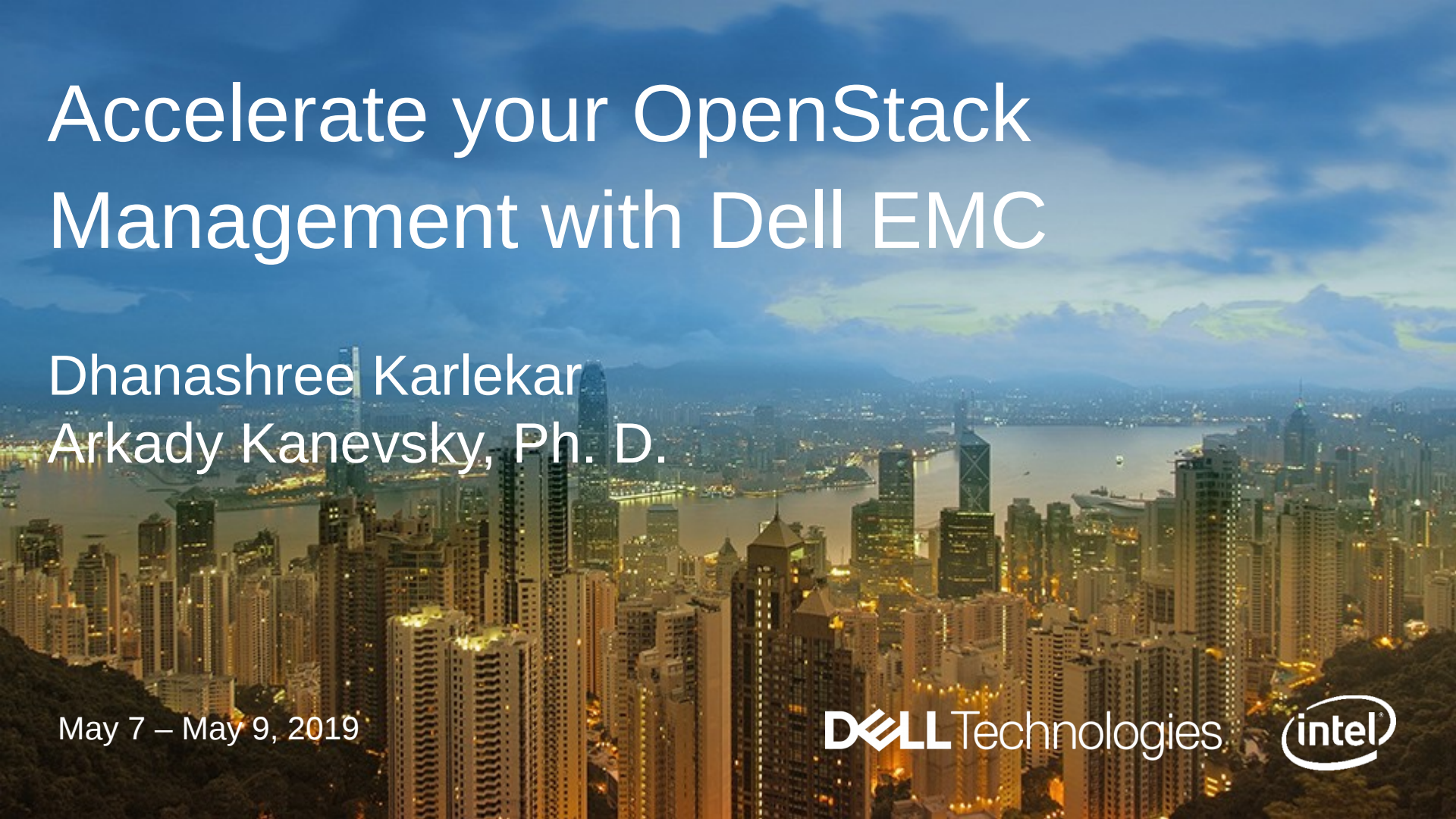
Accelerate your OpenStack Management with Dell EMC

Dhanashree Karlekar
Arkady Kanevsky, Ph. D.

