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Migrate Workloads

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Introduction

Adapting to changing business requirements can drive the need to move application workloads from one platform to another. Whether you've deployed a new VMware Cloud Foundation® (VCF) private cloud, want to repatriate workloads from the public cloud, or looking to consolidate data centers, you need to migrate your application workloads. Avoid missteps and benefit from workload migration best practices developed by VMware technology experts.

1 Use cases driving workload migrations

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Use cases driving workload migrations

VCF is a full-stack private cloud solution designed to accelerate digital transformation by boosting developer productivity and embracing cloud-native and AI technologies. It gives organizations the confidence to deliver applications and services to their stakeholders faster while maintaining control and efficiently managing resources. By offering the benefits of a public cloud experience within a private cloud environment, VCF provides compelling advantages that are driving workload migrations for use cases such as:

Cloud Repatriation: Moving from a public cloud to an on-premises data center or private cloud to address concerns like escalating costs, data sovereignty, security, performance issues, and the need for greater control.

Data Center Modernization: Retiring legacy infrastructure, moving from physical to virtual or consolidating service delivery onto a modern cloud platform.

Hypervisor Consolidation: Transitioning from non-VMware hypervisors like KVM, Hyper-V, or AHV to standardize on VCF infrastructure.

IoT Edge Computing: Shifting applications and processing tasks from centralized environments to edge devices, gateways, or local servers to reduce latency, improve real-time decision-making, enhance security, optimize bandwidth, and provide greater autonomy.

Migrating application workloads requires careful preparation and planning. It is essential to classify and prioritize which workloads are to be migrated, understand the dependencies between applications, and develop a detailed plan that avoids disrupting current operations.

2

Classify and Prioritize Workloads

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Classify and Prioritize Workloads

Classifying and prioritizing application workloads into distinct categories is pivotal for effective workload migration strategies. By grouping applications into categories, you can prioritize which ones to migrate to VMware Cloud Foundation.

Retain

applications in their current state and do not migrate

Rehost

to a new cloud platform (possibly limiting any changes to the IPs and applications)

Re-platform

by modifying a few components of the application

Refactor

applications using cloud-native technologies

Retire

applications that are no longer needed or redundant

With applications categorized into these distinct groups and prioritizing which to migrate accordingly, organizations can streamline the migration process, mitigate risks, and maximize the value derived from their initiatives. Determining which applications should be retained, rehosted, re-platformed, refactored, or retired involves conducting a thorough assessment of each application's characteristics, dependencies, and requirements.

3

Migration Planning Considerations

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Migration Planning Considerations

When transitioning workloads to VMware Cloud Foundation, consider several crucial factors:

- Understand your applications and dependencies, such as inter-VM communications, to avoid disruptions in multi-tier applications.
- Organize migration waves systematically and evaluate network infrastructure, including IP address management, directory services, load balancers, and firewall rules, to ensure secure communication.
- Assess storage utilization, provisioning methods, and IO-intensive applications for effective storage policies.
- Ensure virtual machine metadata, configurations, and enhanced vMotion compatibility are up-to-date.
- Address snapshots and backup policies to streamline the migration process. This will ensure no backups are triggered during the migration cutover and snapshots are removed ahead of time.
- Include legacy applications on physical servers through physical-to-virtual conversion to optimize resource utilization.
- Extend essential services like directory services, DNS, DHCP, and NTP to the target site.

By considering these factors holistically, you can ensure a smooth, efficient, and successful migration to VMware Cloud Foundation.

