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IT Executive Decision Framework: From Virtualization to Multi-Cloud

5 Stage Cloud Journey for Application and Cloud Modernization

Executive Summary

Driven by the needs of applications, Digital Transformation is accelerating. IT decision makers must guide their organizations through an evolution that continually aligns IT capabilities with the requirements of application modernization.

The needs of modern applications, and the migration and modernization of existing applications, means IT leaders must make a series of decisions as they transition to a cloud operating model, extending the data center into one or more cloud environments.

This eBook provides a simple framework to help VP of Infrastructure and Operations, and other key senior IT executives, understand and manage the decisions and trade-offs of an evolving set of IT service delivery options.

Introduction: Cloud and Application Modernization

Most IT executives have a simple vision for the digital era

- IT works side-by-side with business executives to guide IT and business strategy.

- Application developers focus on developing software features to meet the needs of the business, without having to think too much about underlying IT infrastructure.

- The IT organization can choose where to deploy workloads based on both business and technology requirements.

- IT can quickly respond to change, shifting workloads as needed without being locked into a particular environment.

Delivering on this vision is not so simple. Enterprises must support a portfolio of existing and new application architectures, while enabling faster release of new features that deliver digital business value.

The latest industry research suggests the cloud and application landscape is getting more complex:

- On average, 47% of existing applications will be modernized or migrated to the cloud unchanged, while 52% of new containerized applications will be deployed natively to cloud.[1]

- The data center will remain important. 76% of IT organizations are committed to hybrid cloud as a long-term strategy.[2]

- Twice as many IT operators are looking for a solution that delivers the benefits of a consistent cloud operating model, and extends data center tools and processes to public cloud, rather than bringing cloud tools back on-premises.[1]

The key questions for VPs of Infrastructure and Operations are:

- How can you deal with this complexity and successfully deliver on the vision of the digital era?

- How can you leverage investments and build on what you have today, while evolving to a cloud operating model that supports all applications, new and old, and works for private, hybrid or multi-cloud environments?

The answer is to take an evolutionary approach, moving to a cloud operating model with a clear understanding of the benefits and limitations of each stage on the cloud journey.

76% of IT organizations are committed to hybrid cloud as a long-term strategy[2]

IT organizations plan to deploy on average **52%** of net new applications to public cloud[1]

1. App Modernization in a Multi-Cloud World, VMware Market Insights, January 2020 (N = 1,205).
2. Enterprise Strategy Group, Research Highlights, Hybrid Cloud Trends: Strategies for optimizing On-premises and Public Cloud Infrastructure, June 2019 (N = 358).

Introduction

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The 5 Stage Cloud Journey Model

This decision framework highlights a 5 stage evolution of IT service delivery capabilities.

- **The model is over-simplified**, but highlights general pros and cons of each stage, as well as factors that indicate when to consider moving to the next stage.

- **It builds on foundational capabilities** such as Virtualization and Software Defined Data Center (SDDC), that have transformed so many IT organizations and serve as a stepping stone to cloud.

- **The destination is a cloud operating model** that transforms IT from a cost and efficiency focus, to agility and application delivery that supports business goals.

- **It is a great fit for VMware customers** as VMware offers solutions that drive IT service delivery transformation at every stage. It offers a way to build on existing capabilities at every stage.

MULTI-CLOUD

HYBRID CLOUD

PRIVATE CLOUD

SOFTWARE DEFINED
DATA CENTER (SDDC)

VIRTUALIZATION

CLOUD OPERATING MODEL
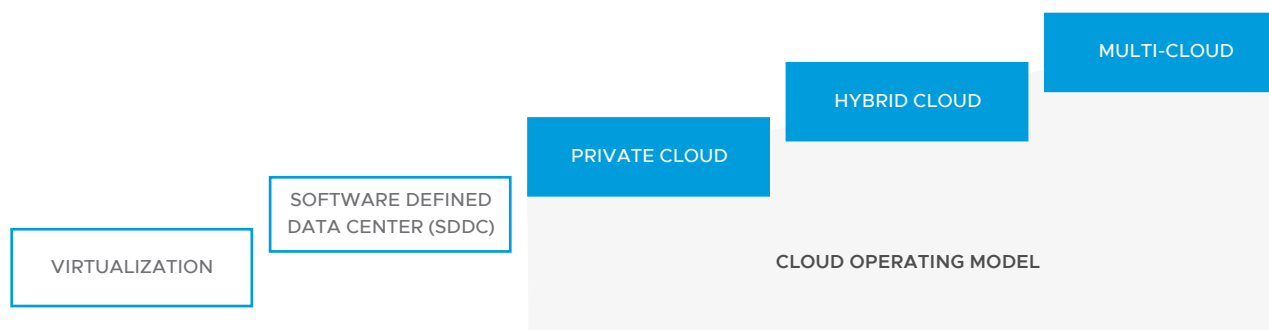
The private, hybrid and multi-cloud stages represent a shift to a different way of operating IT, where service delivery is better aligned to the service consumption needs of the business. It represents a move away from IT focusing on delivering static infrastructure, and a move toward focusing on application modernization and new application architectures that enable digital initiatives.

