

VMware to OpenStack Migration: A Planning Guide





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Introduction

Historically, many organizations have been charting their course through the changing terrain of cloud computing, shifting from proprietary technologies to open-source platforms. This move provides for a significant opportunity to innovate, scale, and achieve cost savings. Until recently, this decision has been at a tactical departmental-level, done on a project-by-project basis. This often happens as new technologies come to market (an “early adopter phase”) inviting groups of individuals who champion, prototype, evaluate, and educate others on new technologies.

Most recently, we have seen a number of forces (such as the acquisition of VMware by Broadcom) accelerate the adoption of Open Infrastructure solutions such as OpenStack, Kubernetes, and KubeVirt across an organization. The reasons for this transition and migration include:

<ul style="list-style-type: none">✓ Cost:<ul style="list-style-type: none">○ Potential for significant cost savings. Open source eliminates licensing fees associated with VMware products, leading to a lower Total Cost of Ownership (TCO). Hardware costs can also be reduced as open-source tools tend to be less resource-intensive
<ul style="list-style-type: none">✓ Scalability and Performance:<ul style="list-style-type: none">○ OpenStack and Kubernetes are designed to be highly scalable and efficient, making them well-suited for handling large-scale deployments and dynamic workloads. This scalability can help businesses meet growing demand without experiencing performance bottlenecks or excessive costs.
<ul style="list-style-type: none">✓ Compliance and Security:<ul style="list-style-type: none">○ Open-source software often provides greater transparency and control over security and compliance requirements. Businesses can audit the code, implement security best practices, and customize configurations to meet regulatory standards and protect sensitive data.
<ul style="list-style-type: none">✓ Reduce Vendor Lock-In:<ul style="list-style-type: none">○ By adopting open-source technologies, organizations can avoid vendor lock-in and dependency on a single vendor with proprietary solutions like VMware. This provides greater freedom to choose different hardware vendors, cloud providers, and software solutions, reducing the risk of being locked into a particular ecosystem.
<ul style="list-style-type: none">✓ Flexibility<ul style="list-style-type: none">○ Open source offers greater flexibility to tailor the infrastructure to specific needs. Open standards and APIs allow for easier integration with various tools and technologies.
<ul style="list-style-type: none">✓ Future-Proofing:<ul style="list-style-type: none">○ Open-source technologies are continuously evolving, with new features and updates being released regularly. By adopting OpenStack and Kubernetes, businesses can future-proof their infrastructure and stay ahead of technological advancements in the rapidly changing IT landscape.



In the past migration processes have often been daunting, resource-intensive, and inflexible, making the transition from one platform to another a complex and taxing endeavor. However, it's crucial to prioritize such migrations to prevent future renewals from consuming budgets that could otherwise be allocated to necessary migrations.

This white paper is to serve as comprehensive guide and roadmap offering valuable insights and best practices for efficiently planning and executing your migration journey. It emphasizes a technology-driven approach, supplemented with practical insights, best practices, and real-world experiences, all aimed at guiding organizations through their migration journey from VMware to Open Infrastructure.

The process begins with an assessment of the current environment, the decision about migrating to OpenStack, Kubernetes, KubeVirt or a combination of the three, followed by an optimized approach to executing the project.

Note - To achieve timelines, goals and save valuable time, money and other resources, prioritize migration as a first objective or priority, determine the total amount of VMs that require rehosting or alternatively retiring. Post this initial "lift and shift" of VMs to your OpenStack environment, then engage in replatforming exercises as a next step or 2nd Priority. Refactor applications at your own speed without the burden of a VMware renewal on the horizon.

Why a Technology-Driven Process

Technology-driven migration solutions, as opposed to a services-driven process, offer numerous benefits when migrating virtualization platforms. In addition to bringing repeatability to the project, they significantly reduce the complexity of the migration process by automating many of the tasks involved, such as data transfer and application rehosting. This not only saves time but also minimizes the risk of errors that can occur with manual processes.

Leveraging technology during the migration process offers numerous other significant benefits such as:

- **Reduced Resource Requirements:** Streamlining migration tasks, minimizes resource utilization.
- **Repeatable and Predictable Process:** Trilio software ensures consistent execution of migration steps, leading to predictable outcomes.
- **Scalable Approach:** Trilio software is scalable and can accommodate all types of migrations.
- **Train the Trainer Model:** Technology enabled migration enables a “train the trainer” model which allows for knowledge transfer within your organization or with a trusted partner. This approach fosters internal expertise and operational efficiency, resulting in reduced long-term costs.

