

INFRASTRUCTURE-AS-A-SERVICE PRIVATE CLOUD COMPARISON

OpenStack compared to VMware vCloud Suite

TECHNOLOGY BRIEF

INTRODUCTION

Infrastructure-as-a-Service (IaaS) clouds allow users to self serve, or consume, their needs for compute, networking, and storage on a pay-as-you-go model. In an IaaS cloud, compute, networking, and storage are defined as software services (e.g., APIs) that are designed to scale out within the datacenter, providing automation over the underlying hardware and system resources.

An IaaS cloud provides services for users to utilize highly available applications that are designed to be resilient to software and hardware failure. OpenStack® is an IaaS cloud platform and toolkit that orchestrates a scale-out architecture across various technologies, including compute, hypervisors, networking, and storage.

Alternatively, traditional datacenter virtualization focuses at the basic level of virtualization, allowing IT organizations to consolidate their physical infrastructures into scale-up virtual infrastructures. In this model, IT departments are still responsible for addressing user requests for virtual machines (VMs), storage, and networking, but do so in a scale-up method. They add more system resources to existing virtual machines, essentially maintaining a larger, monolithic environment.

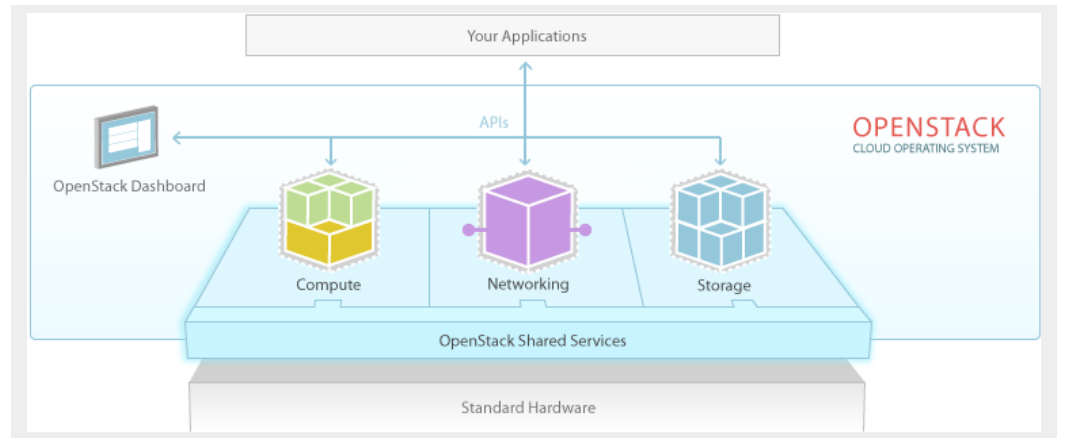
VMware offers vSphere and vCloud Suite to address traditional virtualization and cloud needs. This document is intended to share the main differences between OpenStack and VMware vSphere and vCloud Suite.