A CLOUD OPERATING MODEL IS INDEPENDENT OF WORKLOAD LOCATION, AND IS KEY TO ACHIEVING TRUE DIGITAL TRANSFORMATION.

A Cloud Operating Model includes key capabilities:

On-demand – self-service access without ticket-and-wait manual IT service requests.

Automated – abstracted and programmatic access to infrastructure directly through APIs or orchestration solutions like Kubernetes.

Scalable – to meet consumption demand as it occurs.

Service-oriented – services are bundled to deliver more than elemental infrastructure resources.

Policy-driven – access, configuration and usage controls are applied consistently in any environment.

Stage 1: Virtualization

Virtualization is software that creates an abstracted representation of underlying hardware resources. Initially, virtualization focused on the Virtual Machine (VM) that abstracted server resources allowing many VMs to run on a single server, delivering immediate cost savings. The next wave of virtualization included abstraction of storage and networking resources. The current generation of virtualization supports new containerized application architectures managed inside or side-by-side with traditional VMs.

What's good?	What's missing?	What's next?
• Immediate cost savings and more cost-efficient resource usage.	• Not automated enough – IT may utilize manual processes.	• Need to utilize more automation to increase IT agility and operational efficiency.
• Creates a foundation for more agile IT infrastructure.	• IT is delivering infrastructure services.	• Need automation to support digital transformation.
• Is a key enabler and prerequisite to cloud computing.		

Stage 2: Software Defined Data Center

The Software-Defined Data Center (SDDC) pools and combines virtualized resources. A single management layer can orchestrate compute, network and storage resources together as a unified infrastructure. Converged and hyperconverged infrastructure stacks support more efficient procurement, deployment, scale and management of physical and virtual resources.

| What's good?	What's missing?	What's next?
• Management tools purpose-built to effectively monitor and manage the unified infrastructure stack. • Automated infrastructure deployment and lifecycle management. • Policy-driven deployment and placement of workloads (VMs) improves operating efficiency with higher workload availability, security, and performance.	• Automation is mainly focused on internal IT operational improvements. • Unified stack does not directly change how IT services are delivered to and consumed by the business. • IT efficiencies don't directly support digital transformation objectives.	• Need to streamline application development by making virtualized resources available on demand. • Need to enable delivery of "infrastructure as code" and deploy, configure and update resources programmatically via API call. • Need to package and deliver configured workloads programmatically, instead of as individual infrastructure elements.
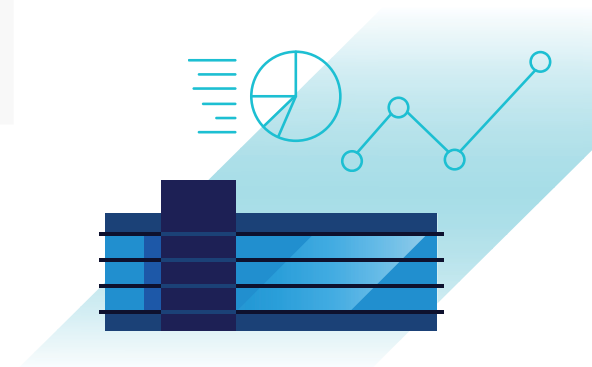
Stage 3: Private Cloud

Private cloud is a significant step on the IT modernization journey. IT resources are delivered as bundled and defined services, on demand, in a scalable and automated way – and in some cases as pay-per-use. Software Defined Data Center (SDDC) enables the infrastructure automation. But the new cloud operating model, with changes to IT roles and processes, allow IT services to be consumed based on application requirements, with less focus on infrastructure elements.

What's good?	What's missing?	What's next?
• Transforms IT offerings - X-as-a-Service through self-service catalogs and rich APIs for developers. • Infrastructure becomes transparent – it is there, it just works, and is easily consumable. • Policy-based security protections intrinsic to all layers of virtual infrastructure are applied automatically, and follow workloads as they move across infrastructure.	• Scale depends on IT-procured hardware infrastructure. • Scale and location of data centers are limited by capital purchases. • Does not support applications that use unique services offered by cloud providers.	• Need public cloud resources to extend to the data center. • Want less responsibility for managing infrastructure part of IT service delivery. • Need more locations for data.

