Red Hat Virtualization
THE NEXT GENERATION OF IT OPTIMIZATION
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### BALANCING INNOVATION, IT OPTIMIZATION

Most customers need virtualization and cloud.

<table>
<thead>
<tr>
<th>VIRTUALIZATION</th>
<th>CLOUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big stateful VM</td>
<td>Small stateless instance</td>
</tr>
<tr>
<td>1 Application -&gt; 1-3 VMs</td>
<td>1 Application -&gt; many instances</td>
</tr>
<tr>
<td>VM lifecycle in years</td>
<td>Instance lifecycle in hours to months</td>
</tr>
<tr>
<td>Increased demand -&gt; Scale up</td>
<td>Increased demand -&gt; Scale out</td>
</tr>
<tr>
<td>High availability (HA) at the infrastructure layer</td>
<td>High availability (HA) at the application layer</td>
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</table>

Modern application portfolios span virtual and cloud deployments.
RED HAT VIRTUALIZATION OVERVIEW

RED HAT VIRTUALIZATION

Centralized management for the KVM hypervisor, as well as compute, network, and storage resources

Enterprise features to support business-critical applications

Cross-portfolio integration, APIs, and software development kits (SDKs) to enable automation

Red Hat Virtualization is built on Red Hat Enterprise Linux + KVM

RED HAT ENTERPRISE LINUX + KVM

Basic virtualization

No enterprise virtualization management features or APIs

Limited number of VMs allowed
OPEN SOURCE PROJECT TO SUPPORTABLE PRODUCT
MAJOR THEMES

- Ease of use
- Ease of automation
- Tighter integration with Red Hat Portfolio
RED HAT VIRTUALIZATION MATURITY

- **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
  - V-2-V 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
  - Updated UI
  - Cisco ACI

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BY THE NUMBERS

Hundreds of new features across Red Hat Enterprise Linux, KVM, oVIRT.

Bug Fixes and Feature Requests since 4.1.0:

- 1,850 BZs closed
- 350 features (RFEs) delivered
MANAGEMENT INTERFACES

RED HAT VIRTUALIZATION MANAGER

- Designed for large scale (500+ hosts and 5,000+ VMs)
- REST API to integrate with Red Hat portfolio, third-party applications, backup and recovery software
- Can be integrated with existing infrastructure—active directory, Red Hat CloudForms®, OpenStack, etc.

COCKPIT

- Included as part of Red Hat Virtualization Host image
- Used to configure networking, storage, tuning, subscriptions, and other aspects of the virtualization host
- Can be used to deploy Red Hat Virtualization in high availability
NEW USER INTERFACE

Get to important information faster, learn fewer tools, streamline operations

- Same PatternFly library as Red Hat portfolio
- At-a-glance, drill downs of the entire environment
- Easy, intuitive navigation
- Reduces learning curve
- Faster

WHICH USE CASES?

- PERFORMANCE SENSITIVE
- DEV AND TEST ENVIRONMENTS
- HYBRID AND MULTIHYPERVISOR
- TECH WORKSTATIONS
- SERVER CONSOLIDATION

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NEW USER INTERFACE
Save your location as bookmark

Hyperlinks everywhere
IMPROVED EASE OF USE

Spend less time on tasks and more time for initiatives

Self-hosted engine
- Simplified installation wizard

WHICH USE CASES?

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NATIVE DISASTER RECOVERY

Business continuity without vendor lock-in

• Active/active cluster allows virtual machines to migrate to secondary site if primary site is unavailable.
• Integration with a specific storage vendor is not required.
• Failover and failback is automated with Red Hat Ansible Automation.
• Supports Block and file based storage
NATIVE SOFTWARE DEFINED NETWORK (SDN)

PROVIDES NATIVE, ISOLATED NETWORKING FOR VIRTUALIZED WORKLOADS

- Neutron compatible API for OVN
- Mix and match host networking connectivity and isolated networks
- Full control of network, subnets, ports and routing
- Integrated with CloudForms, Cloud network management and OpenStack

WHICH USE CASES?

