THE ROAD AHEAD FOR RED HAT OPENSTACK PLATFORM

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May 9, 2019

WHAT YOU WILL LEARN IN THIS SESSION

INTRODUCTION
15 MINS

The power of our portfolio

Red Hat Openstack Platform Benefits

RED HAT OPENSTACK USE CASES
15 MINS

NFV, Edge, AI/ML

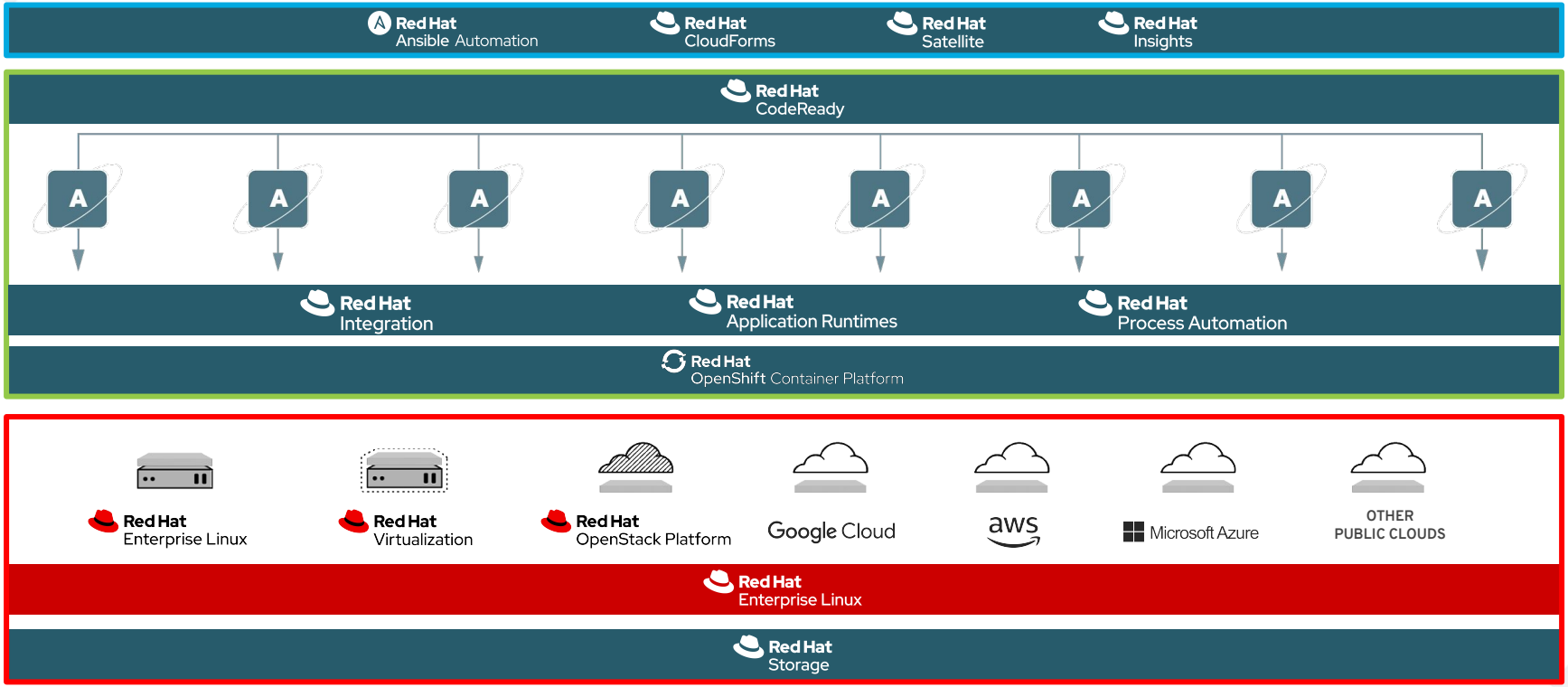
OpenShift on OpenStack

PRODUCT ROADMAP
15 MINS

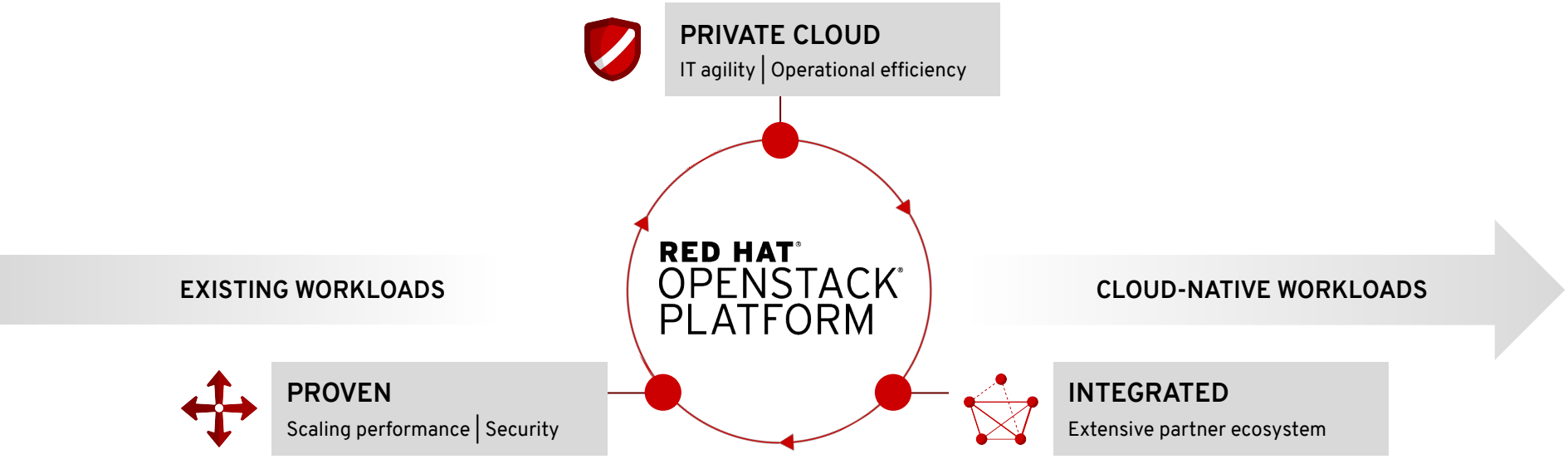
New Lifecycle

The road ahead with OpenStack Platform next releases

THE RED HAT PORTFOLIO



RED HAT OPENSTACK PLATFORM:
THE ON-PREM FOUNDATION FOR HYBRID CLOUD

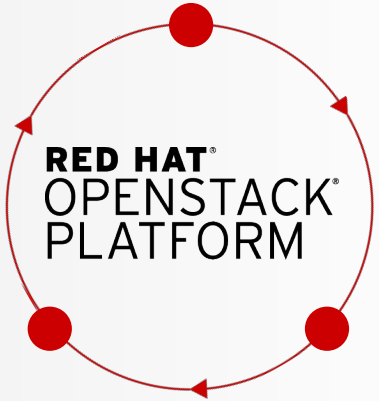


DELIVERING TRANSFORMATIVE AND DIFFERENTIATED BUSINESS VALUE

Red Hat

RED HAT OPENSTACK PLATFORM

A strategic part of our portfolio



- **INTEGRAL PART OF OUR OPEN HYBRID CLOUD VISION**
  Proven on-premises cloud platform
- **DELIVERING INNOVATIONS FOR MULTIPLE USE CASES**
  Upcoming OSP 15, edge computing capabilities, AI/ML, etc...
- **CONTINUED FOCUS ON INCREASING BUSINESS VALUE**
  In partnership with our customers to help transform their organizations

Red Hat

IT ALL STARTS WITH OUR LINUX PLATFORM

The intelligent operating system that is the consistent foundation for the enterprise hybrid cloud.

