VMware Cloud Workload Migration Tools

vmware®

MIGRATION PLANNING RESOURCES

- *VMware Cloud Launch Pad*
- *vRealize Cloud Universal*
- *vRealize Operations Cloud*
- *vRealize Network Insight Cloud*

Overview

This paper provides an overview of the different migration strategies and migration tools that can be used to migrate workloads to a given VMware Cloud™ SDDC. These migration tools span from native offerings from VMware to 3rd party solutions that enable workload relocation to cloud native rehosting based on your business and application needs. Each migration tool is accompanied by a specific migration strategy, migration type(s), and some additional commentary.

This document does not reflect the endorsement or support for any specific 3rd party solution used for workload migration to a VMware Cloud SDDC. The solutions listed in this document reflects the most commonly used tools by VMware customers and field and does not include the exhaustive list of 3rd party solutions that is supported on VMware Cloud.

For any feedback, suggestions, or corrections, please send an email to: *vmwcloudmigration@vmware.com*.

Migration strategies

Before starting a migration project, it is important to understand the different migration options available to you. The types of migration options used will depend largely on your organization's goals, timelines, and workloads. For example, you may choose to modernize a select set of applications that fundamentally differentiate your business. You might also want to reduce your on-premises datacenter footprint both from a cost and operational standpoint.

In this case, it is common to relocate your traditional workloads to the public cloud first initially. Once that has been completed, your organization will choose to refactor specific workloads and/or create new workloads that can also take advantage of cloud native services from a given cloud provider.

Below are the seven common migration strategies which are commonly referenced from *Amazon's 7 Rs: The seven common migration strategies for moving applications to the cloud*.

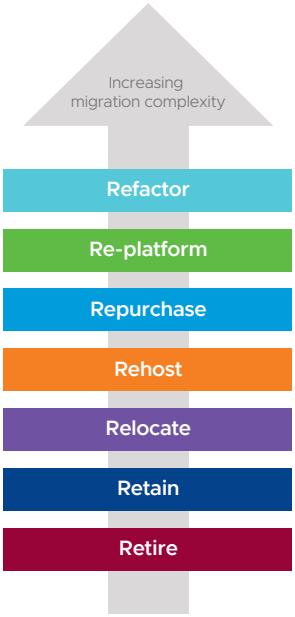

Figure 1: Common migration strategies

1. **Refactoring** involves changing the application at the source code level. Typically applications are re-written to take advantage of cloud micro-services architecture and to incorporate new services such as IoT, machine learning, and others.
2. **Re-platforming** involves changing the operating system such as going from Windows to Linux, changing the application middleware such as going from self-managed Database to cloud provider managed Database
3. **Repurchasing** involves drop and shop (e.g., Moving away from perpetual license model to a SaaS model)
4. **Rehosting** involves a change in the hypervisor. (e.g., migrate applications from one virtualized environment to another)
5. **Relocating** involves determining networking configuration and moving applications without changing the underlying hypervisor or applications at source code level (e.g., migrate VMs from one virtualized environment to another without requiring changes
6. **Retaining** means leaving workloads in on-premises environment
7. **Retiring** means decommissioning workloads

Migration types

After selecting the specific migration strategy, which may differ from workload to workload, it is also critical to understand the different types of migrations and choose the one that best fits the needs of your business. For example, you may have a Dev/Test workload, which can afford downtime during the evenings, a production workload that cannot afford any downtime, and a staging workload which can have minimal downtime when scheduled. From a migration execution standpoint, you would then select three different migration types as mentioned below for each of the respective workloads, maximizing the speed at which you can migrate the workloads and maintaining the application service level agreements (SLA).

Hot

A Hot migration is referred to as a live migration and is the most familiar to VMware administrators. It is a staged migration where the virtual machine stays powered on during the initial full synchronization and the subsequent delta sync, using the VMware vSphere® vMotion® feature.

