Red Hat Cloud Platforms with Dell EMC

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Red Hat Mission

To be the catalyst in communities of customers, contributors, and partners creating better technology the open source way
We participate in and create community powered upstream projects.

We integrate upstream projects, fostering open community platforms.

We commercialize these platforms together with a rich ecosystem of services and certifications.
Do these challenges sound familiar?

<table>
<thead>
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<th>Do these challenges sound familiar?</th>
<th>Possible solutions</th>
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<tbody>
<tr>
<td>“It takes too long to get cloud infrastructure up and running”</td>
<td>Too many resources spent ramping OpenStack-powered clouds, delaying time-to-results</td>
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<td>“We’re having trouble with reliable operations”</td>
<td>A production-scale environment that meets reliability and security standards is required</td>
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<td>“Data center management is too complex”</td>
<td>Need to deploy, provision, monitor, manage and scale OpenStack while managing hardware, operating system, and cloud software</td>
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OpenStack use cases

IaaS with layered PaaS and CaaS
Create a streamlined, unified enterprise environment for as-a-Service (IaaS, PaaS, and CaaS) operations.

Cloud hosting platform
Build a reliable service provider foundation for hosting and/or managing cloud-based application and service delivery.

Platform for big data analytics and HPC workloads
Construct an agile, scalable enterprise platform for running big data analytics and high-performance computing workloads.

Network functions virtualization
Virtualize communications network functions onto a unified infrastructure for modern service provider and telecom networks.
Dramatic savings in time and operational cost

**Challenge:** Needed to streamline operational costs, become more agile while maintaining reliability across 400+ production services

**Solution:** Deployed a flexible, scalable OpenStack-based cloud environment for university services

- Reduced deployment time from **3 weeks to 1 day**
- Improved customer service
- Lowered total cost of ownership by **3.5x**
Delighting customers with cloud IT

**Challenge:** Wanted a scale-out cloud infrastructure to support large data demand peaks

**Solution:** Build a flexible, OpenStack-based cloud environment for internal systems and content delivery services

Reduced IT expenses by 90%

Accelerated IT response times and service deployment

Established a foundation for a software-defined datacenter

“The flexibility of OpenStack running on a Dell EMC platform was one of the main reasons for choosing the technology.”

– Yui Onodera, Server Engineer, Infrastructure System Group, C.A. Mobile
HPC tailored to meet research needs with Red Hat OpenStack cloud

Challenge
The university sought a consolidated approach to sourcing large compute jobs for researchers.

Solution
A University of Kentucky executive attended a Dell EMC briefing on OpenStack. This seeded the idea of using an open source platform for a private cloud that could offer HPC Infrastructure-as-a-Service (IaaS).

Results
- Improved resource flexibility and control
- **Reduced licensing** costs by up to 60%
- Reduced processing times from 30 days to 12 hours

“Now, university researchers can get more flexibility and control over their compute resources using our OpenStack HPC platform from Dell EMC. Plus, we’ve helped reduce the university’s IT islands, saving money and staff time, thanks to the Dell EMC Red Hat OpenStack solution.”

Cody Bumgardner,
Director, Research Computing, University of Kentucky
Largest NFV Deployment

Verizon launches industry-leading large OpenStack NFV deployment

Verizon collaboration with Big Switch Networks, Dell and Red Hat advances open source knowledge; Companies to discuss project at the OpenStack Summit in Austin

AUSTIN, Texas – Verizon has completed the industry’s largest known Network Function Virtualization OpenStack cloud deployment across five of its U.S. data centers.

Open architecture platform

47% Lower total cost of ownership (TCO) over 5 years

3x Service agility advantage for new service enablement

65% Lower cost for new service enablement

Source: 2017 ACG Research commissioned by Dell EMC & partners.
JOINED VALUE PROPOSITION
Did you know that Dell EMC and Red Hat ...?

Provide a jointly engineered, deeply integrated, and fully-validated OpenStack solution for private and hybrid cloud.

Created dedicated and jointly staffed labs for OpenStack and open source development, testing, and performance engineering.

Delivered the first complete, co-engineered OpenStack solution with high availability, live migration, and software defined storage.

Tested and published the first SPEC Cloud IaaS performance benchmark results.

Built 10-node proof of concept units ready to ship out in rugged half-rack containers for customers to quickly and easily try OpenStack.
Dell EMC Ready Bundle for Red Hat OpenStack Platform

Rapid, automated deployment of a reliable and easy-to-manage OpenStack cloud

The Dell EMC Ready Bundle for Red Hat OpenStack Platform combines a core validated architecture with selected extensions to create an adaptive infrastructure that integrates innovations from the OpenStack community with proven Dell EMC and Red Hat technologies.

Benefits

1. **Rapid, automated deployment** — with a solution bundle that simplifies and speeds deployment with cloud services and automation.

2. **Reliable operations** — Dell EMC and Red Hat address gaps in OpenStack and deliver a highly scalable, secure and supported OpenStack-powered cloud infrastructure.

