White Paper

Maximizing the Full Value of VMware Cloud Foundation

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IDC OPINION

Cloud computing has become the dominant paradigm for application development, deployment, and security. Consequently, organizations across various sectors are actively modernizing their IT infrastructures to leverage the benefits of cloud-native design principles. While public cloud adoption remains significant, a resurgence of interest in private cloud platforms and hybrid architectures is evident.

This renewed focus on private cloud solutions is partially a result of the increasing importance of artificial intelligence (AI) and the three associated concerns around its implementation: cost, complexity, and compliance. Organizations are seeking private AI solutions to gain enhanced control over applications and data, ensuring compliance with evolving regulatory requirements and internal governance policies. This approach allows for greater data security, privacy, and sovereignty, which are often critical considerations for sensitive workloads.

In today's rapidly evolving technological and business landscape, the ability to maintain consistency across diverse deployment environments is essential. Therefore, selecting platforms that seamlessly support both virtual machine (VM) and container-based applications, regardless of their deployment location (public cloud, private cloud, or edge), is crucial. This platform consistency simplifies management, reduces operational overhead, and enables greater application portability.

A comprehensive and strategic implementation plan is necessary to maximize the value of a private cloud platform. This plan should encompass the full range of platform features and capabilities, ensuring alignment with business objectives and technical requirements. A well-defined strategy will facilitate efficient resource utilization, optimize performance, and drive innovation within the organization. By adopting a strategic approach to private cloud implementation, organizations can effectively address the challenges of modern IT infrastructures and position themselves for future growth and success.

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IN THIS WHITE PAPER

This White Paper outlines the compelling reasons for organizations to adopt and embrace VMware Cloud Foundation (VCF) as their strategic private cloud platform. Broadcom has delivered significant enhancements and innovations to the platform as a way to establish a clear pathway to nondisruptively import existing vSphere environments ("brownfield" deployments) to a full VCF stack.

Recognizing that complete adoption may require a phased approach, this paper suggests that customers follow step-by-step pathways to incrementally deploy individual VCF components. This phased implementation strategy should help in achieving three key business outcomes:

- **Infrastructure modernization** to assist transitioning to a modern, software-defined infrastructure that offers enhanced agility, scalability, and efficiency
- **Unified cloud experience** to provide a cloudlike experience for developers, empowering them with self-service capabilities for faster delivery of applications bringing the cloud operating model to on-premises, private AI infrastructure
- **Secure and resilient platform** for implementing preventative security controls and ensuring compliance with relevant regulatory requirements (Cyber- and disaster recovery features help restore operations faster.)

For each of these three key outcomes, best practices dictate a four-step implementation process. Each step is designed to deliver incremental value to the customer, with a clear focus on the following aspects:

- **Business outcome:** The tangible business benefits achieved by implementing the step
- **Economic benefit:** The financial advantages, such as cost savings or increased revenue generation
- **Deployment complexity:** An assessment of the implementation effort required
- **Key features:** The specific VCF features needed to realize the desired outcomes of agility, efficiency, and cost savings

The migration path is highly customizable, allowing organizations to tailor the implementation to their unique needs and priorities. By adopting a phased approach and focusing on clear business outcomes, organizations can effectively leverage VCF to achieve their private cloud objectives and drive improved business value.

SITUATION OVERVIEW

Digital infrastructures provide mission-critical underpinnings for agile digital business, including emerging workloads and use cases powered by high-performance, data-intensive AI technologies and automated DevOps and data science tools chains.

Architecting, implementing, operating, and continually refreshing digital infrastructure computing, storage, networking, edge, and cloud capabilities require IT leaders to partner with line-of-business (LOB), DevOps, and data science teams to anticipate ways in which infrastructure technologies and cloud infrastructure services will evolve and disrupt the status quo — and then proactively harness those technologies to gain a business advantage.