May 7 – May 9, 2019



Our design philosophy

Open Architectures

Maximum choice, flexibility and investment protection, without forklift upgrades

Modern Portfolio

Modern systems and technologies no vested interest in legacy systems

Modular Systems

Open building blocks enabling mix-and-match interoperability up and down the stack

Scalable Solutions

Systems tailored to your workloads and designed to grow with your business and extensible for your needs

Dell EMC Red Hat solutions portfolio

- Dell EMC Ready Architecture for Red Hat OpenStack Platform (13.1)
- Dell EMC Ready Architecture for Red Hat OpenStack HCI (13.0)
- Dell EMC Ready Architecture for Red Hat OpenShift Container Platform (3.11)
- Dell EMC Ready Architectures for Red Hat Ceph Storage
- KNI concept

New: 13.1 Release Feature Summary

Dell EMC Ready Architecture for Red Hat OpenStack Platform

- Server: R640, R740, R740xd
- Networking: S3048/S4048, S5232
- NICs: Intel XXV710 25GbE, MLNX CX5 100GbE
- Storage: SDS w/ RH Ceph Storage (v3.2)
- Dell EMC Unity external storage
- BIOS: Legacy BIOS & UEFI as supported by Platform

- Red Hat OSP 13 (Latest Bits)
- Red Hat Enterprise Linux (v7.6)
- OS10 for Dell EMC Networking
- Market Certification
- RH Dell EMC servers Ironic Certifications
- Unity for Cinder, Glance, and Manila
- SDS w/ RH Ceph Storage (v3.2)

- JetPack Profiles (CSP and XSP)
- NFV Enhancements: OVS offload (tech preview)

- 13.1 Ready Architecture Guide
- HW configuration
- Validation results
- BOM
- Release Notes

- CSA with Red Hat

- PS Catalog of Services
- S/W Deployment Guide
- PS Readiness - Training

What's new for 13.1

Support of latest Red Hat OpenStack 13 and Ceph: latest long term supported Red Hat OpenStack Platform 13 (z6) and latest Ceph 3.2, fully containerized.
Support for Dell EMC S5232F-ON Switch: S5232-ON is a fixed form factor top-of-rack switch offering multiple options of 100GbE SFP28 ports for in-rack server and storage. Based on Broadcom Trident3 chipset, S5232-ON key features include enhanced buffering, higher forwarding tables and hardware support for L3 VXLAN while continuing to support Open Networking.
Mellanox CX5: CX5 provides 100GbE dual port NIC with variety of offloads, including Accelerated Switching And Packet Processing and HW-based IO virtualization to improve workload performance, decrease network latency and decrease CPU usage.
Dell EMC Unity: Dell EMC converge mid-range storage provides support for both block storage via iSCSI and file system for NFS and CIFS. 13.1 introduces Unity storage for Cinder, Manila and Glance via cinder backend on Unity. It is fully integrated with Red Hat OSP director and JetPack.
Manila & Octavia: OpenStack File System (Manila) and Load Balancer (Octavia) projects. Manila is supported on Dell EMC Unity. Octavia provides virtual load balancer.

Dell EMC Ready Architecture for Red Hat Hyperconverged OpenStack Infrastructure

Tested reference architecture design to simplify and accelerate HCI deployments

Pre-validated with Dell EMC cloud infrastructure hardware and Red Hat HCI software, Dell EMC Ready Architecture for Red Hat Hyperconverged OpenStack Infrastructure helps customers minimize adoption time and significantly reduces time to service to deploy HCI

