VMware Cloud Foundation and VMware Tanzu

A Premier Private Cloud Solution for Cloud Native App Development and Delivery

"We are transitioning all our software to modern, containerized apps. With VMware, we have progressed quickly on that journey, and transforming our software has helped us become a more agile business moving in the direction consumers want."

- Vishwas Chitale, CEO and CTO, Chitale Dairy

In today's innovative technology landscape, delivering modern cloud native applications is at the core of almost every business. To deliver these modern applications, infrastructure and platform teams are constantly in search of a robust infrastructure that provides the scalability, flexibility and innovation of public cloud and the security and performance of private cloud. They also need an application platform that supports an agile development methodology for cloud native applications so that they can bring innovation faster to the market.

Requirements for Deploying Cloud Native Apps

The infrastructure for cloud-native applications must be designed to meet the demands of platform engineering teams and application teams. Key requirements include **resiliency and high availability** for continuous business operations, **scalability and flexibility** to support changing business needs, **automation and orchestration** for consistent and repeatable deployments, **security and compliance** for protecting data and regulatory adherence, **observability and monitoring** for real-time insights into performance, as well as **multi-tenancy support** for efficient resource utilization. From application teams perspective, they need a **single, easy to operate platform for deploying traditional as well as modern apps** so that they can accelerate the deployment of cloud native applications **without escalating costs**. Together, they need a robust platform for developing, deploying, and managing cloud-native applications.

Key Challenges in Deploying Cloud Native Apps

Building and curating cloud native platforms and applications presents a unique set of challenges. Some of the key challenges are:

- **Skill Gaps:** Lack of experience and skills in areas like containerization, Kubernetes, and microservices architecture can pose significant hurdles. Also, traditional Infrastructure and Operations (I&O) staff struggle with identifying reusable digital capabilities for cloud-native platforms and managing complex requirements from multiple product teams.

"Enterprise Strategy Group validated that VMware Cloud Foundation helps organizations accelerate all phases of modernization. VMware Cloud Foundation's ability to accelerate the deployment of infrastructure resources enables faster provisioning of environments for development, testing, and production workloads, leading to quicker time to market for applications and services."

- Enterprise Strategy Group

- **Lack of Integration:** Integrating various cloud-native tools, services, and platforms into a cohesive infrastructure can be costly, complex and time consuming, especially when dealing with a mix of legacy monoliths and modern applications.
- **Operational Overhead:** Managing and maintaining cloud-native platforms at scale can introduce significant operational overhead. The need for continuous monitoring, updating, and optimization of resources can strain IT teams, especially if automation is not fully implemented.
- **Ever-increasing Costs:** With hidden costs in cloud-native architectures and lack of proper monitoring and governance, organizations can quickly encounter unexpected expenses due to over-provisioning, inefficient resource use, egress costs, data transfer costs or lack of visibility into cloud spending.
- **Inconsistent Infrastructure and Operations:** Ensuring consistent cloud-native services and management across diverse hybrid cloud environments also presents a significant challenge. Additionally, inconsistent management experience of cloud native Kubernetes platforms adds complexity after migrating existing applications to a new platform.

Solution Description

VMware Cloud Foundation and VMware Tanzu - Addressing challenges of Cloud Native Application Deployment

VMware Cloud Foundation and VMware Tanzu Platform help organizations accelerate delivery of their cloud native applications by simplifying and integrating the processes and tools used by developers and IT operations into a single solution, providing unmatched flexibility and deployment options. Depending upon the needs of the organization, customers can deploy VMware Cloud Foundation and leverage the integrated Kubernetes runtime and associated infrastructure services. For those customers with more advanced app requirements, they can deploy VMware Tanzu Platform as an advanced service running on top of VMware Cloud Foundation.

Let's look at some of the key features of VMware Cloud Foundation and VMware Tanzu Platform:

VMware Cloud Foundation:

VMware Cloud Foundation is a comprehensive private-cloud platform that combines the scale and agility of public cloud with the security and performance of private cloud, offering industry-leading TCO. Purpose built to modernize infrastructure and accelerate innovation, VMware Cloud Foundation delivers integrated, enterprise-class compute, networking, storage, management, and security across all endpoints such as private cloud, public cloud, partner clouds, sovereign clouds, edge, and co-location. By seamlessly integrating the infrastructure components into a single unified platform, it provides maximum visibility, allowing IT operations teams to optimize performance and costs constantly, and shift focus to outcomes rather than operations. VMware Cloud Foundation abstracts away the complexity of underlying infrastructure so that platform engineering teams can build and curate the application platform for application teams.

