

Adobe Digital Marketing's IT Transformation with OpenStack

OPENSTACK CASE STUDY

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Executive Summary

Most organizations have IT infrastructure that was leading-edge in the past but limits opportunities in the present. New needs for agility, simplicity, security and resiliency often highlight the gaps and limits in an IT infrastructure.

The Technical Operations team in Adobe's Digital Marketing group knew they needed to drive an evolutionary revamp that would take their infrastructure into leading-edge territory. They had a fundamental goal -- to improve a core customer-facing business function -- the Adobe Marketing Cloud.

Adobe Digital Marketing and its Marketing Cloud provide SaaS digital marketing capabilities to large B2B enterprises. Their Marketing cloud enables superior web experience management, analytics, social marketing, media optimization, testing and targeting, and campaign management for hundreds of organizations around the world. As a core business function, agility, resiliency, and innovation are key measures of success.

Adobe's environment was typical for many organizations -- some VMware virtualization, paired with physical resources, across many datacenters worldwide. But that was no longer enough -- Adobe needed to leverage their VMware infrastructure in a new way by shifting toward a leading-edge, fully-fledged private cloud infrastructure.

Challenges and Opportunities

Customers have some basic expectations of SaaS offerings.

- **Rapid, incremental innovation**
- **A relentless emphasis on security**
- **Resiliency and performance in line with expectations**

Adobe's infrastructure teams rethought how they could meet these expectations. They saw the cloud as the best way to accelerate the full software development lifecycle. From sandbox (playing around) and development, to quality engineering, staging/beta, and into production – the initial goal was to provide a consistent, abstracted layer that would be automatically and seamlessly provisioned via a self-service model. From an operational perspective, Adobe wanted to give developers, testers, and operational engineers a consistent and reproducible experience from concept through to production.

In addition, Adobe wanted to transform their IT infrastructure by consolidating resources and shifting toward software defined capabilities that abstract away many limitations of bare-metal infrastructure. Adobe had already pushed traditional compute virtualization to its limits, using VMware across the infrastructure, but wanted to also virtualize networking and storage as well.

For a couple of years, the Technical Operations team had explored options, experimenting with various test and development scenarios, and began to see significant opportunities to deliver IT transformation.

Exploring Requirements

Adobe realized that they could re-invent their IT infrastructure with a more automated private cloud. It needed to include a cloud management layer and offer a robust self-service interface by which product teams could programmatically consume resources as needed.

Their primary goal was to provide Infrastructure as Code, enabling operation and engineering teams to consume this infrastructure in a standardized manner through a known language (JSON). By achieving this goal, their IT environment would become a software-defined datacenter rather than one limited by hardware and manual processes.

They had a few basic technical requirements to meet.

- **VMware support** – performance, resilience, and investment protection
- **Network requirements** – security, micro-segmentation, and true multi-tenancy
- **Software-defined storage and networking** – to drive down costs and complexity

Beyond technical requirements, they had several objectives.

