Dell and Red Hat's OpenStack Journey to Enterprise

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Agenda

• Intro

• Why OpenStack?

• Why Dell & Red Hat OpenStack Partnership?

• Why Dell & Red Hat OpenStack Solution?

• What is Dell & Red Hat OpenStack Solution?

• Reference Architecture and Beyond

• Flexibility

• Demo

• Next

Introductions

- Dell and Red Hat teams
  - Dell OpenStack Solution Engineering
  - Red Hat System Engineering
  - Dell Storage Engineering
  - Red Hat Cloud Practice team
  - Red Hat OpenStack team
  - Red Hat Tools team

Why OpenStack?
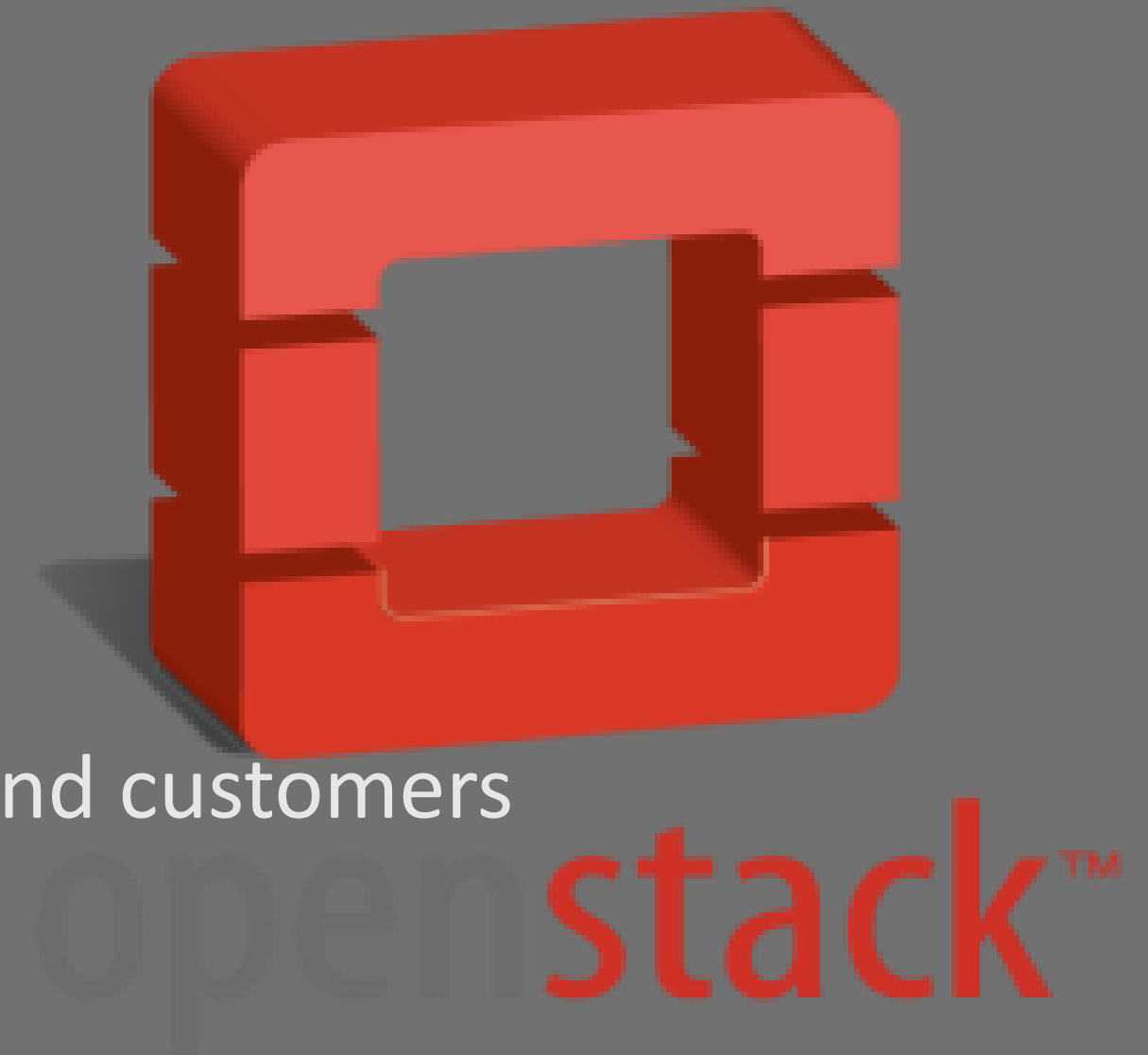
It's Open

- Openness and standardization is its foundation – no more giant, proprietary systems and customers getting locked into closed systems
- RESTFul API

It's Massively Scalable

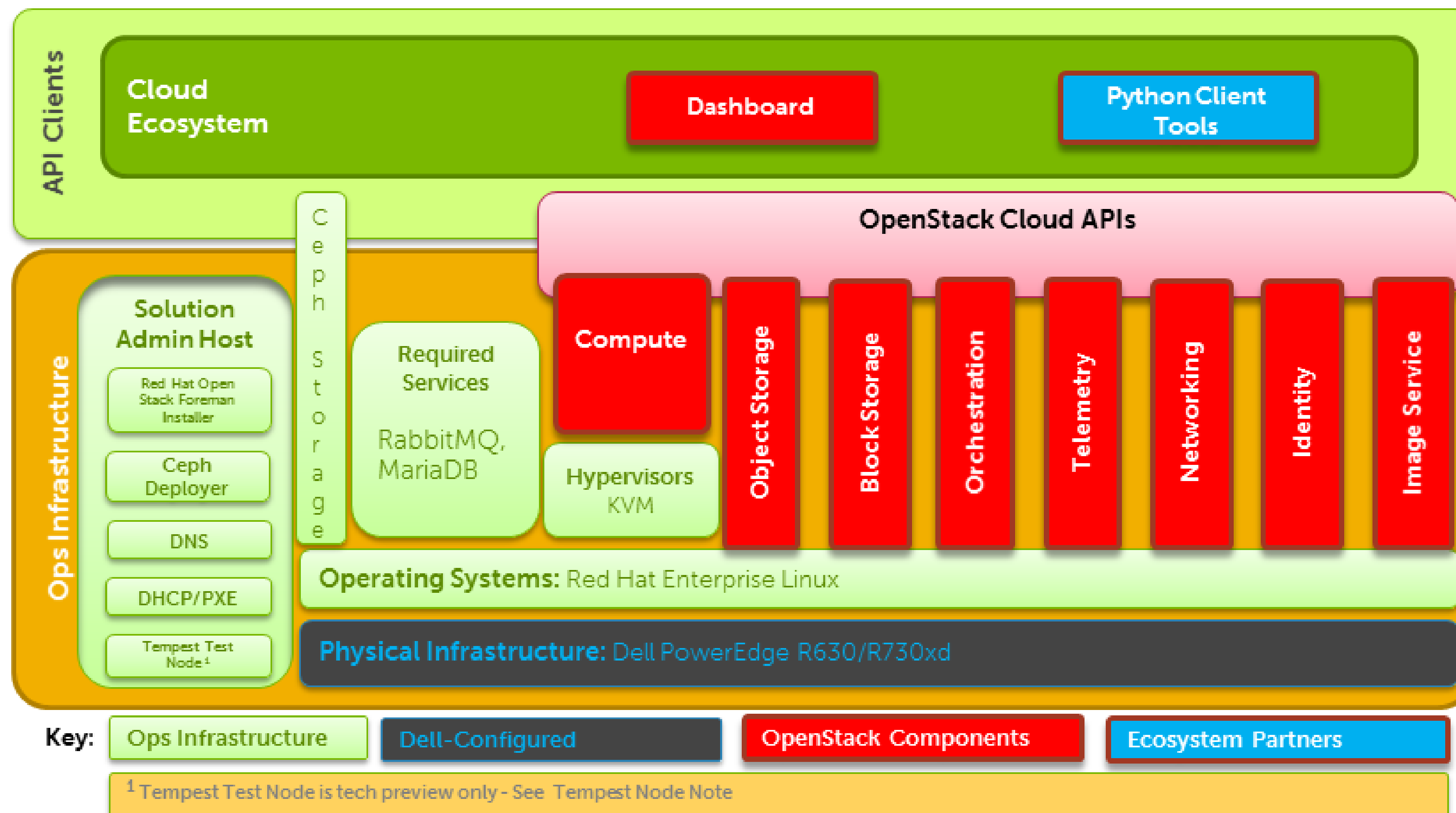- Just like the public cloud – 1000's to 10,000's of VM's!

