



EMC & OpenStack: A View from Within

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EMC WORLD 2013
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TRANSFORMATION**

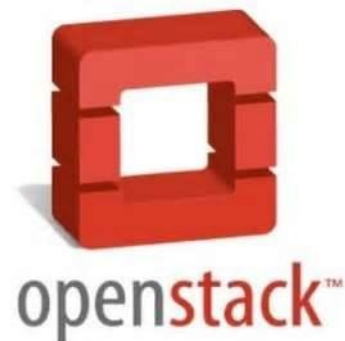
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Agenda

- EMC Storage and OpenStack – Strategy Overview
- An OpenStack Technology Review
- EMC Participation And Contribution
- EMC Value-Add



Mission Statement

"To produce the ubiquitous Open Source cloud computing platform that will **meet the needs of public and private cloud** providers regardless of size, by being **simple to implement and massively scalable.**"



Code —

openstackTM
CLOUD SOFTWARE

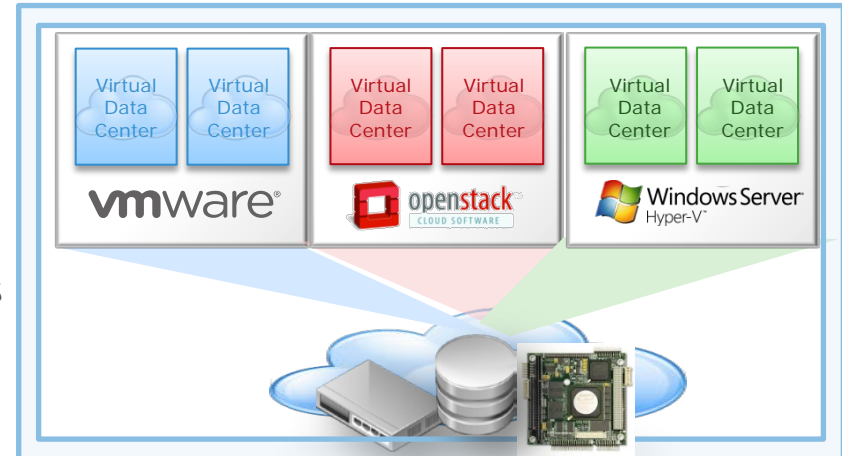
— **Community**

Source: OpenStack Foundation

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OpenStack: Open Source Cloud OS

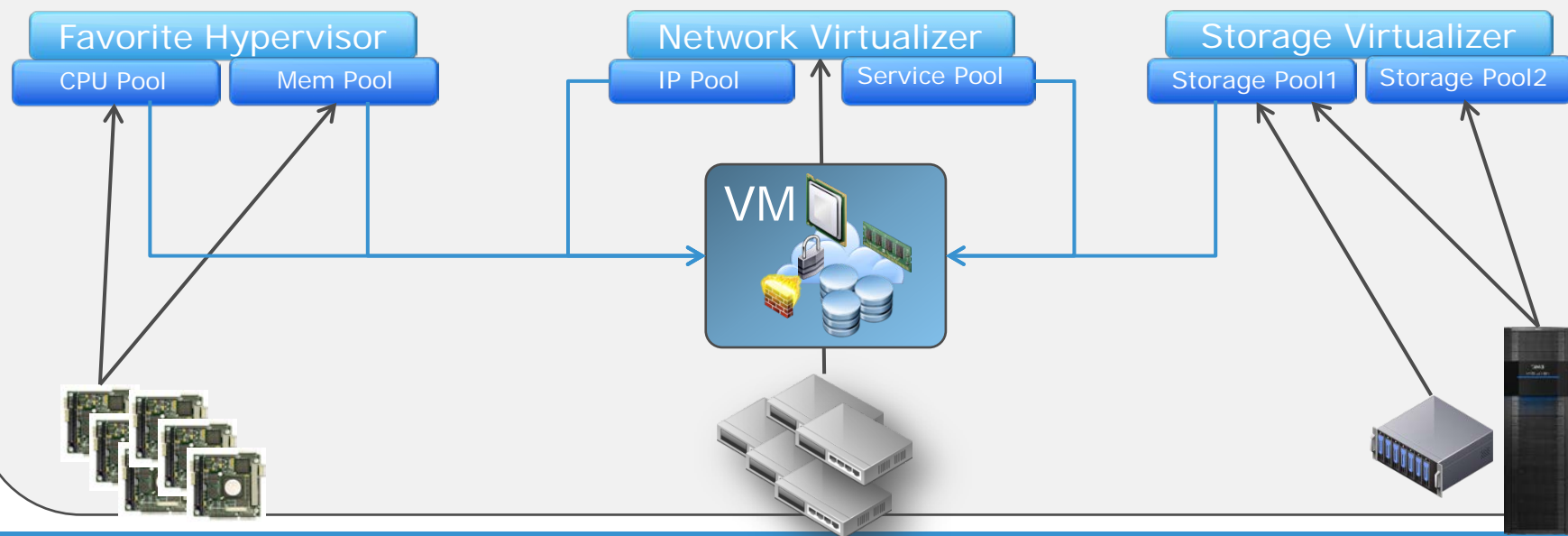
- Public clouds – level the playing field against “the big three”
 - Major Opportunists: Rackspace, HP
 - And many more...
- Private clouds – open the door to many distributors
 - Canonical, Red Hat, SUSE, Rackspace, and a host of others...
 - And create opportunity for customers to manage lower cost, and ultimately flexible, private clouds