KEY DIFFERENTIATORS

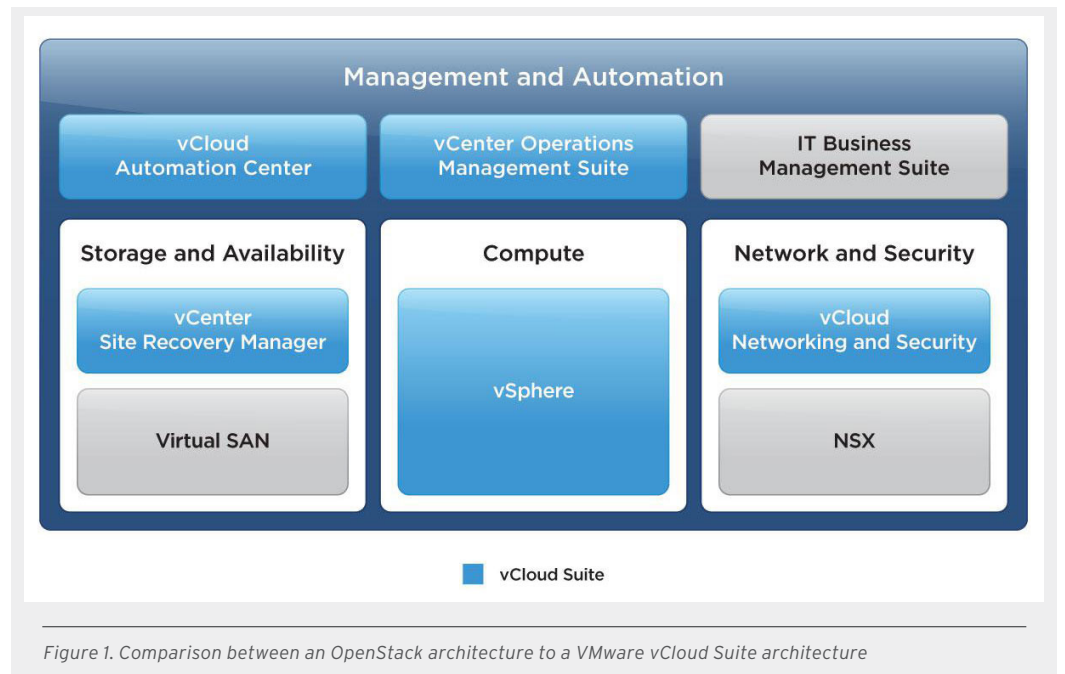
	RED HAT	VMWARE
Types of applications	<p>OpenStack is cloud-ready and well suited to stateless, non-persistent, and scale-out applications.</p> <p>Legacy scale-up applications might not retrofit well with the new scale-out OpenStack approach.</p> <p>One way to migrate legacy applications is to use block storage, keeping the latest snapshot of the instance in Glance (image service) and monitoring it. If an instance goes offline, you can easily create a new one from the image and mount block storage with the data.</p>	<p>Traditional, legacy applications from physical and virtual environments (e.g., ERP, CRM, databases, email, traditional 3-tier web applications) work well here.</p> <p>Workloads in a traditional virtualization environment often maintain many of the characteristics of their physical counterparts. And while there are many advantages inherent to traditional virtualization, many of them are at the infrastructure layer and do not transfer to the operating system or applications running inside the VMs.</p>

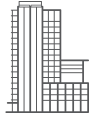
	RED HAT	VMWARE
How to scale/grow	<p>Scale out automatically and instantiate new instances as load increases. Scale-out allows you to combine the power of multiple machines into a virtual single machine with the combined power of all of them, removing the limitations of a single unit.</p> <p>Users do not have to scale down after a burst, as the system automation scales as needed.</p>	<p>Scale up manually and increase resource (CPU/memory) per instance as load increases. However, in a scale-up scenario, you'll have a hard limit (e.g., the scale of the hardware or maximum limits of the software).</p> <p>Administrators have to manually scale down to find the ideal amount of memory and CPU to optimize consolidation ratios.</p>
How failure is handled	<p>Failure is abstracted into an open source application design. If hardware fails, the application is designed to continue as it was already running across multiple VMs to begin with—resulting in zero application downtime.</p> <p>The state of a running instance or VM is ephemeral, not persistent. The state can be stored in (1) a Cinder storage volume or (2) a snapshot. Storage in a Cinder volume is preferred as a new instance can be launched from Cinder.</p>	<p>Failure is managed by VMware proprietary technology. Therefore if a host fails, the VM/workload will be rebooted on an alternate host. This incurs some downtime while the workload is automatically restarted.</p> <p>Fault tolerance provides availability for applications in the event of server failures by creating a live shadow instance of a VM that is always updated with the latest changes from the primary VM.</p> <p>If the primary VM fails, VMware fails over to the secondary VM. Backend databases have to be synchronized to prevent data loss.</p>
Example e-commerce application	<p>A distributed stateless application might load purchase orders into a queue and use background servers dedicated to processing the orders (asynchronously) while users continue to purchase and browse products on the primary servers.</p>	<p>A traditional 3-tier application is used when demand increases during a busy season, more resources (e.g., memory, CPU, disk) are manually added to VMs, which are placed behind a load balancer.</p>

OPENSTACK ARCHITECTURE



VMWARE VCLLOUD SUITE ARCHITECTURE





ABOUT RED HAT

Red Hat is the world's leading provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux, and middleware technologies. Red Hat also offers award-winning support, training, and consulting services.

Red Hat is an S&P company with more than 80 offices spanning the globe, empowering its customers' businesses.

SUMMARY

As businesses integrate IaaS into their datacenters, many discover both scale-up and scale-out infrastructure capabilities are needed to meet their unique application needs. By adding a cloud-enabled, scale-out infrastructure, organizations can better address internal and external business demands from users and customers.

Red Hat is a full-service cloud provider, with a broad range of cloud solutions to address your unique datacenter needs. To learn more about Red Hat's OpenStack technologies and cloud solutions, visit our redhat.com/openstack/vadmin.

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