Red Hat Virtualization

THE NEXT GENERATION OF IT OPTIMIZATION

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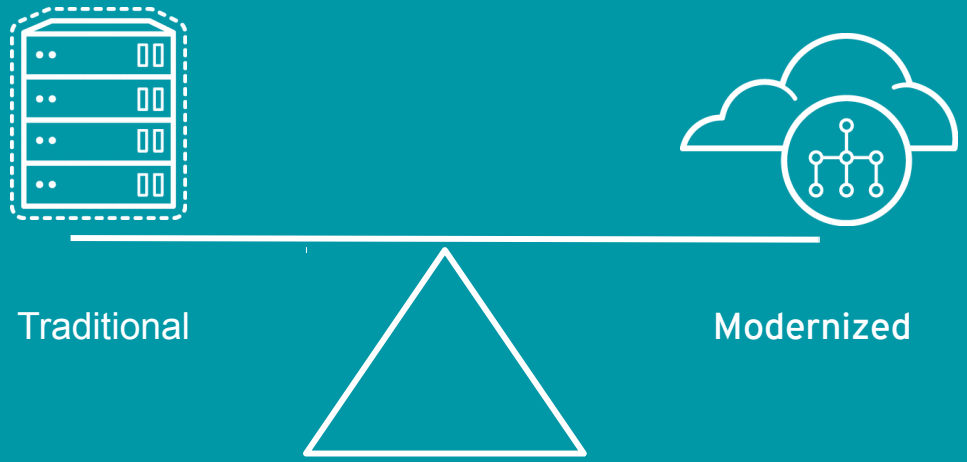
#RedHatOSD

BALANCING INNOVATION, IT OPTIMIZATION

MOST CUSTOMERS NEED VIRTUALIZATION AND CLOUD

VIRTUALIZATION
Big stateful VM
1 Application -> 1-3 VMs
VM lifecycle in years
Increased demand -> Scale up
High availability (HA) at the infrastructure layer

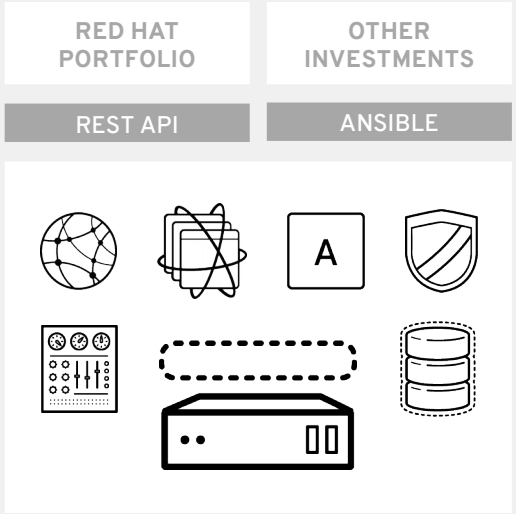


Modern application portfolios span virtual and cloud deployments.

CLOUD
Small stateless instance
1 Application -> many instances
Instance lifecycle in hours to months
Increased demand -> Scale out
High availability (HA) at the application layer

redhat.

RED HAT VIRTUALIZATION OVERVIEW



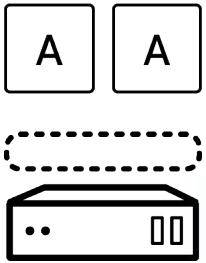
RED HAT VIRTUALIZATION

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



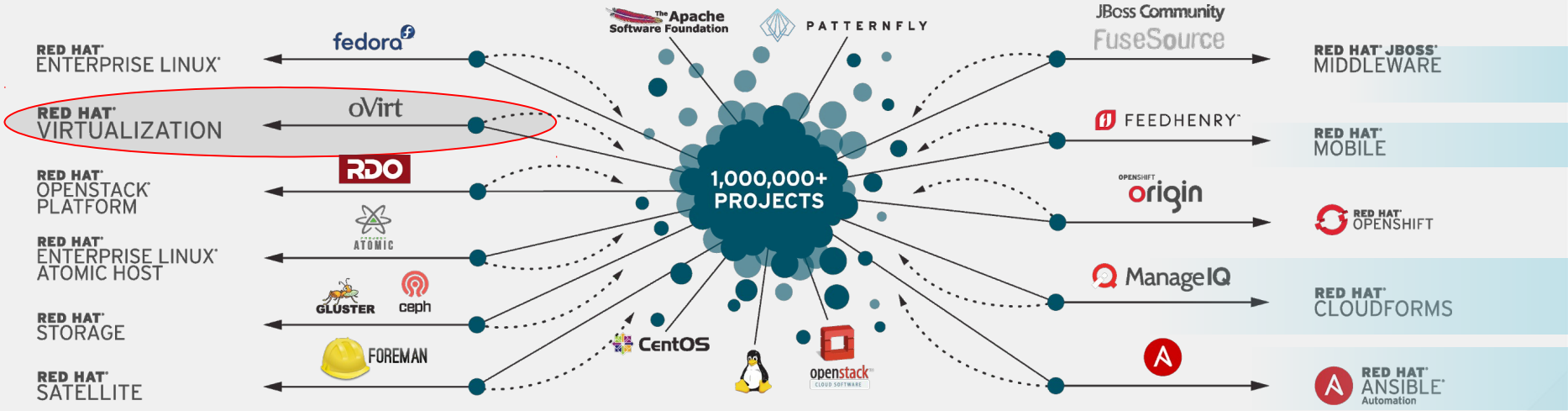
RED HAT ENTERPRISE LINUX + KVM

Basic virtualization

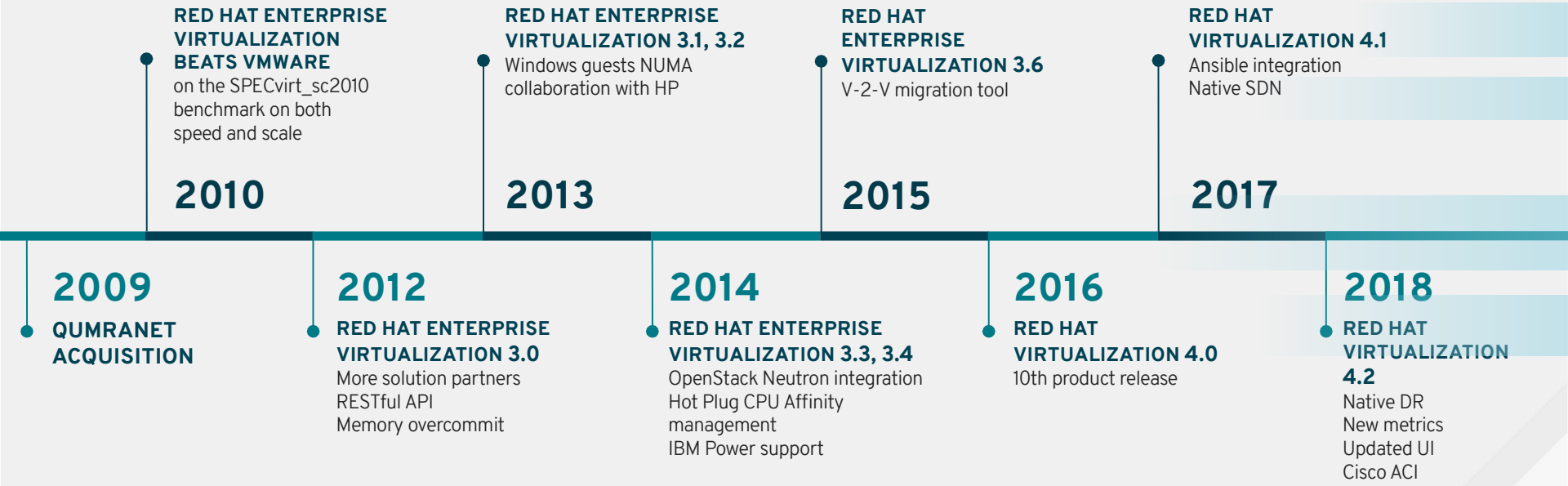
No enterprise virtualization management features or APIs

Limited number of VMs allowed

OPEN SOURCE PROJECT TO SUPPORTABLE PRODUCT



RED HAT VIRTUALIZATION MATURITY



BY THE NUMBERS

Hundreds of new features across

Red Hat Enterprise Linux, KVM, oVIRT.