Digital transformation can ONLY be done with Linux.

ONLY Red Hat Enterprise Linux provides an intelligent OS that is the consistent foundation for the enterprise hybrid cloud.

Delivering any application on any footprint at any time giving you **Control. Confidence. Freedom.**

LINUX IS THE FOUNDATION OF RED HAT OPENSTACK PLATFORM

Red Hat
Enterprise Linux 8

Support starts with Red Hat OpenStack Platform 15

Continues to offer customers a secure, robust and integrated Linux operating system

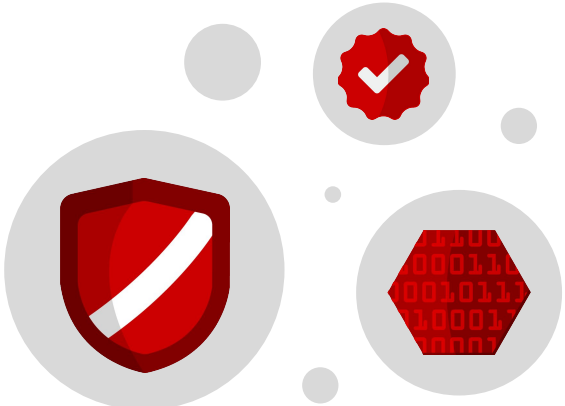
Provides top-performing functionality through support for:

- Emerging workloads like AI/ML via GPU/vGPUs support
- Enhanced TCP stack,
- Improved load balancers
- Efficient kernel tracing and monitoring

RHEL 8 guest support for Red Hat OpenStack Platform versions 9, 10, 13, and 14+

HARDENED SECURITY SERVICES FOR ENTERPRISE WORKLOADS

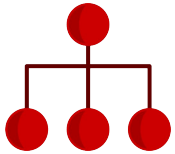
Red Hat® OpenStack® Platform



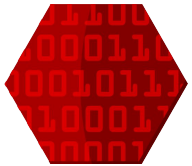
- **INFRASTRUCTURE SECURITY**
  Red Hat OpenStack Platform service hardening and key management
- **DATA INTEGRITY**
  Data encryption: at rest and on the fly
- **FEDRAMP GUIDED REMEDIATIONS**
  Moving toward better risk management

