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EMC²



Orchestration of Fibre Channel Technologies for Private Cloud Deployments OpenStack Summit; Ecosystem Track

April 15th, 2013

Oregon Convention Center
777 NE Martin Luther King Jr Blvd
Portland, OR 97232

Agenda

- ▶ Why are we adding Fibre Channel support to OpenStack?
- ▶ What's available in Grizzly?
- ▶ What's being planned for Havana?
- ▶ How can you get involved?



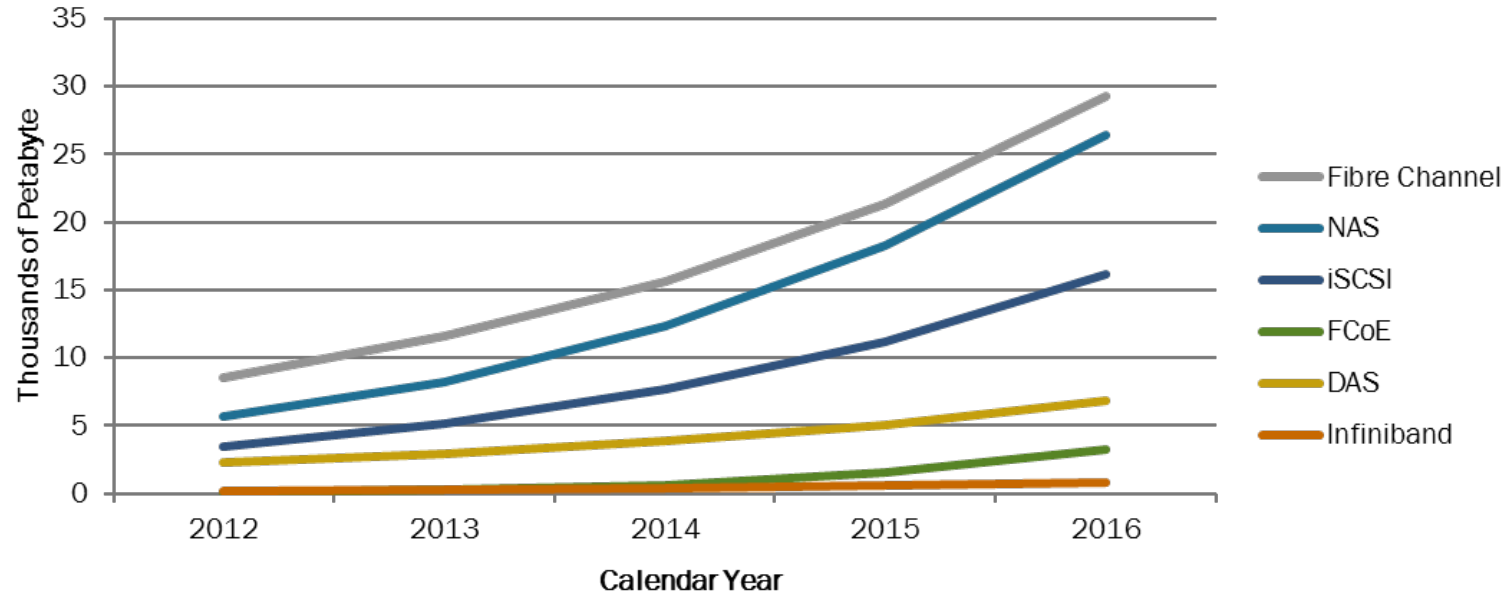
Adding OpenStack Fibre Channel Support

Why are we here?

- ▶ Development group came together at the Grizzly Design Summit – Oct '12
- ▶ Purpose:
 - Extend OpenStack with the ability to provision infrastructure using Fibre Channel SAN interconnect
- ▶ Cross industry participation
 - HP, Brocade, EMC, IBM

FC storage (PB) predicted to have 36% CAGR (2012-2016)

Worldwide External Enterprise Storage Capacity



Why are we bringing FC into OpenStack?