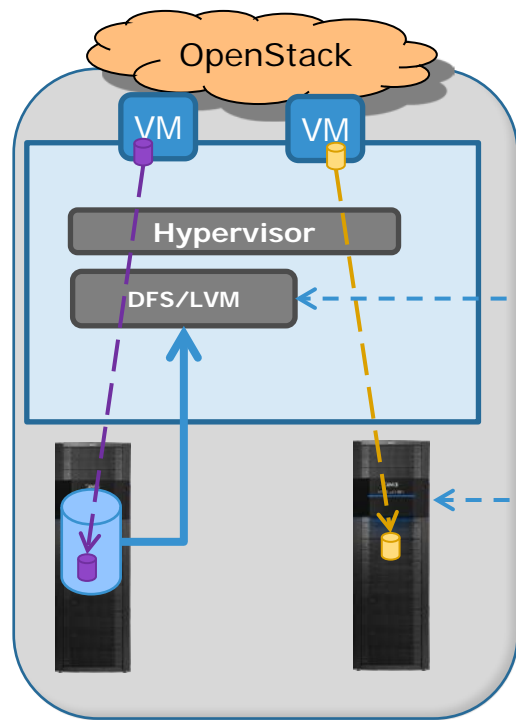
Virtualized Data Centers

Resource disaggregation fundamental to Software Defined Data Centers

Favorite Cloud OS & Configuration Mgmt System



Disaggregation of Storage Resources



Disaggregation at host level

- Roll-your-own storage nodes with services based on a DFS or LVM
- All storage and data services on storage node
- This is SDDC goal for many apps

Disaggregation at array level

- Not as flexible/ubiquitous as disaggregation at host level
- But: proven, performant, and inherently resilient
- Storage arrays have been disaggregating disks for years
- Array-based storage & data services
- This is topic for today