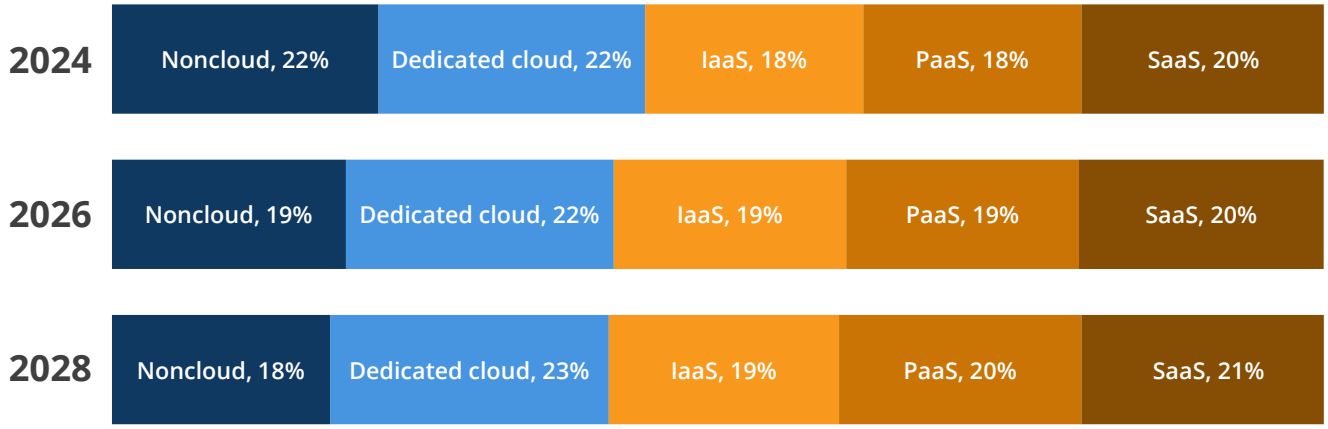
Private clouds play a crucial role in a comprehensive workload placement strategy by offering a controlled and secure environment for specific application and data requirements. A portfolio approach strategically distributes workloads across various deployment models (public cloud, private cloud, and edge), allowing private clouds to address the critical needs for data sovereignty, regulatory compliance, performance predictability, and cost optimization.

By incorporating private clouds into a broader workload placement strategy, organizations can ensure that workloads reside in the most appropriate environment. The results of IDC's *Cloud Pulse Survey* show that organizations already include private clouds as part of their infrastructure strategies and plan to continue using them (see Figure 1).

FIGURE 1

Diversity in Workload Placement

Q. What percentage of applications are deployed in the following locations?



n = 1,724

Source: IDC's *Cloud Pulse Survey,* October 2024

IDC defines the private cloud as a cloud infrastructure that operates solely for a single organization. This infrastructure may be on premises within the organization's datacenter or a third-party provider may host it. Key characteristics of a private cloud include self-service access, elasticity, resource pooling, automation, and fleet-level management. These elements mirror the core attributes of public cloud environments but are within a dedicated and controlled setting.

Several key drivers contribute to the adoption of private cloud solutions:

- **Complexity:** Private clouds offer greater control over complex IT environments, enabling organizations to tailor their infrastructure to specific application requirements and manage intricate interdependencies.
- **Compliance:** For organizations operating in highly regulated industries, private clouds provide enhanced control over data security, governance, and compliance with industry-specific regulations and data sovereignty requirements.
- **Cost:** While the initial investment may be a factor, private clouds can offer long-term cost advantages for specific workloads, particularly those with predictable resource utilization or stringent performance requirements. They can also mitigate the unpredictable public cloud costs associated with fluctuating demand.

A notable trend in infrastructure modernization is the repatriation of workloads from public cloud environments. IDC research indicates that approximately 80% of organizations plan to repatriate some computing and storage resources from the public cloud within the next 12 months (source: IDC's *Server and Storage Workloads Survey,* 2024).

The increasing adoption of AI is significantly influencing private cloud deployments. The emergence of private AI solutions (deployed within private cloud environments) addresses concerns related to data privacy, security, and compliance associated with sensitive AI workloads. By leveraging private cloud infrastructures, organizations can maintain control over their AI models, training data, and inference processes, mitigating risks and ensuring adherence to regulatory requirements. This trend reinforces the strategic importance of the private cloud as a key enabler for secure and controlled AI adoption.

