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

Solution Admin Host
- Red Hat Open Stack Foreman Installer
- Ceph Deployer
- DNS
- DHCP/PXE
- Tempest Test Node

Ceph Storage
- Required Services
  - RabbitMQ, MariaDB
- Hypervisors
  - KVM

OpenStack Cloud APIs
- Compute
- 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
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 Openstack 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


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BACKUP
SECTION HEADLINE
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