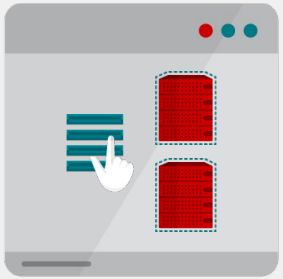
Bug Fixes and Feature Requests since 4.1.0:

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

MAJOR THEMES

- Ease of use
- Ease of automation
- Tighter integration with Red Hat Portfolio

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

PATTERNFLY

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?

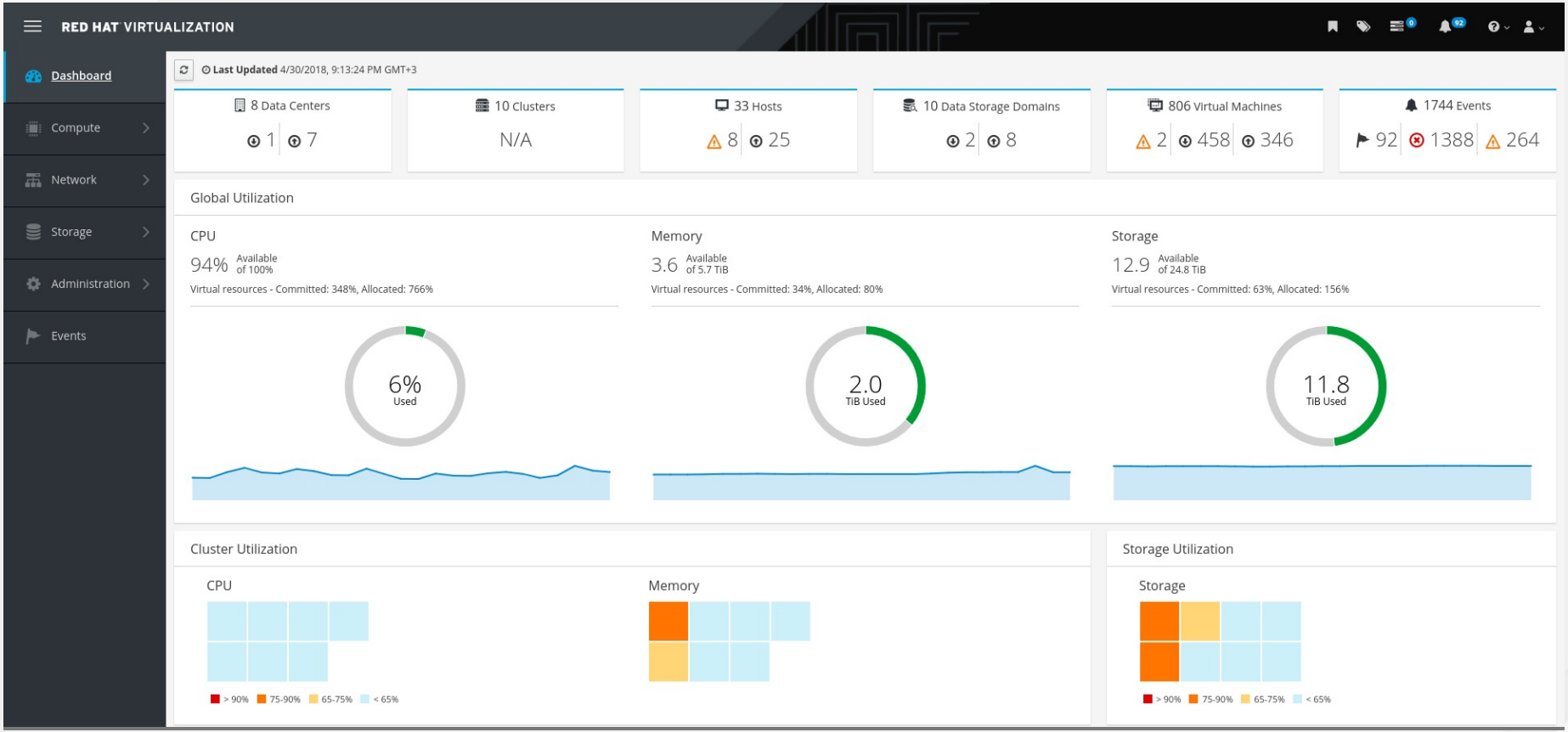
PERFORMANCE SENSITIVE

DEV AND TEST ENVIRONMENTS

HYBRID AND MULTIHYPERVISOR

TECH WORKSTATIONS

SERVER CONSOLIDATION



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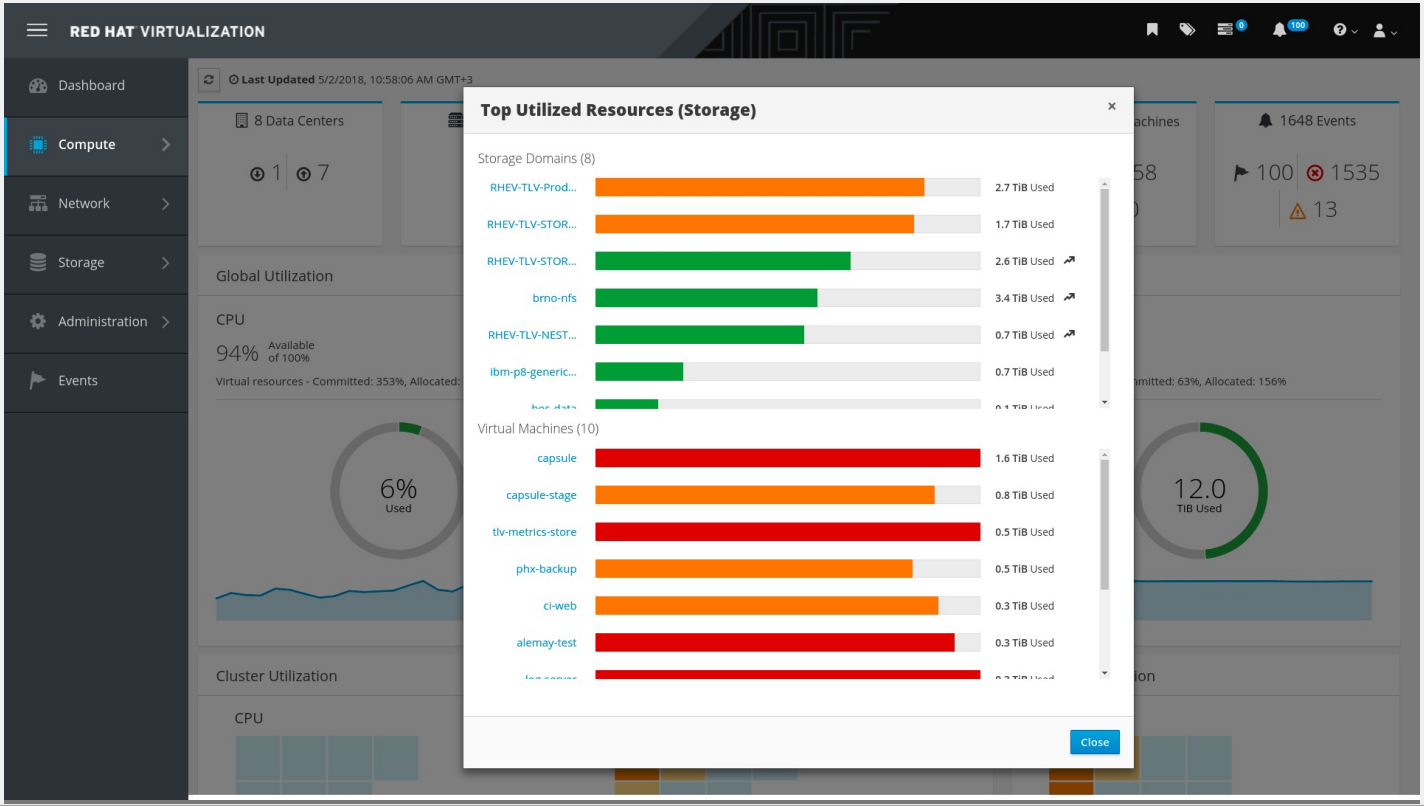
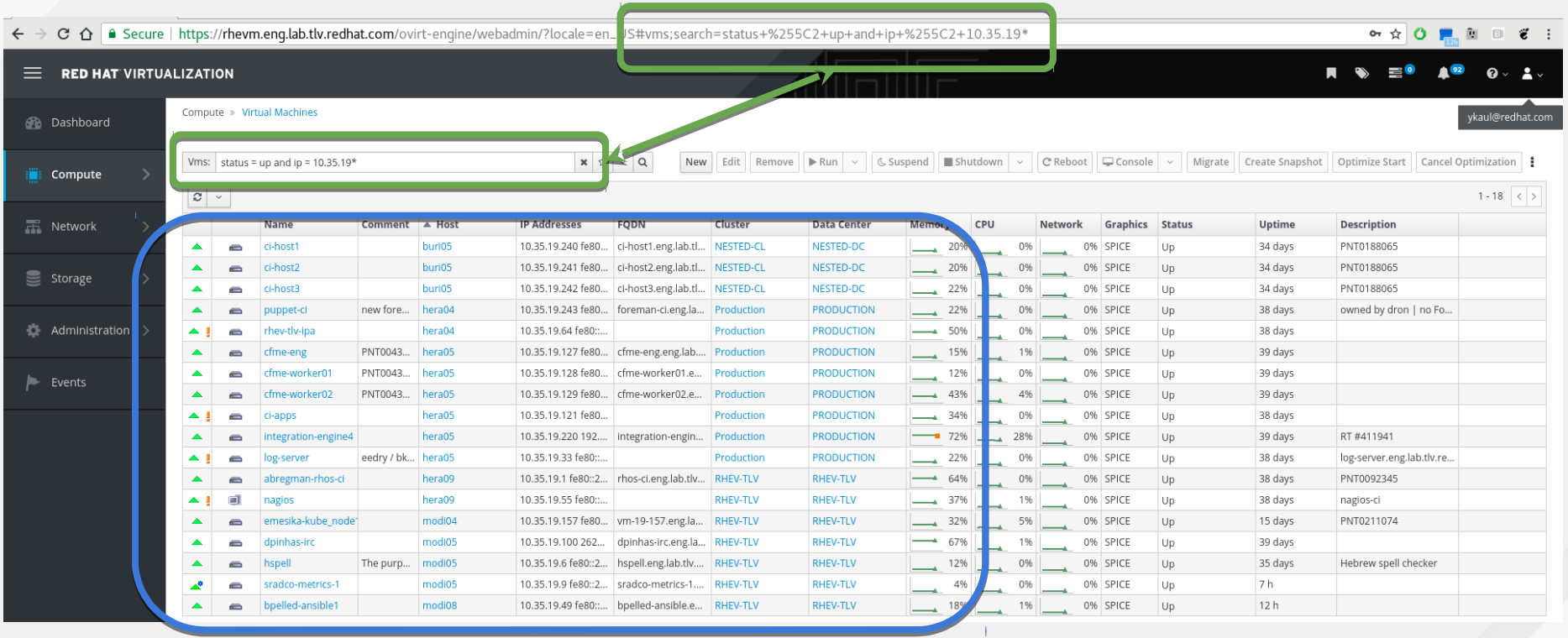
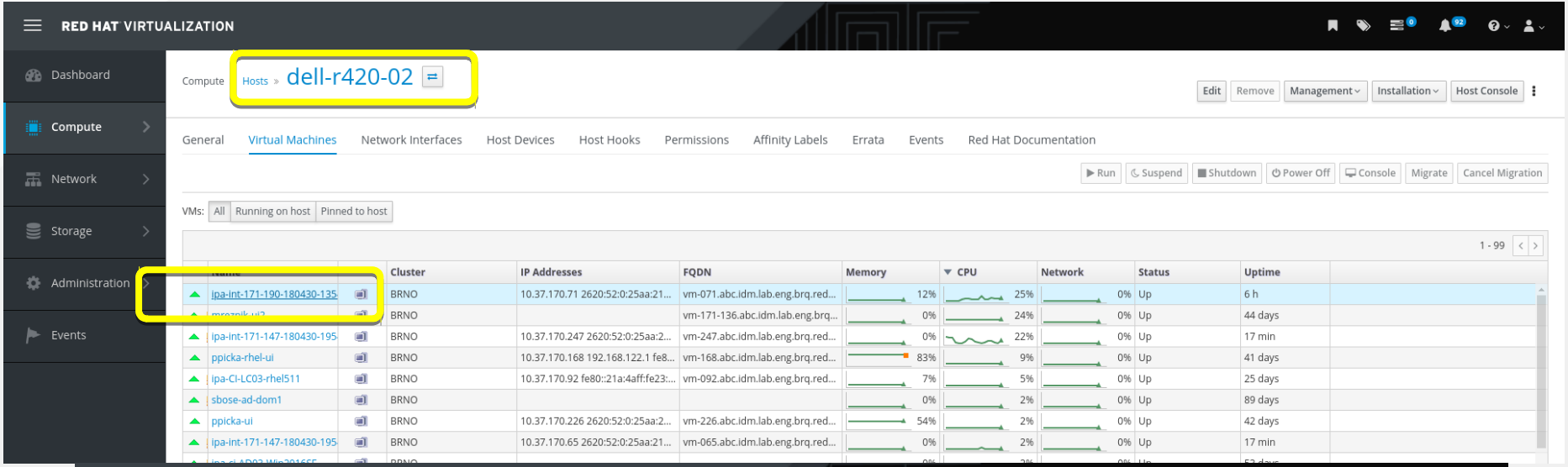
NEW USER INTERFACE

