OPENSTACK FOR DATACENTRE NETWORKS

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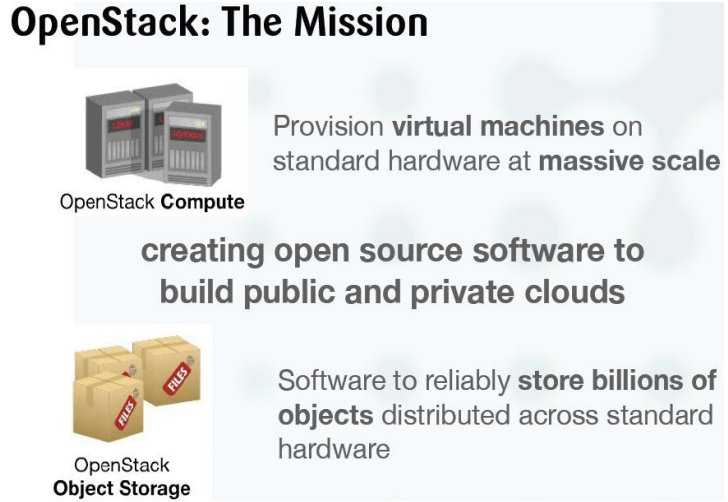
What is OpenStack?

Solution, Community, Foundation



- An emerging open source IaaS cloud management framework targeted at both Enterprise and SP environments
- Created by Rackspace & NASA
  - July 2010: merged and open sourced Cloud Software (storage) and Nebula (compute)
  - September 2012: OpenStack Foundation launched for a more vendor neutral consortium
- While not the first initiative in that space, OpenStack has captured the hearts and minds of the industry
  - Rapidly becoming the de facto open source standard for Cloud computing, benefiting from a worldwide developer community
  - Is an entryway for hosting providers and enterprises to build private and public clouds: allows to create and offer cloud computing capabilities using open source software, rapidly and at a low cost

OpenStack Taxonomy

Five Major Components

OpenStack core services:

- Virtual Machines (compute)
- Object Store (object, data blurb)
- Block Storage aka Virtual Block Devices (hard drives, volume)
- Virtual Networks (networking)
- Dashboard (user portal)

There are two other components that serve "middleware" functionality:

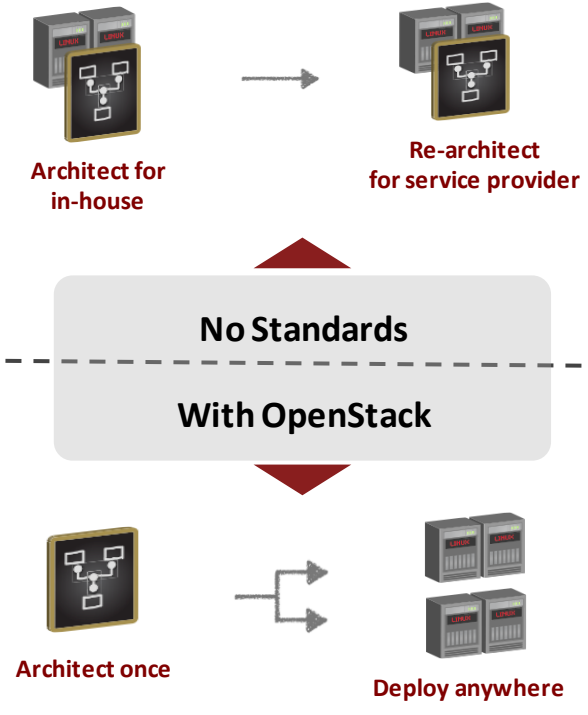
- The disk image registry (Glance)
- The authorization and authentication framework (Keystone)

Cloud Core Services	OpenStack Project	Amazon Web Services Equivalent	Rackspace Equivalent
Virtual Machines	Nova	EC2	Cloud Servers
Object Store	Swift	S3	Cloud Files
Block Storage	Cinder	EBS	Cloud Block Storage
Virtual Networks	Quantum, Neutron, Melange	VPC	Cloud Networks
Dashboard	Horizon	AWS Mgmt Console	Cloud Control Panel

Source: http://www.pistoncloud.com/cloud-technology/what-is-openstack/

Why does OpenStack "matter?"