It's Innovative

- Community accelerates feature velocity
- An eco-system of value-add extensions
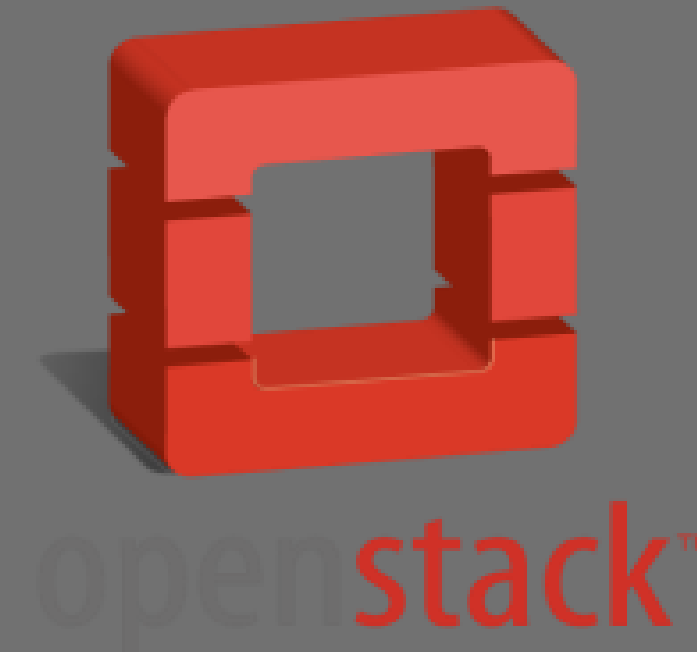- Multi-hypervisors, Container management, baremetal, PaaS

Global Industry Support

- 16000+ members from hundreds of industry leaders from 135 countries
- Governed by an independent foundation

OpenStack Taxonomy

API Clients

Cloud Ecosystem

Dashboard

Python Client Tools

OpenStack Cloud APIs

Ops Infrastructure

Solution Admin Host

Red Hat Open Stack Foreman Installer

Ceph Deployer

DNS

DHCP/PXE

Tempest Test Node [1]

Ceph Storage

Required Services

RabbitMQ, MariaDB

Compute

Hypervisors KVM

Object Storage

Block Storage

Orchestration

Telemetry

Networking

Identity

Image Service

Operating Systems: Red Hat Enterprise Linux

Physical Infrastructure: Dell PowerEdge R630/R730xd

Key: Ops Infrastructure | Dell-Configured | OpenStack Components | Ecosystem Partners

[1] Tempest Test Node is tech preview only - See Tempest Node Note

Why Dell & Red Hat OpenStack partnership?

Unique co-engineered solutions

- Comprehensive private cloud solution integrating Red Hat Enterprise Linux OSP, Foreman, Ceph, Red Hat High Availability, Dell HW, Dell Automation, Dell SW

- Extend and enhance multiple OpenStack projects, all code up-streamed

- Building value-add extensions - Docker/Ceph Object/OpenShift/NFV

Proven success in the Enterprise

- 14 + years joint experience making enterprises successful with open technologies

- Practical, proven use case configs, accelerate enterprise adoption

- Proven platforms, leader in price-performance

- Currently on the 5th joint release

What is Dell Red Hat OpenStack solution?