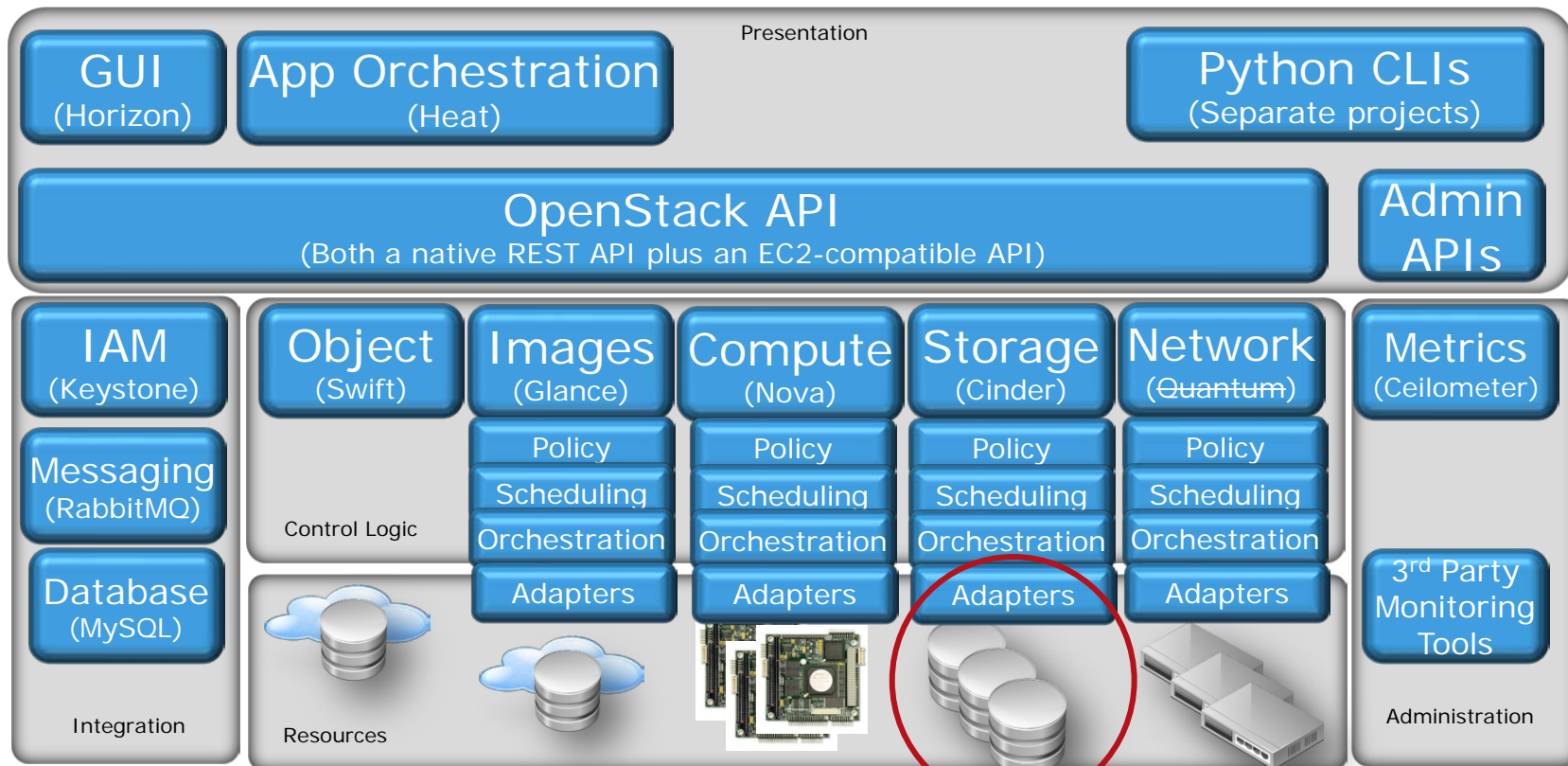
EMC Strategy For CloudOS Options

“Just say yes”