- ▶ To make it easier for enterprise data center private cloud deployments to use OpenStack
- ▶ Option for enterprise data centers to leverage their established storage infrastructure & expertise
- ▶ Leverage the performance, resiliency and security associated with FC SAN for private

OpenStack FC Use Case

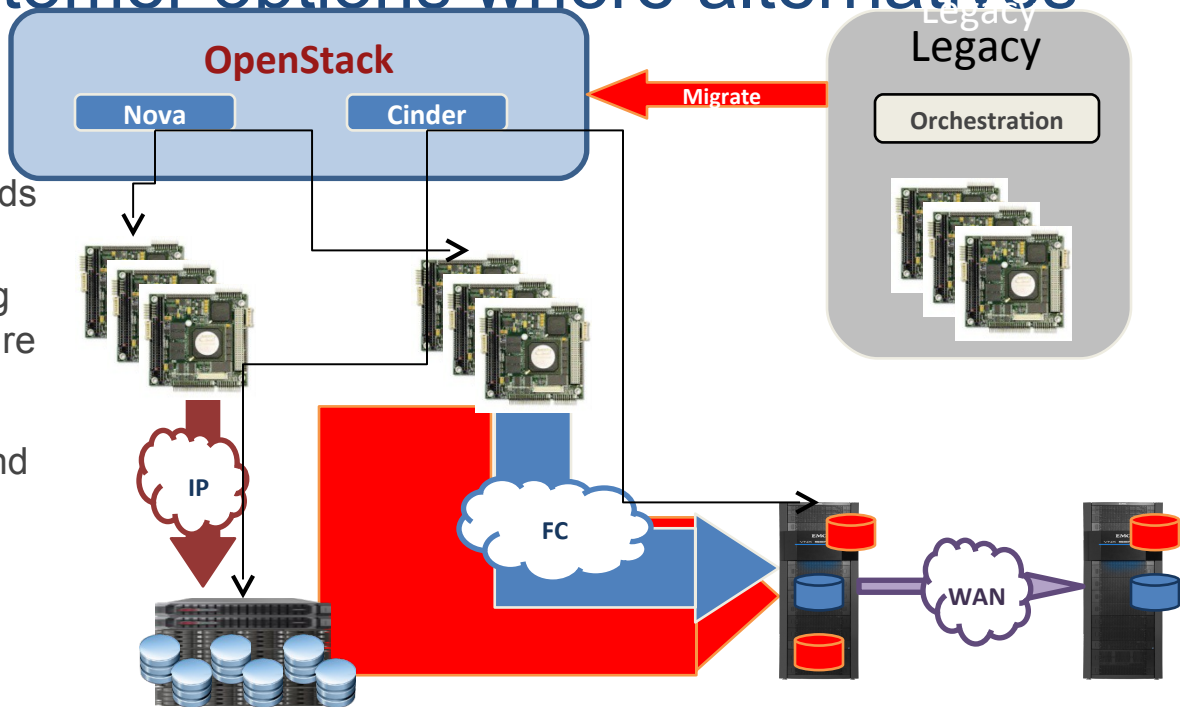
▶ Embracing customer options where alternatives exist to add picture

- ▶ Application Use Case:
Low latency transactional Workloads:

- Migration of legacy workloads to OpenStack private cloud
- New applications leveraging enterprise class infrastructure

▶ Benefits:

- Share existing resources and infrastructure
- HA/High Perf QOS Storage Configs within Cinder
- Remote replication



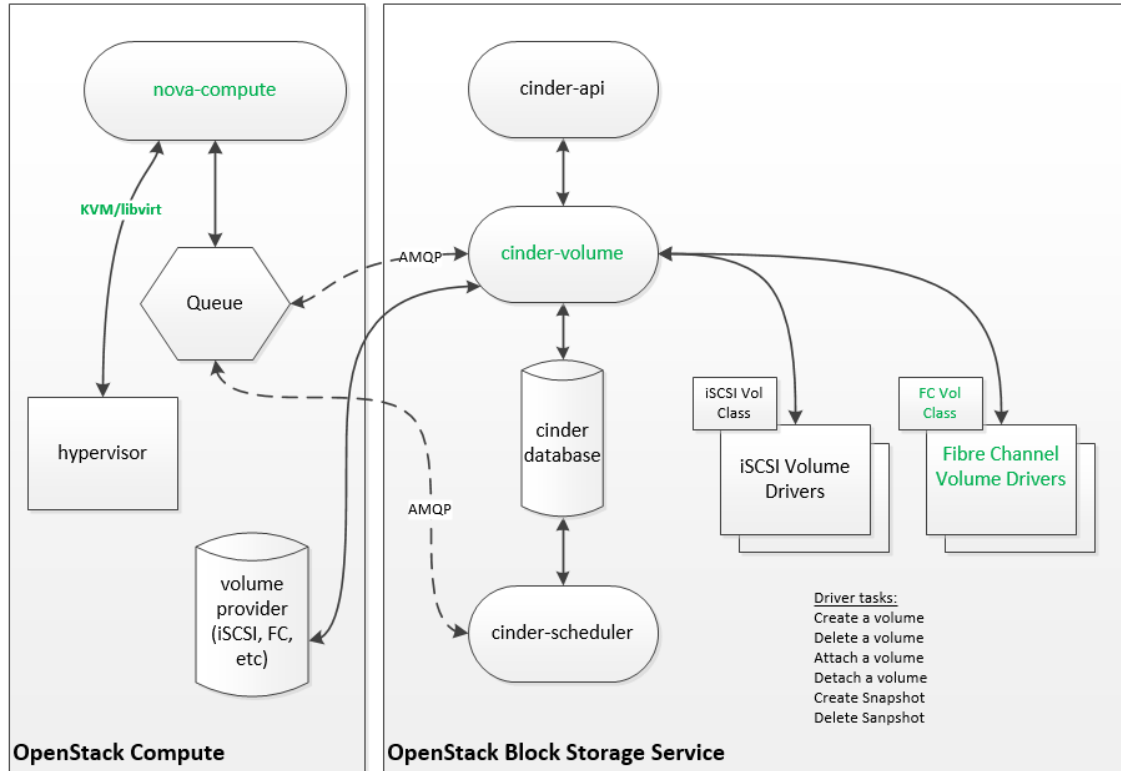
What have we accomplished?