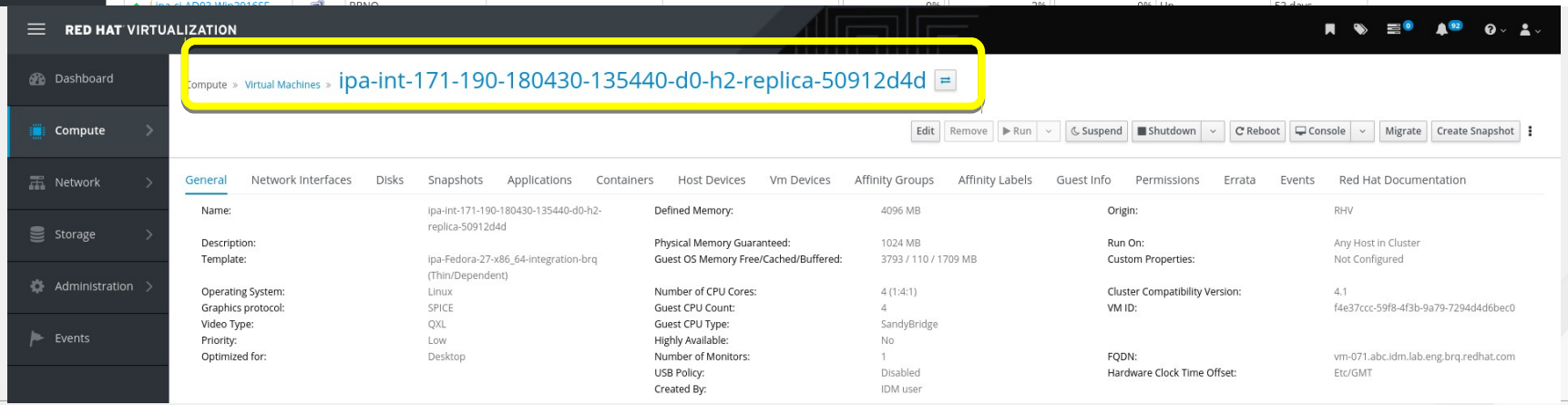


Save your location as bookmark



Hyperlinks everywhere


RED HAT VIRTUALIZATION
Dashboard
Compute
Network
Storage
Administration
Events
Compute
Hosts » dell-r420-02
Edit
Remove
Management
Installation
Host Console
General
Virtual Machines
Network Interfaces
Host Devices
Host Hooks
Permissions
Affinity Labels
Errata
Events
Red Hat Documentation
Run
Suspend
Shutdown
Power Off
Console
Migrate
Cancel Migration
VMs: All Running on host Pinned to host
1 - 99
Cluster
IP Addresses
FQDN
Memory
CPU
Network
Status
Uptime
ipa-int-171-190-180430-135
BRNO
10.37.170.71 2620:52:0:25aa:21...
vm-071.abc.idm.lab.eng.brq.red...
12%
25%
0%
Up
6 h
BRNO
vm-171-136.abc.idm.lab.eng.brq...
0%
24%
0%
Up
44 days
ipa-int-171-147-180430-195
BRNO
10.37.170.247 2620:52:0:25aa:2...
vm-247.abc.idm.lab.eng.brq.red...
0%
22%
0%
Up
17 min
ppicka-rhel-ui
BRNO
10.37.170.168 192.168.122.1 fe8...
vm-168.abc.idm.lab.eng.brq.red...
83%
9%
0%
Up
41 days
ipa-CI-LC03-rhel511
BRNO
10.37.170.92 fe80::21a:4aff:fe23:...
vm-092.abc.idm.lab.eng.brq.red...
7%
5%
0%
Up
25 days
sbose-ad-dom1
BRNO
0%
2%
0%
Up
89 days
ppicka-ui
BRNO
10.37.170.226 2620:52:0:25aa:2...
vm-226.abc.idm.lab.eng.brq.red...
54%
2%
0%
Up
42 days
ipa-int-171-147-180430-195
BRNO
10.37.170.65 2620:52:0:25aa:21...
vm-065.abc.idm.lab.eng.brq.red...
0%
2%
0%
Up
17 min


RED HAT VIRTUALIZATION
Dashboard
Compute
Network
Storage
Administration
Events
Compute » Virtual Machines » ipa-int-171-190-180430-135440-d0-h2-replica-50912d4d
Edit
Remove
Run
Suspend
Shutdown
Reboot
Console
Migrate
Create Snapshot
General
Network Interfaces
Disks
Snapshots
Applications
Containers
Host Devices
Vm Devices
Affinity Groups
Affinity Labels
Guest Info
Permissions
Errata
Events
Red Hat Documentation
Name: ipa-int-171-190-180430-135440-d0-h2-replica-50912d4d
Description:
Template: ipa-Fedora-27-x86_64-integration-brq (Thin/Dependent)
Operating System: Linux
Graphics protocol: SPICE
Video Type: QXL
Priority: Low
Optimized for: Desktop
Defined Memory: 4096 MB
Physical Memory Guaranteed: 1024 MB
Guest OS Memory Free/Cached/Buffered: 3793 / 110 / 1709 MB
Number of CPU Cores: 4 (1:4:1)
Guest CPU Count: 4
Guest CPU Type: SandyBridge
Highly Available: No
Number of Monitors: 1
USB Policy: Disabled
Created By: IDM user
Origin: RHV
Run On: Any Host in Cluster
Custom Properties: Not Configured
Cluster Compatibility Version: 4.1
VM ID: f4e37ccc-59f8-4f3b-9a79-7294d4d6bec0
FQDN: vm-071.abc.idm.lab.eng.brq.redhat.com
Hardware Clock Time Offset: Etc/GMT

IMPROVED EASE OF USE

Spend less time on tasks and more time for initiatives

Self-hosted engine

- Simplified installation wizard

WHICH USE CASES?