FOCUS ON DATA SECURITY IN YOUR ON-PREMISE PRIVATE CLOUD

DIRECTOR: MAKING RED HAT OPENSTACK PLATFORM EASIER TO MANAGE



FLEXIBLE ARCHITECTURE



INTEGRATION OF ANSIBLE®

VALIDATIONS FRAMEWORK

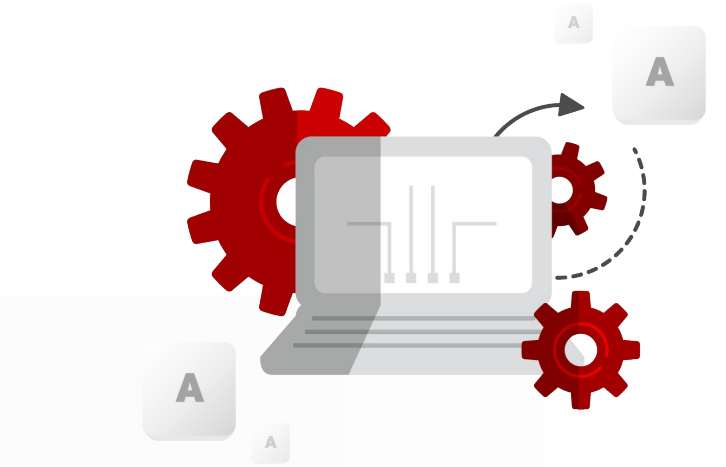
PLUGIN-BASED SOLUTION

UPGRADE OPTIONS

Red Hat

DIRECTOR

AREAS OF PRODUCT ENHANCEMENT



Scalability

From 500 nodes to more than 1K nodes

Ease of Use/Operations

Increased ansible automation to reduce complexity

Bare Metal Management

Best On Prem IaaS for Red Hat Openshift
From Core to Edge

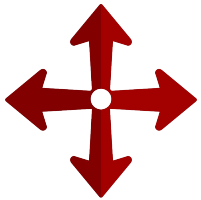
Red Hat

ENABLES A BROAD SET OF USE CASES

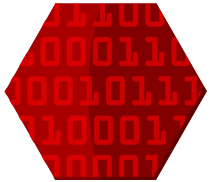
Red Hat® OpenStack® Platform

NETWORK FUNCTION VIRTUALIZATION

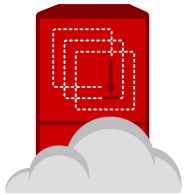
WEB APPS/DEVELOPER CLOUD



EDGE COMPUTING



AI/ML/HPC



SERVICE PROVIDER

Red Hat

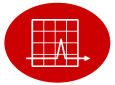
NFV

THE TELCO NETWORK CHALLENGE

WHAT YOUR CUSTOMERS WANT

GREAT EXPERIENCES
Services that stand out

TOTAL ACCESS
Anything, anywhere, any time



UNLIMITED CAPACITY
Ever-increasing demand for more

PLATFORM OPPORTUNITIES
Enterprise innovation on your assets

HOW RED HAT HELPS

SERVICE INNOVATION
Enhance customer engagement

BUSINESS AGILITY
Respond and scale rapidly

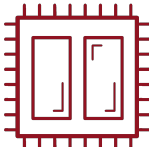
IMPROVED EFFICIENCY
Get more from what you have

SPEED TO REVENUE
Create customer value faster

NFV SPECIFICS EXTENSION

NETWORK FUNCTION VIRTUALIZATION

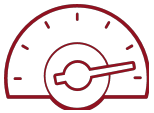
Red Hat OpenStack Platform incorporates enhanced platform awareness (EPA) to expose hardware acceleration features in OpenStack.



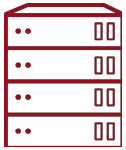
vCPU PINNING

NUMA-AWARE SCHEDULING*

HUGEPAGE SUPPORT FOR VMs



ACCELERATED PACKET PROCESSING*



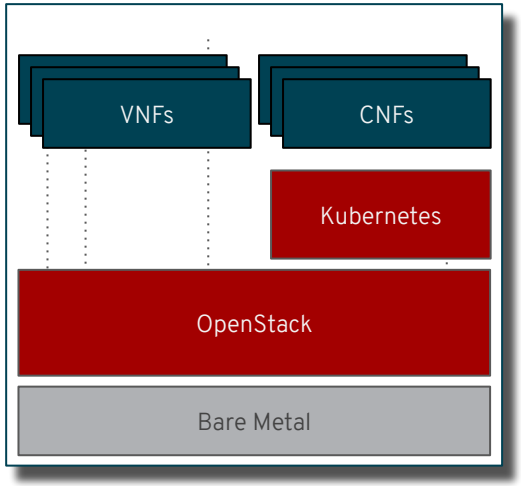
RESOURCE-AWARE SCHEDULING

OPEN VIRTUAL NETWORKING*

Red Hat

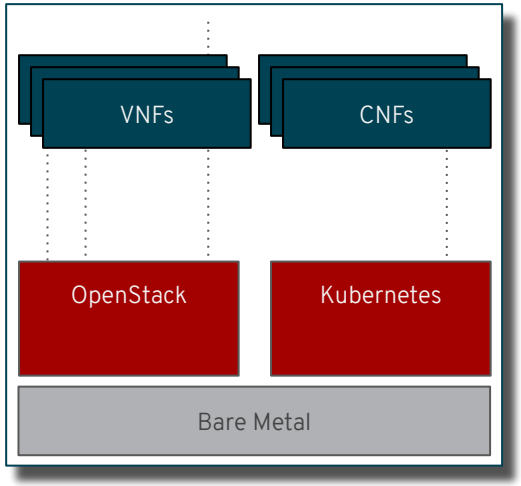
The Evolution of a Winning Platform

Short Term



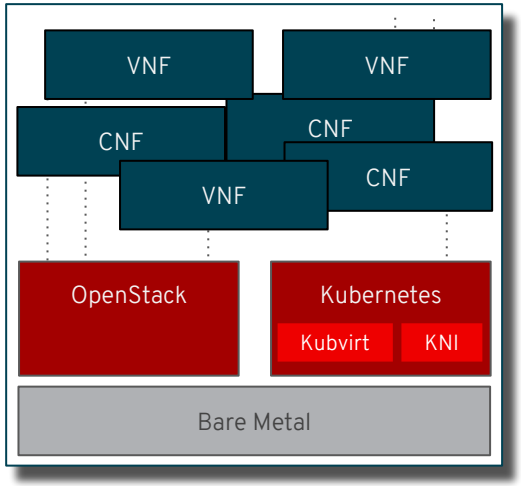
Enable Openshift 4 on Openstack

Medium Term



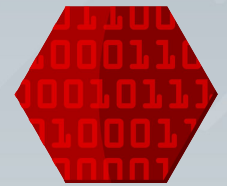
Once Openshift can manage the bare metal, we can then have each workload running on bare metal