Any technology-enabled VMware migration should automate much of the “lift and shift” of the VMs described as part of the implementation and execution of the migration. At a high level, below is a migration workflow example Trilio recommends implementing:

We suggest you look at your VMware renewal date as the driving force the create energy around the migration. Even though migrating applications to a new platform can look like a complex process, with a clear strategy and the right tools, it can be accomplished efficiently.

We suggest a multi-step approach. Step One: Move to OpenStack; Step Two: Look at modernizing the applications by containerizing it and making it available on Kubernetes.



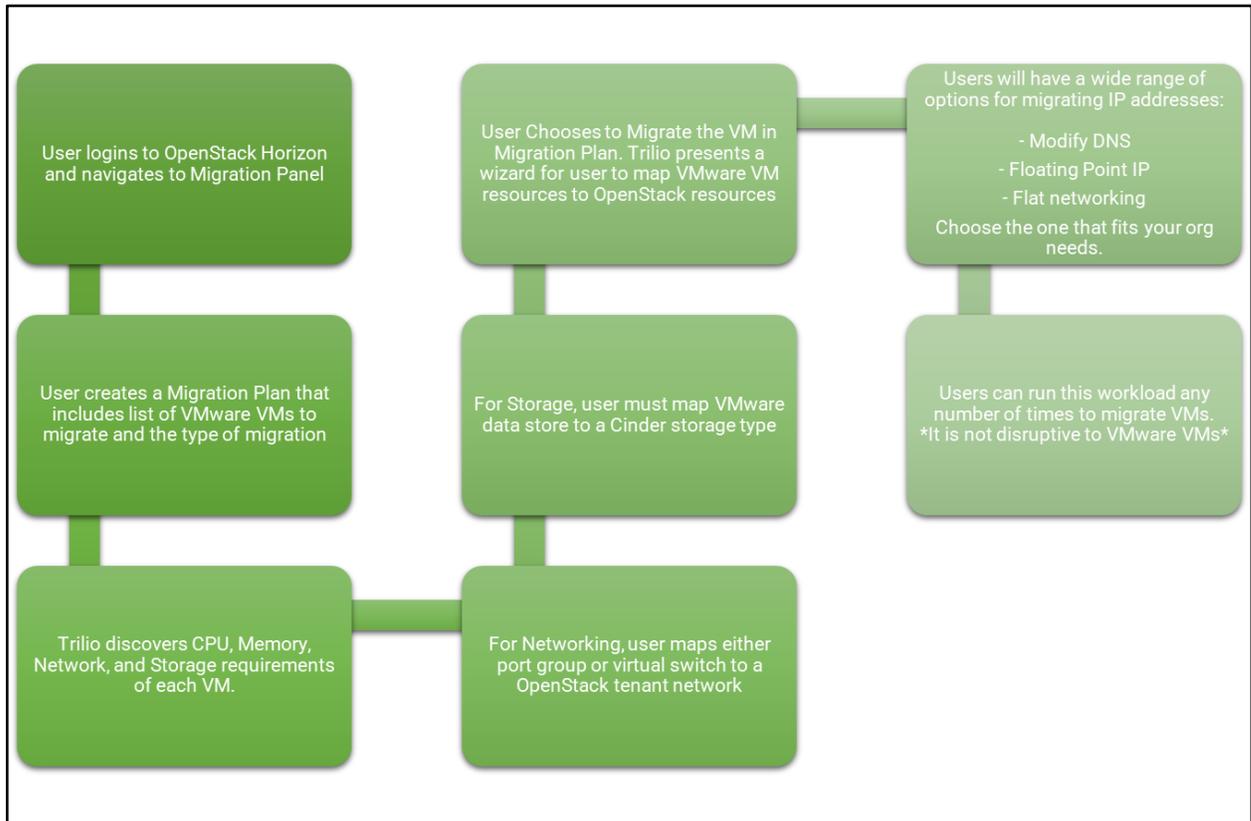
Using the above framework, you would first look at a swift mass migration to OpenStack. It's flexible and scalable nature makes it an ideal platform for such a task, allowing for the rapid transfer of data and applications.