PERFORMANCE SENSITIVE

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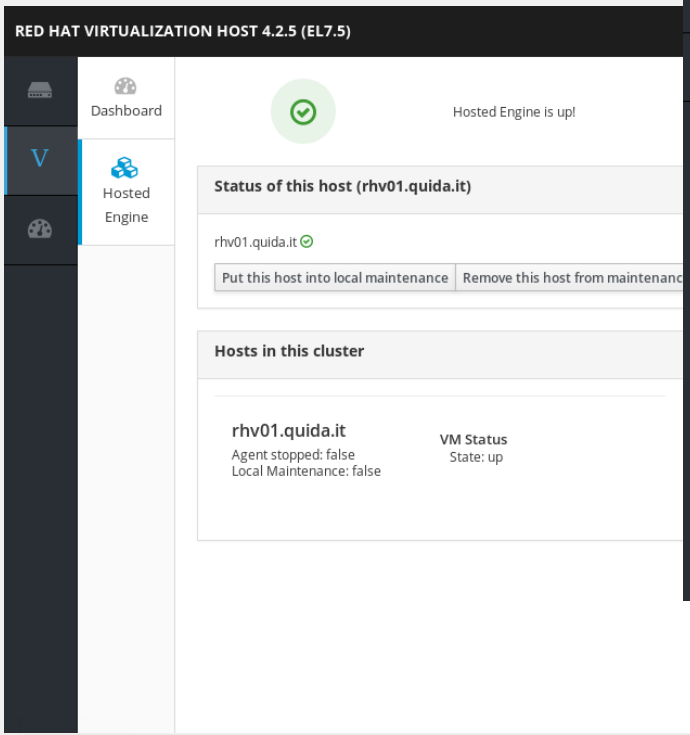
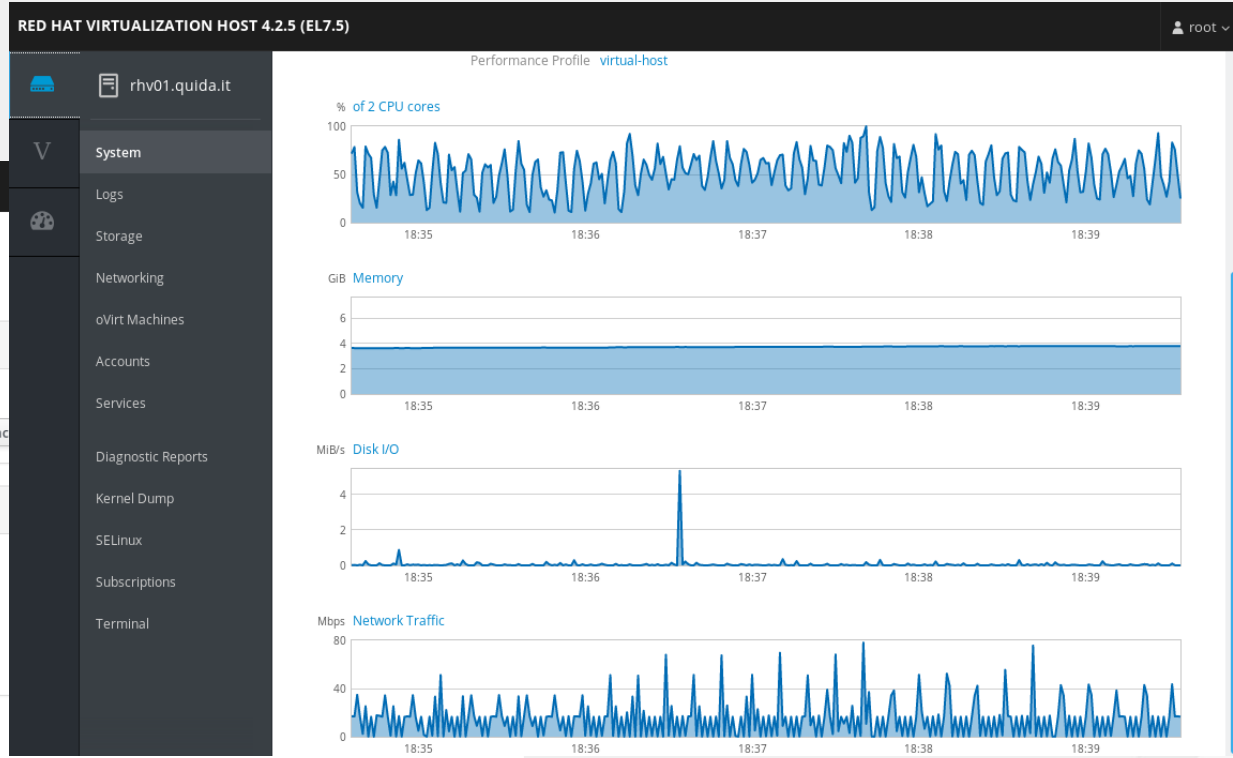
HYBRID AND MULTIHYPERVISOR

TECH WORKSTATIONS

SERVER CONSOLIDATION

COCKPIT





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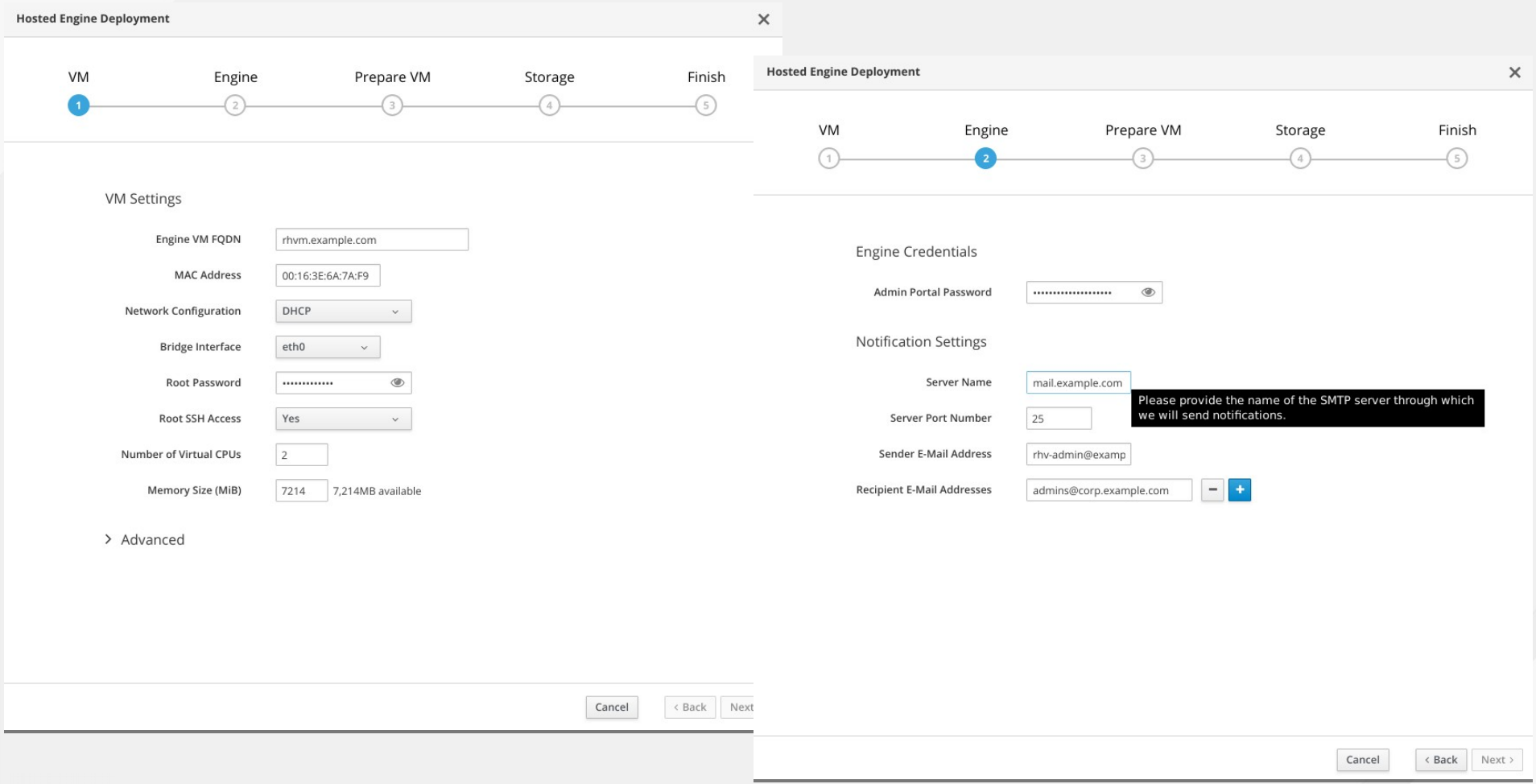

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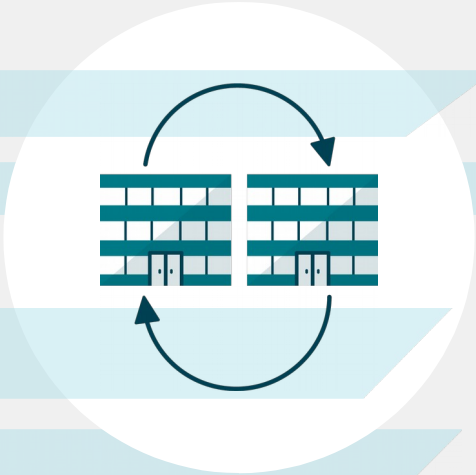
RED HAT® ANSIBLE® Engine

NATIVE DISASTER RECOVERY

Business continuity without vendor lock-in



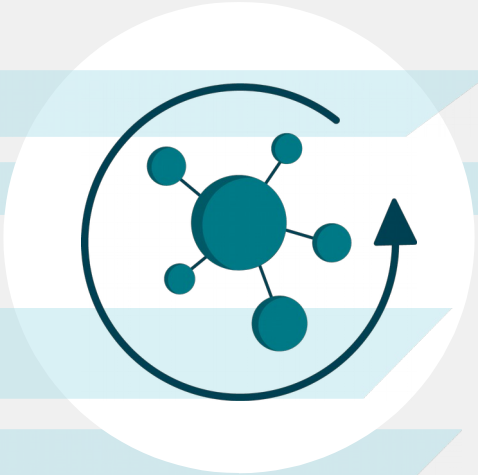
- Active/active cluster allows virtual machines to migrate to secondary site if primary site is unavailable.
- Integration with a specific storage vendor is not required.
- Failover and failback is automated with **Red Hat Ansible Automation.**
- Supports Block and file based storage

WHICH USE CASES?

