RHV 4.3 Features and Roadmap

Enterprise virtualization in a containerized world

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WHAT DOES RED HAT DO?
THE 3 PILLARS OF OUR BUSINESS

OPEN HYBRID CLOUD

HYBRID CLOUD INFRASTRUCTURE
Infrastructure software across the 4 footprints, with RHEL at the very core.

CLOUD-NATIVE APP PLATFORMS
Software to rapidly & efficiently develop & deploy apps across hybrid cloud.

MANAGEMENT & AUTOMATION
Software can simplify management & automation of hybrid cloud environments.
A (BRIEF) HISTORY OF RED HAT VIRTUALIZATION
FROM THEN, TO NOW

- **2009** QUMRANET ACQUISITION
- **2010** RED HAT ENTERPRISE VIRTUALIZATION BEATS VMWARE on the SPECvirt_sc2010 benchmark on both speed and scale
- **2012** RED HAT ENTERPRISE VIRTUALIZATION 3.0
  - More solution partners
  - RESTful API
  - Memory overcommit
- **2013** RED HAT ENTERPRISE VIRTUALIZATION 3.1, 3.2
  - Windows guests NUMA collaboration with HP
- **2014** RED HAT ENTERPRISE VIRTUALIZATION 3.3, 3.4
  - OpenStack Neutron integration
  - Hot Plug CPU Affinity management
  - IBM Power support
- **2015** RED HAT ENTERPRISE VIRTUALIZATION 3.6
  - V2V migration tool
- **2016** RED HAT VIRTUALIZATION 4.0
  - 10th product release
- **2017** RED HAT VIRTUALIZATION 4.1
  - Ansible integration
  - Native SDN
- **2018** RED HAT VIRTUALIZATION 4.2
  - Native DR
  - New metrics store
  - New UI
  - Cisco ACI
  - Container-native Virtualization 1.0
- **2019** RED HAT VIRTUALIZATION 4.3
  - RHEL 8 Guests
  - OSP 13/14 SDN
  - CNV 1.2
  - Tech preview w/OCP 3.11
KERNEL-BASED VIRTUAL MACHINE (KVM)

- KVM is a part of the Red Hat Enterprise Linux kernel
- QEMU uses KVM to execute virtual machines
- libvirt provides a management abstraction layer that homogenizes capabilities and simplifies the creation, consumption, and management of KVM-based virtual machines
- Red Hat Virtualization, Red Hat OpenStack Platform, and Container-native virtualization all leverage KVM, QEMU, and libvirt
RED HAT VIRTUALIZATION
DEMO

ADDITIONAL INFORMATION

DOCUMENTATION
- RHV landing page: https://red.ht/2FT3MY0
- RHV documentation: https://red.ht/2uHnf7Z
- RHEL virtualization docs: https://red.ht/2uF4Ulu

OTHER
- RHEL blog: https://red.ht/2JVTCDk
- RHV Partner Connect Zone: https://red.ht/2WGbtfq
RED HAT VIRTUALIZATION OVERVIEW

Directory service
• Active directory
• IPA
• Red Hat Directory Server
• IBM Tivoli Directory Server

Web browser
Administrator portal
REST API/Python SDK/Java SDK
Web browser
User portal

Web service
Web app
Web app

Backend

RED HAT ENTERPRISE LINUX
RED HAT VIRTUALIZATION MANAGER

Storage domain

Console access

PostgreSQL

Internal web service
HTTPS
SSH / SSL

RED HAT VIRTUALIZATION HYPERVERSOR

VDSM
libvir

xB6_64
PPC

SPICE or VNC
● Primary management interface for RHV
  ○ Ability to create, manage, and control configuration of physical (hosts, storage), logical (datacenter, cluster, etc.), and virtual machine resources

● User interfaces
  ○ Administrator portal for managing RHV resources
  ○ Virtual machine portal for non-administrators
  ○ REST API for automation and integration
    ■ Multiple SDKs available (Python, Java, Ruby)
ADMINISTRATOR DASHBOARD
HYPERVERSORS

- 2 different hypervisor “models”
  - Appliance: Red Hat Virtualization - Host (RHV-H)
  - Traditional OS: Red Hat Enterprise Linux (RHEL) w/RHV packages
- Both result in the same capabilities!
  - RHV-H has a smaller footprint, having only what’s needed to be a hypervisor
- Configuration and management are both handled the same by RHV-M
  - Updates/upgrades, power management, etc. all equivalent
  - Logical entities (e.g., networks and storage) are created and managed the same
- Do you want/need to customize the hypervisor OS layout and/or package set extensively?
  - Yes - RHEL
  - No - RHV-H
HYPERVISOR ARCHITECTURE
A datacenter has 1 or more clusters
Clusters are composed of 1 or more hosts
VMs are hosted by the clusters and can be migrated to any host in the cluster
All hosts in the cluster must access the same physical networks
All hosts in the datacenter must have access to the same shared storage
RED HAT VIRTUALIZATION 4.3 THEMES