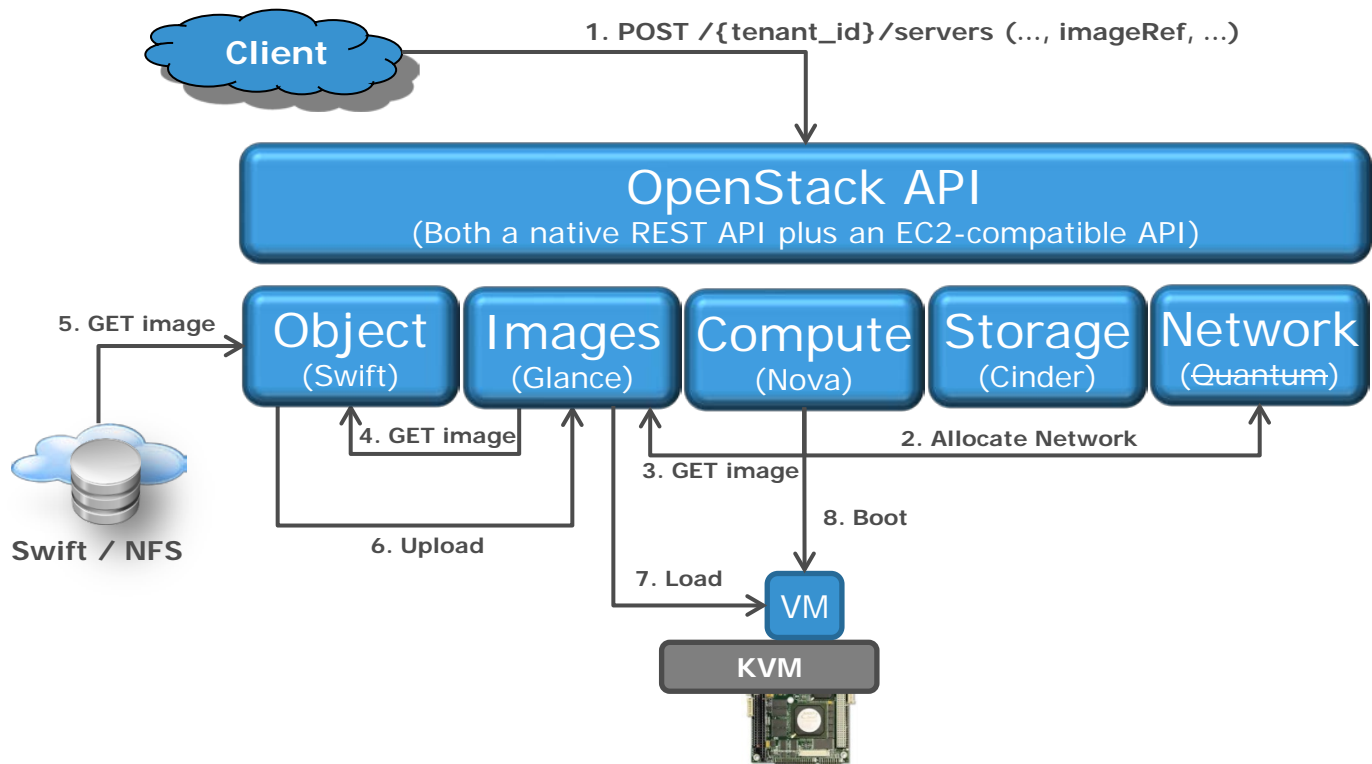
- Across Variety Of CloudOS Platforms
- Variety of Solutions Within Each CloudOS Platform
- Continuously Evolve Solutions To Support Customer Options