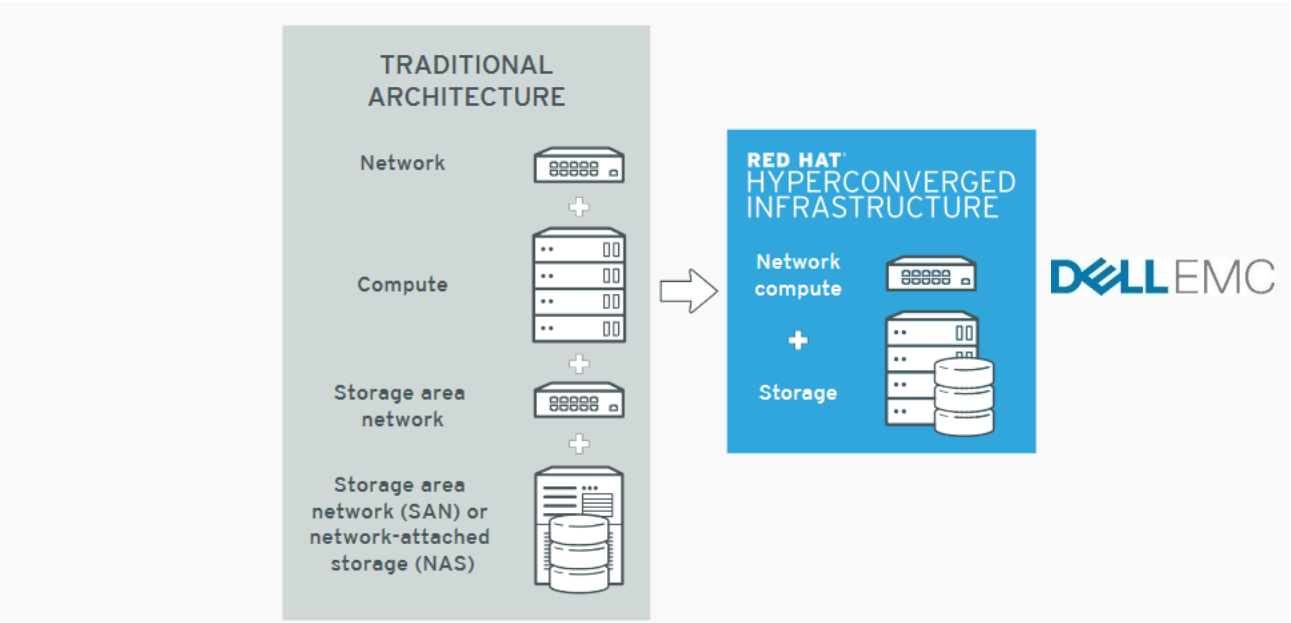
Key Values:

With advanced data reduction capabilities and software-defined networking functionality, Dell EMC Ready Architecture for Red Hat Hyperconverged OpenStack Infrastructure empowers organizations to:

- Deploy an open and versatile software-defined infrastructure with minimum footprint.
- Easily virtualize business applications, maximizing resource utilization through infrastructure consolidation and resulting operational efficiencies.
- Manage integrated compute-plus-storage resources with a single management interface.

Dell EMC Ready Architecture for Red Hat Hyperconverged OpenStack Infrastructure

Components



Components:

Dell EMC PowerEdge R640 and R740xd Servers

Dell EMC S5248-ON Switch

Dell EMC S3048-ON Switch

Red Hat Ceph 3.2 Storage

Intel NVMe, SATA SSDs

Intel XXV710 25GbE, Intel X710 Quad Port 10GbE NIC

DELL Technologies intel

Dell EMC Ironic Support

- Dell EMC has been founding member of Ironic project
- We support 3 drivers: IPMI, iDRAC, Redfish
- Dell EMC third party Ironic CI runs on PowerEdge and DSS9600 Series Servers.
- Dell EMC is one of 5 vendors who run third-party Ironic CI
  - Dell EMC has the most comprehensive of driver coverage for servers among all third-party Ironic CI supporting vendors, and covers IPMI, iDRAC and Redfish drivers on Dell EMC servers
- Dell EMC is only one of 2 vendors who is listed on Marketplace in OpenStack for Ironic Drivers:
  - https://www.openstack.org/marketplace/drivers/
- Dell EMC is the first server vendor to have Red Hat Bare Metal certification

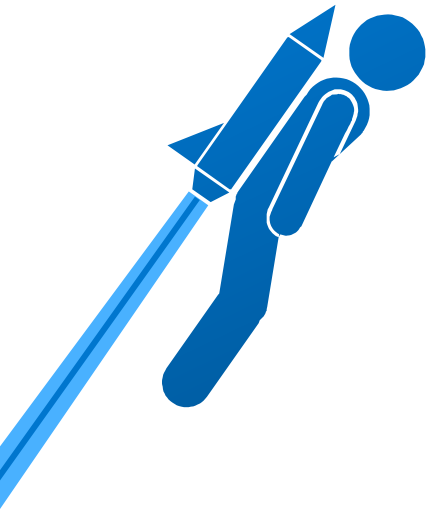
Dell EMC Ironic CI Build	Driver	Hardware	Boot Mode
dellemc-poweredge-R730-R630-tempest-dsvm-ironic-idrac	idrac	R730, R630, R430	BIOS
dellemc-poweredge-R730-R630-tempest-dsvm-ironic-ipmi	ipmi	R630 (FX2)	BIOS
dellemc-poweredge-R740-R640-tempest-dsvm-ironic-idrac	idrac	R740xd, R640	BIOS
dellemc-poweredge-R740-R640-tempest-dsvm-ironic-redfish	Redfish	R740xd, R640	BIOS
dellemc-poweredge-R740-R640-UEFI-py2-tempest-dsvm-ironic-idrac (Python2 support)	idrac	R740, R640	UEFI
dellemc-poweredge-R740-R640-UEFI-tempest-dsvm-ironic-idrac (Python3 support)	idrac	R740, R640	UEFI
dellemc-poweredge-R740-R640-UEFI-tempest-dsvm-ironic-ipmi	ipmi	R740, R640	UEFI
dellemc-poweredge-R740-R640-UEFI-tempest-dsvm-ironic-redfish	Redfish	R740, R640	UEFI
dellemc-DSS9000-tempest-dsvm-ironic-idrac	idrac	DSS9600	BIOS
dellemc-DSS9000-tempest-dsvm-ironic-redfish	Redfish	DSS9600	BIOS