- Delivered 80 requests for enhancement (RFEs)
- More than 240 customer bugs fixed
- 1,588 Bugzilla bugs fixed
- Several integrations in tech preview

Ensure RHV has Happy Customers by caring for RFEs, Automation and UX

Red Hat Virtualization is a stable, reliable, and trusted platform for enterprise virtualization

Infrastructure migration solution(s) ready to host workloads migrated to Red Hat’s portfolio
Red Hat Virtualization 4.3

**Enhancements**
- Red Hat Enterprise Linux 8 guest support
- Red Hat OpenStack Platform 10, 13, and 14 SDN integration
- IBM POWER9 CPU architecture
- Upgrade Manager GUI

**Fixes and Changes**
- Ansible 2.7 and expanded roles
  - infra
  - hosted-engine-setup
  - engine-setup
  - shutdown-env
- RHV-H - pVLAN, OpenSCAP
- VMs - Live migration w/ pinning, Windows Server Failover Cluster
- Removal of 1-gen Spectre CPUs

**Improvements**
- Scale
  - 384 vCPUs
  - 4TB RAM p/ VM
  - 5000 VMs
  - 500+ hosts
  - 70 storage domains
- IPv6 support
- New metrics deployment
  - OCP 3.11 based
  - Scale OUT
IPv6 in RHV 4.3
WHAT’S NEXT?

- RHEL 8
  - Full hypervisor support
- Network
  - Cluster support for Open vSwitch
- Storage
  - Storage offload and integration via CinderLib
  - Live Storage Migration Progress Indicator
- Backup
  - Changed block tracking for virtual machines
WHAT’S NEXT?

● RHV-M
  ○ HTML5 console (noVNC) and UX improvements for VM portal
  ○ Nested virtualization
  ○ Import Debian and Ubuntu VMs from VMware and Xen
● Red Hat Insights integration!
Managed Block Storage
Partner motivation and interest is being driven by customers moving away from VMware to Red Hat.

**Strategic**

- IBM
- SAP
- Lenovo
- Dell EMC
- NVIDIA

**Storage/DR**

- TRILIO
- VeeAM
- Veritas
- CommVault
- Lenovo
- Rubrik
- Actifio
- Storware
- HP
- Bocula

**Networking**

- Cisco
- VMware
- Juniper Networks
- Nuage Networks

**OEM/HW Certifications**

- Red Hat
- Enterprise Linux

- **RHV + DR solution is #1 competitive gap**
  - RHV 4.4 enables partners with CBT, incremental backup (targeted for RHEL 8.1)
- Partner self-certification is proving successful
- IMS partner requirement enablement is baked into RHV roadmap and release plans

If it runs on RHEL, it runs on RHV.
THE FUTURE OF VIRTUALIZATION
TODAY AND TOMORROW

- **Red Hat Virtualization**
  - Today - enterprise virtualization workloads for traditional applications or any application which needs resiliency from the infrastructure
  - Tomorrow - continued reliability, scalability, and incremental improvements in capabilities to meet the needs of enterprise virtual machines
  - RHV is the mature, trusted platform for tier 1 application virtualization!

- **Container-native Virtualization**
  - Today - Tech preview (based on KubeVirt), cloud native applications which rely on virtualization components and/or which are transitioning from virtual machines to containers where a single platform is desired
  - Tomorrow - Evolution and improvement of features and capabilities to decrease the function gap between traditional and container-native virtualization
  - Tech preview, as a part of OpenShift 3.11, enabling you to test and experiment with container semantics for virtual machines
RHV VS CNV?

- Each targets different use cases
  - RHV = traditional virtualization for “mode 1” applications, providing robust, resilient infrastructure for traditional applications
  - CNV = VMs deployed and managed as containers, simplifying the transition of existing applications from conventional virtualization to containers
- Different maturity stages
- Different availability timelines
- It’s all KVM!
- Both share the same vision

RHV and CNV don’t compete, they complement each other!
## OPENSHIFT 4 PROVIDER ROADMAP

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<th>Installer Provisioned Infrastructure (IPI)</th>
<th>User Provisioned Infrastructure (UPI)</th>
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| **OPENSHIFT** by Red Hat 4.3 (tentative) | ![Alibaba Cloud](https://via.placeholder.com/150) ![IBM Cloud](https://via.placeholder.com/150) ![Red Hat Virtualization](https://via.placeholder.com/150) | ![Microsoft Azure](https://via.placeholder.com/150) ![Google Cloud Platform](https://via.placeholder.com/150) ![Red Hat OpenStack Platform](https://via.placeholder.com/150) |** On qualified hardware stack

**RHHI**: On qualified hardware stack
QUESTIONS?
THANK YOU

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