OpenStack Technology Review

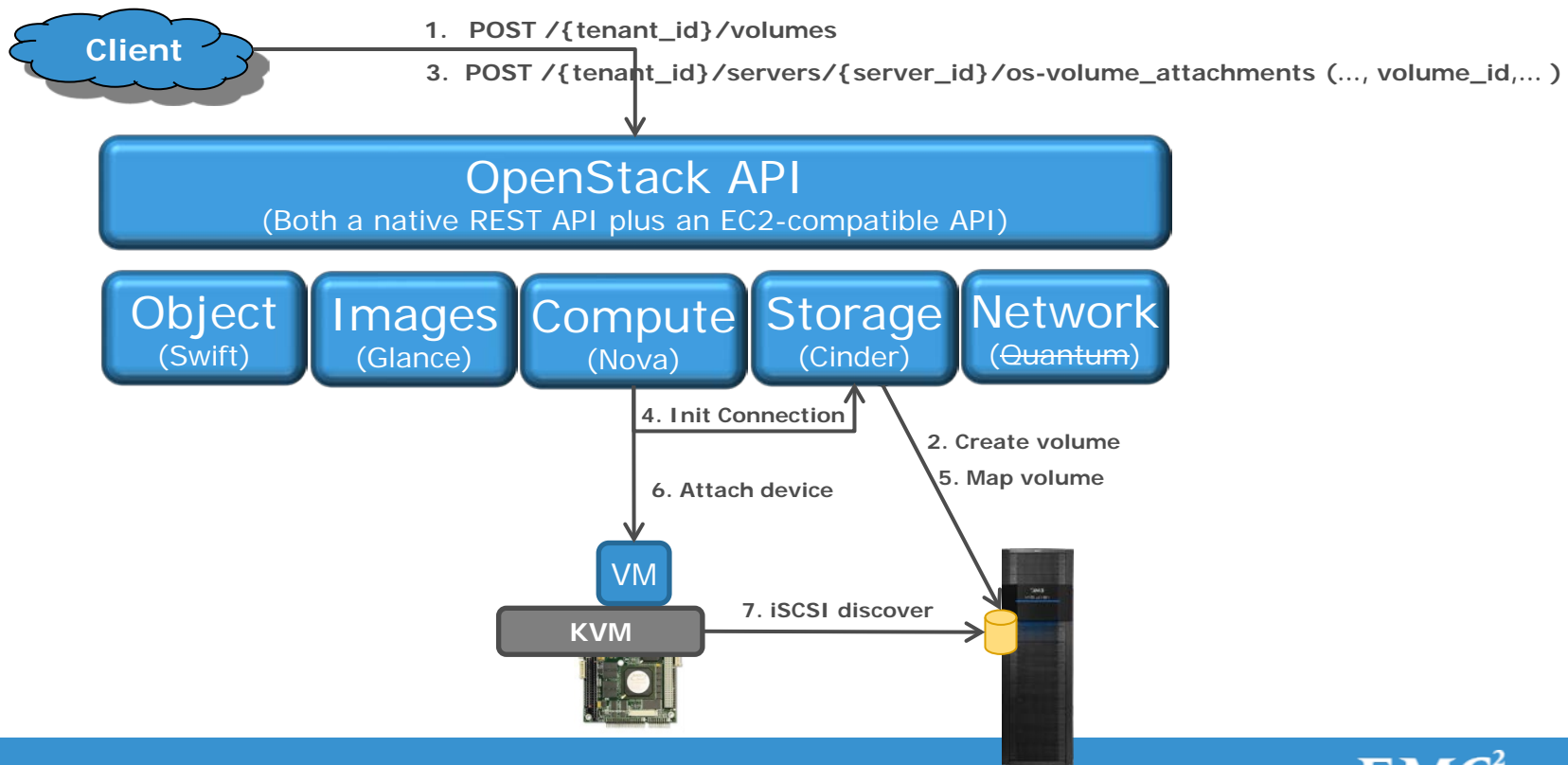
The OpenStack Layer Cake



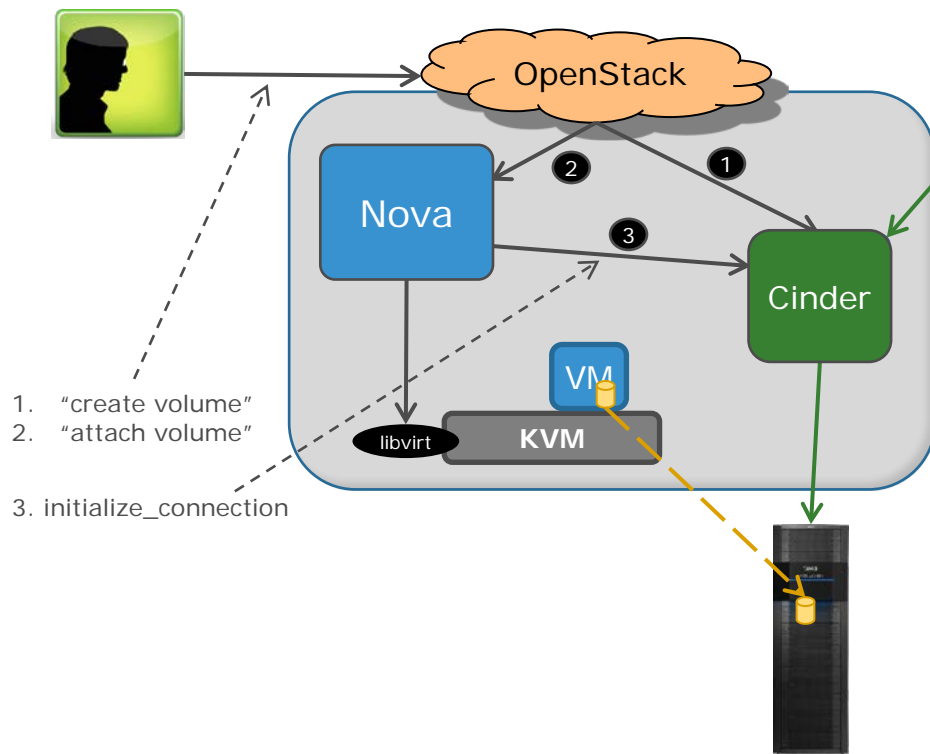
Creating An Ephemeral VM



Attaching A Persistent Block Volume



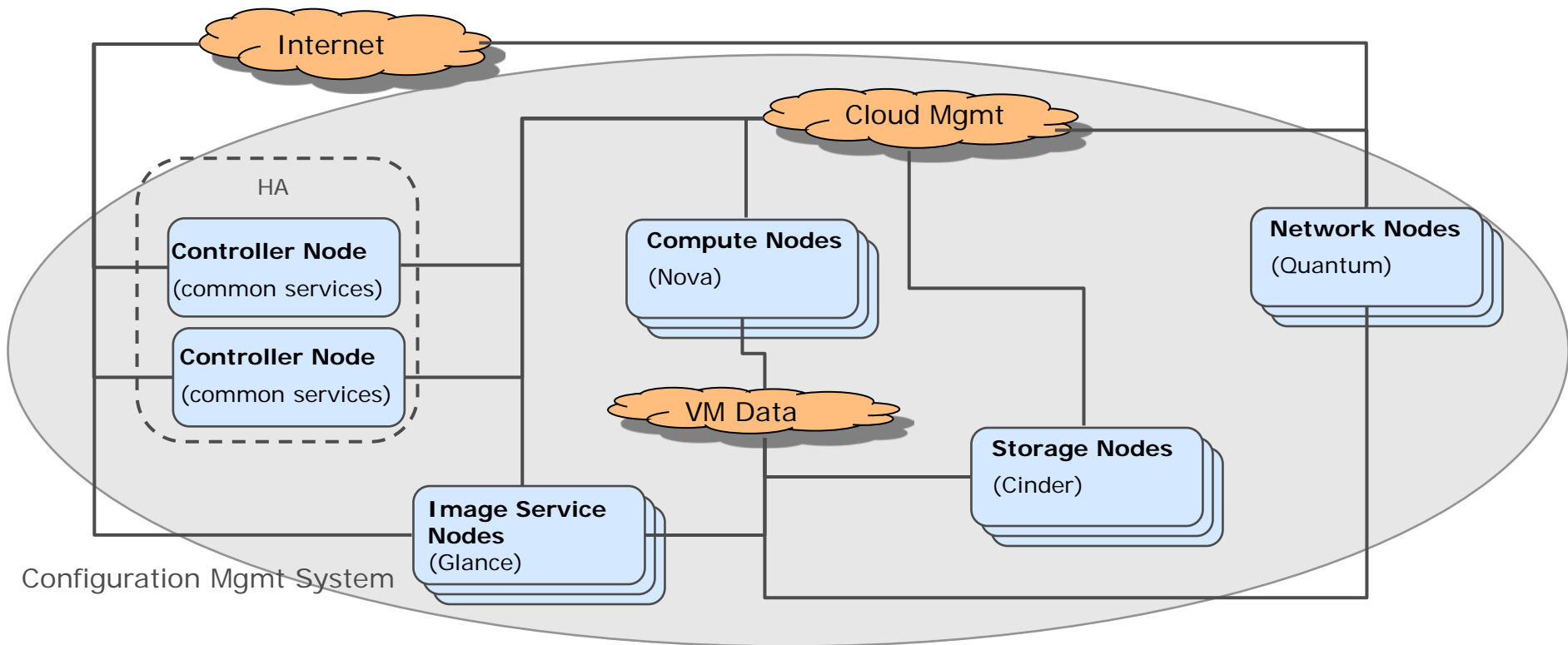
Cinder Persistent Volume Functions



Supported Functions:

- Create/Delete Block Volume
- Initialize/Terminate Connection (From Nova, Performs Map/Mask)
- Create/Delete Snapshot
- Create Cloned Volume
- Create Volume From Snapshot
- Copy Volume To/From Image
- New: Backup/Restore Volume

An Example OpenStack Deployment



EMC Participation And Contribution

EMC's Commitment To OpenStack



- Joined OpenStack Foundation As “Corporate” Sponsor In Dec 2012
 - <http://www.openstack.org/foundation/companies/>
 - <http://gigaom.com/cloud/emc-follows-vmware-rest-of-world-into-openstack/>
- Contributed VNX/VMAX iSCSI Adapters Into Grizzly Build In Dec 2012
- Joined Rackspace “Alamo” Quality Assurance And “Private Cloud” Certification Program In Jan 2013
 - <http://www.rackspace.com/blog/rackspace-private-cloud-certification-program-combines-product-innovation-and-enterprise-stability/>
- Engaged Other Distro Leaders:
 - Canonical/Ubuntu, SUSE, Red Hat

