



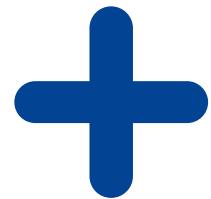
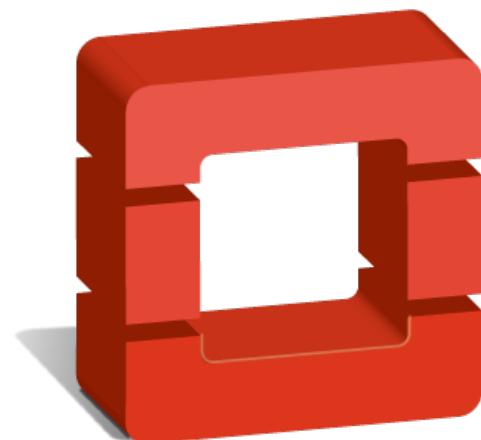
A yellow chevron icon pointing to the right, positioned to the left of the title text.

Nutanix & Openstack

Predee Kajonpai

pd@nutanix.com | Sr. Systems Engineer

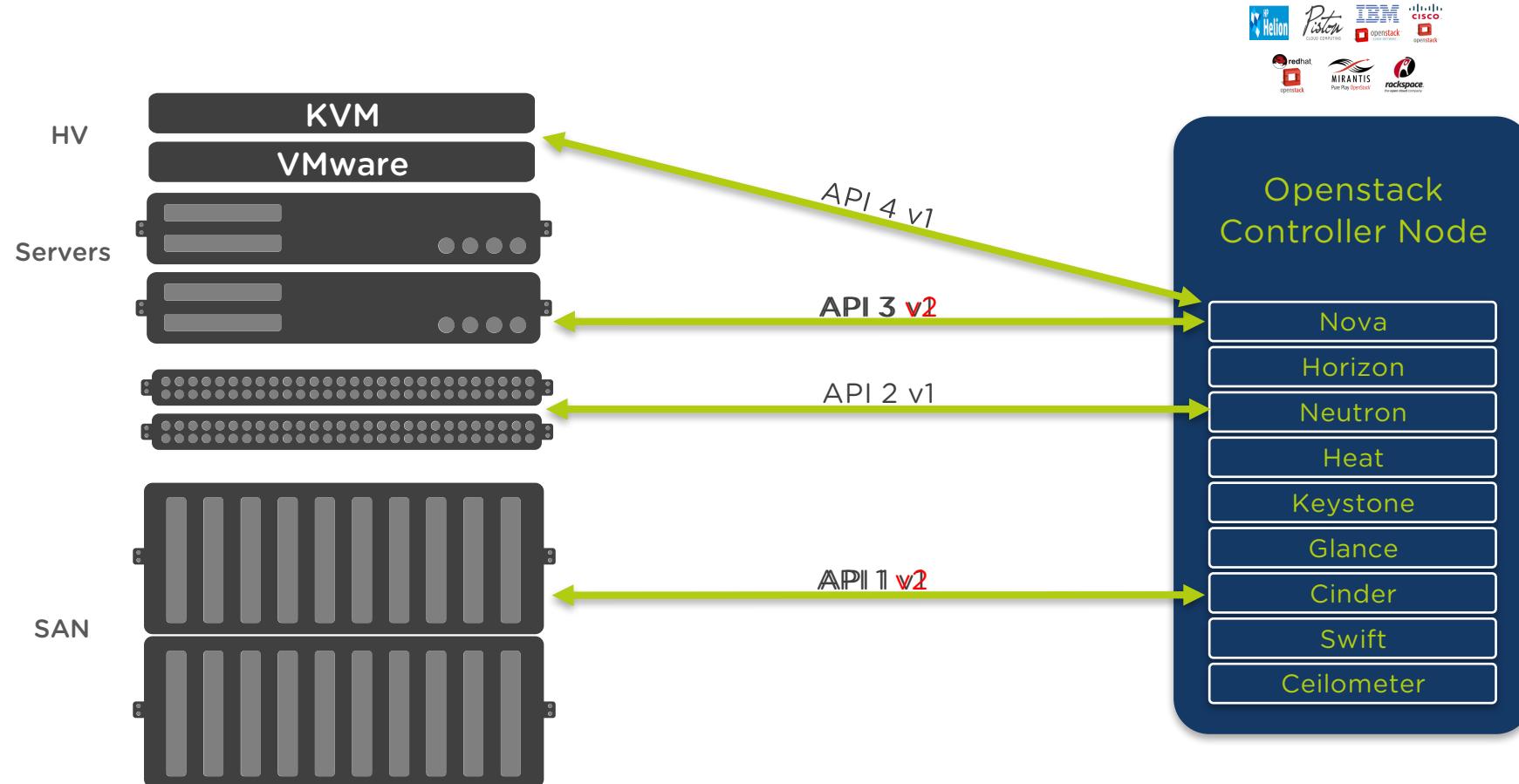
Openstack and Nutanix



openstack™



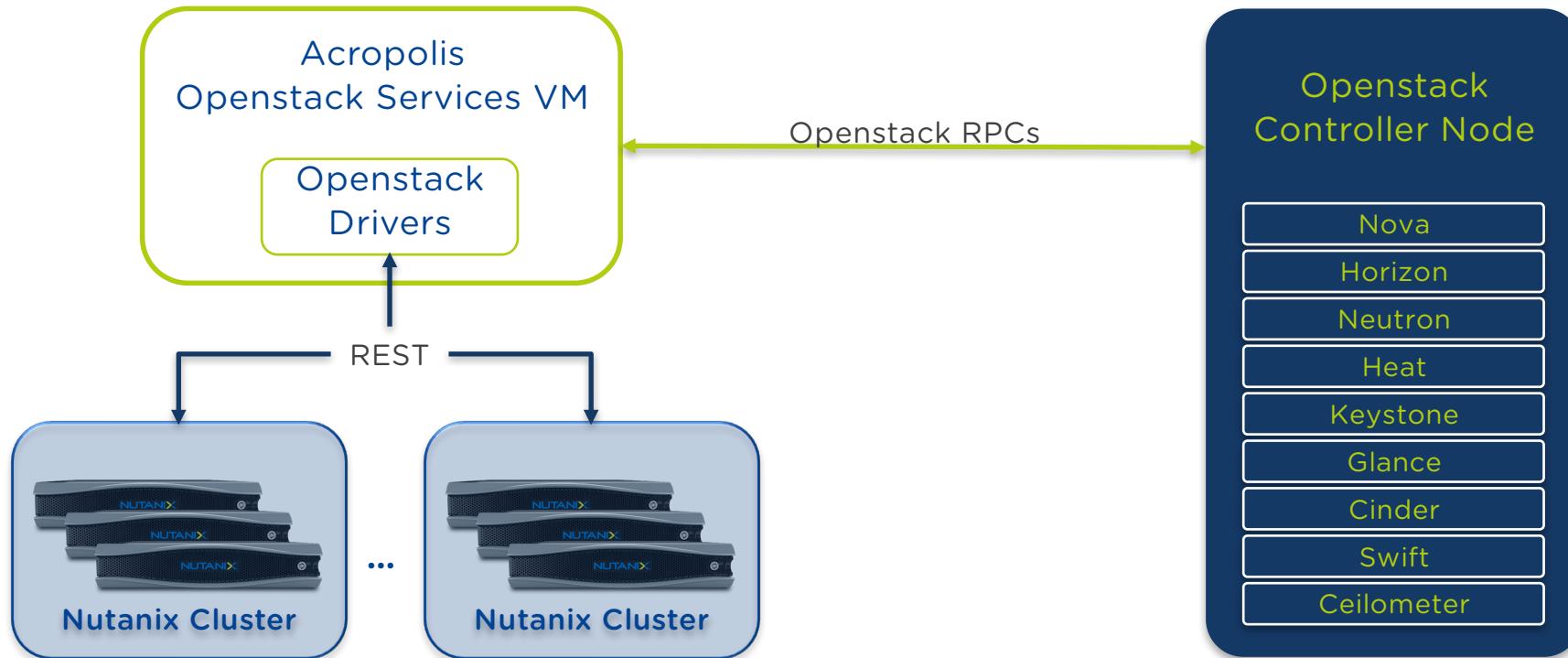
Openstack Challenges with 3 (4)-Tier



Issues with a traditional infrastructure approach for Openstack:

- Installation Complexity
- Multiple APIs & vendors to support
 - Development
 - Upgrade Pain
 - Troubleshooting Challenges

