

VMware Cloud Foundation Operations HCX

Workload mobility and migration platform

At a glance

VCF Operations HCX® simplifies workload mobility and migration to VMware Cloud Foundation. An encrypted, scalable, resilient, traffic-engineered hybrid interconnect automates the creation of network extensions. This allows support for hybrid services, such as application migration and workload rebalancing. With a VCF Operations HCX interconnect in place, applications can reside anywhere independent of the underlying infrastructure.

What is VMware Cloud Foundation Operations HCX

VMware Cloud Foundation (VCF) Operations HCX®, an application mobility platform, simplifies application migration, workload rebalancing, and business continuity across data centers and clouds. VCF Operations HCX enables high-performance, large-scale app mobility across VMware vSphere® and non-vSphere cloud and on-premises environments to accelerate data center modernization, consolidation, and cloud transformation.

VCF Operations HCX automates the creation of an optimized network interconnect and extension, and facilitates interoperability across KVM, Hyper-V and vSphere (add link to interop) to current VCF versions. This delivers live and bulk migration capabilities without redesigning the application or re-architecting networks.



Figure 1: Move VMs to and from on-premises and cloud data centers enabled with VCF Operations HCX.

Why VCF Operations HCX

As organizations adopt hybrid and multi-cloud architectures leveraging VMware infrastructure, they stand up new environments locally and, in the cloud, to simplify operations and increase business agility. However, the promise of a modern data center or hybrid cloud can't be realized until applications and workloads exist in these new environments. VCF Operations HCX enables data center and cloud transformation by simplifying the process of populating and optimizing workload placement and customizing workload attributes (for example, IP addresses, MAC addresses, VM tools etc.) on modern VMware Cloud Foundation infrastructure. VCF Operations HCX creates a hybrid interconnect that tethers sites so networks can stretch securely across sites, enabling seamless mobility of virtual machines (VMs).

Use Cases

Workload live migration at scale

Accelerate private cloud modernization with VCF Operations HCX. Automatically create a hybrid interconnect to easily migrate thousands of vSphere and non- vSphere VMs within and across data centers and clouds without requiring VM reboot. Once migrated, you can use networks without any retrofit/redesign.

Workload rebalancing

Move workloads at any time to meet scale, cost management, compliance, and vendor neutrality goals. Actively rebalance your cloud and on-premises application footprint with VCF Operations HCX as an always-on, secure, scalable, resilient hybrid interconnect that tethers cloud to on-premises environments for on-demand migration, data center extension, and cloud bursting.

Business continuity

Leverage the VCF Operations HCX hybrid interconnect and migration capabilities to provide continuous network connectivity and access to other applications and shared services on VMware infrastructure across sites with no reconfiguration of IPs.

Key Capabilities

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vSphere-to-vSphere migration	Non disruptive migration of workloads to VMware Cloud Foundation deployed on-prem, as a managed service, or as infrastructure as a service (IaaS). Typical use cases include one-step migration from older version of vSphere to the latest version, migration of workloads during hardware refresh, and reconfiguration of VM attributes (such as VM hardware version, VM Tools, and re-IP address).
Non-vSphere-to-vSphere migration	Migrate KVM and Hyper-V workloads to current vSphere versions compatible with full VMware Cloud™, VMware Cloud Foundation, VMware Cloud Provider™ Program, and IaaS offerings.
VMware HCX hybrid interconnect	Create and secure connections between VCF Operations HCX installations, supporting management, migration, and replication.
Network Extension	This service extends the virtual machine networks from a VCF Operations HCX source site to an VCF Operations HCX destination site. VMs migrated or created on the extended segment at the destination site are Layer 2 adjacent to VMs placed on the origin network. Network Extension High Availability protects extended networks from disruptions associated with Network Extension appliance downtime.