- Running a large private cloud?
- Enables interoperability between clouds by seamlessly federating virtual workloads across them
  - Portability: vendor & technology agnostic
- Is extensible to meet specific deployment needs
  - Vertical flexibility (plugin)
  - Horizontal flexibility (API extension)
- Is designed to be massively scalable
  - Very large groups of virtual private servers, terabytes or even petabytes of data
  - Platform itself scales horizontally



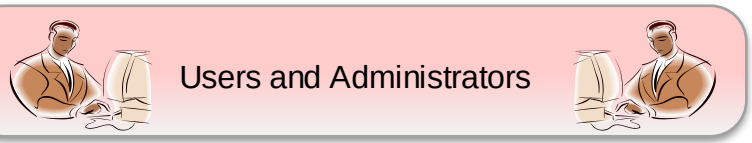
OpenStack Marketplace Significance

Open Source, Open Architecture

- 8,000 participants in the Open Source community
- 200+ companies
- 87 countries
- 550 developers
- 300,000 downloads
- 50+ early adopters in production

OpenStack Worldwide

Cloud Management with OpenStack



App & VM Mgr

NMS

SRM

Service Orchestration

Self-service Portal / API
(Service Catalog, SLA Reports, Billing)

Business Logic
(Service Management, Resource Management, Metrics Data Collection)

Orchestration Engine
(Provisioning, Configuration, Scheduling)

Compute Controller | Network Controller | Storage Controller

VMware
Hyper-V
XenServer
KVM

L2 VLAN
Flat Networking
L3

Local disks
Block Storage
Object Store
NAS
iSCSI

Infrastructure Pre-staging

Service Monitoring

Service Metering

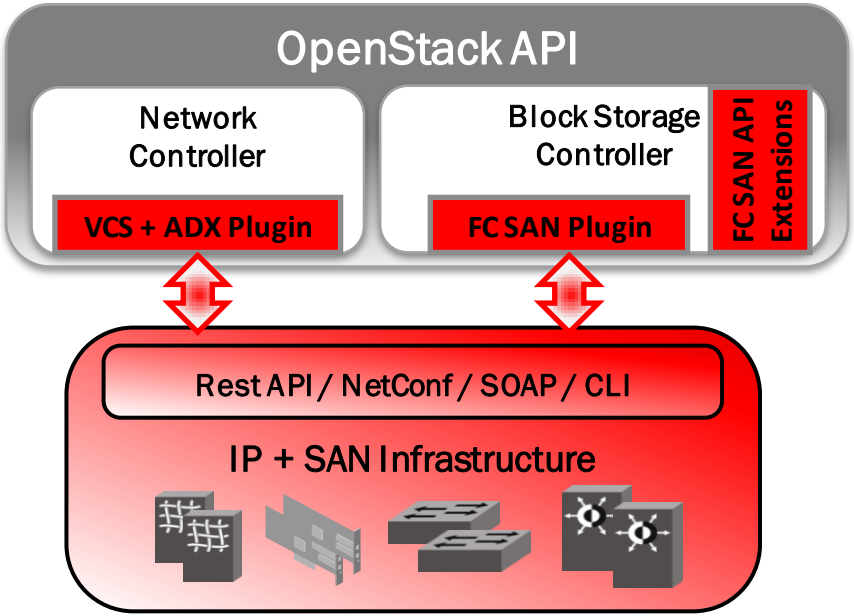
Brocade and OpenStack

- Brocade are fully committed to OpenStack
  - OpenStack is a *very* useful orchestration framework
- Product support will be developed further
  - L2/L3
  - Load Balancing
  - Fibre Channel

Brocade's Key OpenStack Contributions

OpenStack Pluggable and Extensible Architecture

- Brocade joined in May 2011, became Corporate Sponsor in September 2012
- Drive networking architecture (frameworks, services, APIs) in the OpenStack community
- Contribute back and open source Brocade integration and add-on software
  - Network Controller (Quantum) plugin for VCS
  - Network Controller (Quantum) for ADX
  - Drive FC Block Storage Controller (Cinder) initiative with HP, EMC, IBM and HDS
    - FC storage framework extension Community approved
    - Brocade FC SAN blueprint
    - FC SAN framework extension for FC SAN (Zone Mgr)
    - FC SAN plugin for Brocade SAN products