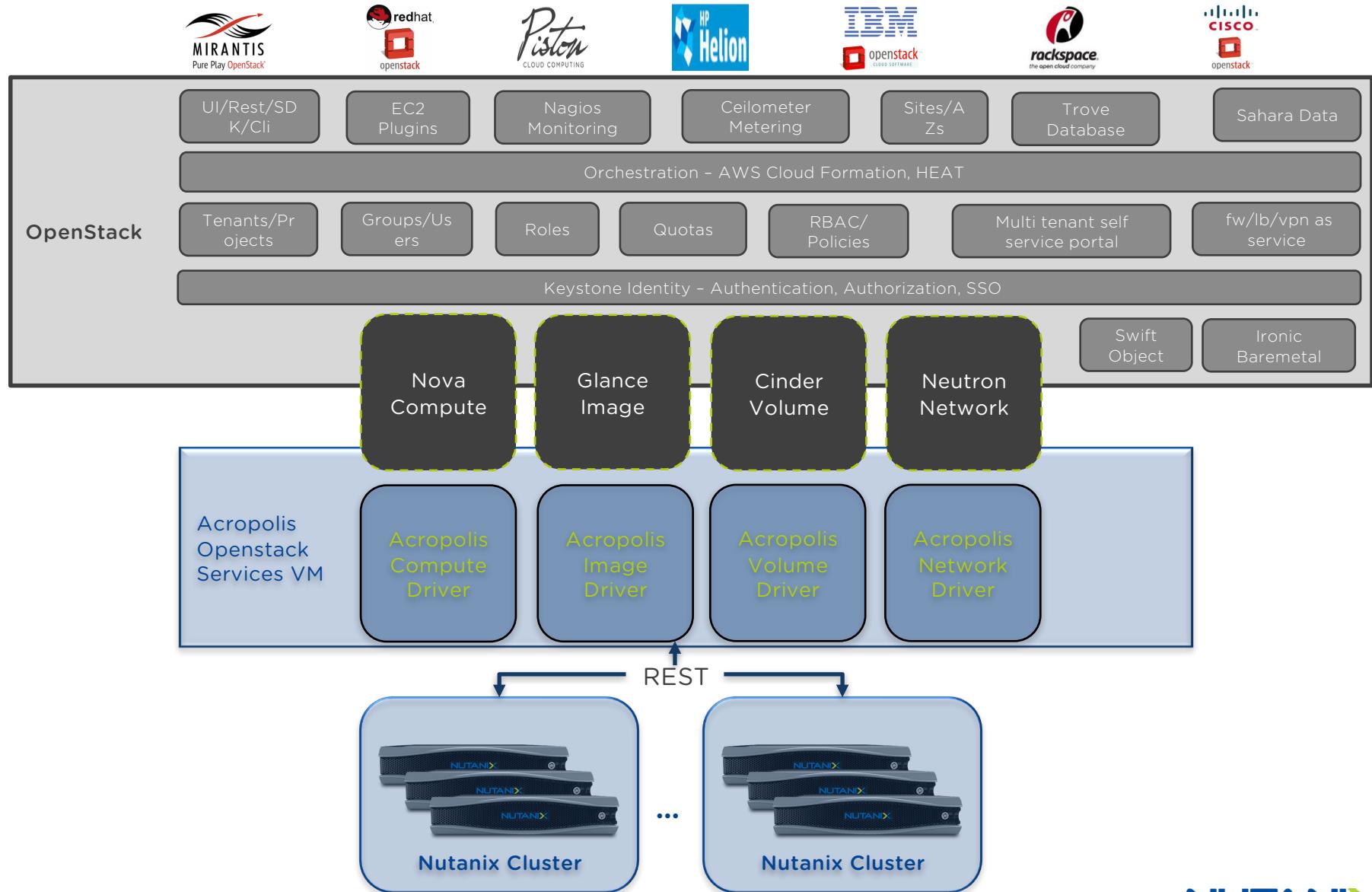
High Level Architecture



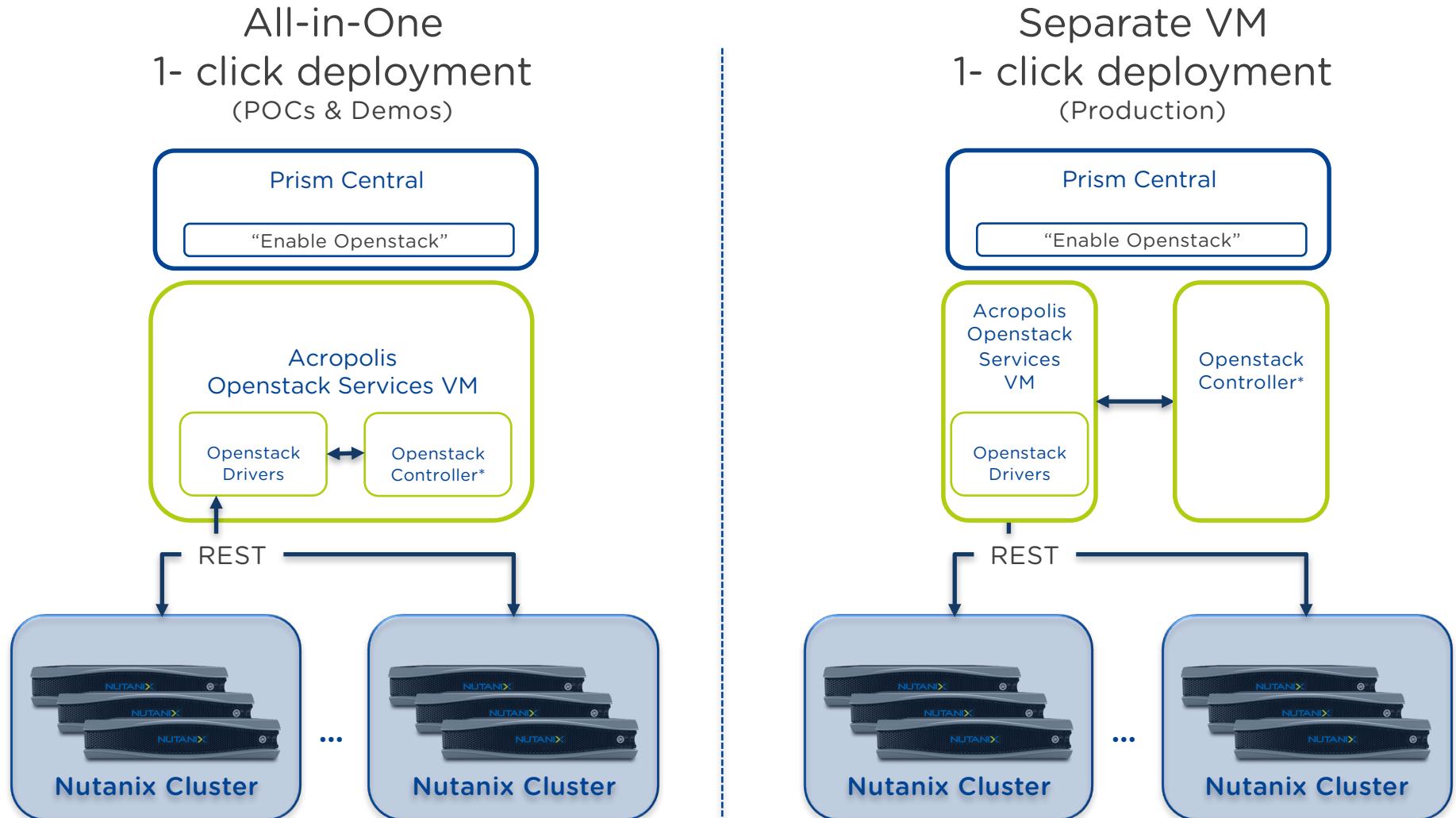
Benefits of using Nutanix for your Openstack deployment:

- Short TTM, Ease of deployment (<1 hour)
- No development resources required
- No pain when you upgrade the infra
- Single Point to Troubleshoot