Long Term



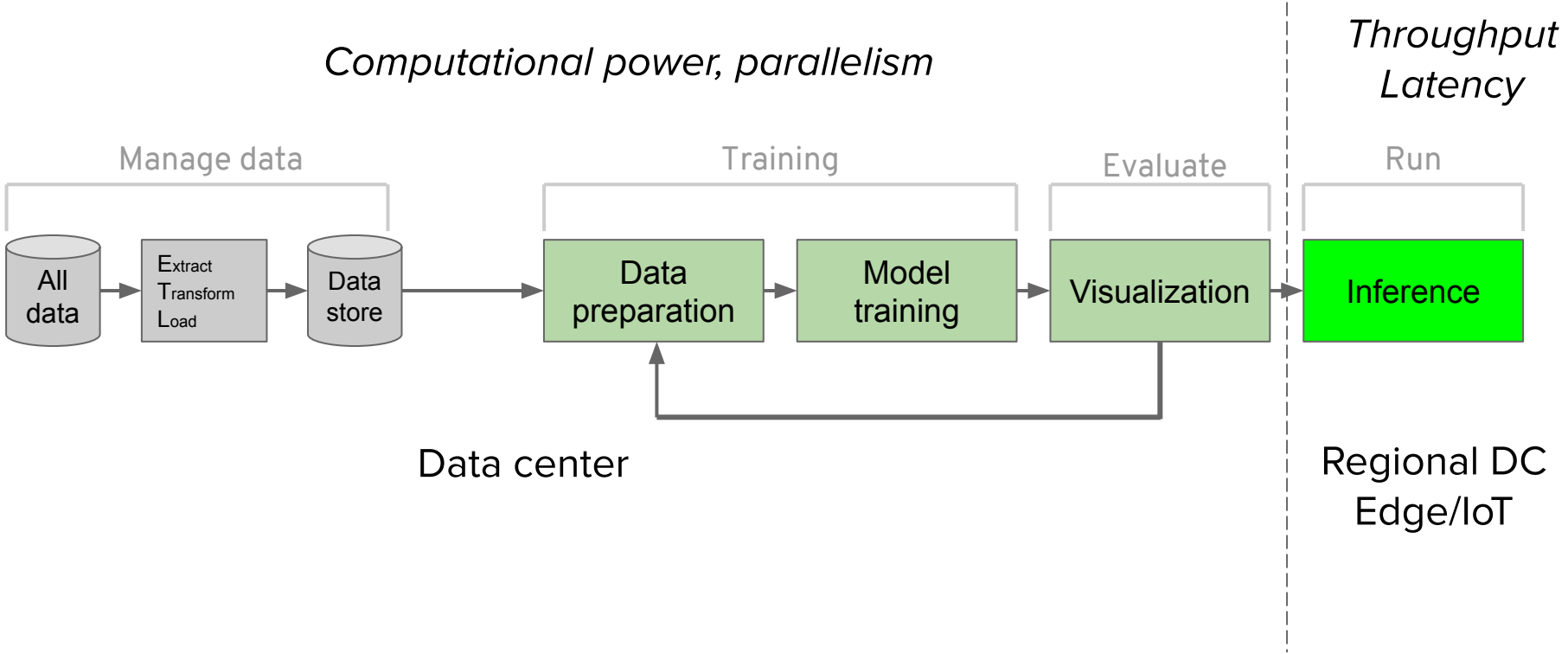
Providing our customers and partners choice : A mature OpenStack Platform or a Next Generation Platform based on Kubernetes

Red Hat



AI/ML & Analytics

Analytics pipelines, from training to inference



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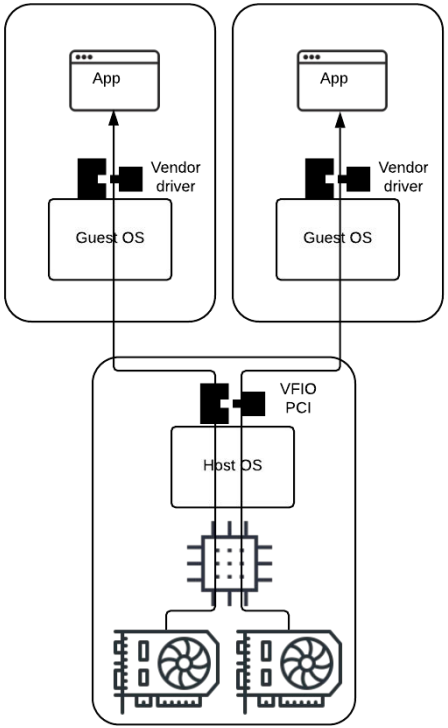
GPU passthrough