OpenStack Integration Roadmap

Execution Plan (Roadmap)

Phase 1 (Essex Release)	Phase 2 (Grizzly and Havana Releases)	Phase n (Ultimate State)
POC delivered	H2 2013	TBD

OpenStack Dashboard

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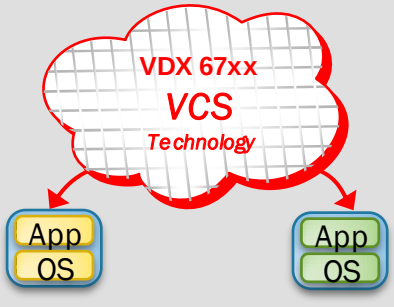
VCS Plugin



Rackspace Private Cloud
Piston Cloud
Red Hat RHOS

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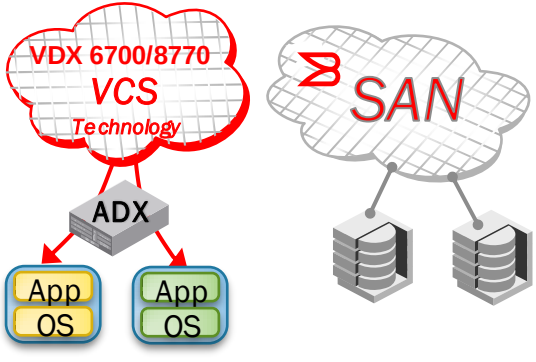
VCS + ADX + FC SAN Plugins



OpenStack Ecosystem

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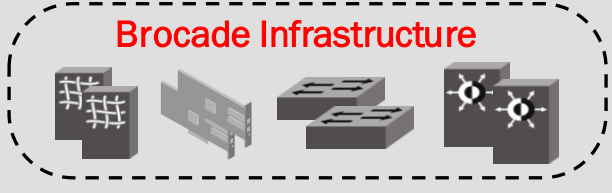
Brocade Plugins
(Network & Block Storage)

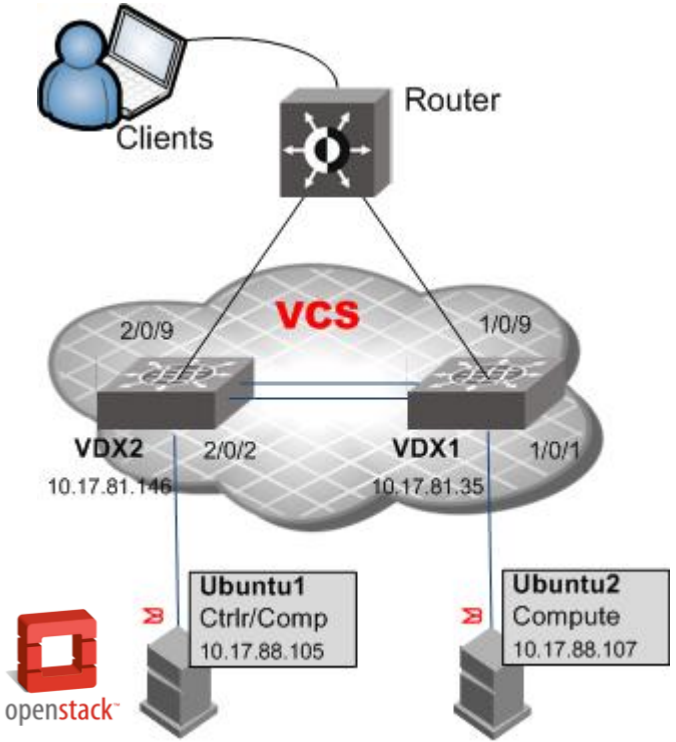


VDX Series, ADX/vADX, SAN Series, Vyatta, ICX, MLX

OpenStack

Physical Topology

- OpenStack Controller
  - Runs OpenStack Orchestration Services
- OpenStack Compute Node
  - Runs the Virtual Machines that are deployed
- Brocade VCS Fabric
  - Implements RESTful API and Port Profiles
- Clients
  - Cloud users manage VMs through dashboard
  - End users access deployed applications