Acropolis Drivers for Openstack



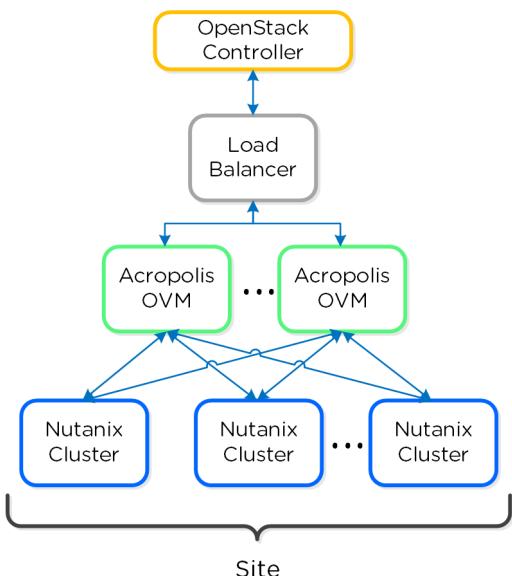
Deployment Modes



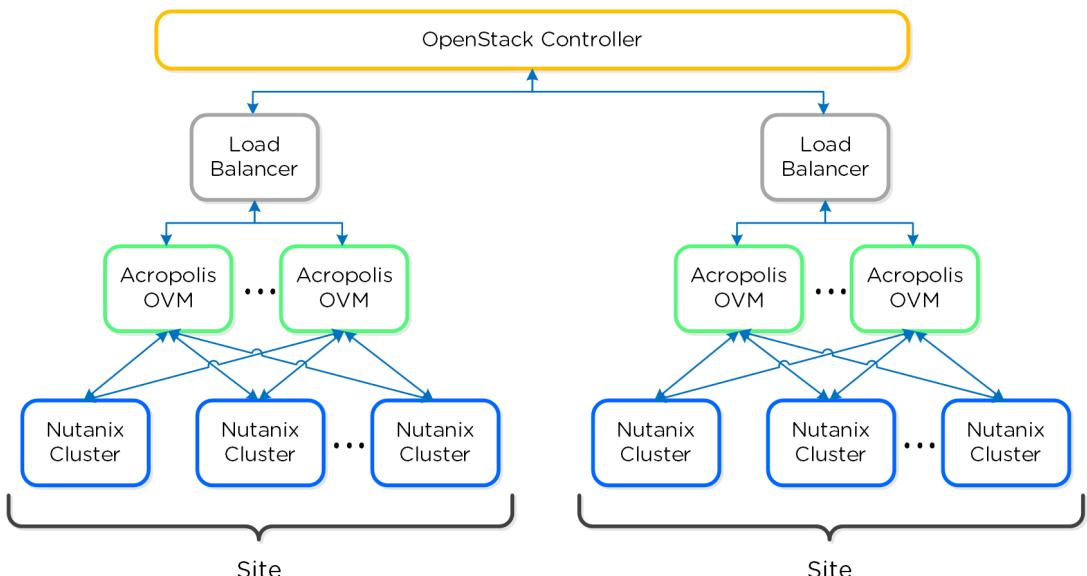
*Nutanix will not provide an Openstack controller. The Openstack controller (min. Kilo) needs to be chosen and deployed by the customer.

Single- & Multisite Deployment

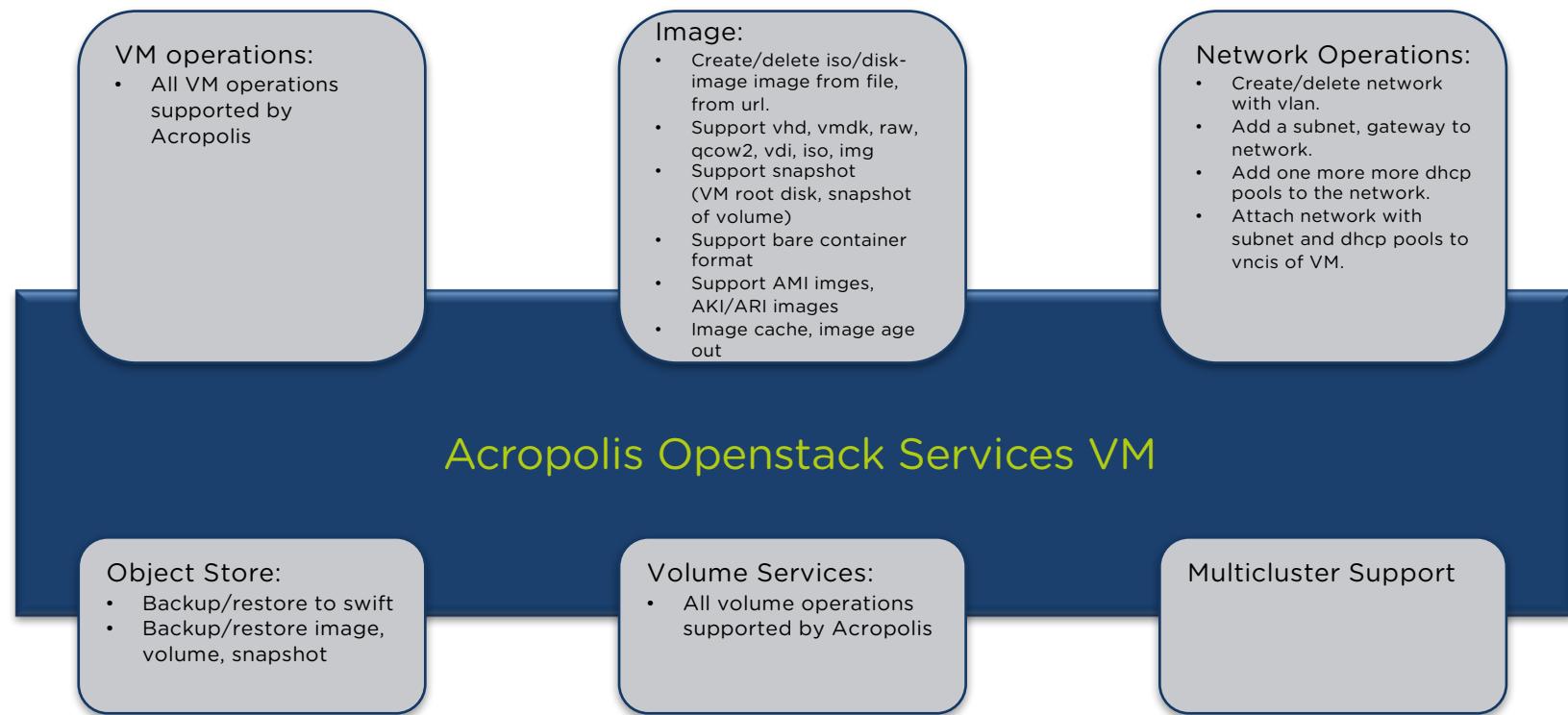
Single Site Architecture



Multiple Site Architecture



Openstack Services VM: Functionalities



[Learn more](#)