Implemented by OpenStack Compute since Havana

Supported by Red Hat OpenStack Platform since ages

Pros:

- Full compatibility on the guest
- Maximum performance on the guest

Caveats:

- Device exposure to the guest
- PCI-E lanes limitations per CPU
- Guest UEFI firmware is recommended
- Capacity management challenges

Red Hat

Machine Learning with GPU passthrough

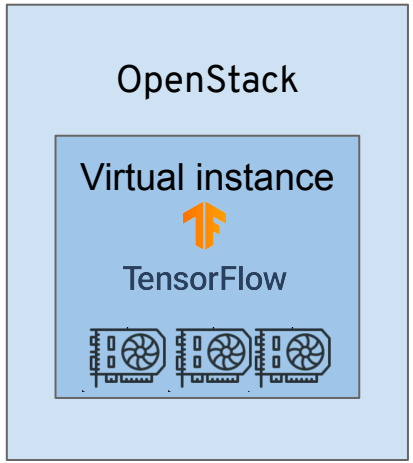
CPU

```
Step            Img/sec                              total_loss
1    images/sec: 2.6 +/- 0.0 (jitter = 0.0)    8.108
10   images/sec: 2.7 +/- 0.0 (jitter = 0.0)    8.122
20   images/sec: 2.6 +/- 0.0 (jitter = 0.0)    7.983
...
----------------------------------------------------------
total images/sec: 2.6
```

GPU

```
Step            Img/sec                              total_loss
1    images/sec: 157.9 +/- 0.0 (jitter = 0.0)  8.011
10   images/sec: 158.2 +/- 0.3 (jitter = 0.5)  7.732
20   images/sec: 158.2 +/- 0.2 (jitter = 0.6)  7.686
...
----------------------------------------------------------
total images/sec: 157.85
```

Code: https://github.com/tensorflow/benchmarks




```
TensorFlow:  1.13
Model:   resnet50
Dataset: imagenet
Mode:    training
```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Virtual GPU (vGPU)

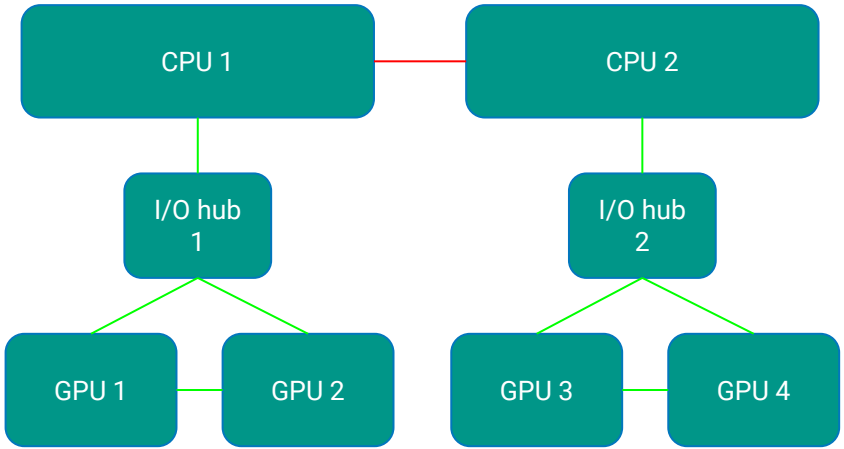
Tech Preview in Red Hat OpenStack Platform 15

Pros:

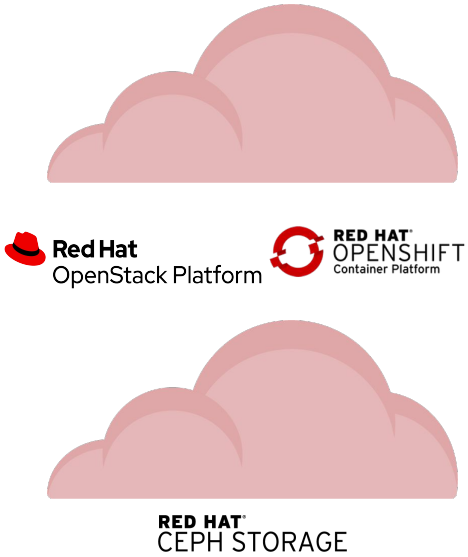
- Manageable host API for allocating resources on demand
- Device management only on the host
- Introspectable hardware on the host

Caveats:

- Vendor-specific driver
- Product lines specific
- Guest driver limitations



The Foundation for Data Analytics Cloud



IN-MEMORY (DATA GRID)

ELASTIC COMPUTE RESOURCE POOL

INGEST	ETL	INTERACTIVE QUERY	BATCH QUERY & JOINS
Kafka *AMQ Streams* compute instances	**Hive/Map Reduce** *Cloudera* compute instances	**Presto** compute instances	**Spark/Hadoop** *Rad analytics*
		Platinum SLA	Silver SLA
		Gold SLA	Bronze SLA

SHARED DATA LAKE

Multi-tenant workload isolation with shared data context

Red Hat

Show more

MLaaS on OpenShift: Ministry of Defense Israel use case

Day/Time: Tuesday, May 7, 3:45 p.m.-4:30 p.m.