Once the initial migration to OpenStack is complete, the focus, if determined, can then shift to optimizing the new environment. This is where technologies such as Kubernetes or KubeVirt come into play. One distribution of KubeVirt is Red Hat's OpenShift Virtualization (OCP-Virtualization). OpenShift-Virtualization allows you to run and manage virtual machine workloads alongside container workloads. It's a powerful platform that can provide additional flexibility and efficiency in your cloud environment.

Of course, you can decide to migrate from vSphere to OpenShift-Virtualization as your platform of choice. Whereby, leveraging migration tools such as Red Hat's Migration Toolkit for Virtualization (MTV) to migrate virtual machines from VMware.

While the deadline may look difficult to meet, with the right approach, it's possible to achieve a smooth and successful multi-step transition. Remember, the goal is not just to migrate, but to create an environment that supports your organization's growth and evolution in the long term.

Below is an overview of the migration steps, which are covered in some detail in the planning section.



Migration Planning

The following sections are the steps that we urge you to implement to assure a successful migration from VMware to Open Infrastructure platforms.

Define Migration Goals and Objectives:

The first step is to determine platform so that basic goals and decisions can be set.

- Select the Platform(s) to migrate to. For example:
 - Focus on Containerized Applications ► Kubernetes
 - Need for Traditional VMs and Cloud Management ► OpenStack
 - Achieve Hybrid Approach

The primary reason for defining Migration Goals is to streamline the process, ensuring that all involved parties understand the desired outcomes. This approach has several advantages.

- It allows for the efficient allocation of tasks and resources, which can lead to significant time savings.
- It enables the tracking of progress against quantifiable stages, allowing for adjustments as needed to stay on schedule.
- It promotes teamwork and communication, fostering a sense of collective responsibility.
- It helps to mitigate risks by foreseeing potential obstacles and planning for them.

Therefore, setting migration goals with a focus on time efficiency, resource optimization, and measurable stages is a key factor in achieving timely success in a cloud migration project.

Assess Your Current Environment:

Conduct a comprehensive assessment of the existing VMware environment, including virtual machines, storage, networking, and dependencies. Document the current configurations, workloads, performance metrics, and usage patterns. As a part of this phase, categorize and prioritize individual applications as - to be retired vs. to be migrate by priority (P1, P2) or modernized (reengineer them to a container-based architecture).

Assess Application and Workload Compatibility:

Based on the above assess compatibility, dependencies, and performance requirements of applications running on VMware to ensure seamless migration.

Build a Project Team:

Assemble a small cross-functional team with expertise in virtualization, cloud computing, networking, security, DevOps, application development and project management. These teammates are not required on a full-time basis. However, they can act as governance boards, decision makers and liaisons to other stakeholders and groups within your organization. Ultimately, the goal is to assemble a team that can

effectively manage the technical, business, and human aspects of the cloud migration process.

Select Migration Tools and Technologies:

Evaluate migration software, automation frameworks, and best practices for migrating workloads, data, and configurations for migration. Choose tools that align with migration requirements, scalability, and ease of use.

Develop a Migration Plan and Timeline:

Develop a detailed migration plan outlining the sequence of migration tasks, dependencies, milestones, and timelines. Identify potential risks, challenges, and mitigation strategies to minimize disruptions during the migration process.

Pilot Testing and Proof of Concept:

Conduct pilot testing and proof of concept (POC) exercises to validate the migration plan, evaluate migration tools, and assess the feasibility of migrating critical workloads to OpenStack. Gather feedback, iterate on the migration plan, and address any issues or challenges identified during testing.

Skills Inventory:

Perform a skills inventory and if you find any gaps. Engage consultants and other experts when there is a skills gap in the organization. These external experts bring in specialized knowledge and experience that can bridge the skills gap effectively ensuring that the project stay on track, adhering to the set timelines.

Working alongside these partners, during the migration, internal teams and relevant stakeholders will have the ability to learn about the future platform(s) that will replace VMware including architecture, deployment methodologies, best practices, and troubleshooting techniques.



Project Management:

Make sure you have a single voice of project status through a project manager. They will play a pivotal role during a cloud migration, offering several benefits including timeline management, cost control, communications, risk mitigation and issue escalation and resolution.