4

VMware Cloud Foundation Professional Services Workload Migration Methodology

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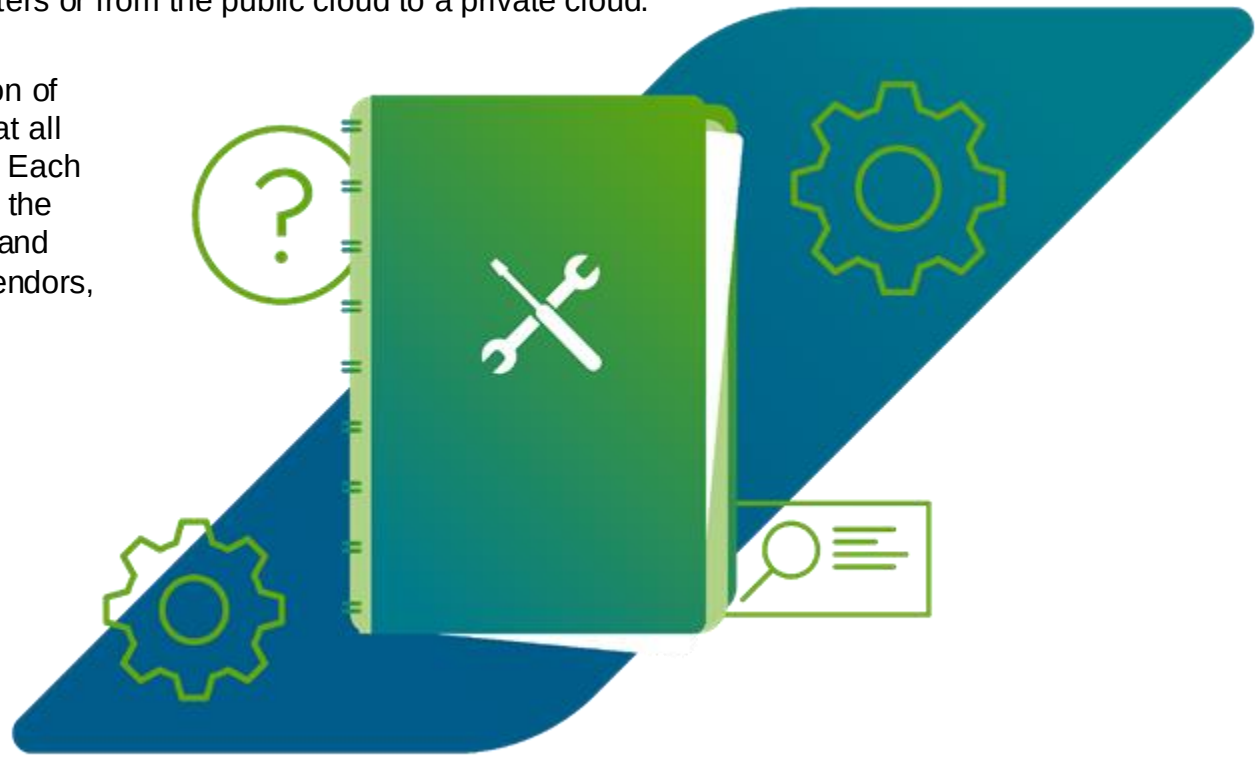
VMware Cloud Foundation Professional Services Workload Migration Methodology

VCF Professional Services can help you migrate to VCF. Our experts have the right knowledge and skills to develop a comprehensive strategy that addresses the end-to-end migration lifecycle using a proven, repeatable process with any VMware Cloud Foundation platform. VCF Professional Services aims to provide organizations with a robust and versatile framework for successfully migrating workloads across on-premises data centers or from the public cloud to a private cloud.

A pivotal aspect of a successful migration strategy lies in the early identification of your migration team. By establishing this team from the outset, you ensure that all relevant stakeholders are actively engaged in the migration planning process. Each team member plays a vital role, fostering clarity and accountability throughout the migration journey. With a dedicated migration team in place, communication, and coordination among stakeholders, including technical teams, management, vendors, and end-users are streamlined.



Each customer's migration strategy is tailored to their unique needs and business requirements. We develop a migration strategy specifically designed to minimize risk while addressing your specific needs. Planning your migration strategy involves considerations such as reducing the changes, downtime, testing, maintenance schedules, and characteristics of your workloads.

Discover and Analyze

We conduct interviews with stakeholders to gather comprehensive information about the applications and workloads to be migrated. This encompasses details regarding physical and virtual workloads, as well as third-party tools such as CMDB and RVTools. Following this, we employ a variety of tools to validate the accuracy of the gathered information and to identify any potential gaps.

