

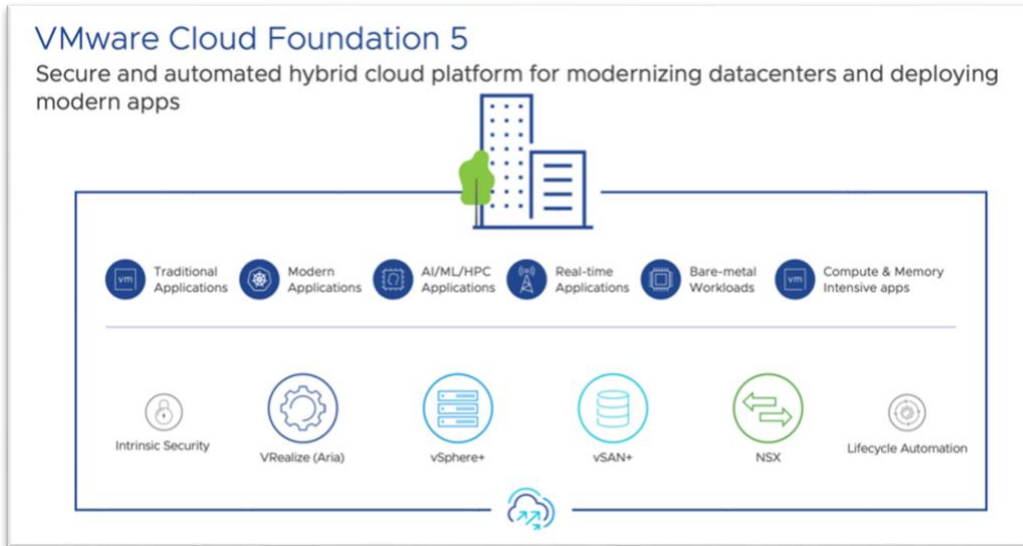
VMware Cloud Foundation 5.0

Silverton Consulting, Inc. StorInt™ Briefing



Introduction

Ideally, data and application hosting should not be locked into one availability zone (AZ) or region (or even cloud provider). To provide the ultimate hosting agility, a solution needs to flexibly span public clouds, private clouds, and data center environments, as well as supply cloud-scale Infrastructure-as-a-Service (IaaS) in every environment.



Not surprisingly, the multi-cloud is a desired end point of many a cloud journey. The idea behind the multi-cloud is that it shouldn't matter where an application is hosted so long as the hosting makes economic sense and supports performance and security needs.

Few solutions offer these sorts of advanced

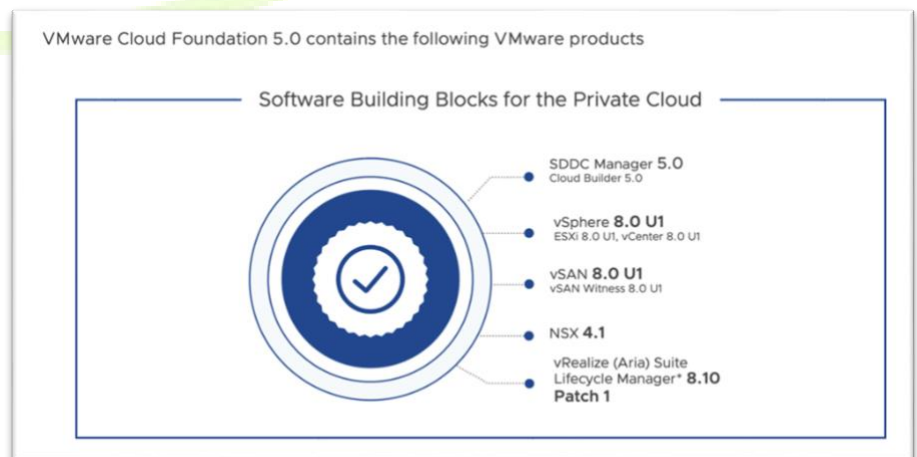
capabilities, and only one has supported highly available, mission-critical enterprise services for more than two decades: VMware® and its VMware Cloud Foundation™.

VMware Cloud Foundation 5.0

VMware Cloud Foundation (VCF) 5.0 is a new platform release of functionality that underpins VCF, VCF+, VCF-S (term) and VCF-P (perpetual) licensed environments. VCF 5.0 delivers enhancements from SDDC Manager, vSphere®, vSAN™, NSX®, and vRealize® (Aria) Suite to provide customers with the following:

- Better **IaaS** scaling
- Simplified **multi-cloud operations** and
- A more **secure cloud environment**.

Introduced last year, VCF+¹ offers a new operating expense (opex) consumption model for VCF. In addition to opex economics, VCF+ includes a cloud console control plane for VMware that is cloud entitled,



¹ VMware Cloud Foundation+ will not support VCF 5.0 at initial GA, but will be supported post-GA

metered, and billed to offer a keyless environment for VCF. This cloud-connected service provides a way for admins to deploy, manage and monitor VCF instances wherever they reside, all from a single cloud console.