EMC Contributions To Date

- Post-Folsom Release (Dec 2012)
(For Use In Current Distro Programs)
 - VNX iSCSI
 - VMAX iSCSI
- Grizzly Release (April 2013)
 - VNX iSCSI
 - VMAX iSCSI

VMAX / System Requirements

System Requirements

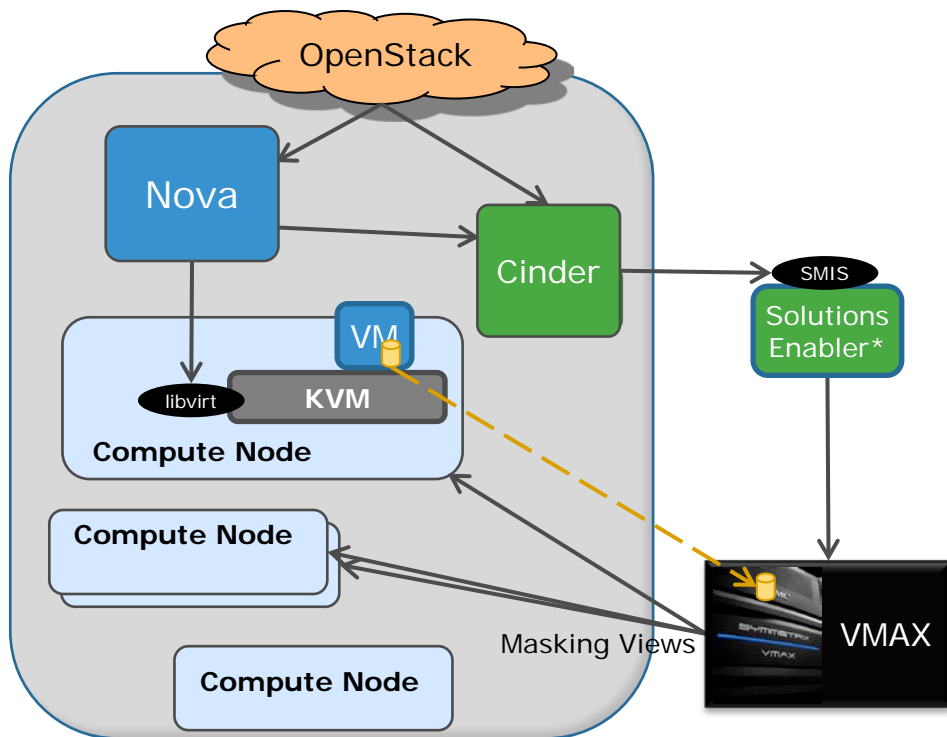
- Host for driver install: Ubuntu 12.04 or later
- Solutions Enabler: SMI-S 4.5.1 and higher

VMAX Requirements

- Microcode: 5875 for most VMAX
 - 5876 for VMAX10K
- Masking view for Compute host(s) including 6 gatekeepers mapped to each Compute host
- VMAX/VMAXe storage pool for Cinder use must be created before using the VMAX/VMAXe Cinder driver

VMAX Constraints

- CreateVolumeFromSnapshot not supported



*Solutions Enabler may be run as a SUSE VM, or on a standalone server. Each Solutions Enabler supports multiple backend arrays.