We use VMware Cloud Foundation® Operations for networks (formally VMware Aria Operations® for Networks) which leverages machine learning and statistical analysis to discover applications by using the network traffic flows from either the VMware vSphere® distributed switch or VMware NSX®. This method uses a combination of machine learning techniques called Disconnected Component and Outlier Detection to discover application boundaries automatically.

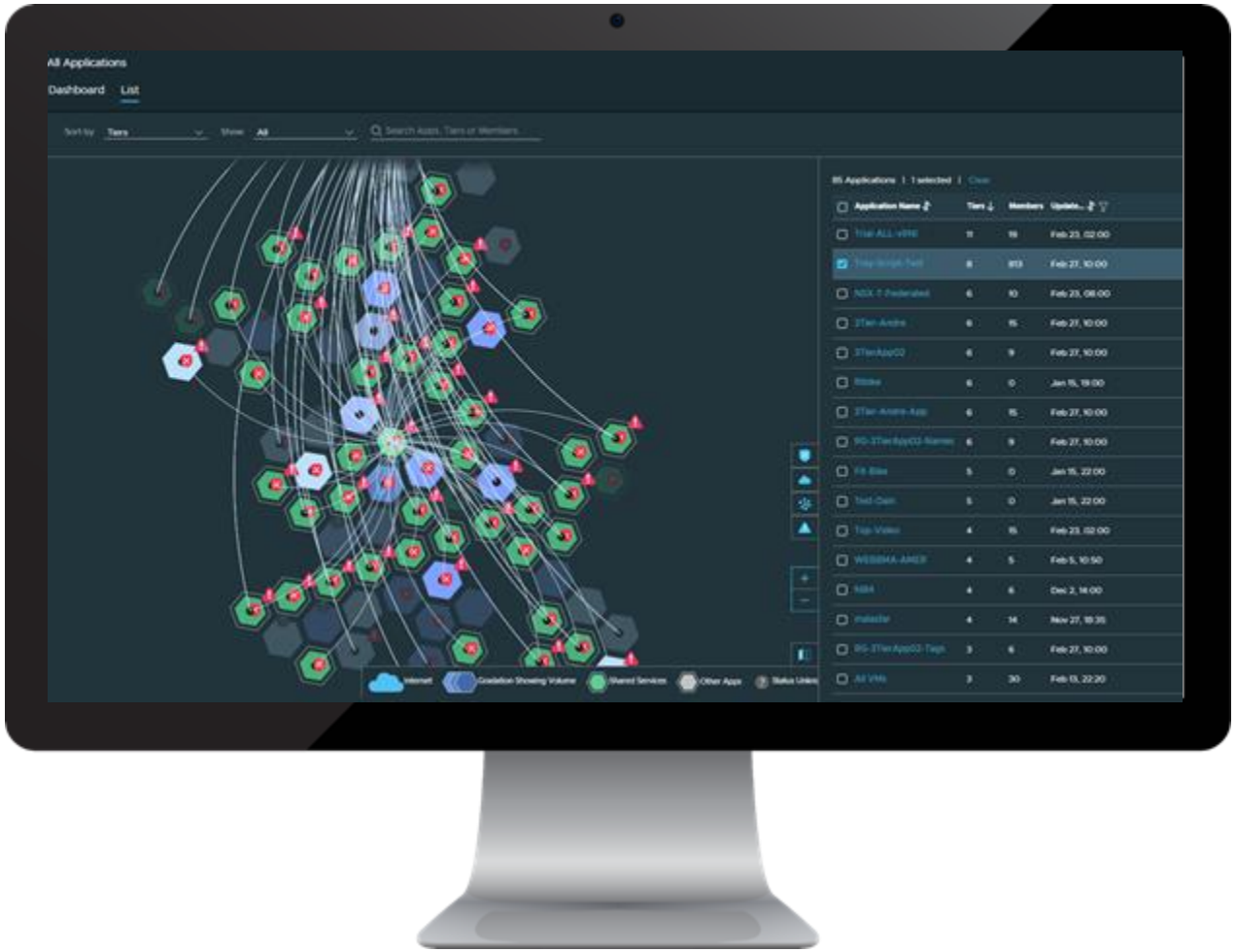
The system analyzes the flows on multiple dimensions and groups VMs with high similarity into a unique application. Dimensions analysis includes density of the flows between VMs, common open ports between VMs, number of incoming against outgoing connections, configuration data from load balancers. After determining the application boundaries, the process moves on to determine the tiers within the application by repeating the process again, but only among the VMs that are already grouped into an application.

