33% to 65%.

Learn more at
www.nutanix.com/go/optimizing-your-it-costs

## Upgrade your datacenter for modern apps

The public cloud continues to be an important part of practically every enterprise strategy, but IT leaders are reimagining their technology stacks and modernizing their datacenters to take advantage of new opportunities. Many organizations are now adopting a hybrid multicloud model, extending the benefits of the public cloud to their on-premises datacenters and the edge. Next-generation IT requires a hybrid multicloud platform built on hyperconverged infrastructure (HCI) to support the rapidly evolving business landscape of the future.

## Inside...

- Modernize your enterprise datacenter
- Support cloud-native and containerized apps
- Implement a hybrid multicloud strategy
- Accelerate IT transformation with Nutanix
- Address AI infrastructure requirements

NUTANIX

**Lawrence Miller** served as a Chief Petty Officer in the U.S. Navy and has worked in information technology in various industries for more than 25 years. He is the co-author of *CISSP For Dummies* and has written more than 250 *For Dummies* books on numerous technology and security topics.

Cover image: © Connect world/stock.adobe.com



ISBN: 978-1-394-32936-6
Not For Resale


for dummies®
A Wiley Brand

# WILEY END USER LICENSE AGREEMENT

Go to www.wiley.com/go/eula to access Wiley’s ebook EULA.