VMWARE CLOUD FOUNDATION

VCF is a full-stack, private cloud platform that supports digital transformation initiatives by enabling organizations to accelerate developer productivity. VCF embraces cloud-native and AI technologies to deliver apps and services to the market faster.

Offering a consistent infrastructure layer and user experience for private cloud deployments, VCF streamlines resource management, accelerates innovation, and improves operational efficiency by reducing organizational silos.

The platform is designed to address three key areas:

- **Modern infrastructure:** VCF plays a crucial role in transforming traditional IT infrastructures into more agile and adaptable private cloud environments. This transformation is key to enabling organizations to deploy core private cloud use cases that deliver strategic outcomes, lower the total cost of ownership, and increase productivity. VCF provides organizations with a uniform, software-defined infrastructure layer that results in a consistent and extendable cloud operating model across cloud endpoints. Automation and orchestration standardize and simplify the entire infrastructure life cycle, including day 0 deployment, day 1 provisioning, and day 2 operations (i.e., patches, updates, compliance, troubleshooting, diagnostics, and logging).
- **Unified cloud experience:** To keep continuous development pipelines running at peak efficiencies for modern workloads and private AI, ensuring that developers have frictionless, self-service access to application code, infrastructure services, runtime environments, system tools, libraries, and registries is critical. VCF includes an embedded, upstream-compliant Kubernetes

runtime via vSphere Kubernetes Service (VKS); a cloud consumption interface; and a set of infrastructure and automation services, including infrastructure as code, software configuration management, and infrastructure pipelines.

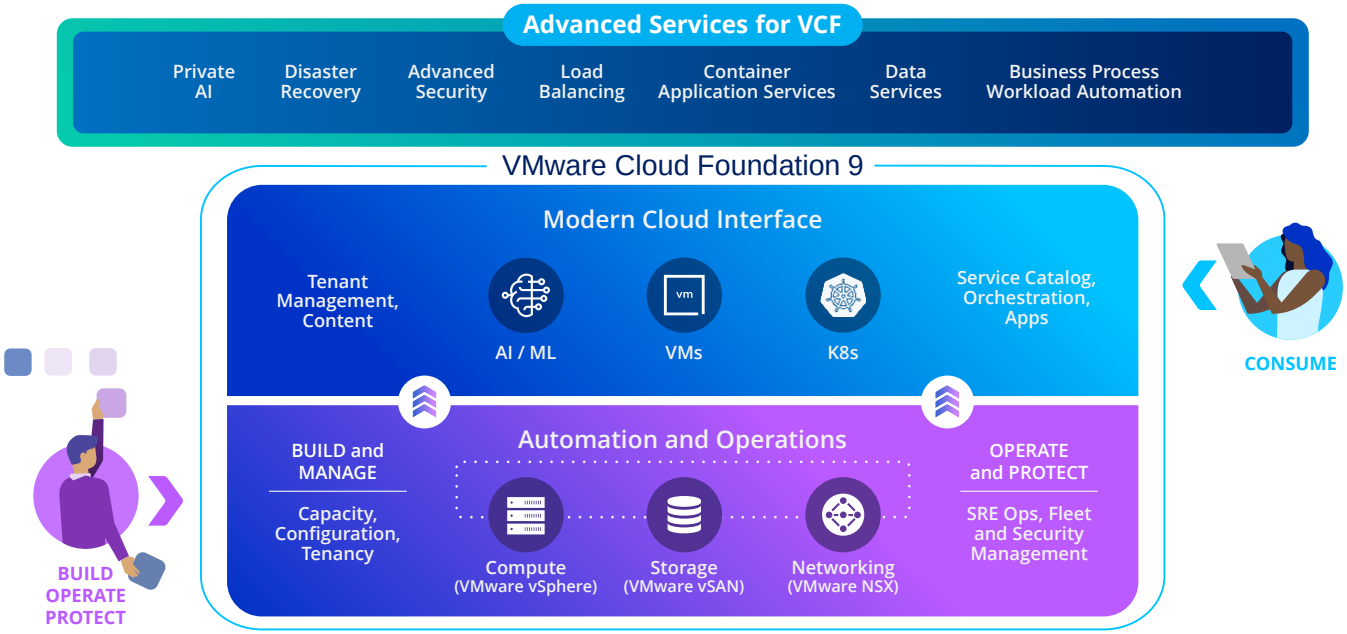
- **Secure and resilient platform:** VCF provides a consistent, secure platform that can extend the security architecture with intrusion detection and recovery, addressing key challenges such as ransomware threats, disaster scenarios, and advanced security architecture. VCF's security features address prevention and compliance leading to faster recovery.