JetPack and Deployment Automation

DELL Technologies

Dell EMC JetPack Automation Toolkit

Automate deployment, lifecycle ops, and maintenance



Workload Profiles

Automatic node discovery and proposed role assignment

Orchestration of Ironic administration

Support for composable roles

<2 hours per rack*

Rapid OpenStack deployment

Preconfigured for Life Migration support

Workload Optimized?

1. Choice of HW components specific for Workload
    1. NIC with PF support and offload for NFV workload
    2. Combination of NVMe and HDDs for Hadoop
    3. GPUs and FPGAs for Machine Learning or HPC
2. HW configuration
    1. BIOS setting for virtualization acceleration
    2. Processor off-load for encryption, Secure Boot
    3. MTU on switches and port grouping
3. OpenStack configuration
    1. Huge Page, NUMA pinning, DVR, MTU size, SR-IOV, DPDK,
4. Orchestrate and coordinate across all of them

How do you put it all together? – JetPack and TripleO

Open Source Project - https://github.com/dsp-jetpack/JetPack

Deployment and Lifecycle Flexibility specific to a workload

Predefined Profiles for specific Workloads: Telco/NFV, Generic Service Provider/xSP

Flexibility to customize all features beyond predefined profiles

Layered on top of TripleO and Ironic

How do you put it all together? – JetPack and TripleO

Technical:

Deployment and Lifecycle Flexibility

Feature set

In-place Upgrades

Part of OpenStack project / standards

Business:

Partner Ecosystem

Award winning, follow the sun support

Entire Stack ownership

Know-how

Takeaways

- In order to provide complete solution – hardware and software need to be developed and integrated together
- Minimize deployment and solution life-cycle risk by selecting good partners with know-how
- Look for value-add features that enhance OpenStack experience
- Stay on open source, flexible, extensible, yet optimized solution(s)


DELL Technologies

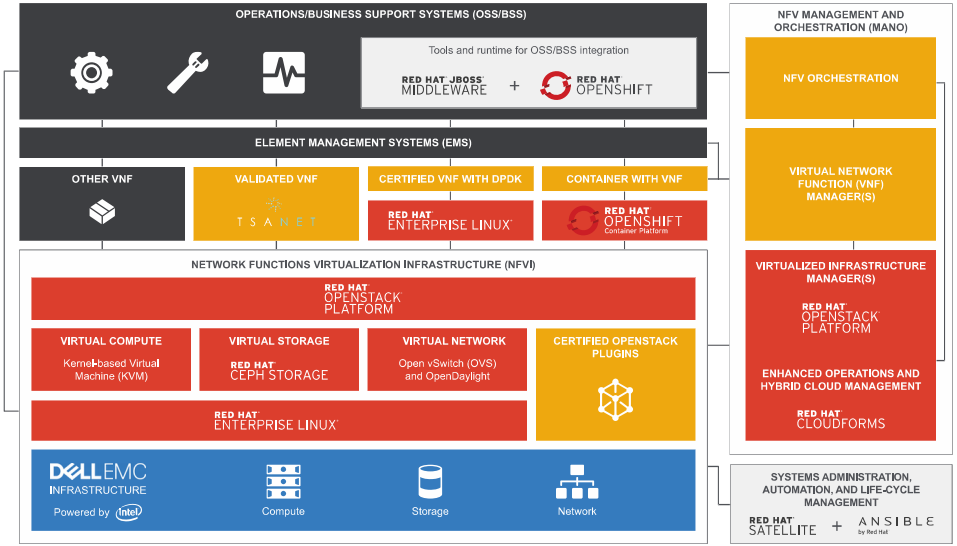
Dell EMC Ready Architecture for Red Hat OpenStack Platform (13.1)
Components