Better IaaS scaling

Public clouds popularized IaaS and continue to enjoy a sizeable lead there. Any multi-cloud offering must build on top of native public cloud IaaS facilities. Nonetheless, supplying state-of-the-art, cloud-scale IaaS services is a challenge because the public cloud offerings continue to evolve.

VMware's intent with VCF is to make the IaaS experience for DevOps and Operations teams as public cloud-like as possible while at the same time supplying enterprise-class infrastructure to run critical workloads. The enhancements in VCF 5.0 affect several different systems, including SDDC Manager, vSphere, vSAN, vRealize and NSX.

Previously, using VMware **Enhanced Link Mode (ELM)**, customers could have had a vSphere Single Sign On (SSO) environment connected to one Management WorkLoad Domain (WLD) with up to 14 Virtual Infrastructure (VI) WLDs within a single VCF instance. New for VCF 5.0, SDDC Manager offers increased WLD configuration flexibility within a single VCF instance using **isolated WLDs**. Isolated WLDs are a vSphere SSO-ELM environment connected to a single VI WLD. With VCF 5.0, customers can now add multiple isolated WLDs to their VCF instance.

For instance, within a single VCF instance using ELM, customers can have one vSphere SSO environment connected to a Management WLD and add up to 24 isolated WLDs (each having a different vSphere SSO environment connected to a single VI WLD) or alternatively, they could have a vSphere SSO environment connected to a Management WLD and 14 VI WLDs and add up to 10 more isolated WLDs. In the latter case, there would be 11 separate vSphere SSO domains within a single VCF instance. Note, these are only two of the many options available for configuring isolated WLDs in VCF.

Moreover, WLD creation can now execute in parallel rather than serially, which should speed up instance deployment.

VCF 5.0 incorporates almost all changes from vSphere 8.0 and 8.0 Update 1. For example, for GPU VMs, VCF 5.0 supports **NVIDIA™ NVSwitch** hardware, which offers higher GPU counts/server and GPU to GPU direct transfers to speed up data loading. In addition, vSphere now allows for heterogeneous (sized) vGPUs for finer grained resource utilization of GPUs.

NVIDIA NVSwitch speeds up AI/ML/DL training and inferencing for large neural network (NN) models that span multiple

vSphere 8 Update 1

What's New

Enhance Operational Efficiency

- vSphere configuration profiles — Enable host configuration at a cluster level.
- Heterogeneous vGPU profiles on the same GPU — Deploy different types of workloads on the same GPU.
- Integration of Skyline Health and Diagnostics with vCenter — Detect and easily remediate issues.
- vSphere Green Metrics — Monitor VM and host power consumption.

Supercharge Workload Performance

NVIDIA NVSwitch enablement — Increase the speed of GPU-to-GPU communication.

Elevate Security

- Okta Federated Identity Management for vCenter — Expand support for 3rd party identity providers with Okta.
- Achieve higher availability and security for VMs — Support for fault tolerance of VMs employing vTPM.
- ESXi quick boot support on servers with TPM 2.0 chip.

*Note: VCF 5.0 does not yet support vSphere Distributed Services Engine (DSE) Support

GPUs because of their size. Heterogenous vGPUs can also increase GPU utilization for VMs using smaller NN models.

For VMware Tanzu Kubernetes Grid (TKG), VCF 5.0 incorporates more DevOps automation for deployments within admin guardrails and simpler cluster creation using ClusterClass APIs. Further, TKG now supports **Carvel**, an open-source suite of composable tooling that helps build and deploy container apps and TKG clusters. VCF 5.0 also supports TKG AZ for highly available Kubernetes®(K8s) clusters and container applications.²

VCF 5.0 incorporates almost all vSAN 8.0 and 8.0 Update 1 functionality. This functionality includes new Original Storage Architecture (OSA) performance improvements, to better support high-performing storage workloads and more real-time performance metrics for finer grained performance reporting.³

NSX Advanced Load Balancer™ (ALB), formerly known as Avi Networks, is an add-on SKU within VCF 5.0. As the NSX-native, legacy load balancer is reaching end of life and NSX ALB delivers more value, customers are encouraged to move to NSX ALB during this release cycle. NSX ALB is a state-of-the-art, API-driven, software-defined load balancer that offers enhanced automation and analytics for application delivery controller (ADC), global server load balancing (GSLB), web application firewalls (WAFs) and K8s container application ingress via NSX ALB K8s operations (AKOs) adding application awareness to VCF deployments.

Simplified Multi-Cloud

Customers increasingly demand multi-cloud support so that they can move workloads across environments. Customers with workloads that span clouds, on-premise data centers and out to the edge need reliable hypervisor services across all environments they use.

VCF supports one of the broadest multi-cloud offerings available today. The VCF platform software uses the exact same stack for compute, storage, networking, and management that runs in data centers; on private and Telco clouds that support core-edge environments managed by VCF; and on public clouds such as AWS™, Azure®, and GCP™ that offer VMware services.

VCF 5.0 vSphere now complies with VM memory (DRAM) and persistent memory (PMem) requirements when placing and migrating VMs for larger memory needs. In addition, ESXi™ upgrades can be performed in parallel to speed up adoption of the latest updates across VCF.