3. **Simplified management** — Streamlines and removes the complexities of OpenStack and its operating environment.
A complete, co-engineered OpenStack solution

- **Red Hat CloudForms**
  Multi-cloud management

- **Red Hat OpenShift Container Platform**
  Cloud-native Platform-as-a-Service (PaaS)

- **Red Hat OpenStack Platform**
  Agile Infrastructure-as-a-Service

- **Red Hat Ceph Storage**
  Scalable, cloud-native storage

- **Dell EMC PowerEdge Servers**
  Flexible, scalable rack and modular options

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**Dell EMC Ready Bundle for Red Hat OpenStack Platform**
Solution architecture

Dell EMC Ready Bundle for Red Hat OpenStack Platform, Release 10.1

- CLOUD MANAGEMENT LAYER
  - Red Hat CloudForms

- CONTAINER/PLATFORM-AS-A-SERVICE LAYER
  - Red Hat OpenShift Container Platform

- INFRASTRUCTURE-AS-A-SERVICE LAYER
  - Red Hat OpenStack Platform

- PLATFORM LAYER
  - Red Hat Enterprise Linux
  - Red Hat Ceph Storage

- INFRASTRUCTURE LAYER
  - Intel Xeon Gold series processors
  - Dell PowerEdge servers and storage
  - Dell Networking switches

Certified 3rd party extensions
Professional services
Enterprise support
Validated designs
Prescriptive deployment guides
Purpose-engineered configurations
Dell EMC PowerEdge-based solutions

Dell EMC Ready Bundle for Red Hat OpenStack Platform

- Two options for server platforms:
  - PowerEdge R-series rack servers or
  - PowerEdge FX-series modular servers

- Compute, controller, and software-defined storage nodes for Ready Bundle

- Dell EMC Networking

- Multiple optimized CPU and memory options validated and supported
PowerEdge R-series system scalability

**Start with 16U**
- Minimum of 3 compute and 3 storage nodes
- Plus 3 controller and 1 administration host nodes
- Requires 1 management and 2 top of rack (TOR) switches

**Expand to 30U**
- Add up to 8 compute or 7 storage nodes
- Requires no additional switches

**Scale out to 60U or 90U**
- Add up to 19 compute or 14 storage nodes per rack
- Requires 1 management and 2 top of rack (TOR) switches per rack
- Requires aggregation switch after first rack

Scales from a half rack to three racks

Independent compute and storage growth
Cloud-native Platform-as-a-Service (PaaS) with Red Hat OpenShift Container Platform

Container application platform with native docker and Kubernetes integration

- Speed application development
- Deliver the tools developers want
- Enable DevOps and collaboration
- Secure your application environment

Validated extension | Scale-tested | Verified configurations | Deployment guides
Hybrid and multi-cloud management with Red Hat CloudForms

Accelerate service delivery
Reduce operational costs
Improve visibility and control
Ensure compliance and governance

Validated extension | Scale-tested | Verified configurations | Deployment guides

Fully featured hybrid cloud management platform (CMP)
Capabilities

Service Catalog Management

Security

Portal Cloud

Analytics

SmartState

Physical

Virtual

OpenStack

Containers

Public Cloud
Capabilities

- Service Catalog Management
- Security
- Portal Cloud
- Analytics
- SmartState

- Physical
- Virtual
- OpenStack
- Containers
- Public Cloud
Capabilities

Service Catalog Management
Security
Portal Cloud
Analytics
SmartState

Physical
Virtual
OpenStack
Containers
Public Cloud
HOW IS THIS ACHIEVED
Dell EMC JetPack Automation Toolkit

Automate deployment, lifecycle ops, and maintenance

- Deployment templates for Red Hat OpenStack Platform director
- Role-based node optimization
- Hardware configuration management
- Update and upgrade management
**JetPack automated deployment sequence**

1. Rack and stack hardware, implement network plan and cabling, program switches
2. Set up Automation Answer File, create Solution Admin Host (SAH) with Red Hat Enterprise Linux
3. Start automated deployment from JetPack CLI on SAH node
4. Red Hat OpenStack Platform director installed on SAH node
5. Red Hat Storage console installed
6. Red Hat OpenStack Platform director sets up BIOS and RAID with JetPack scripts
7. OpenStack controller, Nova compute, and Red Hat Ceph Storage nodes installed
8. Installation complete

- **Not automated by JetPack**
- **Automated by JetPack**
Touchless installs and integrated Dell Remote Access Controller (iDRAC)

BARE METAL TO CONFIGURED OPENSTACK NODE

- DHCP server assigns IP address to bare metal node
- Script configures iDRAC settings for JetStream
- Ironic configures RAID and BIOS settings
IaaS with layered PaaS and CaaS

Dell PowerEdge servers and storage

Red Hat OpenShift Container Platform

Red Hat OpenStack Platform

Red Hat CloudForms
Benefit from ...

Rapid, automated deployment
Reliable operations
Simplified management

...with the Dell EMC Ready Bundle for Red Hat OpenStack Platform
THANK YOU

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