- ▶ Created two Fibre Channel blueprints under the Cinder initiative
 - Fibre Channel Block Storage
 - Blueprint approved and implemented in the Grizzly release
 - Fibre Channel Zone Manager
 - Blueprint submitted as a discussion item for Havana
- ▶ First Fibre Channel Session at an OpenStack Summit



Fibre Channel Grizzly Support

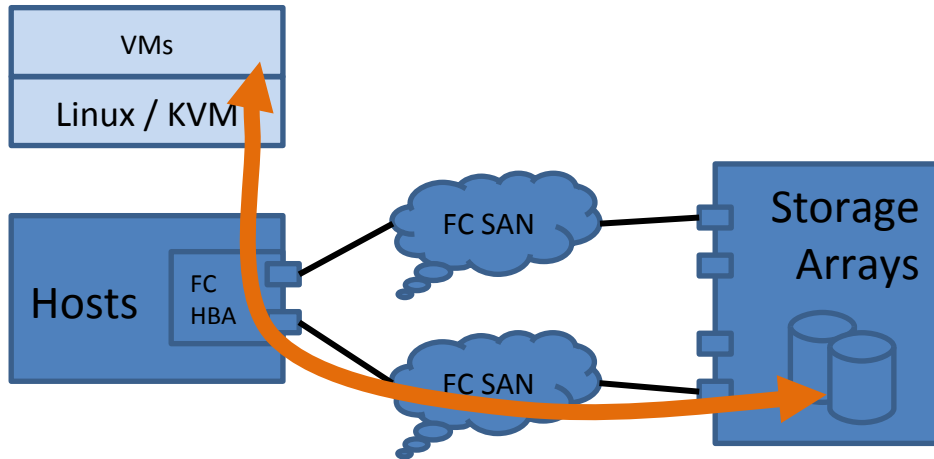
Fibre Channel – Grizzly Changes



- Modifications to add Fibre Channel

- ▶ Cinder changes to add support for FC volume class driver
- ▶ Cinder changes to add support for FC volume attach
- ▶ Nova changes to support FC volume attach

Infrastructure Support



- ▶ Single or multi-path infrastructure supported
- ▶ SCSI initiator & target WWN's exchanged between nova/cinder on storage attach to

What can be done with Grizzly?

- ▶ Vendors can develop Cinder drivers for arrays exporting Fibre Channel storage
 - HP 3Par FC driver is a reference implementation
- ▶ Enterprises & Service Providers can run OpenStack using Fibre Channel SAN infrastructure connecting servers & storage
- ▶ Users create & attach volumes to VMs in the same way as with iSCSI block storage.
 - No change to the user experience

Known limitations

▶ What about SAN zoning?