Stage 4: Hybrid Cloud

Hybrid cloud extends the private cloud environment to include hyper-scale public cloud services such as AWS, Google Cloud Platform and Microsoft Azure. Consistent virtual infrastructure based on VMware vSphere wherever workloads are deployed enables a single operating model that extends from the data center to the cloud. Enterprises can extend their IT teams' existing skills, tools and processes by leveraging familiar management and automation technology, integrating on-premises and third-party cloud environments. Virtual networks extend between on-premises and cloud environments to provide seamless and secure connectivity.

What's good?	What's missing?	What's next?
• A single service operating model works across environments, transparent to IT service consumers. • Workloads become portable – deploy or move to meet diverse and changing business requirements. • Enables new use cases including simplified migration and scale on demand. • Enables microservice architecture where various services can be deployed to take advantage of proximity or unique services.	• Limited to where consistent infrastructure is deployed. • Other workloads may be deployed on cloud-native infrastructure.	• Application needs require services from multiple unique clouds. • Business owners choose multiple clouds for business or technical reasons.

Stage 5: Multi-Cloud

Multi-cloud includes workloads deployed to environments that may not have VMware consistent infrastructure. Multi-cloud enables organizations to get consistent operations with Kubernetes or DevOps automation tools, and other cloud management platforms, independent of underlying infrastructure. Multi-cloud operations includes centralized management and monitoring of various technologies in various locations, such as cost or compliance management.

What's good?	What's missing?	What's next?
• VM and containerized workloads consume the best cloud services with seamless network connectivity. • Cost, policy and security are managed and monitored consistently and centrally. • Next-gen investments in Kubernetes, security, networking and Edge become critical to customer success in a multi-cloud world.	• Cloud provider diversity may introduce complexity that needs to be intentionally and centrally managed.	• The business can drive digital initiatives built on the benefits of IT modernization.

5 Stage Journey Summary Table

Stage	What is it?	What's good?	What's missing?	What's next?
1 **Virtualization**	Software abstracts underlying hardware resources	Improved resource efficiency	Not necessarily automated	• Reduce manual process work • Gain operational efficiency through automation
2 **Software-Defined Data Center**	Virtualized resources orchestrated together	IT operational efficiency	Automation is mainly focused on internal IT operations	• Automate app development lifecycle • Support business digital transformation goals
3 **Private Cloud**	IT services bundled and automated for new delivery models	Automated and outcome-oriented service delivery and application development	• Scale requires CapEx • Does not include unique public cloud service options	• Need more scale or more location • Access unique cloud services
4 **Hybrid Cloud**	Single operating model extending from data center to public cloud	• Consistent infrastructure and consistent operations • Easily tap into unique cloud services	Need to manage all cloud workloads	• Need central management of multiple cloud environments • Applications use cloud-specific services
5 **Multi-Cloud**	Central visibility and management of multiple cloud environments	Visibility and control of cloud deployments	Complexity introduced by multiple cloud platforms	The business is free to drive digital initiatives with confidence

VMware unique value

VMware is committed to delivering solutions that help customers at every stage
of the cloud and application modernization journey. VMware transformed the
industry with virtualization and SDDC technology. VMware has delivered cloud
solutions and partnerships with leading public cloud providers that deliver
consistent infrastructure and operations across data center, cloud and Edge
environments. And VMware continues to invest in and deliver innovative app
modernization solutions that ensure IT can support digital business initiatives
into the future.

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Why Choose VMware?

- *VMware Cloud Foundation* (VCF) bundles computing, storage and network virtualization into a single platform for private and hybrid cloud operations.

- The VMware Cloud Foundation is available for data center and Edge environments with stand alone software, Hyperconverged Infrastructure (HCI), or hosted solution options.

- The Cloud Foundation is also available at all major cloud providers – AWS, Microsoft Azure, Google Cloud Platform, IBM Cloud, Alibaba and Oracle – as well as 4,300 Global VMware Cloud Provider Partners.

- VMware continues to innovate with new solutions for containers and Kubernetes to support cloud-native application architectures.

- With VMware, you can leverage and extend existing investments to the cloud, as well as modern application architectures.

- You can leverage existing skills, and simplify complexity, with a single-vendor offering to build a foundation for digital business success.

Learn more:

vmware.com/go/hybrid-cloud

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