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CISCO ACI INTEGRATION

Integrated and automated SDN and distributed security policies

WHICH USE CASES?

PERFORMANCE SENSITIVE

HYBRID AND MULTIHYPERVISOR

SERVER CONSOLIDATION

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- Scalable network virtualization
- Distributed security policies
- Micro-segmentation
- Ability to automate Cisco ACI with Red Hat Virtualization using Red Hat Ansible Automation

Hear more about it @ “Running RHV Integrated w/ Cisco ACI SDN” - Room 2020 on Thursday 5/10, 2:00 - 2:20 PM
METRICS AND LOGGING

Real-time reporting and visualization for improved business efficiency

INTEGRATION W/OPENSIFHT METRICS STORE

- **Elasticsearch** — a search and analytics engine with a REST/http interface
- **Fluentd** — Data collector and shipper that unifies the metrics and logs data
- **Kibana** — Visualize trends in real time, slice and dice the data from Elasticsearch dynamically
- **Collectd** — Simple and powerful daemon that gathers metrics from various sources

WHICH USE CASES?

- PERFORMANCE SENSITIVE
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- SERVER CONSOLIDATION
HIGH-PERFORMANCE VM TYPE

Streamline consistent tuning process for virtualization administrators

- Enable passthrough of host CPU to the VM
- Enable input/output (I/O) threads, num of I/O threads = 1
- Set the I/O and emulator threads pinning topology
- Disable non-critical devices (sounds, USB, balloon)
- Define as headless (no graphics device)

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DISK AND VM UPLOAD/DOWNLOAD IMPROVEMENTS

Storage deployment flexibility for virtualization architects

- Download snapshots, not just disks
- Faster uploads via direct uploads to hosts
- Efficient upload with sparse support
- VM import and export as Open Virtualization Appliance (OVA) files
- Upload ISO disk images to data domain - no need for a dedicated, NFS-based, ISO domain anymore!
➢ Upload ISO images from the Admin portal UI
➢ To any storage domain type, file or block!
➢ See progress report

Choose File: `rheil-server-7.5-x86_64-boot.iso`
SUPPORT FOR CEPH STORAGE via iSCSI

Storage deployment flexibility for virtualization architects

- Red Hat Ceph® Storage iSCSI target tested and certified
- Use as a storage domain for virtual machines
- Enables consistent hybrid cloud deployments on RHV and Red Hat OpenStack Platform
RHEL 7.5 SUPPORT

Support the latest RHEL release and its features, inc.:

- Latest CPUs and machine-type support.
- VDO for dedup and compression (integrated in RHII)
- Kernel address space layout randomization (KASLR)

Hear more about RHII and VDO @
“Red Hat Hyperconverged Infrastructure: Your open hyperconverged solution”
- Room 2003 on Tuesday 5/8 from 4:30 PM
VM PORTAL

Self-service access for users and power users, reducing load on administrators

- Replaces previous user portal
- Users and power users can view, create, and manage VMs
- Role must provide permission to edit a VM

WHICH USE CASES?

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VIRTUAL GRAPHICS PROCESSING UNIT

vGPU powered technical workstation support for AI, big data, rich graphics

- NVIDIA (GRID and Quadro vDWS)—maintainer of mediated device framework (mdev)
- Intel (GVT-G)—driver development and reviewer for mdev
- Support for Linux and Windows

Target markets:
- Oil and gas
- Energy
- Sciences and education
- Manufacturing and engineering
- Animation
- Gaming