Warm

A Warm Migration is a virtual machine that is actively running while it is being replicated to ensure minimal downtime. After the migration completes, you either start a manual or automated cutover to make the replicated virtual machine available on the cloud provider. Cutover is a process of powering on the virtual machines at the cloud provider site after the warm migration gets completed. This cutover operation includes a final sync and import of the migrated VM into a destination VMware Cloud SDDC.

Cold

A Cold Migration is a virtual machine that is in a powered-off state before starting the migration. Exporting and Importing virtual machine images is another form of cold migration.

Migration phases

Proper planning is critical before starting your migration journey. To ensure that an organization is successful, VMware has defined the following four phases to help our customers track the lifecycle of their workload migrations. These guiding principles have been used with some of our largest VMware Cloud customers to achieve their goals in an efficient, secure, and cost-effective manner.

Plan

In the Plan stage, you will learn about the various VMware Cloud platforms, assess the size of your on-premises workloads and determine the networking, security and other resources required to support those workloads. This information will help you determine the size and configuration of your VMware Cloud SDDC. Planning is a very important stage that creates the foundation for your migration.

Build

In the Build stage, you will build your VMware Cloud SDDC infrastructure based on the needs you determined in the Plan phase. You will create a cloud SDDC and configure it to be ready to run your workloads.

Migrate

In the Migrate stage, you will configure VMware HCX and establish a tunnel that you will use to migrate your workloads. You will also test the results of the migration with application users. At the end of this stage, you will have successfully migrated virtual machines from your on-premises data center to the desired VMware Cloud SDDC.

Operate

In the Operate stage, you will adjust the approach for ongoing management and operations in the cloud post migration. You will develop a plan and guidelines for monitoring, licensing, security, logging, backups, disaster recovery, performance, etc. leveraging tools such as the VMware vRealize® Suite.

VMware Cloud

VMware Cloud delivers a modern multi-cloud platform that provides unified infrastructure, unified management and operations and unified cloud services in order to help customers build and deploy modern applications, from the data center to multiple cloud and edge environments. It enables the ability to build, run, manage, connect, and protect any application on any cloud. Customers can choose the best cloud or clouds, whether private, public, or hybrid, for their applications without re-architecting and maintaining the highest level of consistency for infrastructure, operations, and experience.

With unified infrastructure, VMware Cloud provides industry's best compute (vSphere), storage (VMware vSAN™), and networking (VMware NSX®), integrated through VMware Cloud Foundation™, across any public cloud or private cloud hardware. Due to consistent infrastructure, customers can migrate workloads seamlessly between environments and ensure that all data and applications remain secure and protected in any cloud. With unified management and operations, VMware Cloud delivers self-service, automation and governance, performance, troubleshooting, capacity and cost analysis services that help customers accelerate innovation, gain efficiency, improve control and mitigate risks. And finally, with unified cloud services, VMware Cloud delivers support for migration services, disaster recovery solutions, 300+ ISV ecosystem solutions and advanced native cloud services from individual cloud providers.

VMware Cloud solutions span multiple hyperscale public cloud providers including Microsoft Azure, Google Cloud, IBM Cloud, Oracle Cloud and Alibaba Cloud as well as our partnership with Dell Technologies Cloud and VMware Cloud on AWS - VMware's preferred public cloud partner for all vSphere-based workloads. Apart from the large hyperscaler cloud partners, VMware Cloud offerings are available through our network of 4,300+ VMware Cloud Providers, including over 230 *VMware Cloud Verified* partners. *Learn more about VMware Cloud.*