Post-Migration Validation and Optimization:

This process should ensure that all migrated workloads are functioning as expected in the new environment. It involves checking the compatibility of applications, verifying network configurations, and validating data integrity. If any issues are identified during this testing phase, you should have the flexibility to re-migrate, as necessary. This iterative approach allows for continuous improvement and fine-tuning of the migration process. It also provides an opportunity to address any unforeseen challenges or complications that may arise, ensuring a successful transition to OpenStack.

Post Migration Ownership:

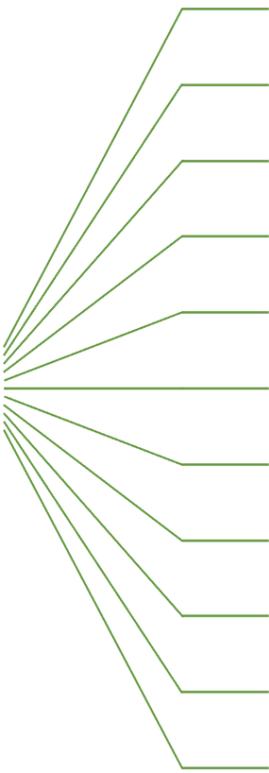
Document migration processes, configurations, and lessons learned to create a knowledge base for future reference and continuous improvement. Organizations can ensure effective knowledge transfer through several strategies: Training Sessions, Mentorship Programs, Regular Meetings, Knowledge Management Systems or Collaboration Tools. Post Migration Ownership and the ability to continuously operate the new environment with Day 2 tooling and platforms, such as backup, recovery and monitoring are critical in the projects continued pursuit of return on investment.

Migration Workflow Summary:

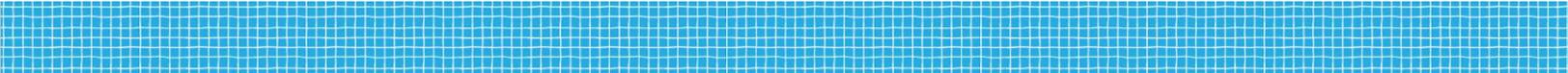
The following image summarizes the Migration Planning components as discussed above in this document. This level of organization helps to identify potential bottlenecks and mitigate issues before they escalate, thereby minimizing risks and helping you achieve quicker success.



**MIGRATION
PLANNING**



- Define Migration Goals and Objectives**
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Conclusion

A technology-driven approach makes planning and executing migrations much simpler enabling a much more efficient transition from VMware to the modern Open Infrastructure of your choice.

The journey is as much more predictable and much shorter than using a services-led approach and can be implemented in phases where benefits can be realized very quickly -- very often in 30-60 days. The migration can also help you realize the benefits of OpenStack and KubeVirt by unlocking the full potential of cloud-native technologies and open standards, and achieve significant benefits in terms of agility, scalability, innovation and cost-effectiveness.

The following are links to additional materials which may help you on your journey:

- *(Whitepaper) Technology-Driven VMware to OpenStack Migration: A Comprehensive Guide*
 - <https://trilio.io/resources/technology-driven-vmware-to-openstack-migration-a-comprehensive-guide/>
- *(Blog Post) Software Driven Migration: VMware to OpenStack*
 - <https://trilio.io/resources/software-driven-migration-vmware-to-openstack/>
- *(Newsletter) Shared Insights Newsletter from Trilio*
 - <https://trilio.io/newsletters/>



About Trilio

Trilio is a leading provider of cloud-native Data Protection software solutions, supporting private, public and hybrid-clouds, engineered from ground up for Kubernetes, KubeVirt and OpenStack environments. At Trilio, we believe that data protection should be effortless, automated, and predictable. Our platforms deliver a modern data protection experience that gives customers more power and control over their applications and data. Cloud Architects, Platform Engineers, ITOps and DevOps departments, rely on Trilio technology for operational resiliency to perform critical tasks such as data backup and recovery, migration, ransomware protection, application mobility and disaster recovery.

Either in place, or into other clusters and clouds, Trilio's software dramatically reduces the amount of time spent on restoration and migration activities empowering customers from diverse sectors, such as telecommunications, financial services, defense, automotive and healthcare with the ability to easily deploy, manage and scale applications with confidence. Trilio has been a Premier Red Hat partner since 2017.

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