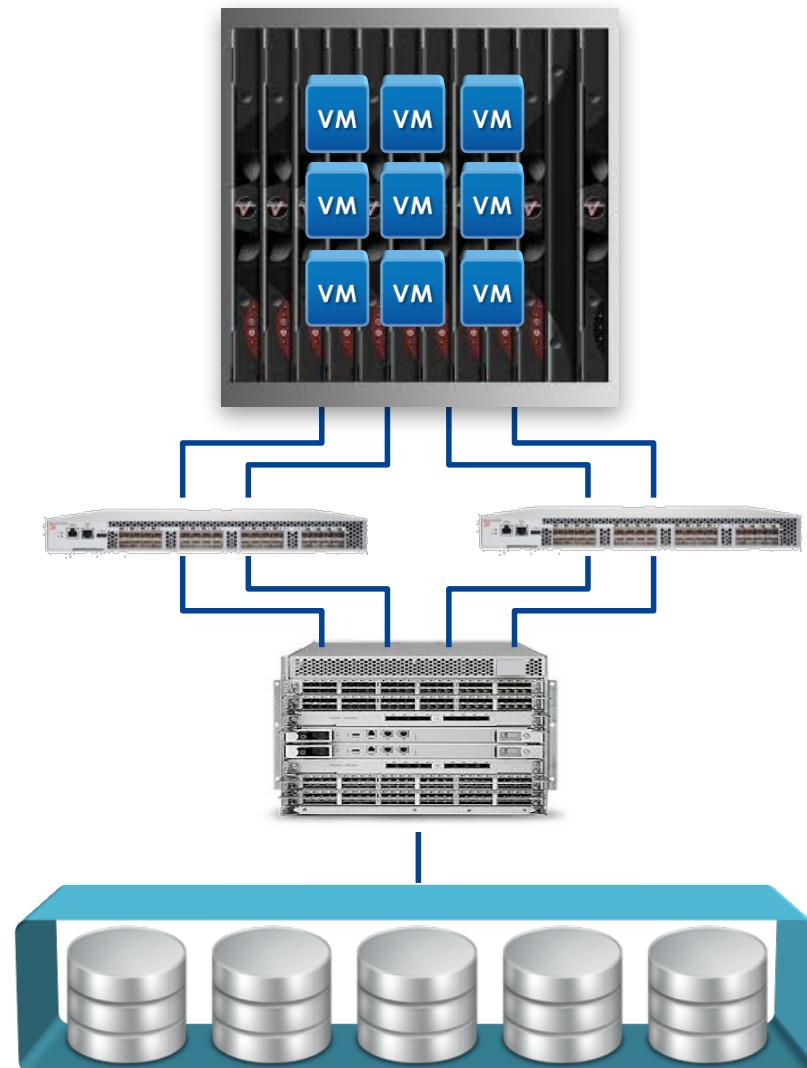


The Nutanix Bible

by Steven Poitras

nutanixbible.com/







1999



2003



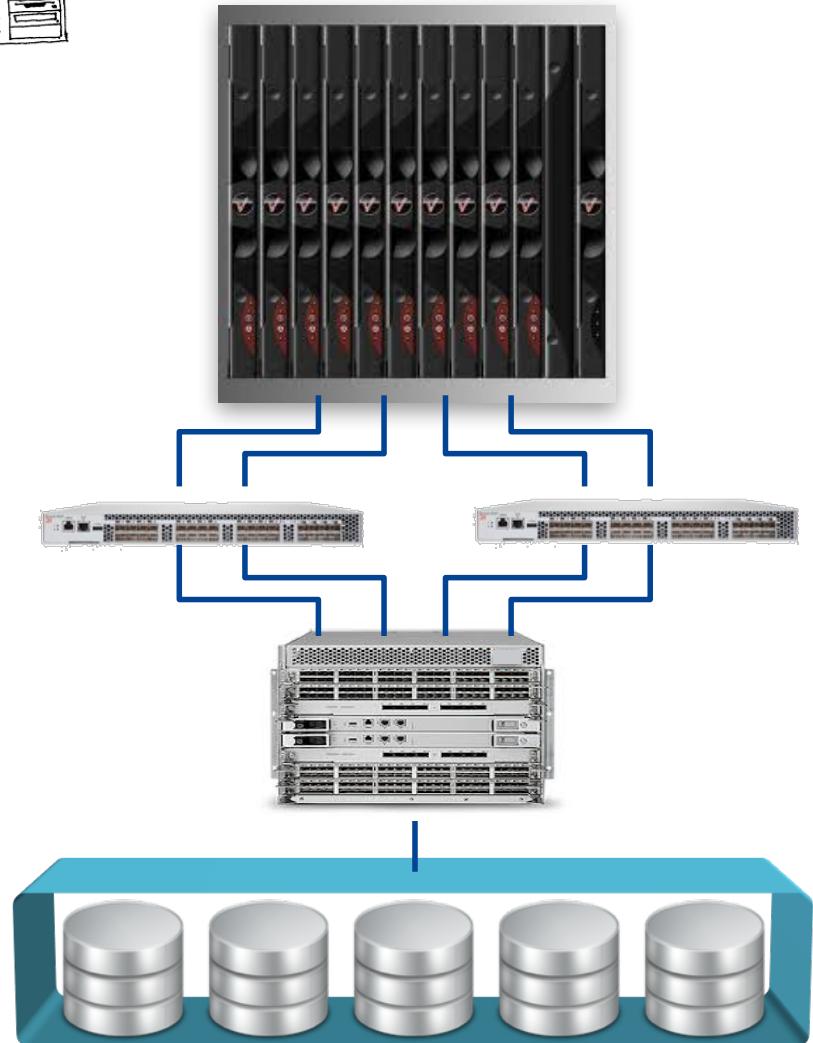
2008

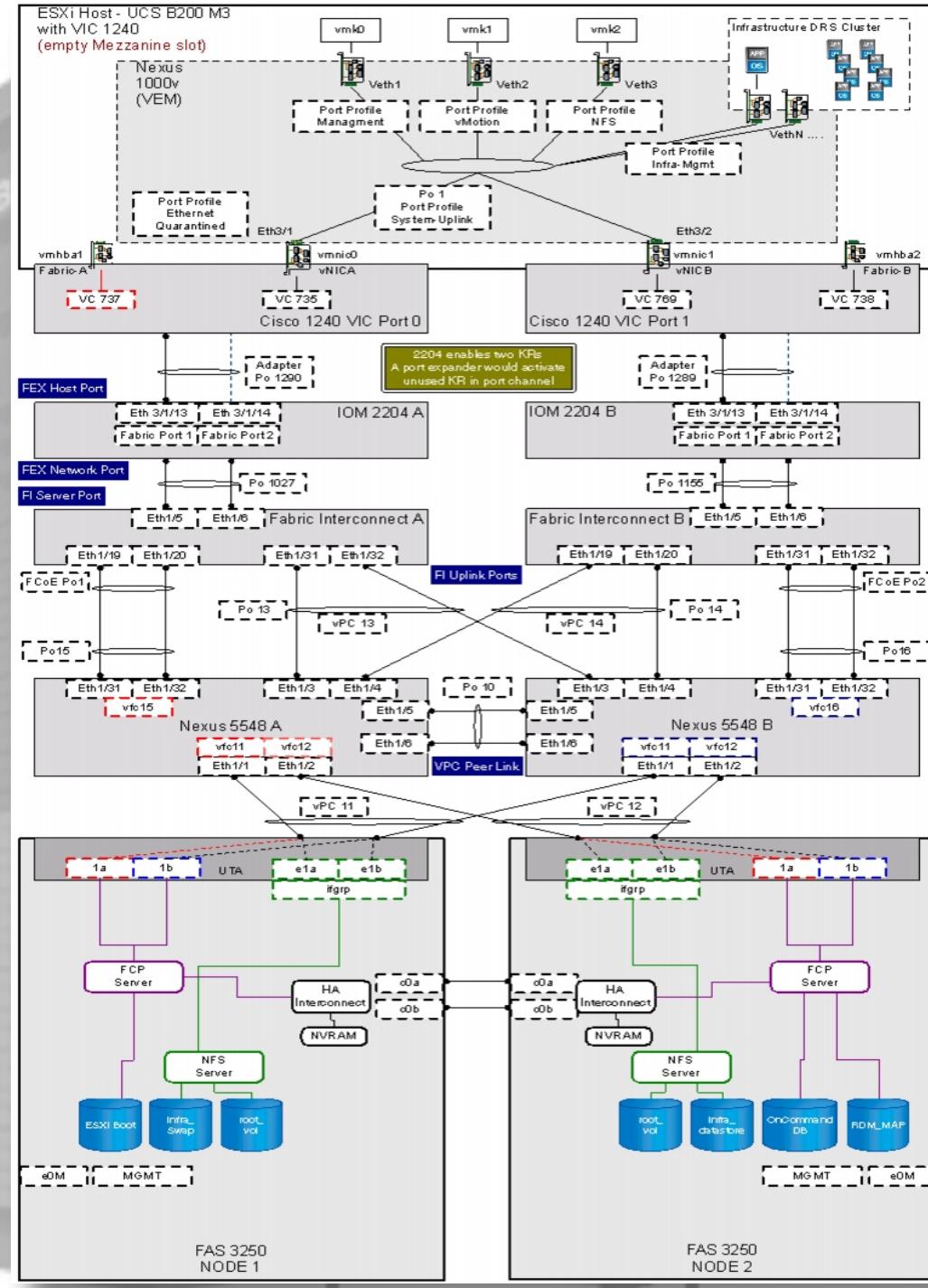


2012



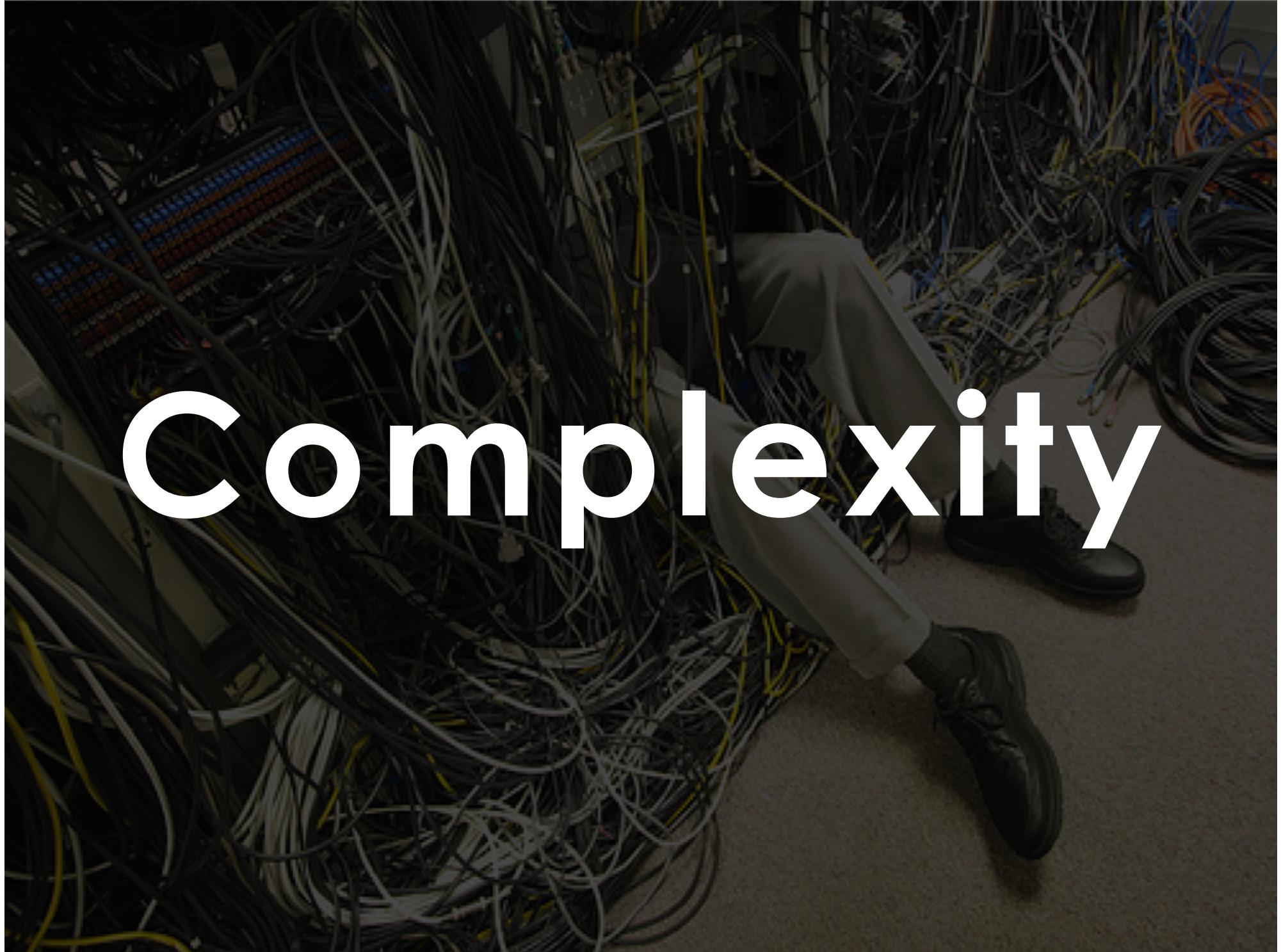
Today!