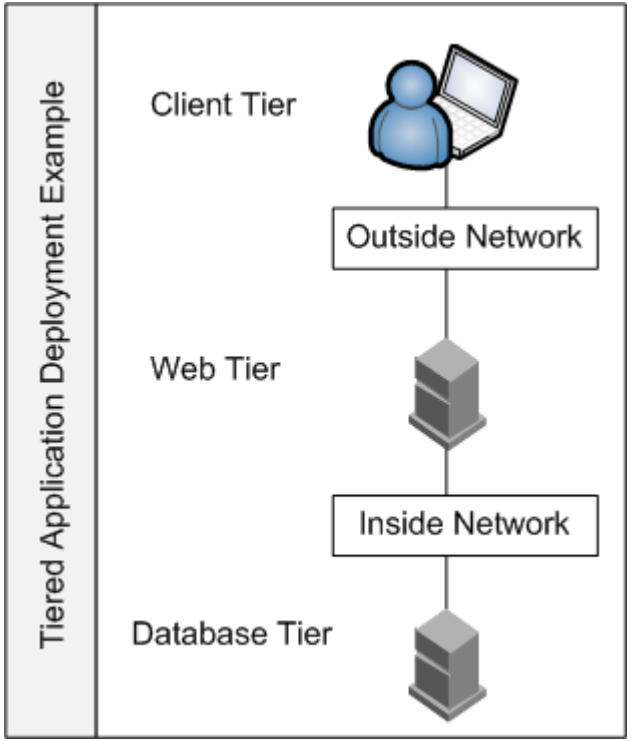


OpenStack: One Workflow

Deployment of New Application

Tenant connects to OpenStack dashboard

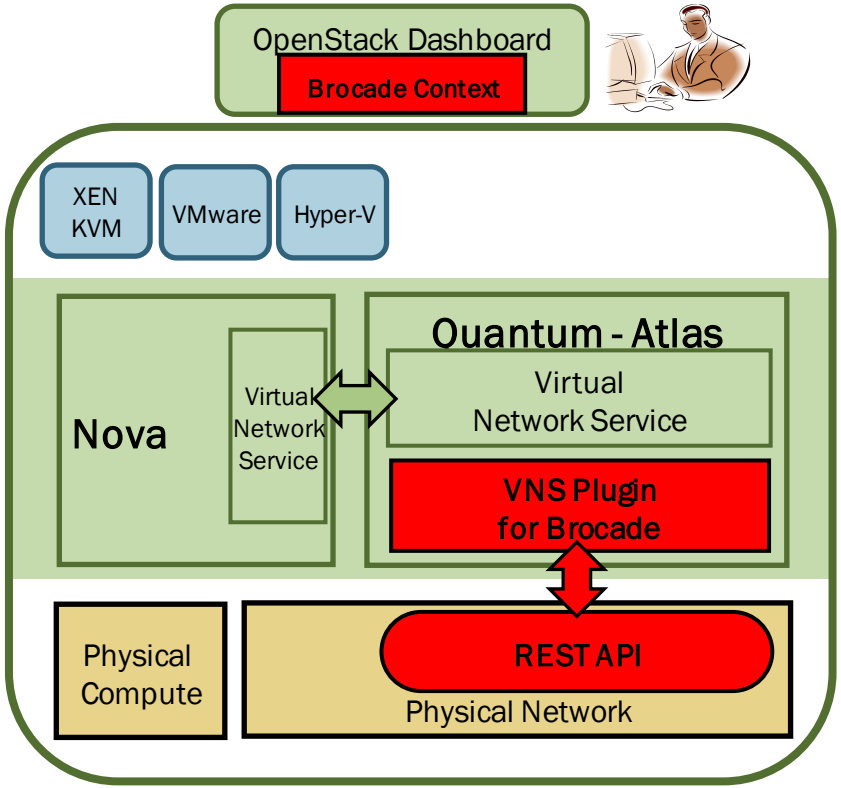
- Create Network(s)
  - Tenant defines the inside and outside networks necessary for the application
- Deploy new image(s)
  - Tenant deploys two VMs from menu selection of images: one for a web server and one for the database server
- Access virtual machine images
  - Verify network and application access