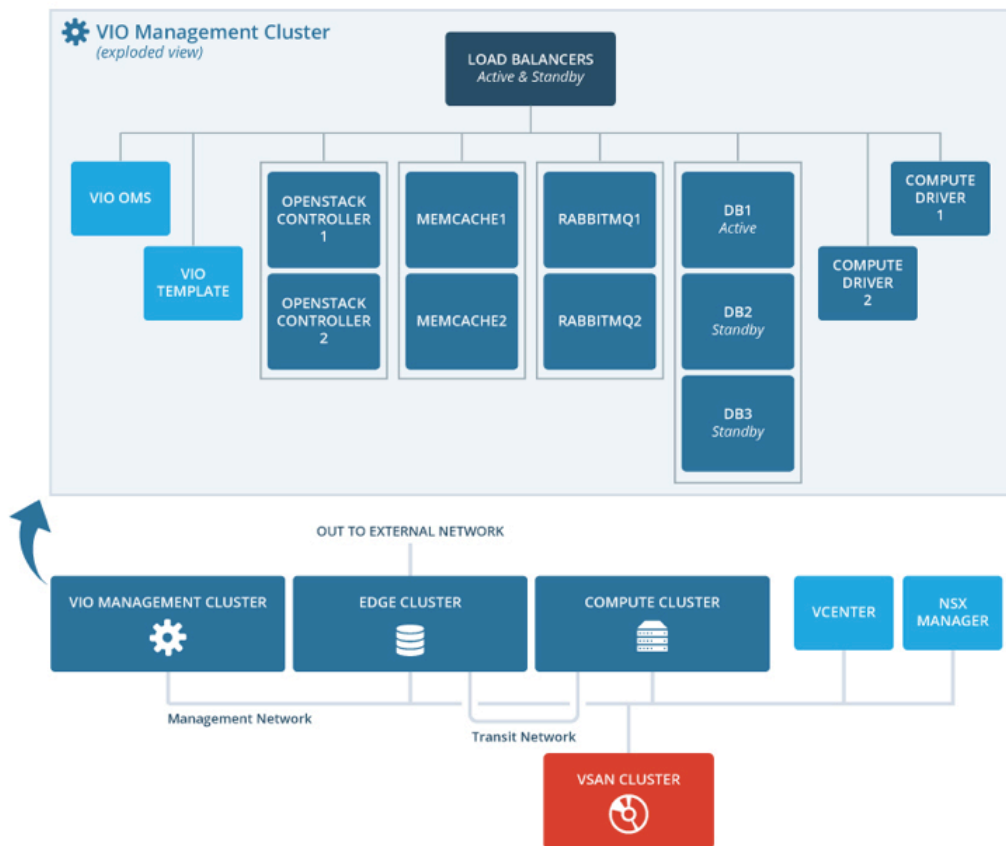
- **Operational** – ease management overhead, centralize the interface, consume infrastructure in a standardized, self-service model
- **Cost savings** – reduce manual intervention, product development and launch delays, and achieve savings from overall standardization of infrastructure

Adobe preferred open source to avoid vendor lock-in, but to explore all opportunities, they also evaluated a few commercial offerings. They were ultimately looking for a well-established, proven option with a strong community and a robust roadmap.

This transformation had the potential to provide both developers and end-users with more elasticity, security, and efficiency. After a rigorous series of tests and evaluations, VMware Integrated OpenStack (VIO), offering a full, standard OpenStack distribution with integration to VMware vSphere, NSX, VSAN and vCenter, offered the best combination of capabilities, maturity, roadmap, and VMware integration. This enabled efficient infrastructure modernization while building on the strengths of their existing environment.

VIO Infrastructure

Once they realized that they could abstract out complexity and use VMware Integrated OpenStack to accelerate change, they needed to demonstrate value. They got started proving their new approach immediately. They kicked off a proof of concept and set an ambitious goal of putting it into production this year.



Adobe began by building a small proof of concept (POC) environment made up of 14 servers across four clusters, each with internal storage. They standardized on a set of commodity hardware to avoid unneeded complexity. They chose very dense, converged hardware for efficiency and failover benefits, finally settling on Dell's FX2, a 2 rack-unit blade enclosure that supports up to 8 servers, as well as dedicated storage blades.

From a VMware perspective, they are using ESXi 5.5 (testing 6.0) for the hypervisor and running vCenter 5.5 for centralized management.

They expanded their use of software defined storage using VSAN 5.5 for virtual disk aggregation because it allows them to forego traditional SAN while offering good performance, redundancy, and management simplicity. This approach allowed them to keep storage close to compute and gave them the chance to test the benefits of an SSD layer. They're also trialing VSAN 6.0.

For networking, they implemented NSX for the first time for their management, transport, and external networks while experimenting with other open switching technologies like Cumulus Linux.