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

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?

PERFORMANCE SENSITIVE

DEV AND TEST ENVIRONMENTS

HYBRID AND MULTIHYPERVISOR

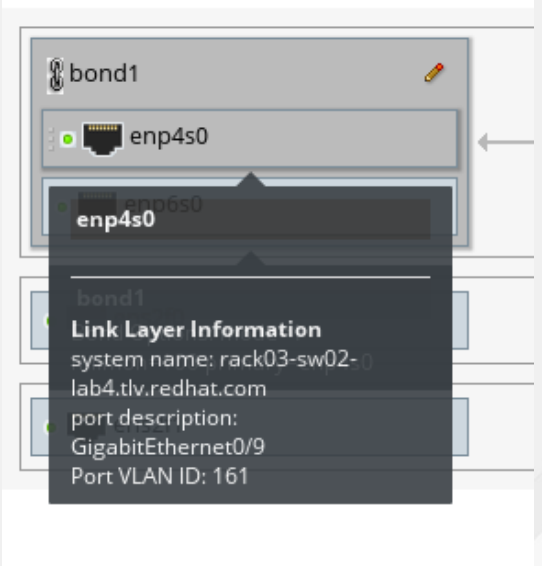
TECH WORKSTATIONS

SERVER CONSOLIDATION

CISCO ACI INTEGRATION

Integrated and automated SDN and distributed security policies

- 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

WHICH USE CASES?

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

METRICS AND LOGGING

RED HAT® OPENSHIFT

Real-time reporting and visualization for improved business efficiency

INTEGRATION W/OPENSHIFT 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 | DEV AND TEST ENVIRONMENTS | HYBRID AND MULTIHYPERVISOR | TECH WORKSTATIONS | SERVER CONSOLIDATION

System Dashboard *

Engine and Clusters

Engine Name	Cluster Name	Count
rhevm.eng.lab.tlv.redhat.com	NESTED-CL	538
rhevm.eng.lab.tlv.redhat.com	RHEV-TLV	537
rhevm.eng.lab.tlv.redhat.com	RDU-CLUSTER	429
rhevm.eng.lab.tlv.redhat.com	Production	90

Running Hosts

18

Running VMs

130

Logins To Admin Portal

4

Top 5 busiest hosts - Memory

Host Name	Avg. Mem. Usage %
vulcan03.eng.lab.tlv.redhat.com	84.073
vulcan02.eng.lab.tlv.redhat.com	59.531
hera04.eng.lab.tlv.redhat.com	58.378
modi05.eng.lab.tlv.redhat.com	57.877
modi04.eng.lab.tlv.redhat.com	48.207

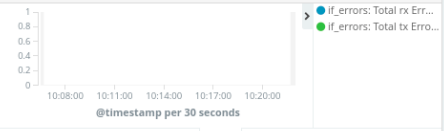
Top 5 busiest hosts - CPU

Host Name	User / System CPU	Avg. CPU Usage %
buri05.eng.lab.tlv.redhat.com	system	24.908
buri05.eng.lab.tlv.redhat.com	user	16.818
hera09.eng.lab.tlv.redhat.com	user	11.319
hera09.eng.lab.tlv.redhat.com	system	5.006
vulcan04.eng.lab.tlv.redhat.com	user	8.351
vulcan04.eng.lab.tlv.redhat.com	system	4.89
vulcan03.eng.lab.tlv.redhat.com	system	4.565
vulcan03.eng.lab.tlv.redhat.com	user	0.691
modi04.eng.lab.tlv.redhat.com	user	3.497

Top 5 busiest hosts - Volumes

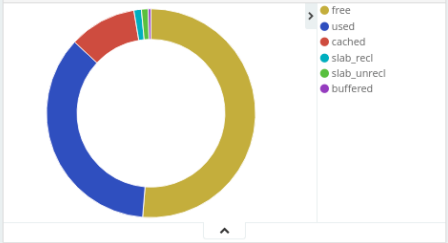
Volume Name	Avg. Usage %
rhev-data-center-mnt-spider.eng.lab.tlv.redhat.com:_vol_rhev__production	85.377
rhev-data-center-mnt-vserver-spider.eng.lab.tlv.redhat.com:_vol_rhev__tlv__dc	66.078
rhev-data-center-mnt-vserver-spider.eng.lab.tlv.redhat.com:_vol_rhev__tlv__nested__dc	54.023
rhev-data-center-mnt-vserver-spider.eng.lab.tlv.redhat.com:_vol_rhev__export	53.495
root	47.295

Network Interface Error/Sec

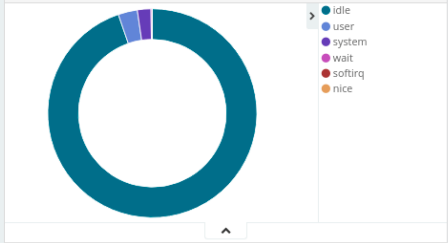


Network Interface Packets/Sec

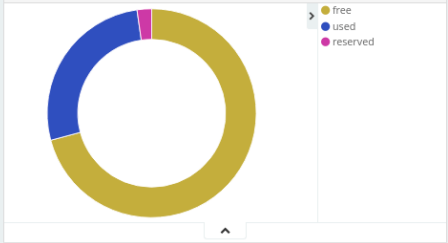
System Memory Usage



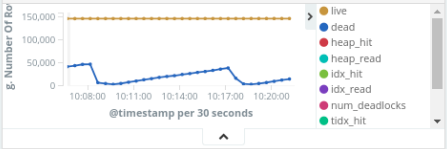
System CPU Usage



System File System Usage

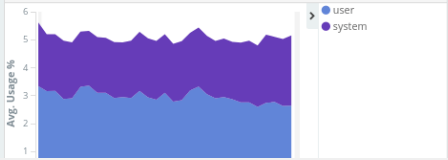


Postgresql - Number of rows in the database per state



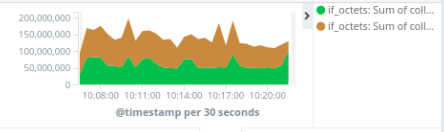
System Memory Usage over time

System CPU Usage over time



System File System Usage over time

Network Interface Bits/Sec



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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)

WHICH USE CASES?

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

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!

WHICH USE CASES?