- Dell – Best HW for OpenStack
  - Servers
    - Right server for the right function
  - Switches
  - Storage

- Red Hat – Best SW for OpenStack
  - Complete SW stack co-engineered to work together
    - RHEL with availability and load balancing tools applied to OpenStack
    - Red Hat Ceph storage

- Jointly
  - Best engineered Solution
    - Architected, designed, integrated, optimized, flexible
  - Reference Architecture (RA) and documentation
    - Balanced architecture for performance, $$$, scalability, security, extensibility and support
  - Best automation
    - OpenStack Foreman Installer (OFI) based deployment automation - now
   - OSP director - future

Solution Details

•Architected to provides features with minimum pain points

•From Proof of Concept -> Production

•Flexible – you choose how many VMs and their sizes, tenants, data, performance

•HA – from the start

•Deployment and Management automation
  – Reducing deployment time in half from release to release
  – Full deployment from Rack/Stack, to full OpenStack, to Ceph
  – Right license for each node functionality – save you $$$
  – Optional Validator for the field – Tempest – for OpenStack logo

•Robustness
  – Fault injection testing
  – Features are formally include after meeting strict test criteria
  – Joint continuous integrations (CI) testing utilizing Dell infrastructure and Red Hat Quality Engineering team

Network Details

•Every node has all the networks required for its functionality

•Separate solution infrastructure networks into categories:
- Solution private
- Public/external
- Internal for management

•Each category share NICs on each node
- vLANs per network flow (tagged or untagged)
- Extensible – no need to add NICs for new network function (add vLAN)
- Cost saving (switch ports and NICs)
- 2 bonded NICs for performance and resiliency
- Uniformity of setup and management

•Implications
- Network settings per category are shared (MTU)

• OpenStack Neutron
- vLAN mode

Cluster Logical Network Architecture
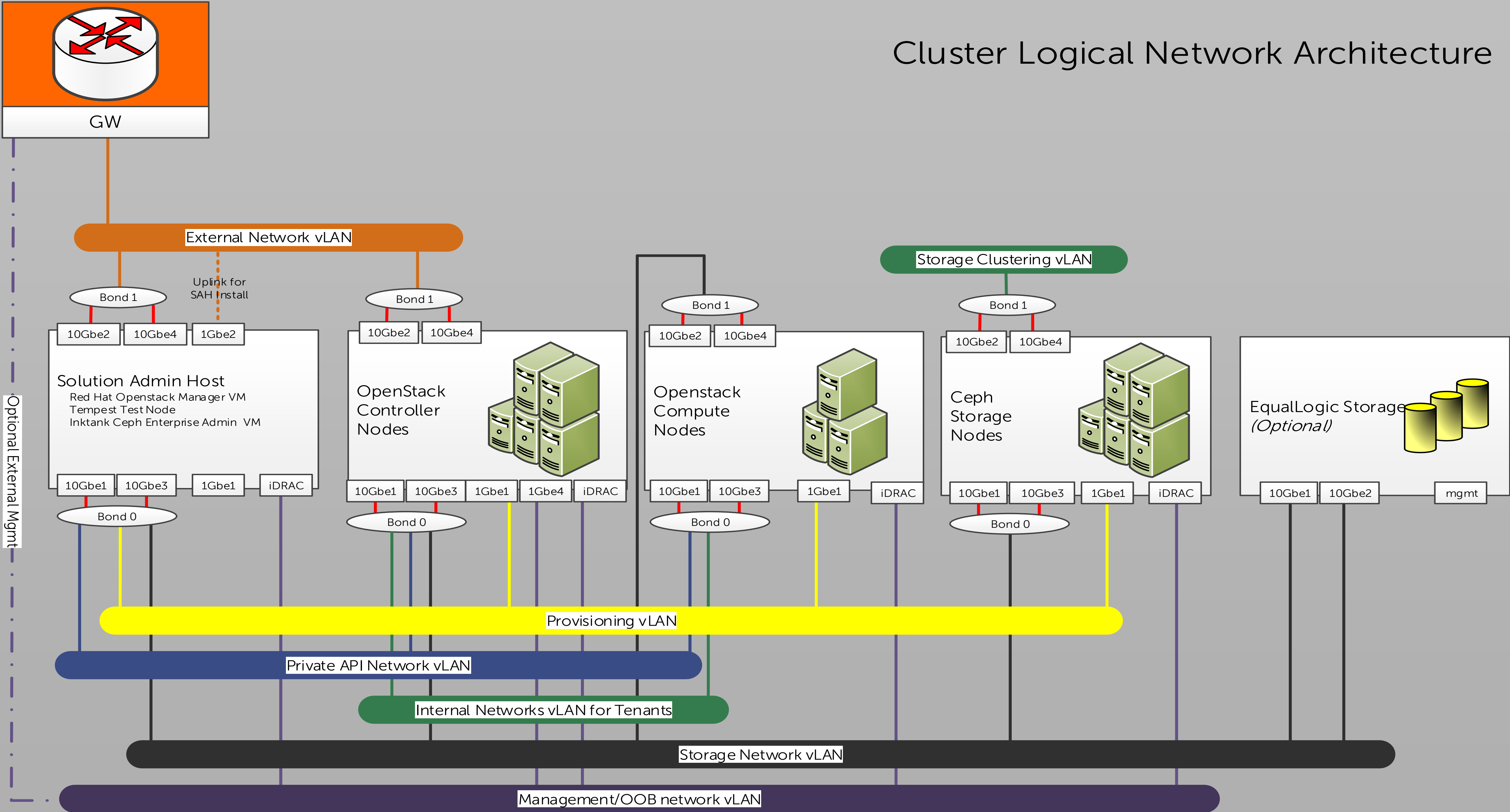
Reference Architecture and Beyond