Within VCF 5.0, vCenter® now supports **Skyline Health Diagnostics**, which is a self-service diagnostic platform that helps to quickly diagnose and remediate vSphere and vSAN problems. The Skyline Health Diagnostics virtual appliance monitors logs, looking to detect system problems and other issues.

² Note: The initial VCF 5.0 release does not include vSphere Distributed Services Engine (DSE) DPU support.

³ Note: The initial VCF 5.0 release does not include vSAN 8 Express Storage Architecture (ESA).



For vSAN, VCF 5.0 includes new insight and visibility into vSAN configuration compatibility and compliance. As WLDs evolve, vSAN configurations can sometimes drift out of compliance. With VCF 5.0, admins can see when vSAN configurations start to change in incompatible ways. Customers running vSAN Direct can also provision Tanzu Private Volume Claim (PVC) “thick” volumes.

For NSX, VCF 5.0 incorporates VMware Hybrid Cloud Extension (HCX™) Migration-as-a-Service, which helps to simplify and automate application migration across deployments. HCX is an application mobility platform specifically designed to help customers move applications faster and more easily across disparate environments, such as KVM, Hyper-V, public clouds, VMware and VCF. NSX HCX delivers application migration capabilities, a key multi-cloud requirement, across a plethora of environments both inside and outside VCF.

To make configuring NSX easier and less error prone, NSX adds improved routing services that include the ability to change Border Gateway Protocol (BGP) Administrative Distance for finer routing control, along with other BGP and virtual routing and forwarding (VRF) enhancements. NSX also adds stateful Active/Active Edge services to improve high availability for Edge node failures.

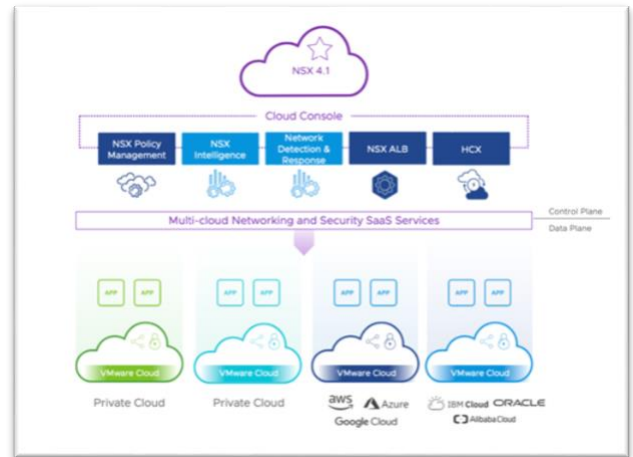
VCF 5.0 includes vRealize (Aria) Suite Life Cycle Manager 8.10 Patch 1, which integrates vRealize Log Insight and vRealize Operations Manager for simpler management pack configuration changes. Moreover, vRealize Automation has been enhanced to auto-revert failing upgrades to recover faster from update issues.

Secure Cloud

In today’s increasingly hostile cyber environment, cloud security is becoming more important with each passing day. Consistently improving security at every stage, across every environment, is a necessary part of doing business. However, added security often increases the day-to-day burden on users and administrators.

VCF 5.0 now offers Virtual Trusted Platform Module (vTPM) fault tolerance for VMs. VMs with vTPM enabled are protected against hardware failure using replication to deliver application continuous protection.

For NSX, new App ID signatures have been added for distributed and gateway firewalls to ensure that application IP traffic is validated regardless of the port in use. With VCF 5.0, NSX has also added more gateway/edge firewall intrusion detection and prevention system (IDPS) events. IDPS events help identify, track, and prevent networking intrusions, which should help better secure a network environment under VCF 5.0.



Summary

VMware VCF 5.0 offers admins and users better IaaS capabilities; provides a simplified, multi-cloud experience; and improves multi-cloud security across all the environments on which it runs.

For IaaS, VCF 5.0 offers more WLD flexibility within instances; new NVIDIA NVSwitch hardware support; increased vGPU resource flexibility; significantly enhanced TKG functionality; higher vSAN OSA performance with finer grained, real-time performance reporting; and NSX ALB, a state-of-the-art load balancer.

For multi-cloud, VCF 5.0 introduces the Skyline Health Diagnostic virtual appliance for faster problem solving, vSAN configuration monitoring and NSX HCX, a Migration-as-a-Service application mobility platform that spans just about any environment available today.

To secure the multi-cloud, VCF 5.0 supplies vTPM VM fault tolerance and more NSX App IDs, as well as IDPS event definitions to better secure networks.

VCF 5.0 makes multi-cloud environments easier to use, adds high-value IaaS functionality and improves security. VCF 5.0 runs on private clouds and data center environments with extensibility to public clouds making hybrid cloud the default operating model, giving customers the ultimate flexibility in deploying their workloads.

Silverton Consulting, Inc., is a U.S.-based Storage, Strategy & Systems consulting firm offering products and services to the data storage community.