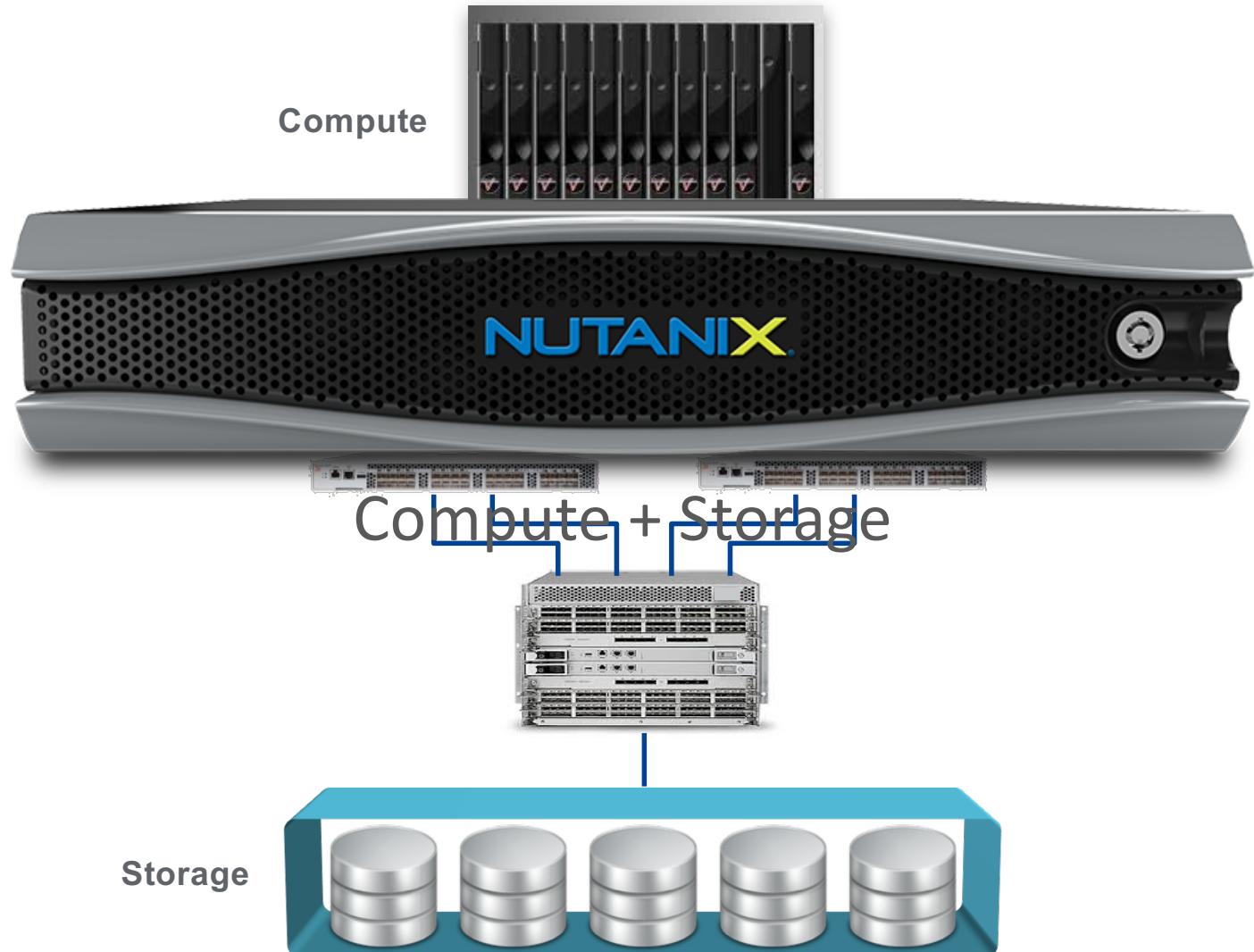


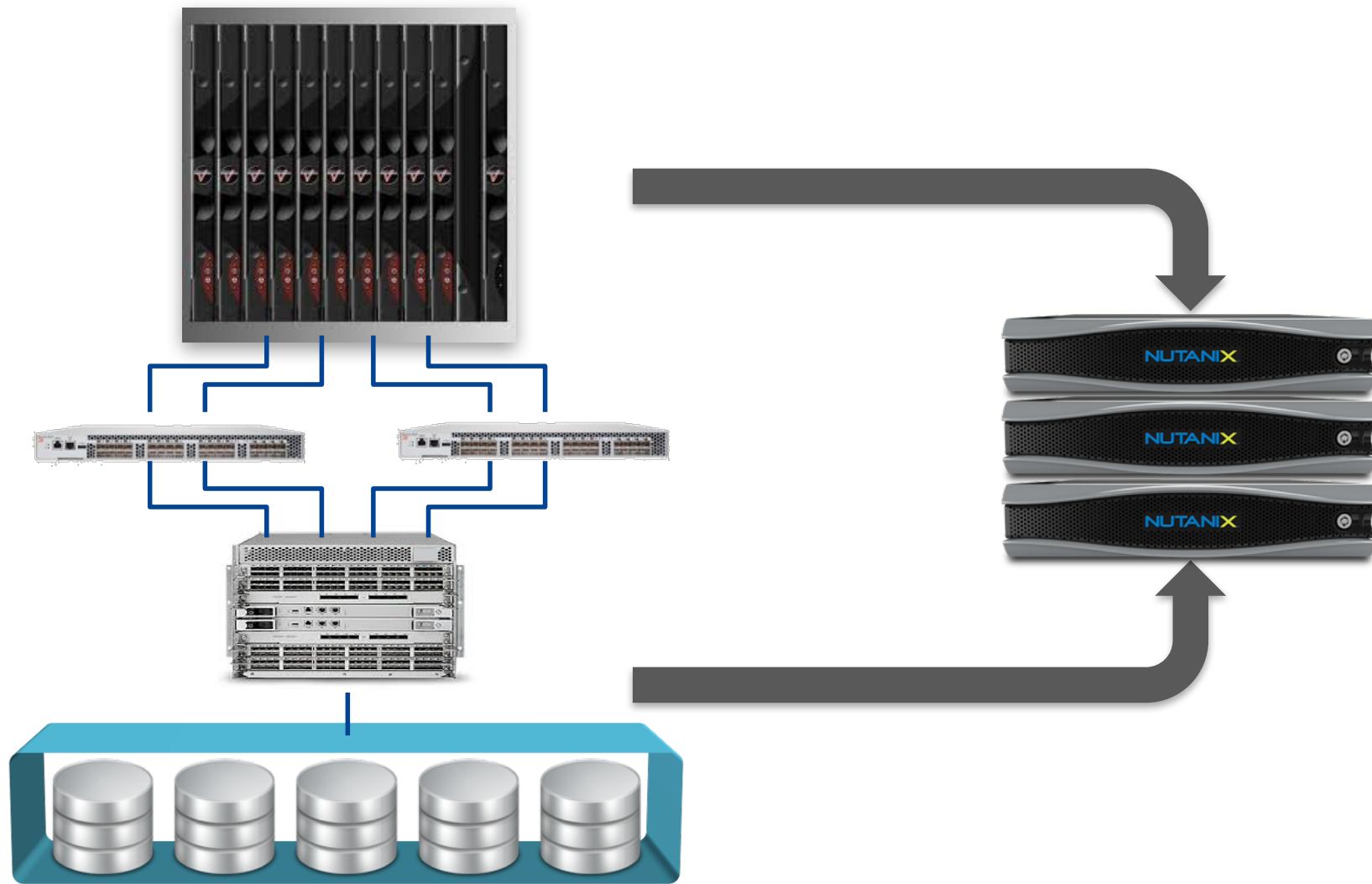


NUTANIX

Complexity