Key Capabilities	
Mobility across networks	Move VMs within your data center—from your local data center to the cloud, or across cloud regions or providers—to optimize resource utilization and avoid vendor lock-in independent of underlying network types (LAN, WAN, VPN, NAT services etc.).
Migration planning with VCF Operations for Networks	Easily identify application and workload dependencies, and logically group VMs for efficient migration.
Extend network and IP space	Reduce complexity and ensure your IP addressing policies, VM networking tags, and administrative boundaries are not broken.
Bulk migration of live VMs	This service uses vSphere Replication protocol to schedule and move VMs in parallel between sites without needing any agents.
Replication Assisted vMotion (RAV)	This service uses both vSphere Replication and vSphere vMotion technologies for large-scale, parallel migrations with no service interruption.
HCX OS Assisted Migration (OSAM)	This service moves Linux or Windows based vSphere and non-vSphere (Hyper-V and KVM) guest virtual machines from their host environment to a VMware Cloud Foundation platform ¹ .
HCX Assisted vMotion (HAV)	The HCX Assisted vMotion (HAV) service works in conjunction with native cross-vCenter vMotion migration to orchestrate migrations between the ESX hosts associated with the source and destination vCenter Servers.
HCX vMotion	This migration method uses the vSphere vMotion protocol to move a single virtual machine between sites with no service interruption.
Cold Migration	Cold migration uses the same network path as HCX vMotion to transfer a powered-off virtual machine. During a cold migration, the Virtual Machine IP address and the MAC address are preserved. Cold migrations must satisfy the vMotion requirements.
Mobility groups	This service supports assembling one or more virtual machines into logical sets for migration and monitoring as a group. Group migration provides the flexibility to manage migrations by application, network, or other aspects of your environment.
Traffic engineering	VCF Operations HCX optimizes network traffic for HCX Interconnect and Network Extension services.

¹ Supported Guest Operating Systems: <https://techdocs.broadcom.com/us/en/vmware-cis/vcf/vcf-9-0-and-later/9-0/workload-mobility/vmware-hcx-user-guide-vcf-9-0/migrating-virtual-machines-with-vmware-hcx/understanding-vmware-hcx-os-assisted-migration/supported-guest-operating-systems.html>

Resources

[Take the HCX Hands-on Lab](#)

[Visit the HCX product page](#)

[Watch Demos, overview videos, and more](#)

[Read the latest HCX blog](#)

[Read HCX documentation](#)

How to buy

VCF Operations HCX is now available as part of VMware Cloud Foundation. Consult your VMware sales professional or partner for details.

For more information or to purchase VMware products

Call 877-4-VMWARE (outside North America, +1-650-427-5000), visit vmware.com/products/cloud-infrastructure/hcx, or search online for an authorized reseller.

	<ul style="list-style-type: none">• Application Path Resiliency creates multiple tunnel flows for both Interconnect and Network Extension traffic, which can follow multiple paths across the network infrastructure from the source to the destination data centers. The service intelligently forwards traffic over the optimal path and dynamically switches between tunnels depending on traffic conditions.• TCP MSS Clamping adjusts the segment size during the TCP connection handshake between end points across the Network Extension. This optimizes the average packet size to reduce fragmentation and lower the overall packet rate.• Generic Receive Offload reassembles inbound packets into larger ones before delivery to the workload applications, allowing for enhanced application performance.• Tunnel encryption uses transport encryption to protect Network Extension data and migration traffic between site pairs.
Mobility Optimized Networking (MON)	MON is a capability of the Network Extension feature. MON enables optimized virtual machine traffic for virtual machines that span multiple segmented networks, that have multiple VLAN dependencies or have hybrid applications during the migration cycle. Migrated virtual machines can be configured to access any destination through an optimized path.
Seed checkpoint for Bulk and RAV migration	The seed checkpoint feature provides recoverable migration progress with checkpoint seed data; that is, users have the option to retain replica disks at the target datastore if a migration is failed or canceled. Seed checkpoints enable HCX to reuse the disks on the target for seeding replication data, avoiding the need to transfer all the data again.