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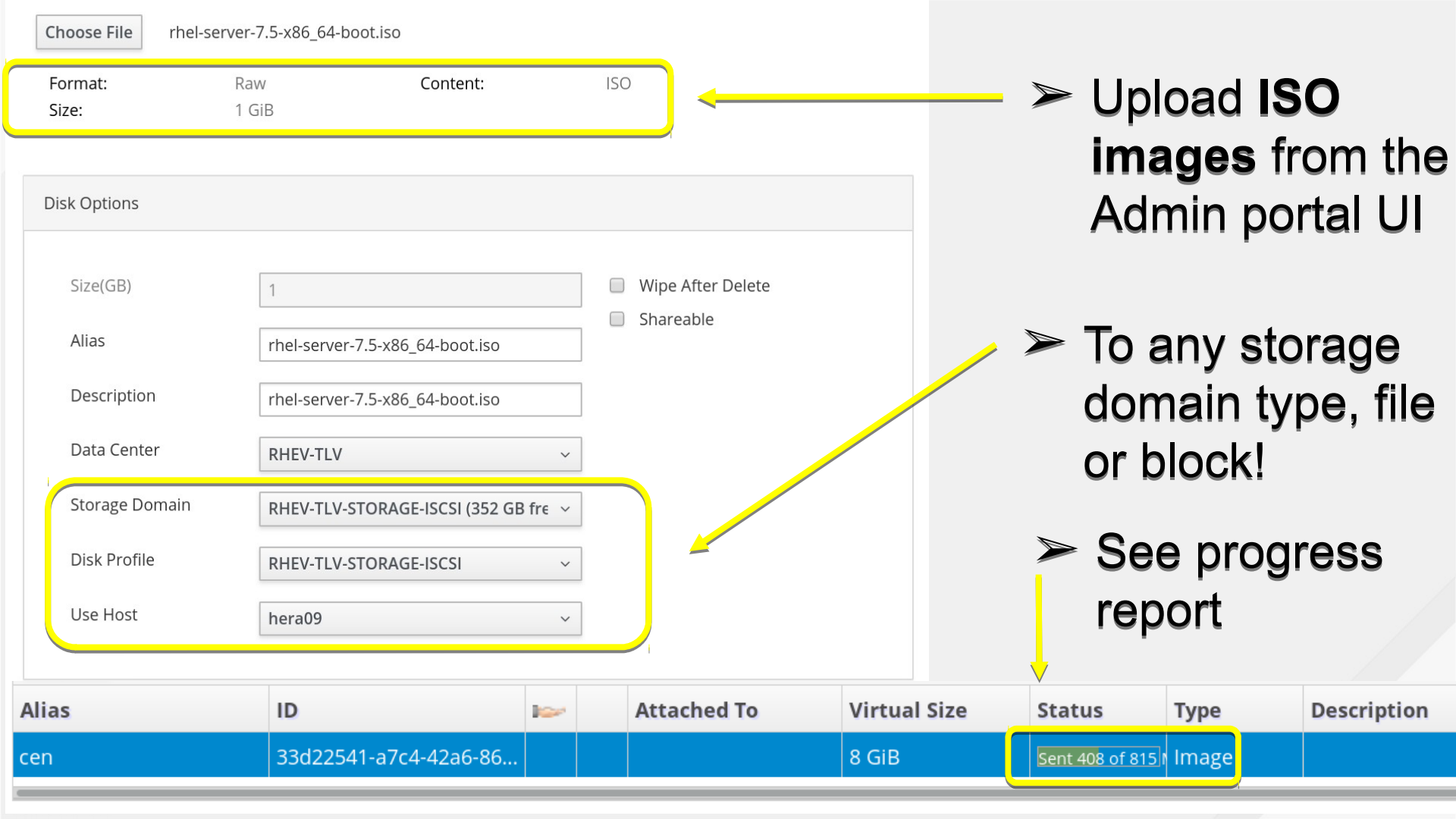
Choose File
rhel-server-7.5-x86_64-boot.iso
Format: Raw
Content: ISO
Size: 1 GiB
Upload ISO images from the Admin portal UI
Disk Options
Size(GB) 1
Wipe After Delete
Shareable
Alias rhel-server-7.5-x86_64-boot.iso
Description rhel-server-7.5-x86_64-boot.iso
Data Center RHEV-TLV
Storage Domain RHEV-TLV-STORAGE-ISCSI (352 GB fre
Disk Profile RHEV-TLV-STORAGE-ISCSI
Use Host hera09
To any storage domain type, file or block!
See progress report
Alias ID Attached To Virtual Size Status Type Description
cen 33d22541-a7c4-42a6-86... 8 GiB Sent 408 of 815 Image

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

WHICH USE CASES?

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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 RHHI)
- Kernel address space layout randomization (KASLR)

Hear more about RHHI and VDO @
"Red Hat Hyperconverged Infrastructure: Your open hyperconverged solution"
- *Room 2003 on Tuesday 5/8 from 4:30 PM*

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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RED HAT ANSIBLE AUTOMATION

For all available objects in RHV exists a Ansible Module.

- Affinity groups
- labels
- clusters
- data centers
- disks
- external providers
- groups
- host networks
- host power mgmt
- host storage
- hosts
- MAC pools
- networks
- NICs
- permissions
- quotas
- tags
- users
- scheduling policies
- snapshots
- storage connections
- storage domains
- templates
- VM pools
- VMs…

```
---
- 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
```

1. Credentials (or store in Ansible Vault)
2. Template definition (and URL to download from)

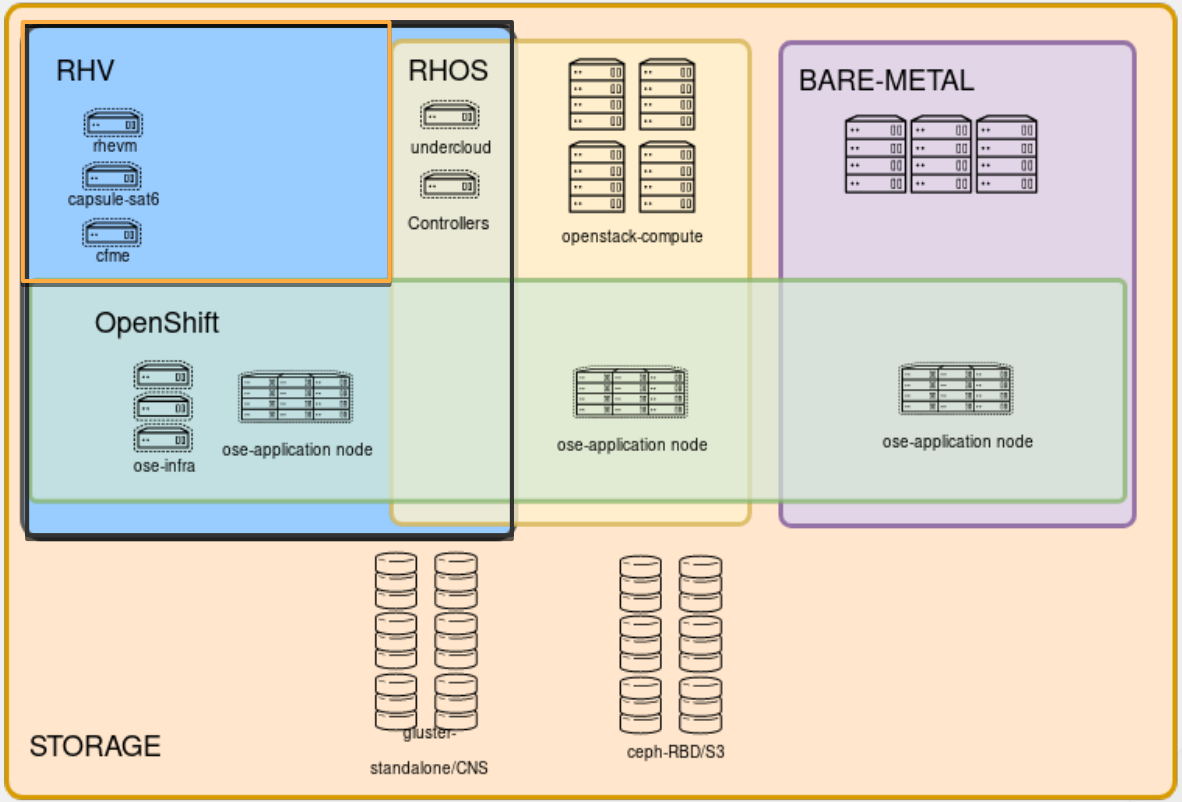
RHOSP UNDERCLOUD & OPENSHIFT ON RHV

redhat.