Red Hat OpenStack Platform

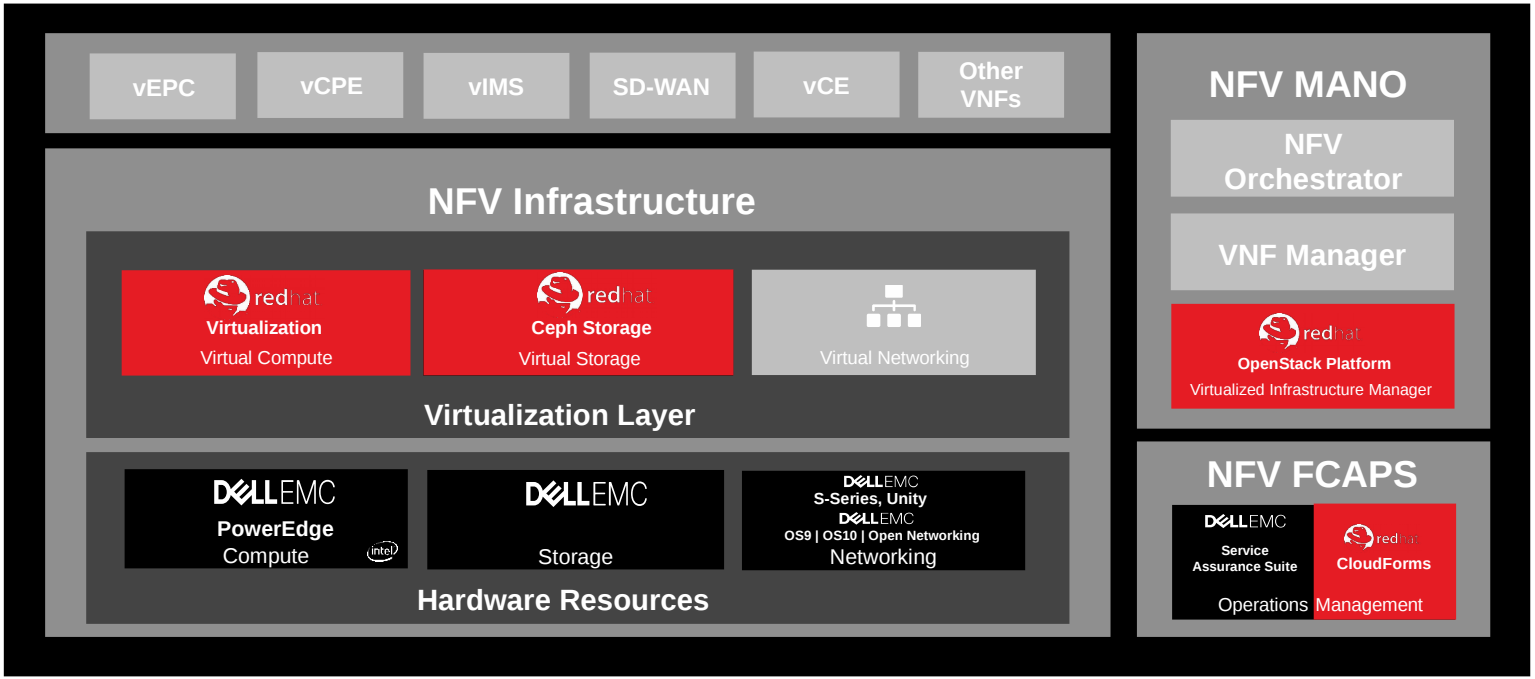
- Kernel-based Virtual Machine
- Red Hat Ceph Storage
- Open vSwitch and Neutron plugins
- Cinder plugins
- Red Hat Enterprise Linux

Dell EMC infrastructure

- Dell EMC Networking
  - 2 x S5232F-ON
  - 1 x S3048T-ON
- PowerEdge Rack Servers
  - 4 x R640/R740 (Intel XXV710 25GbE)
  - 6+ x R740XD (Intel XXV710 25GbE & MLNX CX5 100GbE)
- Dell EMC Unity
  - Block, image, File system



Dell EMC Ready Architecture for Red Hat OpenStack Platform
Depicted in ETSI diagram



A proven, optimized NFV infrastructure solution for CSPs to deploy rapidly

DELL Technologies intel