VCF contains the following components and advanced services (see Figure 2):

- **vSphere:** Enterprise workload offering with developer-ready infrastructure
- **vSAN:** Enterprise-class storage virtualization software
- **NSX:** Full-stack network virtualization
- **VCF Operations:** IT operations, logging, and diagnostics management
- **VCF Automation:** Self-service cloud consumption experience

FIGURE 2

VMware Private Cloud Platform



Source: VMware, 2025

In addition, the following advanced services are available as an add-on to VCF:

- **Data Service Manager:** Enterprise-hardened database services

- **VMware Private AI Foundation with NVIDIA:** AI-ready platform
- **VMware vDefend Distributed Firewall:** Software-defined, network topology-agnostic L7 firewall to limit lateral spread of threats and enforce zero trust micro-segmentation
- **VMware Avi Load Balancer**: Software-defined load balancer
- **VMware Live Recovery:** Cyber- and data resiliency
- **VMware Tanzu Platform:** Cloud-native application platform

VCF delivers a compelling value proposition by bringing the agility and efficiency of the public cloud experience to on-premises environments. This convergence offers significant advantages in terms of cost optimization, operational efficiency, and reduced downtime.

IDC has quantified the business value derived from VCF deployments. Key findings from *The Business Value of VMware Cloud Foundation for Broadcom's VMware Cloud Service Provider Partners* (IDC #EUR252524224, August 2024) highlight the following benefits:

- **Reduced infrastructure costs:** Organizations deploying VCF have realized a 34% reduction in infrastructure costs. This substantial saving is attributed to optimized resource utilization, streamlined procurement, and reduced hardware footprint.
- **Lower operational expenses:** Over a three-year period, VCF deployments have resulted in a 42% decrease in the total cost of operations. This reduction stems from simplified management, automation of key tasks, and improved resource allocation.
- **Minimized unplanned downtime:** VCF's robust architecture and automated recovery capabilities have led to a 98% reduction in unplanned downtime. This enhanced availability ensures business continuity and minimizes disruptions to critical operations.
- **Accelerated VM deployment:** VCF significantly accelerates the deployment of new VMs, achieving a 61% improvement in deployment speed. This rapid provisioning quickens the time to market for new applications and services.
- **Increased infrastructure team efficiency:** VCF's integrated management and automation capabilities have resulted in a 53% improvement in infrastructure team efficiencies. This allows IT staff to focus on strategic initiatives rather than routine operational tasks.

These quantifiable benefits underscore the value proposition of VCF, enabling organizations to achieve substantial cost savings, improve operational efficiency, and enhance business agility.

TRANSFORMING TRADITIONAL DATACENTERS WITH VCF

Transitioning from a traditional vSphere licensing model to a VCF subscription unlocks a significant expansion of available functionality, providing customers with access to a comprehensive suite of advanced capabilities. This upgrade is not merely a change in licensing; it represents a strategic shift toward a fully integrated private cloud platform.

By adopting a VCF subscription, customers can deploy a broad spectrum of new features and services that extend far beyond the core virtualization capabilities vSphere offers. This expanded functionality encompasses software-defined computing, storage, and networking, as well as advanced automation, life-cycle management, and security features.