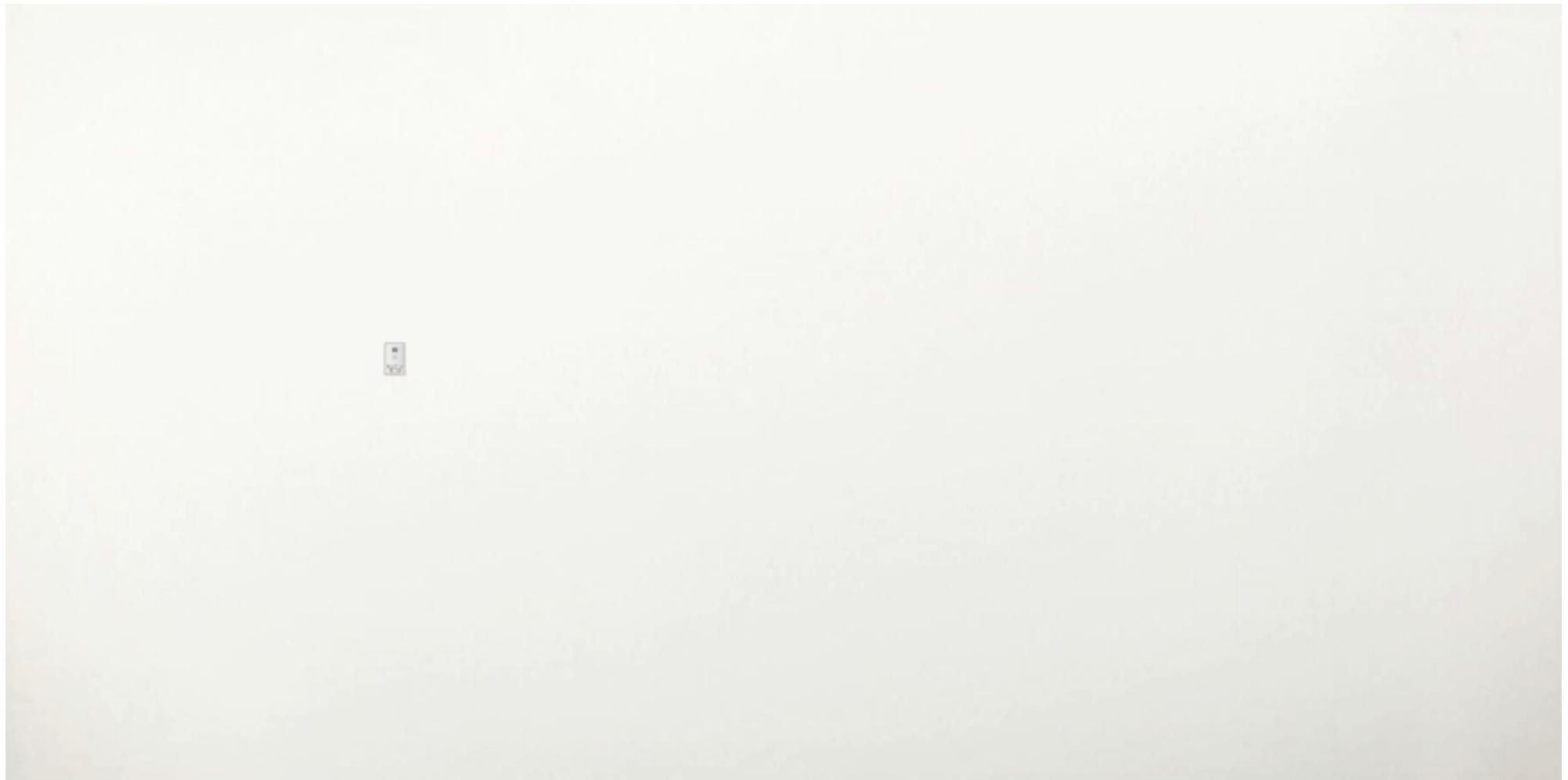




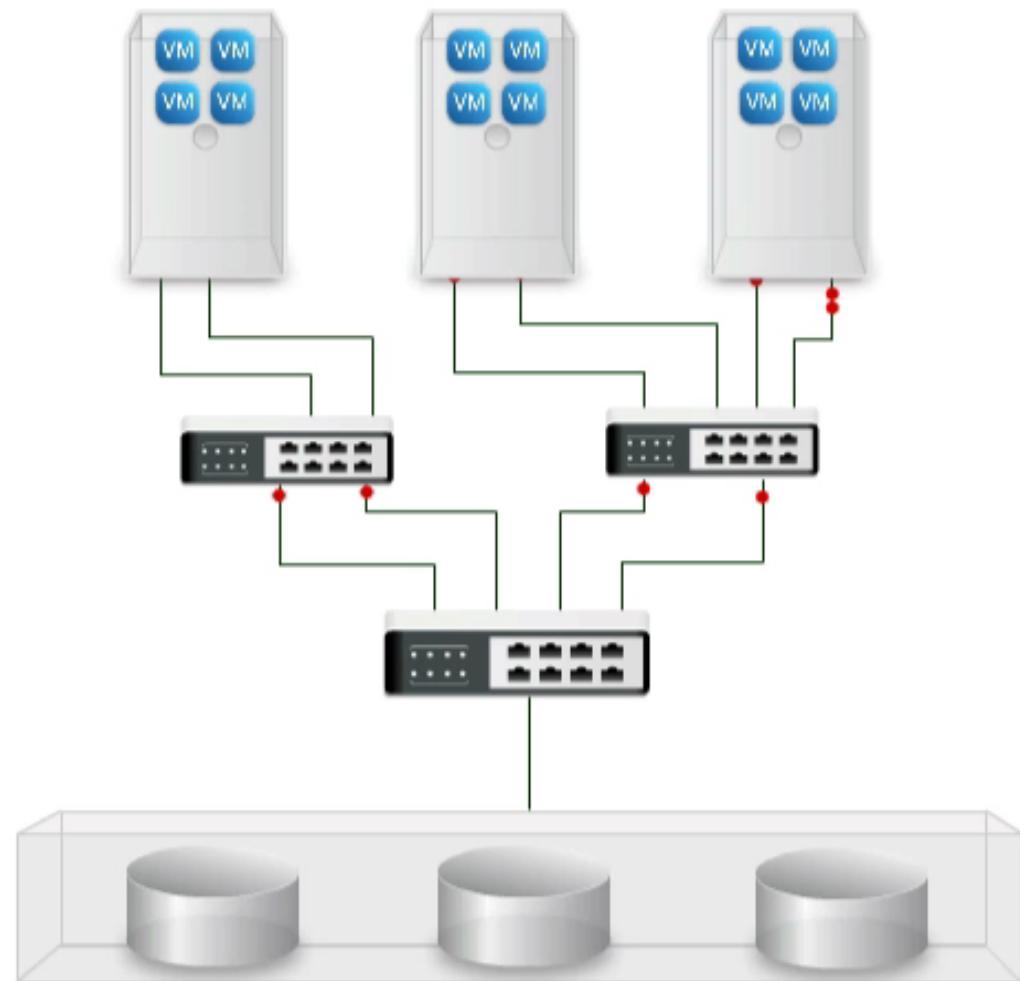
facebook.