Speaker(s): Menny Tsarfati, Red Hat; Miki Kenneth

Session type: Breakout

Abstract: In this session you'll learn about AutoML, an open source framework that lets you turn any data set into a prediction model without

Show more

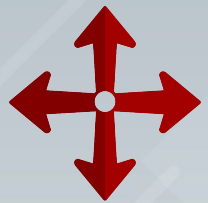
Transforming Cloudera analytics agility in a fast-moving world

Day/Time: Thursday, May 9, 11:00 a.m.-11:45 a.m.

Speaker(s): Brent Compton, Red Hat

Session type: Breakout

Abstract: A Government of Israel (GoI) agency recently launched a "cloudoop" service, transforming their data analytics environment. Cloudoop is their Spark-as-a-Service offering, with Spark provided by Cloudera, multitenant workload isolation provided by OpenStack, and a shared data context provided by Ceph/S3 object storage.

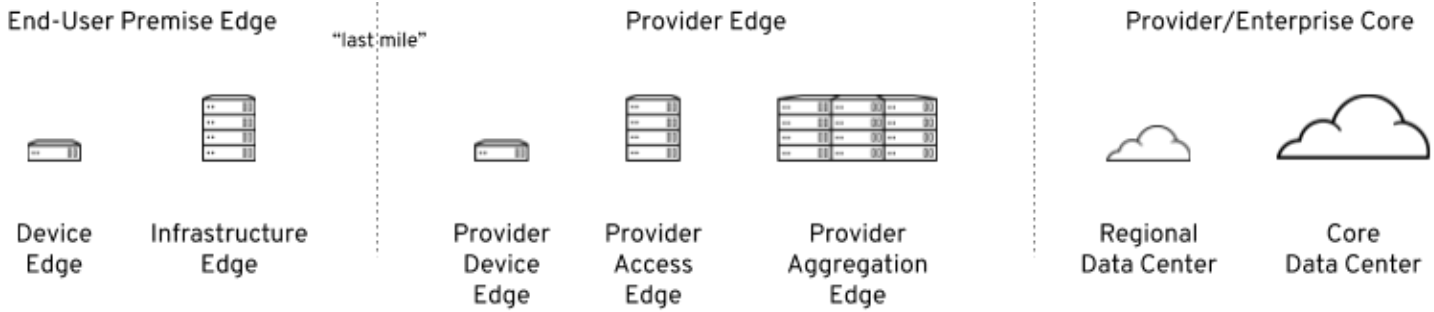


EDGE

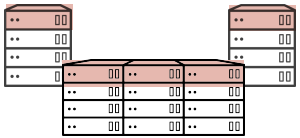
WHAT IS EDGE COMPUTING?

Centralize where you can,
distribute where you must

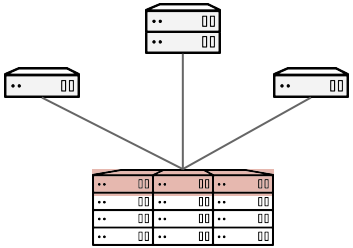
THERE ARE MANY EDGES



OpenStack at the Edge



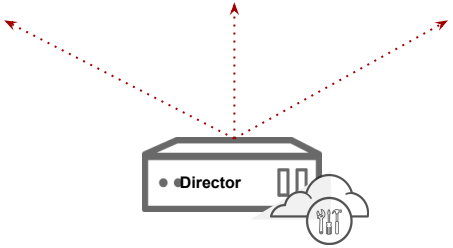
Standalone Cluster(s)



Distributed Compute Nodes

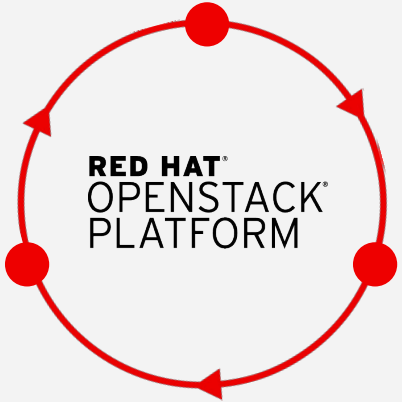
Single Node

(All-in-One)



Red Hat OpenStack Platform with distributed compute nodes (DCN)

Bringing compute power to the edge



Scale while minimizing operational complexity
with centrally managed edge sites

Reduce hardware footprint
and cost at the edge.

Process, analyze, and distribute
data close to real time.

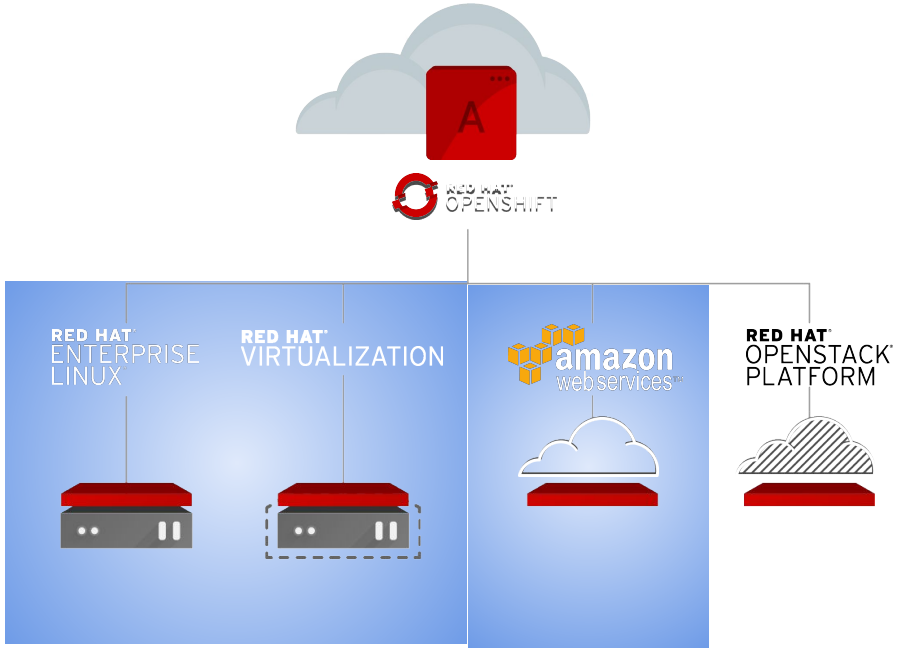
Enhanced security
with an edge-adopted risk management framework.

redhat.