PATHWAYS TO DEPLOY VCF

Modernize Infrastructure

This section outlines the key steps required to achieve operational excellence through infrastructure modernization by leveraging the capabilities of VCF. These steps are designed to streamline operations, enhance visibility, and empower users with a self-service experience:

- **Fleet-level management:** Implementing centralized management across the entire infrastructure fleet ensures consistency, enforces standards, and simplifies administration, enabling efficient control and oversight of all resources. Automating the complete life-cycle management of the software-defined datacenter (SDDC) through VCF encompasses deployment, patching, upgrades, and configuration, significantly reducing manual effort and minimizing operational overhead. Enhancing operational efficiency and gaining comprehensive visibility into the infrastructure through VCF Operations is a low-effort, high-benefit method of providing real-time insights into performance, capacity, and health, enabling proactive management and optimization.
- **Self-service unified platform:** Providing users with self-service capabilities on a unified platform empowers them to provision and manage resources independently, fostering agility and responsiveness to business needs. Replicating the user experience of public cloud environments through VCF Automation includes automated provisioning, orchestration, and management of resources, creating a seamless and efficient experience (a common requirement of modern IT organizations to support a combination of VM, container, and private AI workloads).

- **Scale storage savings:** Optimizing storage utilization achieves significant cost savings through efficient storage management practices and advanced storage technologies. Efficient resource utilization, automation, and advanced storage features help reduce the overall cost of ownership of storage infrastructure while simultaneously improving performance and agility. Incorporating relevant features of vSAN, VMware's software-defined storage solution, enhances storage performance, availability, and management. vSAN serves the needs of new customers by allowing a phased deployment approach, while existing customers can expand to variety of use cases including primary storage, cybervault storage and disaster recovery storage.
- **Adoption of virtual networks:** NSX within VCF abstracts network services from physical hardware, allowing organizations to architect entire virtual networks comprising switches, routers, firewalls, and load balancers as distributed virtual appliances. This abstraction frees businesses from the constraints of hardware-centric networking, fostering agility, security, and operational efficiency within their IT environments. NSX enhances network automation by providing complete automated provisioning of virtual routers, switches, load balancers, firewalls, virtual networks, subnets, and many other network services. This comprehensive approach reduces manual configuration overhead, accelerates network infrastructure deployment, and empowers organizations to achieve greater agility, efficiency, and scalability.

Cloud Experience for Developers

This section outlines the key steps to empower developers and enhance agility through a cloud-native experience within a private cloud environment. These steps focus on providing a unified platform, accelerating development cycles, and enabling secure deployments:

- **One platform for all workloads:** A top priority for organizations is establishing a single, unified platform for all workloads that streamlines development and operations, simplifying management and promoting consistency across different application types. This unified approach drives efficiency, cost savings, and enhanced agility by optimizing resource utilization and reducing operational complexity. By leveraging the relevant features of VKS and providing support for OpenShift, developers gain container orchestration capabilities, enabling them to build and deploy modern, cloud-native applications efficiently.
- **Accelerating developer productivity:** Integrated VCF services accelerate the time from development to production by streamlining the deployment pipeline and automating key processes. Implementing faster and more secure deployments enhances the overall development life cycle, reducing risk and improving time to market. The relevant features of the Tanzu Application

Platform provide a comprehensive suite of tools and services for building, deploying, and managing modern applications, further accelerating development cycles.

- **Deploy private AI:** Enabling the deployment of private AI projects within the private cloud environment addresses data security and compliance concerns associated with sensitive AI workloads. Utilizing a private AI foundation for NVIDIA provides optimized infrastructure and software for deploying and managing AI workloads on NVIDIA hardware, further enhancing performance and efficiency. This empowers enterprises with secure, cost-effective, and high-performance AI. It simplifies deployment, ensures compliance, and delivers optimized performance across various LLMs, leveraging VCF and NVIDIA AI Enterprise.

Security and Resilience

This section outlines the key steps to achieve advanced protection against cyberthreats and ensure robust recovery capabilities within a private cloud environment. These steps focus on maintaining a secure posture, preventing lateral movement of threats, ensuring cyber-resilience, and enforcing compliance:

- **Fleet-level patching:** Maintaining up-to-date patches across the entire infrastructure fleet is crucial for mitigating known vulnerabilities and maintaining a strong security posture. Implementing automated patch and upgrade management by leveraging VCF can streamline this process, ensuring consistent and timely updates across all systems.
- **Containing cyberthreats:** Preventing lateral movement of cyberthreats is achieved through advanced security measures, such as vDefend and Distributed Firewall capabilities, which isolate workloads and limit the spread of attacks.
- **Enhancing cyber-resilience:** Ensuring cyber-resilience through robust backup and recovery mechanisms enables organizations to quickly recover from disruptions and maintain business continuity. Incorporating relevant features of VMware Live Recovery enables rapid failover and failback of critical workloads, facilitating faster and more confident recovery.
- **Enforcing compliance:** Enforcing compliance with relevant regulatory requirements and industry best practices is a critical aspect of security and resilience. Increasing operational efficiency and visibility through VCF Operations provides comprehensive monitoring and reporting capabilities, enabling proactive identification and mitigation of potential security risks.

PROGRAMS TO ACCELERATE VCF DEPLOYMENTS

VMware offers a suite of programs designed to facilitate rapid and effective customer deployments of VCF. These programs provide valuable resources, guidance, and community engagement opportunities to accelerate the adoption and implementation process, including:

- **Private Cloud Maturity Model:** This framework provides a structured approach for organizations to assess their current private cloud capabilities and identify areas for improvement. It offers a road map for progressing through various stages of maturity, enabling a strategic and phased approach to maximize the benefits of VCF.
- **Learning and certification:** VMware offers comprehensive training and certification programs designed to equip IT professionals with the necessary skills and expertise to effectively deploy, manage, and operate VCF environments. These programs provide organizations with the in-house knowledge required for successful implementations.
- **VMware User Group (VMUG):** The VMUG provides a vibrant community forum and local events for VMware users to connect, share best practices, and learn from each other's experiences. This peer-to-peer network of IT practitioners offers valuable insights and support for organizations embarking on VCF deployments.
- **Experience days and workshops:** These interactive events offer hands-on opportunities to explore VCF technologies and engage with VMware experts. These sessions provide practical experience and guidance, accelerating the learning curve and enabling organizations to quickly gain proficiency with VCF.

These programs collectively provide a comprehensive ecosystem of support, enabling organizations to deploy VCF efficiently and effectively and realize its full potential.

CHALLENGES/OPPORTUNITIES

Organizational approaches to private cloud adoption are diverse and nuanced, with no single, universally applicable strategy. The optimal path to cloud adoption is contingent upon the outcomes an organization seeks to achieve. A careful and considered approach is essential to ensure alignment between the organization's chosen deployment strategies and desired business objectives.

Limiting the deployment to only portions of the VCF stack will inherently constrain the potential benefits and return on investment. To fully realize the transformative power of VCF and maximize the value of existing software subscriptions, organizations should prioritize a comprehensive uplift of their existing vSphere and other traditional IT

infrastructures into a fully realized private cloud environment powered by VCF. This holistic approach unlocks the full suite of VCF capabilities, enabling organizations to achieve greater agility, efficiency, and cost optimization compared with partial deployments.

CONCLUSION

As organizations increasingly adopt cloud-native technologies and AI, private cloud and hybrid architectures emerge as strategic solutions. Private cloud offers greater control over data, ensuring compliance and security, especially for sensitive workloads.

Platforms supporting both VMs and containers improve efficiency and agility by providing consistent operations, leading to lower TCO. A strategic implementation plan aligns private cloud with business objectives, prioritizes workloads, ensures security and compliance, optimizes costs, and addresses performance and scalability needs.

VMware Cloud Foundation addresses the needs of a private cloud platform with enhanced features that facilitate nondisruptive upgrades from existing vSphere environments. A phased approach to implementation makes it possible to achieve three key outcomes: infrastructure modernization, enhanced developer experience, and strengthened security and compliance. Embracing the full VCF stack is essential to maximize the value of software investments and achieve true private cloud transformation.

ABOUT IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. With more than 1,300 analysts worldwide, IDC offers global, regional, and local expertise on technology, IT benchmarking and sourcing, and industry opportunities and trends in over 110 countries. IDC's analysis and insight helps IT professionals, business executives, and the investment community to make fact-based technology decisions and to achieve their key business objectives. Founded in 1964, IDC is a wholly owned subsidiary of International Data Group (IDG, Inc.).

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