- Reference Architecture
  - Brings in a cluster ready to go
  - Bring your applications up and begin designing and testing in your own environment
  - Learn OpenStack
    - How to create tenants
    - How to create networks
    - Create, deploy, migrate and destroy Virtual Machines
    - Added integrated storage to your solution

- Beyond
  - Take your lessons learned and use them into Production
  - Use the initial cluster for development
  or
  - Expand the initial cluster to Production
  Your Choice !!!

Dell and Red Hat Enterprise Cloud Solutions

Benefits

- Rapid on-ramp to OpenStack concept testing
- Cost efficient
- Single point of contact for solution support

Components

Dell PowerEdge R630/R730xd Servers

Dell Networking S4810 10G & S55 1G Switches

Red Hat Enterprise Linux OpenStack Platform 6

Red Hat Enterprise Linux 7.1

Ceph -1.2.3

Dell ProSupport

Dell Professional Services

Base RA configuration

- Node 1: Admin node with Red Hat Openstac and Ceph Managers, Tempest VMs
- Node 2-4: OpenStack HA Controllers
- Nodes 5-7: OpenStack Nova Compute
- Nodes 8-10; Ceph Storage
- Dell Networking S4810 - 2
- Dell Networking S55 – 1 (admin)
- Supports ~ 180 virtual machines per compute

Expansion / Modification

- Compute Nodes
  - R630 or R730
  - CPU, memory, and disks configurable
- Controller
  - CPU, memory, and disks configurable
- Networking
  - S6000 or S4810 for 10Gb
  - Can fully opt out
  - May require more services
- Support / Services
  - Dell
    › ProSupport minimum, can upgrade to Plus
    › Any SLA (NBD, same day, mission critical)
  - Red Hat
    › 1-3 years of Red Hat Support
    › Standard (10x5) or Premium (24x7) support

Demo

- RA stamp

- HA demonstration
  - Fully running system with tenants and a few VMs
  - Fault injection – iDRAC kill power Controller node
    - VMs are running
    - OpenStack fully operational
  - Fault removal – iDRAC power on Controller node
    - Everything is working
    - No manual intervention

Future

- Next joint release
  - OSP7
    - Kilo

- More HW options in pipeline for each component: servers, network, storage

- OSP director based deployment and management
  - When it meets our strict solution validation criteria

- OpenStack and partner components

- Foundation for workload specialization
  - NFV
  - PaaS (OpenShift)
  - Hadoop (Sahara)

Pointers and Contact

•More on joint solution - http://www.dell.com/learn/us/en/04/solutions/openstack

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