CONTAINERS

RED HAT OPENSTACK PLATFORM

AND RED HAT OPENSHIFT



Consumption of resources

Provides the container platform layer

Define and share applications

Provisioning of resources

Elastic availability of the **infrastructure** layer

VMs, BM, **IaaS+** services

Red Hat

TIGHT INTEGRATION OF RED HAT OPENSHIFT CONTAINER PLATFORM AND OPENSTACK

Containers, virtual machines, and bare metal

OPENSHIFT CONTAINER PLATFORM

App App App App App App

Containers Containers CNS

App App

VM VM VM

KVM Ironic (Bare Metal) Cinder

Compute Ceph

RED HAT OPENSTACK PLATFORM

Networking

KURYR

Networking

Red Hat CloudForms

Red Hat Satellite

Red Hat OpenStack Platform Director

Red Hat Ansible Automation

SHARED MANAGEMENT TOOLING

STANDARD HARDWARE

Red Hat

THE ROAD AHEAD

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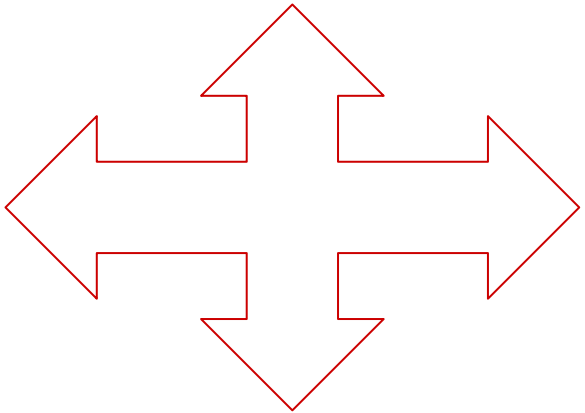
OUR INVESTMENT PRIORITIES