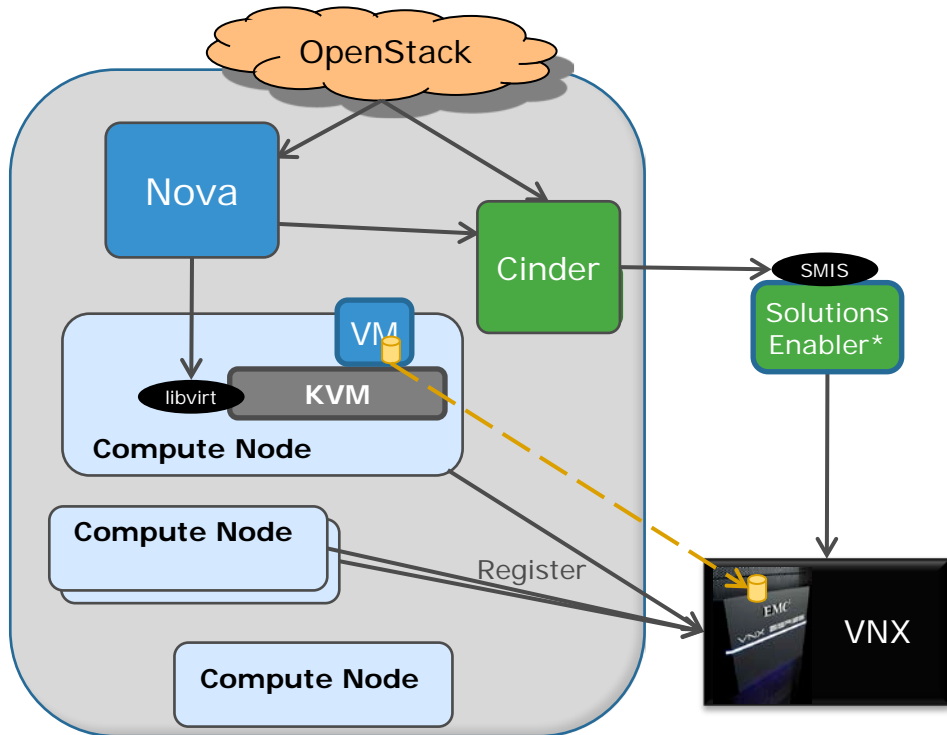
VNX / System Requirements

System Requirements

- Host for driver install: Ubuntu 12.04 or later
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VNX Requirements

- Flare 31 or higher
- Compute hosts registered with VNX
 - Via iscsiadm
- VNX Storage Pool created on array for Cinder to use (Thin LUN's only)



*Solutions Enabler may be run as an ESX VM, or on a standalone server. Each Solutions Enabler supports multiple backend arrays.

EMC Best Practices

- Run EMC Volume Drivers Anywhere
 - Each Driver Is An Independent 'cinder-volume' Service
 - Low CPU/IO Requirements
 - Run On Controller Node For Active/Passive HA
 - However: Future Backup Considerations Will Change This
 - Scale Practice: Run "storage controller nodes" as VMs
- Best Practices For Access Protocols:
 - iSCSI For VNX
 - NFS For Isilon (Havana)
 - FC For VMAX
- Best Practice White Papers Are Work In Progress

What's Next



More
Products



More
Protocols



More
Partners



More
Functionality

How To Access EMC Adapters

- Via OpenStack Foundation, Effective April 2013
 - <https://github.com/openstack/cinder/tree/master/cinder/volume/drivers/emc>
- Via Rackspace “Alamo” Certification Program
 - http://www.rackspace.com/knowledge_center/article/implementing-openstack-cinder-with-emc-storage-on-the-rackspace-private-cloud-software
- Via Other Distributions As They Become Available – Including VARs and ISVs



EMC Value-Add

EMC Technology In OpenStack

- First Things First: Storage Platforms Available For Use
 - EMC Storage Hardware For Building Private Clouds
 - Include Hooks For Snapshot (And Backup in Havana)
- EMC Value Add
 - Enterprise Class Storage And Services
 - Highly Available Infrastructure
 - Deliver Value Above And Beyond Via Advanced Capabilities
- Avenues For Advanced Capabilities*
 - Consistency Groups
 - Integrated Backup Policy And Scheduling
 - Remote Replication

*These features are not committed; we're looking at all the obvious choices and gathering feedback

Advanced Capability Delivery

- Initially:
 - Partners
 - VARs/ISVs
 - Customers
- Where it makes sense
 - Contribute Upstream Into OpenStack

Wrap up

Resources

- Technical Resources

- Datasheets
- Implementation Guides
- Knowledge Center Articles
- Certification Program Test Results
- Reference Architectures
- Blogs

- EMC World Resources

- ESG OpenStack Kiosk
- OpenStack Demo
- See ViPR Demo In ASD Boot

- For more information on OpenStack, please refer to the following links:

- http://one.emc.com/clearspace/community/active/everything_openstack
- <http://virtualgeek.typepad.com/>
- <http://chucksblog.emc.com/>
- <http://openstack.org/start>



Wrap Up: EMC and OpenStack

- EMC Embraces Multiple Cloud OS Frameworks
- EMC Is Active In The OpenStack Cinder Project
- Cinder Volume Drivers Available Now
- Through 2013:
 - More Feature & Driver Contributions To Havana Release
 - In Some Cases: EAP May Be Available For Havana capabilities
- Stay Tuned as EMC Delivers On Advanced Capabilities

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