VMWARE CLOUD ON AWS RESOURCES

VMware Cloud on AWS: Cloud Migration Solution Brief

Blog: Cloud Migration with VMware Cloud on AWS

Pathfinder: Step by step guide on Cloud Migration with VMware Cloud on AWS

Zenrin DataCom case study

VMWARE CLOUD ON DELL EMC RESOURCES

Detailed Overview and Walk Through of the VMware Cloud on Dell EMC Service

VMware Cloud on Dell EMC Technical Whitepaper

AZURE VMWARE SOLUTION RESOURCES

Azure VMware Solution Top Q&A

Overview of Azure VMware Solution Next Evolution

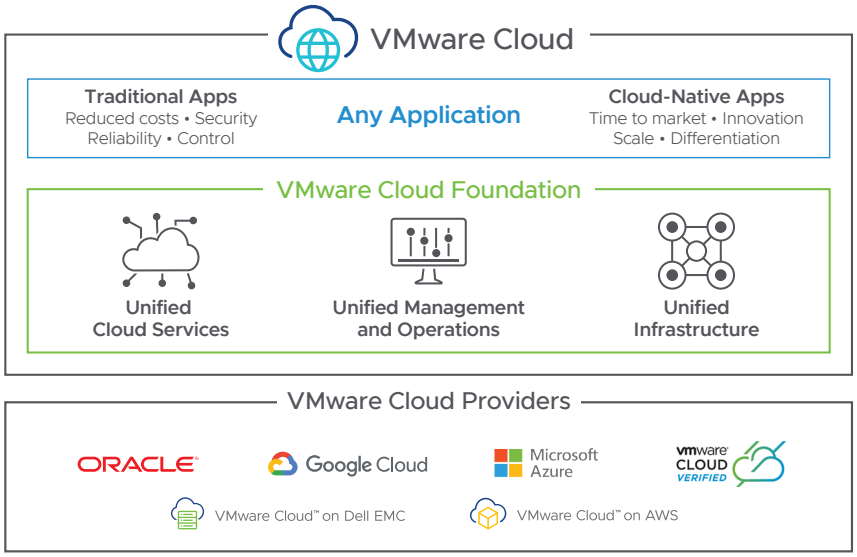

Figure 2: VMware Cloud platform

VMware Cloud™ on AWS

VMware Cloud on AWS brings VMware's enterprise class Software-Defined Data Center software to the AWS Cloud and enables customers to run production applications across vSphere-based private, public and hybrid cloud environments, with optimized access to AWS services. It integrates VMware's flagship compute, storage and network virtualization products (vSphere, vSAN and NSX) along with VMware vCenter® management, as well as robust disaster protection, and optimizes it to run on dedicated, elastic, Amazon EC2 bare-metal infrastructure that is fully integrated as part of the AWS Cloud.

VMware Cloud™ on Dell EMC

VMware Cloud on Dell EMC combines the simplicity and agility of the public cloud with the security and control of enterprise-grade on-premises infrastructure, delivered as-a-service to data center and edge locations. Leveraging the power of VMware Cloud Foundation (vSphere, vSAN and NSX) along with enterprise-class Dell hardware, this fully managed VMware service provides simple, secure, and scalable infrastructure for customer's on-premises datacenter and edge locations. This unique approach empowers you to drive any enterprise workload and focus on business innovation and differentiation, while VMware operates the entire infrastructure end to end.

vmware | Microsoft Azure

Azure VMware Solution is a first party Microsoft Azure service that empowers customers to seamlessly extend or migrate existing on-premises VMware workloads to Azure without the cost, effort or risk of re-architecting or retooling. As a VMware Cloud Verified solution, you can keep using existing VMware investments, skills, and tools you already know including vSphere, vSAN, NSX and vCenter while you modernize your applications with Azure native services.