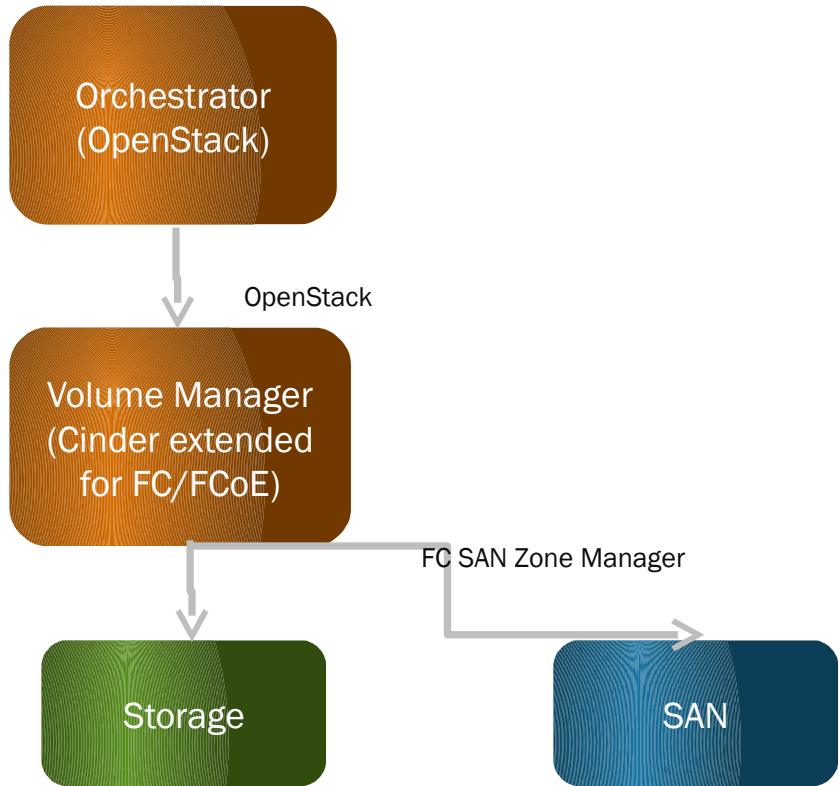
- In Grizzly release, no automated SAN zoning support was added
- Requires FC SANs to be either pre-zoned or Open zoned.
- Being addressed in Havana release

▶ Security

- iSCSI volume attach secures volume access to hosts via CHAP username/secret configured on initiator and target

- No equivalent mechanism in FC to secure per volume attaches

Havana Cinder FC SAN Zone/Access Control Manager Proposal



FC SAN Zone/Access Control Manager

- ▶ Fibre Channel block storage support was added in Grizzly but there is no support for automated SAN zoning (FC SANs are either pre-zoned or open zoned)
 - Add support for FC SAN Zone/Access Control management feature – allowing automated zone lifecycle management in the attach/detach entry points of the volume manager (when

Requirements/Use Cases

- ▶ Defaults and capabilities - support for FC SAN configuration settings (e.g. zoning mode, zone grouping policy, zoning capabilities etc.)
- ▶ Add active zone interface to add the specified zone to the active zone set
- ▶ Remove active zone interface to remove the specified zone from the active zone set
- ▶ Support for provisioning and enumerating SAN/Fabric contexts

Fibre Channel Zone Manager

- ▶ Simplified zone management
 - Active zone set management
 - Small and medium deployments
- ▶ Enhanced zone management (post Havana)
 - Support for full zone life cycle management
 - Large enterprise (managed) deployments
- ▶ Fibre Channel Volume Driver integration
 - VolumeManager uses FibreChannelZoneManager for zone



**Storage Vendor work being done
with Fibre Channel**

EMC FC / OpenStack Havana

- ▶ EMC FC Volume Driver contributions to OpenStack in Havana pending
 - VMAX family
 - VNX family
 - Built atop iSCSI support already in Grizzly
- ▶ Related Futures
 - Multiple QOS support per volume driver
 - Testing with FC Zone Manager Havana effort

Havana FC Design Sessions

- ▶ Cinder: FC SAN Zone/Access Control Manager
 - Thursday, April 18th; 3:20pm – 4pm; room B110
- ▶ Cinder: Multi-Attach and Read Only Volumes
 - Thursday, April 18th; 9:50am – 10:30am; room B110
- ▶ Nova: VMware compute driver roadmap session
 - Thursday, April 18th; 9:50am – 10:30am; room B113

Summary

- ▶ Fibre Channel SAN technology is utilized by most Enterprise data centers today
- ▶ With Grizzly release, OpenStack can now be used with Fibre Channel SAN infrastructure
- ▶ Additional Fibre Channel work coming in Havana
- ▶ If you want to plug into the Havana Fibre Channel development effort, contact:
 - Andre Beausoleil abeausol@Brocade.com – Brocade
 - Gary Thunquest gary.thunquest@hp.com – HP



Thank you!