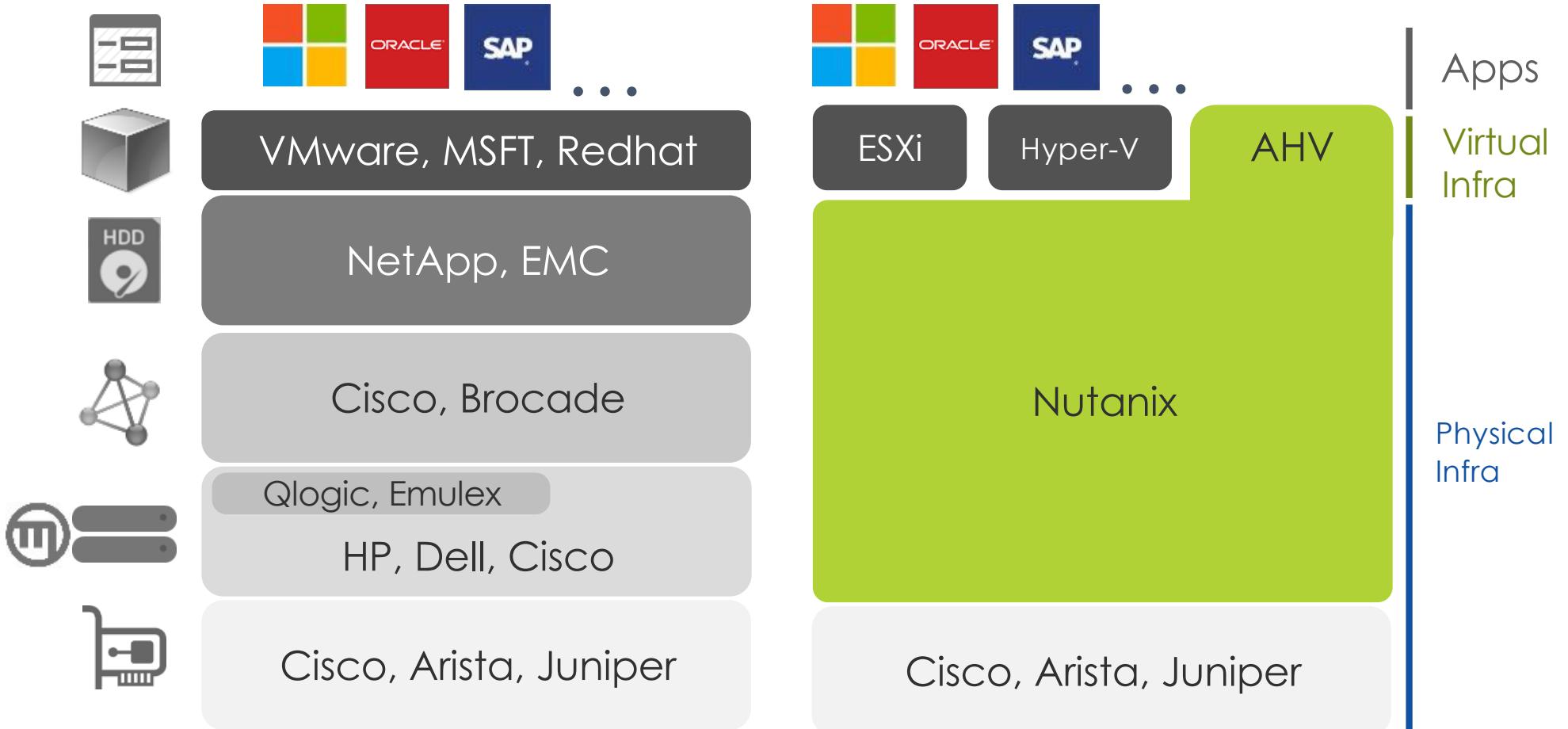


Google

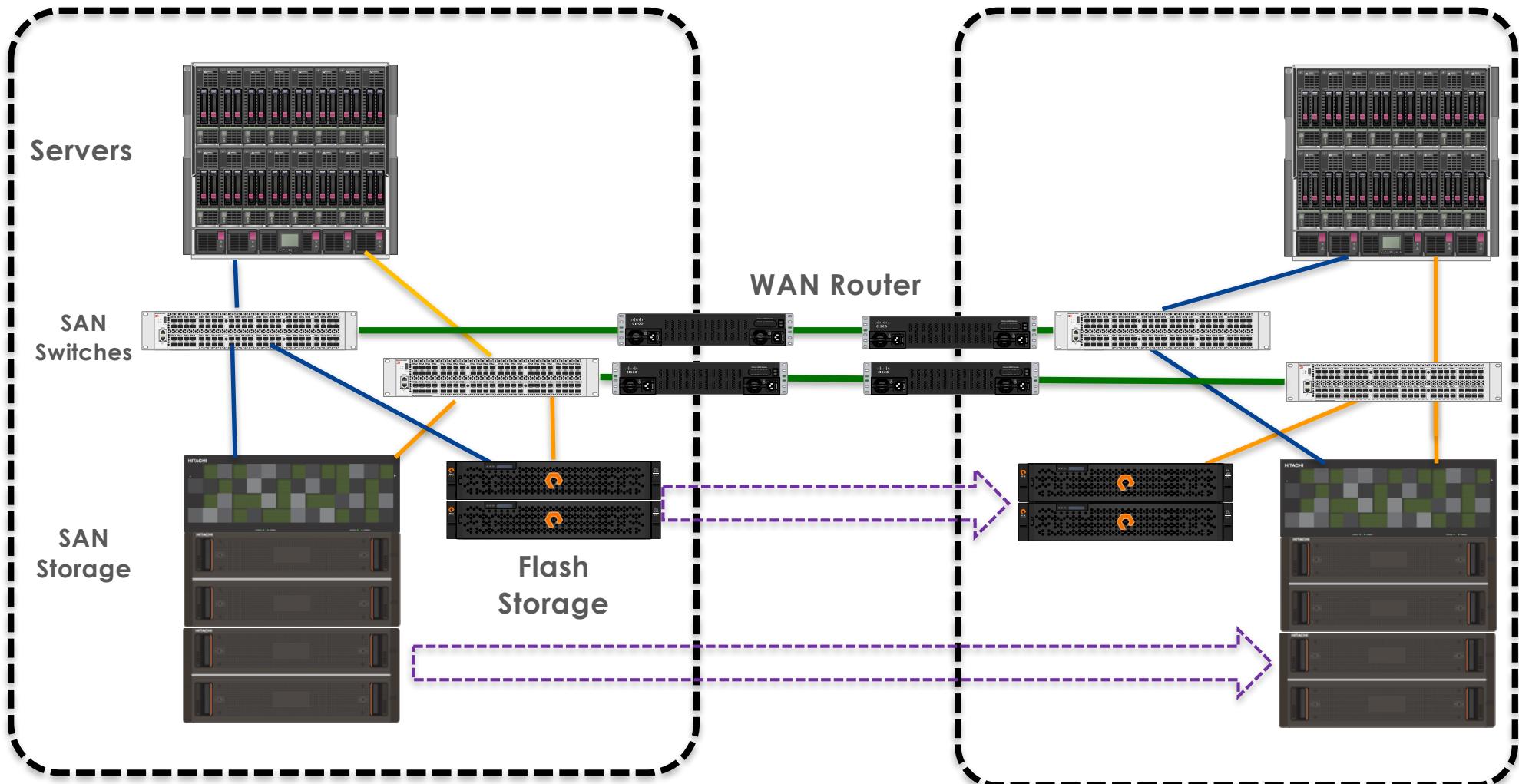






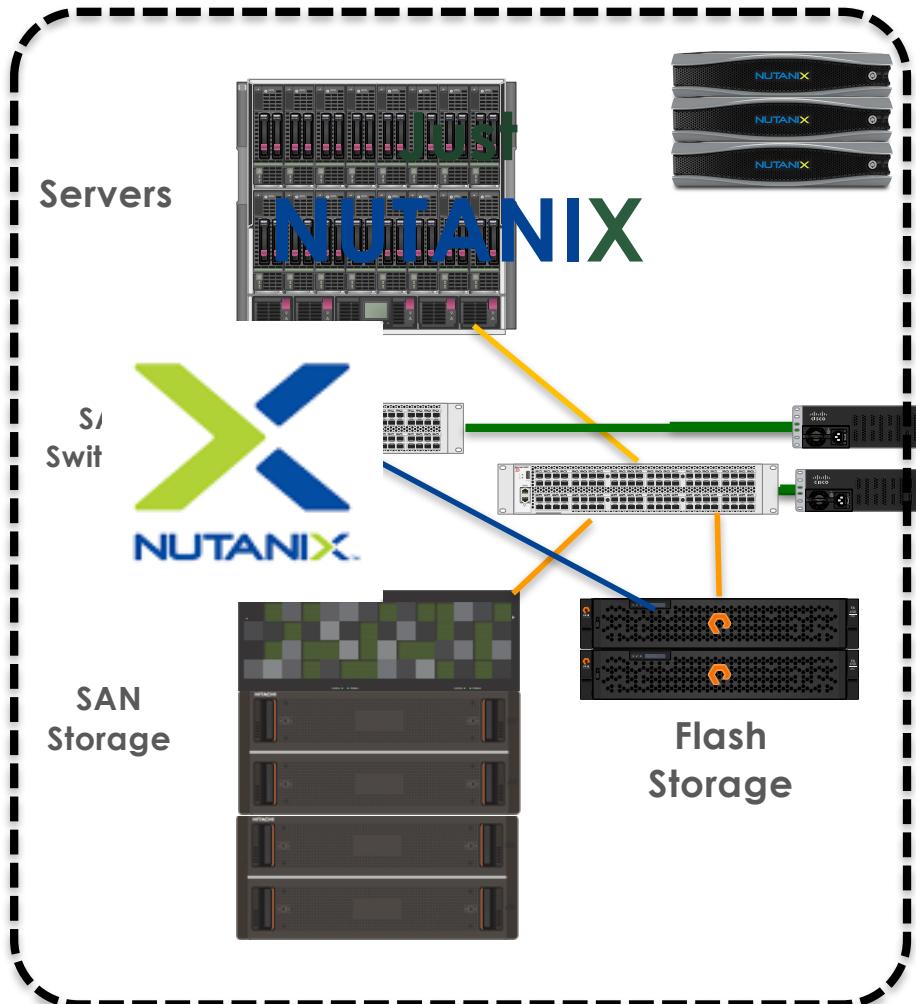


DC Site

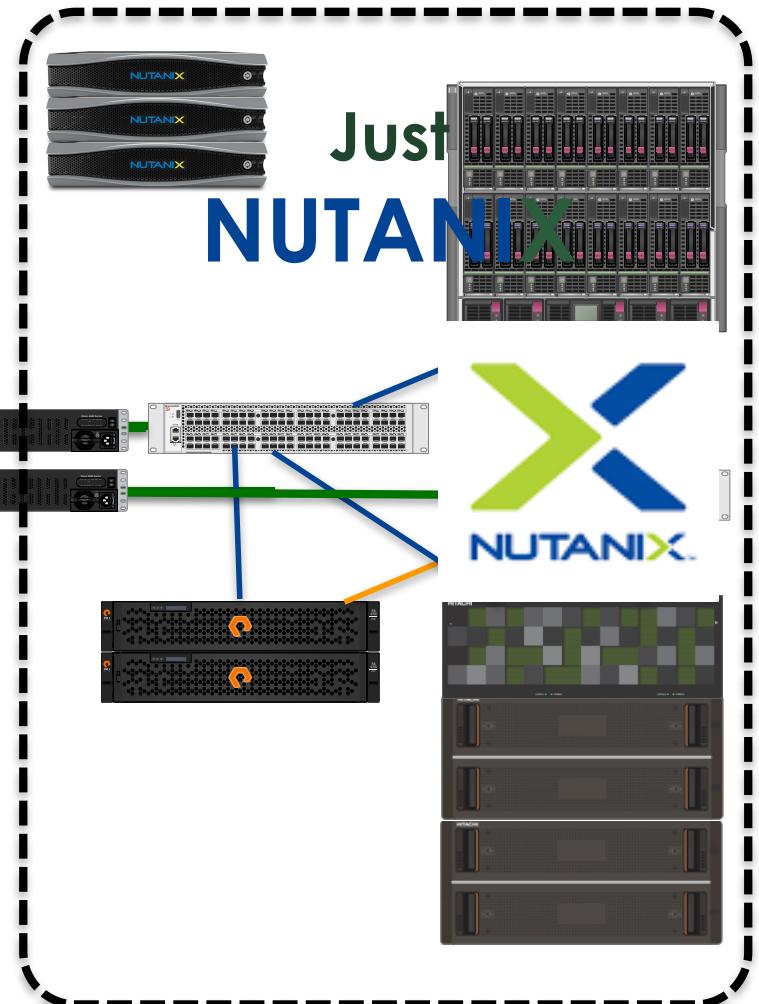


Yesterday.