EDGE

On Prem best IaaS to run Containers

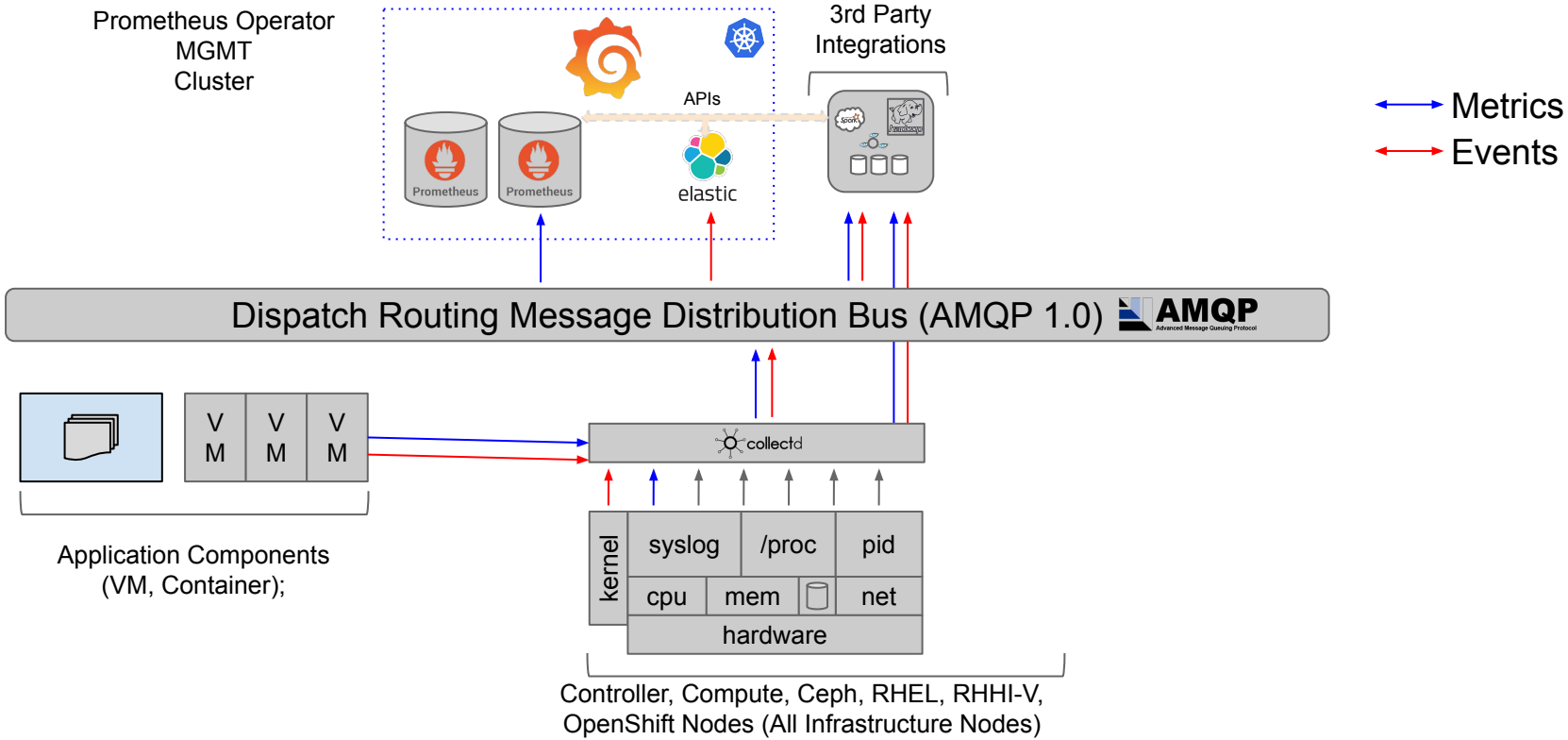


Day 2 Mgmt

Scalability

Red Hat

Service Assurance Framework (SAF) Overview



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Red Hat OpenStack - What's New

NOW IN RHOSP 13

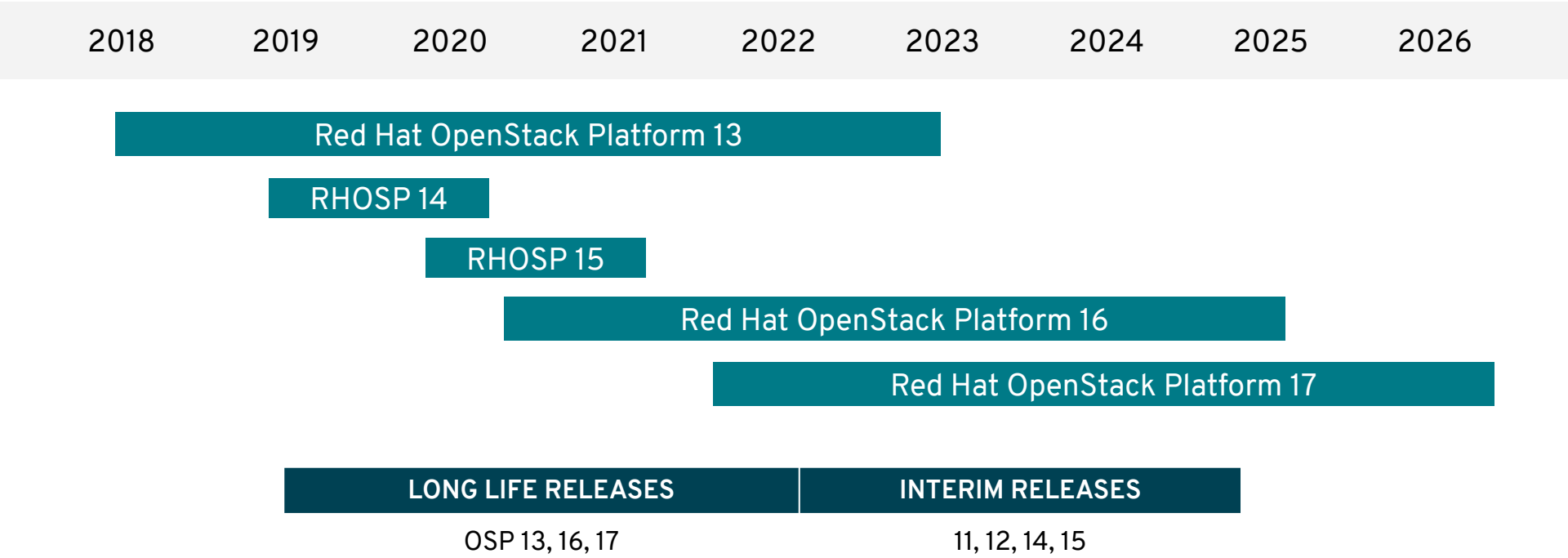
1. Based on Upstream Queens release
2. Long-life release (based on RHEL 7.5)
3. Enhanced Day2 Mgmt (SAF)
4. FFU Enhancements
5. Availability of Distributed Compute Nodes (DCN) for edge computing architectures

UPCOMING RHOSP 15

1. Based on Upstream Stein release
2. Short-life release
3. First release based on RHEL8
4. Openshift 4.2 Integration
5. Introduce Edge additional capabilities
   a. DCN with persistent storage
   b. Flexible and scalable deployment
6. Service Assurance Tech-Preview

RED HAT OPENSTACK ROADMAP

Releases Lifecycle



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Red Hat OpenStack Platform - 15 Highlights

Compute

1. NVIDIA vGPU Full Support
2. Cells v2

Networking

1. OVN
2. QoS Management

Storage

1. DCN with persistent storage (TP)

Others

1. Director: Edge Enhancements
2. Security: HSM for

Red Hat OpenStack Platform - 16 Highlights

Compute

1. Live Migration for Pinned VM
2. SR-IOV Warm Migration
3. Basic FPGA support

Networking

1. IPv6 Full Support (Prov. included)
2. Octavia OVN driver

Storage

1. Storage at the edge productization
2. Dynamic Storage Provisioning for OpenShift

Others

1. Enhanced Day2 Mgmt (Automated Back-up/restore), Logging, Event Mgmt

THANK YOU


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