WHICH USE CASES?
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For all available objects in RHV exists a Ansible Module.
name: Create a template from qcow
hosts: localhost

vars:
  engine_url: https://rhvm-engine.example.com/ovirt-engine/api
  engine_user: admin@internal
  engine_password: 123456
  engine_cafile: /etc/pki/ovirt-engine/ca.pem
  qcow_url: https://images-repo.example.com/images/myvm.qcow2
  template_cluster: production
  template_name: rhel7_template
  template_memory: 4GiB
  template_cpu: 2
  template_disk_size: 10GiB
  template_disk_storage: mydata

roles:
  - oVirt.image-template
2 HTTPd + ANTI-AFFINITY + HA DATABASE

- name: WebApp VMs
  hosts: localhost
  ...
  vars:
  ...

httpd_vm:
  cluster: webapp
domain: example.com
template: rhel7_template
memory: 2GiB
state: running

database_vm:
  cluster: webapp
domain: example.com
template: rhel7_template
memory: 4GiB
high_availability: true
state: running

affinity_groups:
  - name: httpd_affinity_group
cluster: webapp
  vm_enforcing: true
  vm_rule: negative
  vms:
    - name: apache-vm-1
tag: httpd
      profile: "{{ httpd_vm }}"
    - name: apache-vm-2
tag: httpd
      profile: "{{ httpd_vm }}"
    - name: postgresql-vm
tag: db
      profile: "{{ database_vm }}"

roles:
  - oVirt.vm-infra
‘UpShift’ - platform for hosting containerized workloads.

Using **RHV** as IAAS, hosting both **RHOSP Undercloud** and **OpenShift** masters on VMs.
HIGHLIGHTS BEYOND RHV 4.2

- Storage and DR
  - Cinder Integration
  - Incremental Backup
- Multi-Arch Support
  - Power 9, z Systems (TBD), ARM
- Infrastructure Migration Support
  - CloudForms / IMS
- Portfolio Enablement
  - OpenStack Control Plane on RHV
- Support for hybrid, cloud-native application deployments and workloads
  - Service-based shared components (networking, storage, Glance...)
  - Kubevirt as part of OpenShift/CNV/RHV.Next
GRAZIE PER L’ATTENZIONE

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INFRASTRUCTURE MIGRATION SOLUTION
DISCOVERY AND ASSESSMENT OF YOUR MIGRATION

vSphere
INFRASTRUCTURE MIGRATION SOLUTION
SETTING UP A RHV ENVIRONMENT Sized FOR YOUR MIGRATION
INFRASTRUCTURE MIGRATION SOLUTION

INSTALL CLOUDFORMS AND CONFIGURE BOTH PROVIDERS

vSphere  

CloudForms  

RHV

network 100

network 200

network 300
INFRASTRUCTURE MIGRATION SOLUTION

SETUP MULTIPLE CONVERSION HOSTS
INFRASTRUCTURE MIGRATION SOLUTION

USE THE INFRASTRUCTURE MAPPING WIZARD TO MAP BOTH SOLUTIONS
INFRASTRUCTURE MIGRATION SOLUTION
CREATE YOUR MIGRATION PLAN ATTACHED TO AN INFRASTRUCTURE MAPPING

CloudForms

vSphere

RHV

Migration plan

DB  App0  App1

INFRASTRUCTURE MAPPING #1
INFRASTRUCTURE MIGRATION SOLUTION

LAUNCH YOUR MIGRATION
PRESENT STATE

- Traditional Applications
- vRealize
- vSphere

FUTURE OF VIRTUALIZATION

- Cloud-native applications
  - Red Hat OpenShift
  - Red Hat Virtualization, Red Hat OpenStack Platform, vSphere
  - AWS, Azure, GCP

Savings invested to develop cloud-native applications running on any footprint

- Traditional Applications
  - Red Hat Virtualization
  - Red Hat CloudForms + Red Hat Ansible Automation
  - vSphere

Reduce costs by 40-50% in infrastructure by dependence on VMware

- Traditional Applications
  - vRealize
  - vSphere
  - AWS

Increase investment in VMware, stay with traditional apps
GRAZIE PER L’ATTENZIONE

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