AZURE VMWARE SOLUTION					
Product/Feature	Migration Strategy	Hot	Warm	Cold	Notes
VMware HCX	Relocate	✓	✓	✓	• **Native Layer 2 extension included** (required for non-disruptive migration) • Native VMware migration • Supports converting Hyper-V & KVM workloads to vSphere (requires HCX enterprise licensing) • Over internet or direct connect
vSphere vMotion	Relocate	✓		✓	• **Layer 2 extension needed** (required for non-disruptive migration) • Live migrate of running virtual machines in vSphere • vSphere UI or using vSphere API • PowerCLI cmdlet support • *Advanced Cross vCenter vMotion feature* uses Cross vCenter vMotion to migrate VMs across different Sign-On (SSO) domains
Cross vCenter Workload Migration Utility	Relocate	✓		✓	• **Layer 2 extension needed** (required for non-disruptive migration) • Migrate (vMotion) or clone VMs across different vCenter Sign-On (SSO) domains
VMware Site Recovery Manager	Relocate		✓	✓	• Planned workload migration using replication and a one time disaster recovery failover/switchover • Protect mission critical IT services that require very low RPO and RTO
vCenter Converter	Relocate		✓		• SDDC running vSphere 7.0 or newer is not supported • Supports Physical-to-Virtual (P2V) and Virtual-to-Virtual (V2) conversion of workload to a virtual machine running on vSphere • Can be used with VMware Cloud on AWS. *Learn more*
vSphere Content Library	Relocate			✓	• Publisher / subscriber model that works at a vCenter layer • Built-in automatic synchronization of VM templates and other files between vSphere environments • Does require additional step of converting/transferring existing content into OVF format stored in Content Library or the new VMTX format
Azure Migrate	Rehost, Replatform		✓		• Server, database, web app assessment and migration • Two types of assessments: “as is” and performance based • Requires Azure Migrate Appliance in vSphere on-premises environment • Azure Data Box for offline data transfer • Can migrate apps like SQL and Web to native Azure
Carbonite Migrate for Azure	Rehost, Replatform		✓		• Supports physical, virtual, and cloud workloads from any environment to Microsoft Azure • Cutover in seconds or minutes • Real-time byte-level replication
Cloudamize	Rehost		✓		• Server assessment and migration planning • What if scenarios and cloud comparison • Application discovery and dependency mapping • Migrate ASR component for migration or integration with Azure Migrate • Hybrid cloud connectivity tests / gaps and insights

AZURE VMWARE SOLUTION					
Product/Feature	Migration Strategy	Hot	Warm	Cold	Notes
Device42	Rehost		✓		• Server assessment and migration • Dependency mapping • Webhooks & REST APIs • Recommendation engine • Create Migration groups aka Move groups • Integration with Azure Migrate
Lakeside	Rehost, Replatform		✓		• VDI assessment including latency • Relies on Agent-based technology • Integrates with Azure Migrate for migration • Guidance on VDI images
Rackware	Rehost		✓		• Server migration Any to Any migration • Assessment of source including wave planning • Replication of workloads • Cutover is Quiesce / Delta Sync • Two migration to cloud and back to on-prem including bare metal • Minimal (minutes) downtime during cutover
Turbonomic	n/a	n/a	n/a	n/a	• Server assessment including applications, containers, bare metal, etc. • Integration to Azure Migrate via Azure Portal for license • Executes the migration through Azure Site Recovery or the other selected third-party ISVs • Migration downtime based on Azure Site Recovery for cloud migration
UnifyCloud	Rehost, Replatform	n/a	n/a	n/a	• Server and database assessment • CloudPilot product used for migration • Recommendation for IaaS, Pass, etc. • Migration options include Azure Serverless, Container Service, Application Service, Azure Virtual Machine
Veeam	Rehost			✓	• Supports direct restore and migrates to native Azure • *Learn more*
Rivermeadow Cloud Migration	Rehost, Replatform		✓	✓	• Discovery and assessment • Bare metal, virtual servers, cloud to cloud migrations • Live migration - duplicate clone in the cloud; source workloads remain active • Migration service - SQL database to PaaS • Migration service - Non-SQL database to PaaS
Zerto Virtual Replication	Rehost		✓	✓	• DR to support both Warm/Cold workload migration • Leveraging VM backups and then restore to desired destination target

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