DC Site



DR Site



Today.



Gartner
Magic Quadrant for
Integrated Systems

As of August
2015

NUTANIX



Thank You



Nutanix OpenStack Solution Brief

Building an OpenStack based private cloud with the Nutanix Xtreme Computing Platform

The Nutanix Distributed Storage Fabric (DSF) is a scalable distributed file system designed for virtualized workloads. Built for enterprise datacenters to enable a turnkey private cloud building block, the DSF delivers fault tolerance, high performance, scalability and reliability for server and desktop virtual machines. By combining the Nutanix Acropolis software with compute and storage into a converged platform, Nutanix offers a single unit to provision, scale and manage for an OpenStack private cloud deployment. All of the compute and storage you need for your initial environment is included in an easy to deploy 4-node 2U appliance. The Nutanix Acropolis solution also provides an advanced and unique feature set for OpenStack based private clouds. Key features include:

- **Simplicity** - The same great platform that simplified your virtualization deployment can simplify the compute and storage deployment for key OpenStack services (Glance, Nova, Horizon, Keystone, Neutron, Cinder, and Swift)
- **Single Scalable Fabric** - Nutanix DSF provides a single fabric for data storage that integrates seamlessly with OpenStack services. DSF-based storage is easy to provision, manage, and operate at scale.
- **Enterprise Ready** - Nutanix Acropolis enables a full set of enterprise storage features including Elastic Deduplication, Compression, In-Memory and Flash-based Caching, VM-Data Locality, intelligent Information Lifecycle Management (ILM), Snapshots, Fast Clones, and Live Migration.

Best of both worlds: The integration of Nutanix NDFS and OpenStack

The integration of Nutanix Acropolis and OpenStack

Nutanix Acropolis and the Nutanix DSF provide a single scalable data fabric which integrates well with OpenStack services. OpenStack services require four main points of storage integration:

1. **Glance** - Requires storage for the virtual machine images that are uploaded to and managed by the Glance service
2. **Nova** - Requires storage on the nova-compute nodes that the VM instances can run on when the instances are started from a Glance-based image.
3. **Cinder** - Requires storage that can be partitioned into volumes that are managed by the Cinder service. These volumes can also be used to boot instances directly.
4. **Swift** - Requires storage that can be used to store the objects and files uploaded to and managed by the service.

The Nutanix Distributed File System provides all of these storage services for optimal OpenStack integration, along with many other key advantages that are unique to the Nutanix technology and implementation.

Key Benefits

- **Unified platform** - No need for 3rd-party platforms and tools
- **Simple** - OpenStack brought to you by the same platform that simplified your virtualization infrastructure
- **Integrated** - Nutanix includes all the storage and compute hardware and integration which you need to get running with OpenStack.
- **Resilient** - Live migration and high availability
- **Capacity** - Erasure coding, compression, and deduplication increase data efficiency
- **Intelligent snapshots** - Granular sub-block level change awareness
- **Efficient replication** - Evolved sub-block level change transfer
- Support integration with any OpenStack Controller (eg. Ubuntu, RHEV, Mirantis)

Key Features

- Unique integration with the Glance and Nova services, which enable space conservation and fast instantiation of VMs.
- Nutanix plugin to Cinder for native snapshots and volume management
- Flash coupled with ILM for optimal performance and capacity
- Compression and deduplication performed inline and post-process
- Background defragmentation
- Non-disruptive rolling upgrades
- Automatic tiering of hot and cold data
- Scalable – Dynamic cluster grow/shrink
- Thin provisioning
- Zero-detect snapshots
- REST-based API for management and automation
- Granular performance graphs and charts
- Individual VM performance stats for VM-level troubleshooting
- 24x7 “call-home” service tunnels and support



How Nutanix Acropolis integrates with OpenStack Services:

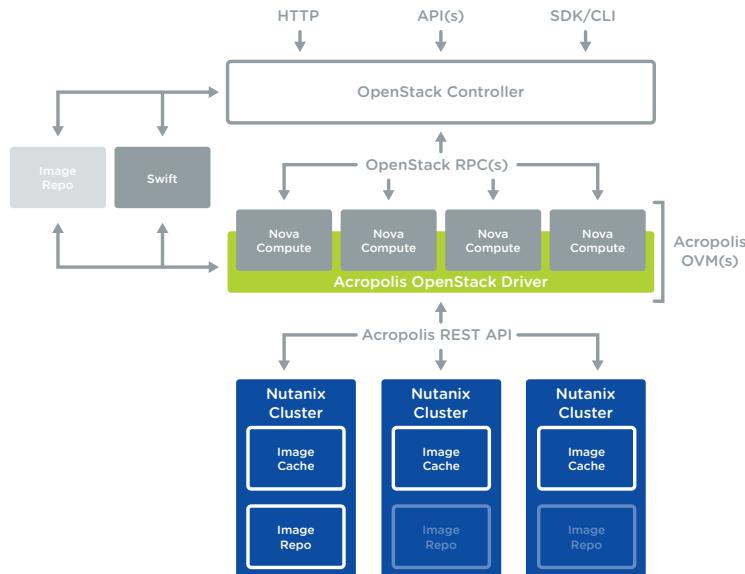
The OpenStack and Nutanix solution is composed of two main components

- **OpenStack Controller (OSC)**
 - An existing, or newly provisioned VM or host hosting the OpenStack UI, API and services. Handles all OpenStack API calls.
- **Acropolis OpenStack Services VM (OVM)**
 - VM with Acropolis drivers that is responsible for taking OpenStack RPCs from the OpenStack Controller and translates them into native Acropolis API calls.

The OpenStack Controller can be an existing VM / host, or deployed as part of the OpenStack on Nutanix solution. The Acropolis OVM is a helper VM which is deployed as part of the Nutanix OpenStack solution.

The client communicates with the OpenStack Controller using their expected methods (Web UI / HTTP, SDK, CLI or API) and the OpenStack controller communicates with the Acropolis OVM which translates the requests into native Acropolis REST API calls using the OpenStack Driver.

The below figure shows a high-level overview of the communication.



Nutanix Supports the Open Source Community

Nutanix has benefited tremendously from Open Source technologies. Several components of the Nutanix system are based on technology of the Apache Foundation, as well as technologies that were open sourced by Facebook and Google. In an effort to give back to the Open Source community, Nutanix has signed on as a sponsor of the OpenStack foundation. We support the advancement of Open Source technologies, and look forward to the growth and development of the OpenStack software and community.

Nutanix Virtual Computing Platform at a Glance

Nutanix Simplified Architecture

Delivers best of both worlds: local bus speed performance to virtualized desktops with all the benefits of globally available shared storage

High-Density Infrastructure

Nutanix uses a hyper-scale server architecture with eight Intel processors in a single 2U spread over four server nodes. Combined with data archiving, compression, deduplication, and erasure encoding, Nutanix can reduce data footprints by up to 4x.

Time-to-value

Reduce project completion times up to 5x. Large clusters set up in hours, not months.

Software-Defined Features

Granular VM operations include: snapshots, FastClones, thin provisioning, de-duplication, compression, site-to-site replication, VM migration and many more.

Smart Data Placement

Proximity-aware data placement places most frequently accessed data on the same host as your running VMs. It compresses cold data on conventional high-capacity spinning disks and maximizes the performance and cost advantages of every storage medium. (Server-side Flash, HDDs)

Turnkey Infrastructure

Just-in-time capacity augmentation reduces unnecessary upfront planning and capacity waste, enabling a more predictable and manageable sizing approach. Nutanix can dynamically grow or shrink, with zero downtime to end-users or application availability.

Time-Sliced Clusters

Like Amazon EC2, Nutanix clusters, coupled with VMware vCloud Director and View, can provide multi-tenant virtualized workloads on the same physical hardware.

Next Steps

Ready to get your OpenStack deployment simplified with Nutanix?

- Email sales@nutanix.com to find out how to get started today
- Visit www.nutanix.com or contact Nutanix Sales Rep/Partner for more information
- Follow us [@nutanix](https://twitter.com/nutanix)