"While study participants attributed gains in effectiveness across their organizations to enhanced agility achieved with VMware Cloud Foundation, they noted development enablement as a core benefit. They explained that their development teams can perform far more effectively when the underlying infrastructure that they rely upon is readily available and maintains high performance. When this happens, developers can move faster to carry out the development, coding, testing, and deployment required to deliver new applications and software functionality to users and customers."[1]

- IDC Business Value Report

VMware Cloud Foundation addresses infrastructure challenges of cloud native application deployment by delivering key capabilities such as:

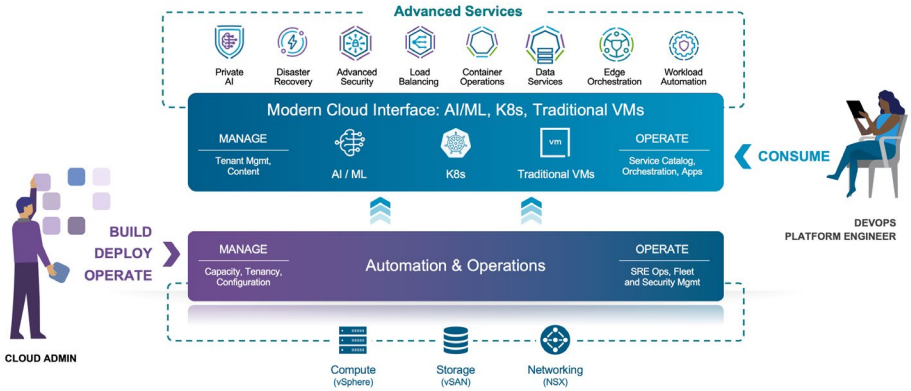

Figure 1: VMware Cloud Foundation

- **Consistent operations:** VMware Cloud Foundation provides consistent operations across all endpoints, which enables IT to reuse existing tools, skill-sets and processes and scale operations across the entire IT infrastructure landscape. It allows IT teams to have end to end visibility and operational control across all environments.
- **A single platform to run VMs and Containers:** VMware Cloud Foundation offers a single unified platform to run traditional VMs as well as containerized workloads. It provides a unified control plane that simplifies management and delivers a consistent experience so that platform engineering teams can seamlessly run traditional and modern applications side by side.
- **Natively Integrated Kubernetes Runtime:** The presence of vSphere Kubernetes Service (VKS) delivers native, CNCF(Cloud Native Computing Foundation)-compliant Kubernetes container orchestration directly into any VCF environment. The VKS container runtime in VCF ensures that the necessary building blocks for a cloud-native app platform are present and minimizes the integration complexity. The VKS service allows IT operators and developers to provision fully configured Kubernetes clusters quickly and efficiently, ensuring that these clusters are automatically integrated with the underlying VCF infrastructure for networking, storage, and security. This service supports the operational needs of modern applications by facilitating DevOps practices, continuous integration/continuous delivery (CI/CD) pipelines, and microservices architectures.
- **Faster delivery of latest Kubernetes versions:** With VKS as an independent service, VCF decouples Kubernetes releases from vCenter, enabling asynchronous updates aligned with upstream Kubernetes. This accelerates innovation for DevOps teams, allowing them to update VKS independently of the vSphere release cycle and use the latest vSphere Kubernetes Releases as soon as they become available.

1. IDC White Paper, sponsored by VMware by Broadcom, The Business Value of VMware Cloud Foundation, doc #US52312224, August 2024

Key Benefits: VMware Cloud Foundation and VMware Tanzu Platform

Transform your business with VMware Cloud Foundation and Tanzu Platform to achieve the following benefits:

- **Built for Platform Engineering:** The Tanzu Platform is optimized for VMware Cloud Foundation, enabling accelerated app delivery on private and hybrid clouds.
- **Maximize Value and Cost-Savings:** An embedded Kubernetes runtime in VCF offers significant cost savings by eliminating the need for customers to invest in a separate Kubernetes solution or runtime. Additionally, Tanzu Platform provides cloud native development and operations capabilities such as container management, enterprise app networking, local build environments, application middleware, secrets management, hardened OSS images, data and more, eliminating costly investments in DIY app platform solutions.
- **Developers' Choice:** Known for its simplicity, VCF and Tanzu Platform offer businesses a powerful set of tools, allowing them to develop, operate and optimize apps efficiently and effectively. With consistent infrastructure and operations, customers can seamlessly migrate existing applications with minimal risk across the hybrid cloud environment. Also, VMware Tanzu Platform supports repaving cloud native workloads across their hybrid cloud estate thus allowing easy migration of containerized workloads from existing platforms to Tanzu Platform and VCF.
- **Simplified API-driven lifecycle and package management for Kubernetes clusters:** With standard Kubernetes commands and APIs, VMware Cloud Foundation enables customers to provision, self-deploy and scale Kubernetes clusters within a few minutes using a simple, fast, and self-service experience. It further simplifies VKS cluster lifecycle and package management with API-driven Cluster Classes and Carvel and thus minimizes IT operational overhead.
- **Resilient and Secure Platform:** VMware Cloud Foundation delivers available comprehensive security with features such as advanced threat detection, micro-segmentation policies, real-time observability and detailed visibility into network traffic and user behavior. It also provides highly available and reliable infrastructure with robust capabilities for rapid recovery of applications and data after a disaster or ransomware attack.
- **Effective Cost management:** VMware Cloud Foundation delivers maximized system utilization, and increased cost controls through deep performance insights to predict, prevent and troubleshoot infrastructure systems. With the out-of-the-box vSphere Kubernetes Service, it enables customers to run containerized workloads without incurring extra costs.
- **Automated Infrastructure as a Service:** VCF delivers necessary infrastructure components for platform engineering to help them build and curate the application platform for developers. Using robust self-service access facilitated by rich APIs, CLIs and service catalog, it empowers platform teams with Infrastructure as Code as well.