From an OpenStack perspective, initially they tested Icehouse, but by choosing VIO (the initial version is based on Juno), they more easily created a private cloud that encompassed the VMware virtual infrastructure. The VIO components are implemented within the management cluster; VIO orchestration deploys with the OpenStack components within that cluster using Nova Compute.

By choosing VIO, there are some unique integration points between VMware and OpenStack. For example, VMware HA, Distributed Resource Scheduling (DRS), and vMotion are natively integrated. Though it's not natively integrated, Adobe uses vRealize Orchestration (vRO), focusing on using it with OpenStack Heat.

They're leveraging several OpenStack software components.

- **Compute (code-named Nova)**
- **Dashboard (Horizon)**
- **Networking (Neutron)**
- **Orchestration Service (Heat)**
- **Image Service (Glance)**
- **They're also evaluating Object Storage (Swift)**

Additional capabilities are in-place or being evaluated.

- **Salt, Chef and Puppet for infrastructure automation**
- **Splunk, Nagios, Zabbix as well as vCenter Operations for monitoring**
- **Chargeback isn't a major priority as of yet, but they're doing POCs on a couple of commercial products**

Most of their customer-facing production workloads are Linux based, scale-out, SaaS delivered, distributed and cloud-optimized. They also have a longer term plan to move some of their internal traditional apps to OpenStack.

VIO provides tight integration of OpenStack provisioning capabilities with VMware-virtualized compute, storage, and networking so that developers can manage their own infrastructure needs throughout the software development lifecycle.

These developers also have programmatic access using APIs to automatically get application resources as the applications require more capacity, throughput, or performance.

Key Experiences

It's become clear to Adobe that OpenStack is mature and robust. That had previously been a concern, but they asked other companies and providers about pains and frustrations, and became comfortable that OpenStack was ready to develop and deploy their customer-facing environment.

Upgrade paths were also a concern for Adobe, but VIO's roadmap and ease of upgrade alleviated that issue.

Some organizations might not have the right staff or expertise to adopt OpenStack without complexity or delay. Fortunately, most of their operational teams understand configuration management (Puppet, Chef, Salt, etc.), so they are used to thinking like developers. Adding VIO was a natural change, an evolution rather than a complete shift due to the extensive VMware experience of their IT staff. Adobe found that they didn't have a need for additional staff, but they used Mirantis training for existing staff to add OpenStack skills. Over time, as they move into production, they may need to augment staff and expertise.

Community is very important to Adobe. They foresee possible needs for custom development in the future and they're open to contributing useful enhancements.

Benefits and Future Opportunities

Adobe sees the benefits of this approach including improved agility, flexibility, and performance. In addition, developer satisfaction, friction, and churn ought to be diminished as the self-service model moves into their 1400 server node production environment. Over the long term, they see the OpenStack infrastructure facilitating hybrid cloud capabilities as well.

So far, time to value has been accelerated. Deploying VIO components took about ten minutes. Choosing VIO offered additional benefits and opportunities, including being able to leverage their current infrastructure, their VMware institutional knowledge, robust resiliency capabilities, and a clear-cut upgrade path that VMware will deliver.

Another advantage of VIO is that both the VMware and OpenStack communities are working together to provide a tightly integrated, mature set of components and capabilities. VMware's roadmap offers to Adobe the capabilities they'll need.

Adobe is achieving the integration they expected and their production plans are on target. Thanks to streamlined deployment, they were able to devote additional time to training which ought to accelerate their production implementation.

Summary

Adobe has achieved a future-looking, leading-edge private cloud that extends their investment in VMware-based infrastructure. Abstracting and automating their infrastructure complexity, using Infrastructure as Code, will allow them, later this year, to enable seamless scale and simplified management across their production environment.

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To learn more about OpenStack, visit www.openstack.org. For information about VMware Integrated OpenStack (VIO), visit www.vmware.com/products/openstack.

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