Discover and Analyze (continued)

Our evaluation encompasses several key aspects including capacity, performance, network connectivity and throughput, and packet flows among applications in the current environments. Additionally, we assess capacity, performance, network connectivity and throughput, as well as business continuity/disaster recovery, compliance, and security requirements essential for the target environment.

Leveraging the discovered information, we proceed to map out application dependencies for each individual application to be migrated. Subsequently, we construct a graphical representation of all dependencies among various applications.

We define application bundling criteria through direct collaboration with customer stakeholders. The bundles are aligned with move events and determine the type of migration based on the workload type.



Plan

Migration planning includes groups of activities which must be accomplished before, during and after the migration. We start by mapping the source infrastructure (server, network, and storage) to the target infrastructure. We identify what is needed to configure the external and core services at the target such as load balancers, active directory, file servers, public IP addresses, and DNS names.

Essential to the process is to prepare a viable rollback strategy to mitigate risk if the migration encounters problems. We determine the size of the VMs to be migrated and the available bandwidth for replication, and bundle and schedule the migrations in waves. The size of VMs and available bandwidth are also needed to create the testing schedule to validate the success of the migration. We produce a migration runbook that defines the VMs to be migrated, their order and additional configuration parameters.

Migrate

The migration process is divided into three distinct phases.

Pre-Migration

During the pre-migration phase, our focus is on ensuring facility readiness. This involves verifying the functionality of services and ensuring that no maintenance activities are in progress.

Migrate and Validate

The migration and validation phase mark the actual performance of the migration waves. Here, we closely monitor and report on the progress of the migration, provide support for user acceptance testing, and promptly report and escalate any unforeseen issues. In large migrations, multiple waves may run simultaneously. We carefully evaluate the outcomes of each wave before transitioning to subsequent waves.

Post Migration

Upon completion of all migration waves, we compile final runbooks, prepare a migration executive summary, and document the valuable lessons learned throughout the process.

Migration Activities

We conduct workshops with customer stakeholders for each group of activities before, during and after migration.

Pre-Migration

T-4 to T-3

- Conduct kickoff workshop
- Create initial migration runbook
- Document from / to mapping
- Document startup and shutdown, backup and contingency, post migration test procedures
- Review target readiness

T-3 to T-2

- Conduct workshop
- Review hour by hour
- Identify and schedule source remediation
- Finalize resource alignment
- Network and security readiness

T-2 to T-1

- Conduct workshop
  - Review infrastructure tasks
  - Review application tasks
  - Finalize hour by hour
- Change approval
- Initiate replication
- Release runbook

Migration

T-1 to T

- Conduct dry run workshop
- Complete pre-migration
- Finalize communication plan
- Go/no-go meeting
- Command center setup
- Perform the migration
- Migration sign-off

Post-Migration

T+1

- Publish migration runbook
- Conduct lessons learned meetings
- Monitor “burn in” period
- Release old servers

Knowledge Transfer and Operational Guidance

To help ensure your team is fully enabled we provide knowledge transfer at each stage of the engagement. We also provide best practices and standard operating procedures for processes such as service request management, capacity management, VM management, and monitoring. We provide guidance on how to integrate these operating procedures with your existing ones.

Conclusion

VCF Professional Services can help you successfully move application workloads from your legacy infrastructure to a new private cloud or from the public cloud in support of your business objectives. We take a holistic approach and use specialized tool chains to address the end-to-end migration lifecycle. Our scalable and standardized methodology supports large scale migrations with minimal downtime and reduced risk.

Learn more about how VCF Professional Services can help your organization.