VMware Tanzu Platform

VMware Tanzu builds on VMware Cloud Foundation with a cloud native application and data platform that helps organizations accelerate their software delivery at scale. VMware Tanzu Platform enables application teams to develop new apps with an intuitive, logical and consistent framework for rapid code deployment, using simple, declarative operations: build, bind, deploy, and scale. This makes it possible to develop applications more quickly, with built-in and integrated functions and data services that facilitate rapid application development.

Governance, consistency, and standardization are priorities for platform engineering and operations teams. To be successful, each operational stakeholder should be able to define application attributes in advance to meet requirements prior to deploying and scaling an application. Application teams should be able to deploy to an application space without navigating ticket-based IT operations. Tanzu Platform brings a dynamic, application-aware runtime with Application Spaces that interprets developer intent when code is deployed, and automates workload placement, scaling, and lifecycle updates over the lifespan of the workload.

Key Benefits (continued)

- **Enterprise-Grade Trust:** The solutions are trusted by enterprises for their enhanced resilience, security, and performance, particularly for Spring applications.
- **Unparalleled Scale:** The proof is in our numbers - there are millions of apps in production on Tanzu Platform, billions of cloud spend managed by Tanzu CloudHealth, and thousands of Kubernetes deployments running on and managed by Tanzu Platform.
- **Top-Notch Development Framework:** As the curator of the #1 Java Framework, Spring, which is utilized by 72% of Java developers[2], organizations are already realizing the benefits of Tanzu for enterprise application development.

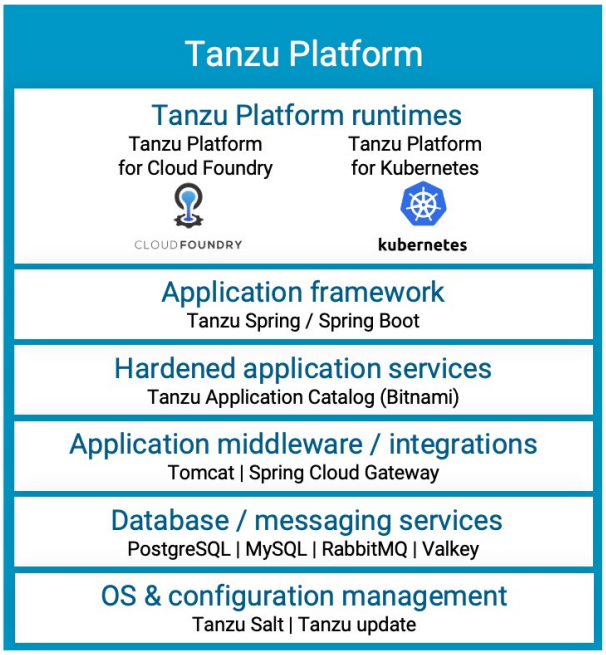

Figure 2: VMware Tanzu Platform

Similar to infrastructure, maintenance of application platforms should be effortless and non-disruptive. Platform and operations teams should be able to reduce risk easily, eliminate persistent threats, and enhance security posture by repaving workloads from a known good state. They need to be able to repair and remediate app and platform vulnerabilities without downtime and rotate service credentials and certificates without disruption. For organizations seeking to provide validated and secure open source and packaged custom software images, the Tanzu Application Catalog is powered by Bitnami the #1 Open Source Software Packaging, indicating its prevalence and trust in the enterprise market. VMware Tanzu Platform accelerates and secures application delivery by making these steps effortless for platform engineering and operations teams.

Take the Next Step

To increase software agility and best respond to the needs of application teams, infrastructure and operations teams and platform engineering must come together to deliver a complete application platform running on a private cloud. And that's where VMware Cloud Foundation along with VMware Tanzu Platform come into picture. VMware Cloud Foundation with Tanzu Platform allows you to focus on outcomes, rather than operations so that you can accelerate innovation.

For more information contact your local account team, certified partner or simply visit:

vmware.com/products/cloud-foundation

tanzu.vmware.com/platform

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2. https://www.jetbrains.com/lp/devecosystem-2023/

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