OpenStack Architecture

Brocade Plug-in for Quantum

- Create Network
  - Brocade plug-in for Quantum instructs VDX to create VLAN information & Port Profiles within the Brocade VCS fabric
  - Information is distributed to all nodes in fabric
- Deploy Image
  - The new image is automatically tied to the Port Profile using the MAC address of the VM
  - Port Profile is installed on physical port of VDX and network is reconfigured automatically
  - MAC address tie minimises reconfiguration



Port Profiles?

- Configuration data tied to MAC addresses, grouped by function
  - VLANs, QoS, security policies by MAC rather than physical port
- Shared across network fabric: configured once per fabric, not once per switch
  - Lessens chance of errors
- VM Aware
  - Moving a VM doesn't mean reconfiguring the network
  - Creating a VM minimises reconfiguration too
- Not *just* an OpenStack focused feature…

BROCADE

THANK YOU

Brocade on OpenStack Useful Information 1/2

OpenStack Open Source Project & Community

- OpenStack is an open source project (under Apache License) building software for private and public cloud. It started by Rackspace and NASA, and now under the governance of OpenStack foundation. Check it out at: http://www.openstack.org/

Brocade on OpenStack

- Brocade on OpenStack videos:
  - http://www.youtube.com/watch?v=FDm2VfjXQ8A&feature=youtu.be - VideoFlash Video on OpenStack
  - https://www.youtube.com/watch?v=sNdvc2uBkHc - short version
  - https://www.youtube.com/watch?v=TCq825Xwawk - long version
  - http://www.youtube.com/watch?v=frkTtKHe3ec&feature=youtu.be - Brocade's OpenStack Spring Launch
- OpenStack Brocade Solutions Collaterals: http://www.brocade.com/openstack - At-a-glance, Solution Brief, White Paper & FAQ
- Brocade OpenStack vision brief: http://www.brocade.com/downloads/documents/solution_briefs/brocade-openstack-sb.pdf
- Brocade VCS plugin description at https://wiki.openstack.org/wiki/Brocade-quantum-plugin
- Brocade Blogs:
  http://community.brocade.com/community/brocadeblogs/data_center/blog/2012/10/10/brocade-and-piston-cloud-orchestrating-cloud-infrastructure-with-openstack
  http://community.brocade.com/community/brocadeblogs/data_center/blog/2012/10/12/brocade-and-openstack
- IDC video blog on FC SAN Extension in OpenStack Cinder: : http://goo.gl/6PTkQ

Brocade on OpenStack Useful Information 2/2

OpenStack Ecosystem

- Red Hat Announces Preview Version of Enterprise-Ready OpenStack Distribution

http://www.redhat.com/about/news/press-archive/2012/8/red-hat-announces-preview-version-of-enterprise-ready-openstack-distribution

- Rackspace Private Cloud offering

RackSpace head and OpenStack co-founder: http://www.youtube.com/watch?v=hWJXywSDZL0&feature=youtu.be
Reference architectures: http://www.rackspace.com/cloud/private/architecture/
Technical Resources Center: http://www.rackspace.com/knowledge_center/article/private-cloud-tech-resources
Rackspace Blog: http://www.rackspace.com/blog/private-cloud-open-reference-architectures-easily-deploy-run-an-enterprise-private-cloud/
Brocade PR: http://www.brcd.com/releasedetail.cfm?ReleaseID=736841

- Piston Cloud

Piston Cloud Partners with Brocade: http://www.pistoncloud.com/2012/10/piston-cloud-partners-with-brocade/
Solution brief: http://bit.ly/R4iCrQ
Joint Piston Cloud and Brocade Press Release: http://newsroom.brocade.com/press-releases/brocade-advances-openstack-based-private-cloud-ado-nasdaq-brcd-0939871