PNT DEVOPS TEAM

‘UpShift’ - platform for hosting containerized workloads.

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



RHHI-1.5

- Deduplication and compression support with VDO
- Cockpit
  - **Scale using the user interface**
  - **Manage your storage and virtual machines**
- Admin portal
  - **Convert virtualization hosts**
  - Configure disaster recovery with failover and failback
  - Upgrade using the user interface
- **Deploy on a single node**

RHV-4.2.7

- **Support of private VLAN by mean of filter for VNIC profiles (NWFILTER), `clean-traffic- gateway`**
- Guest Time Synchronization.
- qemu-img out of order writing. Importing, moving or copying large disks to preallocated storage, can be up to 6 times faster.
- KVM Sparseness is now supported to preserve origianal VM image size during import (thin provisioning).

WHICH USE CASES?

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**

WHICH USE CASES?

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

GRAZIE PER L'ATTENZIONE

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#RedHatOSD

IMS

Infrastructure Migration Solution

Federico Simoncelli
CNV Engineering Manager
fsimonce@redhat.com

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INFRASTRUCTURE MIGRATION SOLUTION

DISCOVERY AND ASSESSMENT OF YOUR MIGRATION

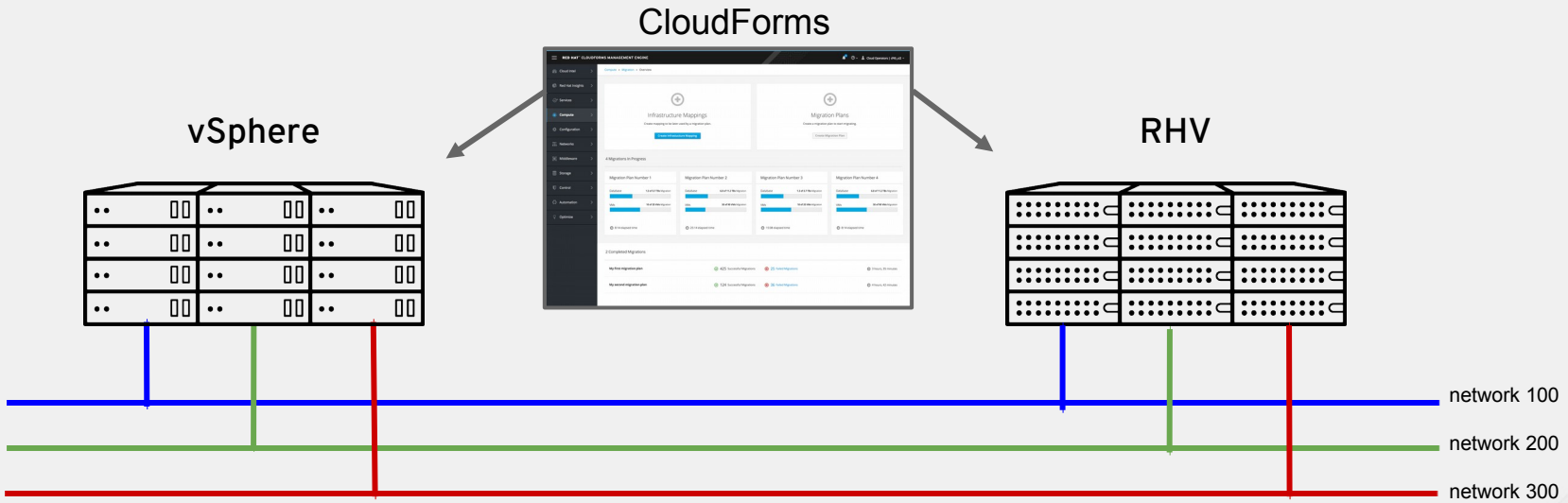
vSphere

INFRASTRUCTURE MIGRATION SOLUTION

SETTING UP A RHV ENVIRONMENT SIZED FOR YOUR MIGRATION

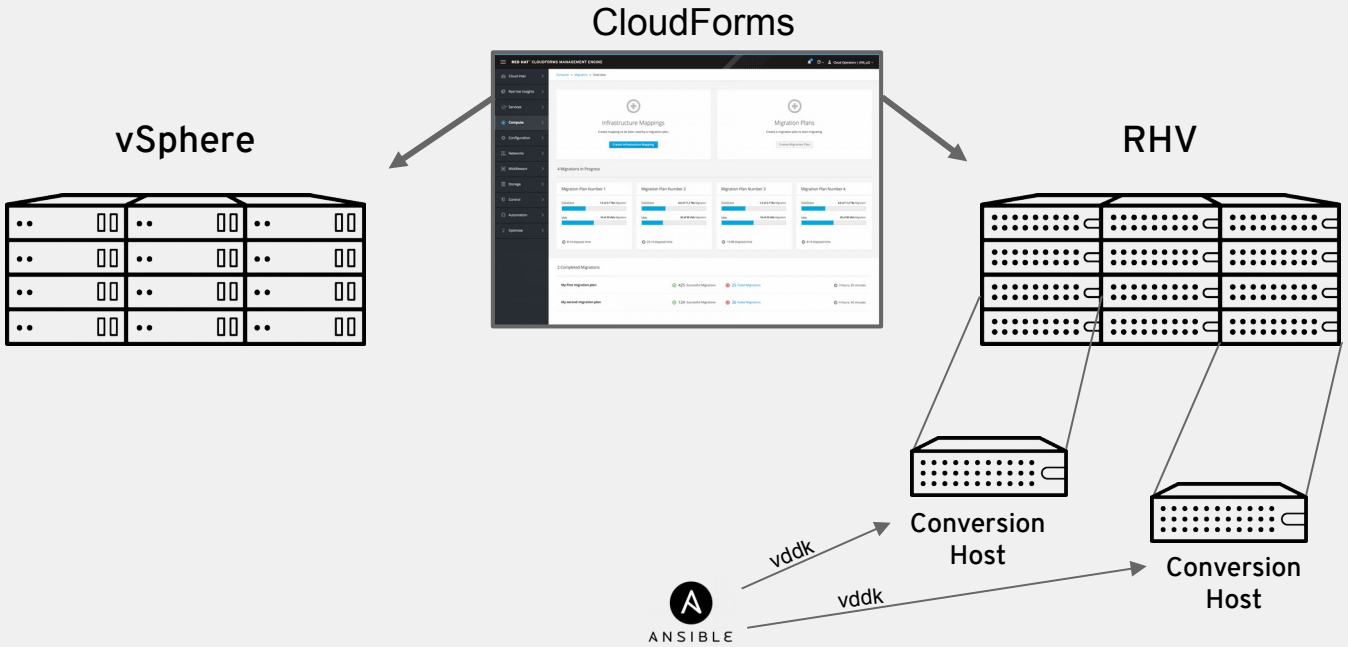
INFRASTRUCTURE MIGRATION SOLUTION

INSTALL CLOUDFORMS AND CONFIGURE BOTH PROVIDERS



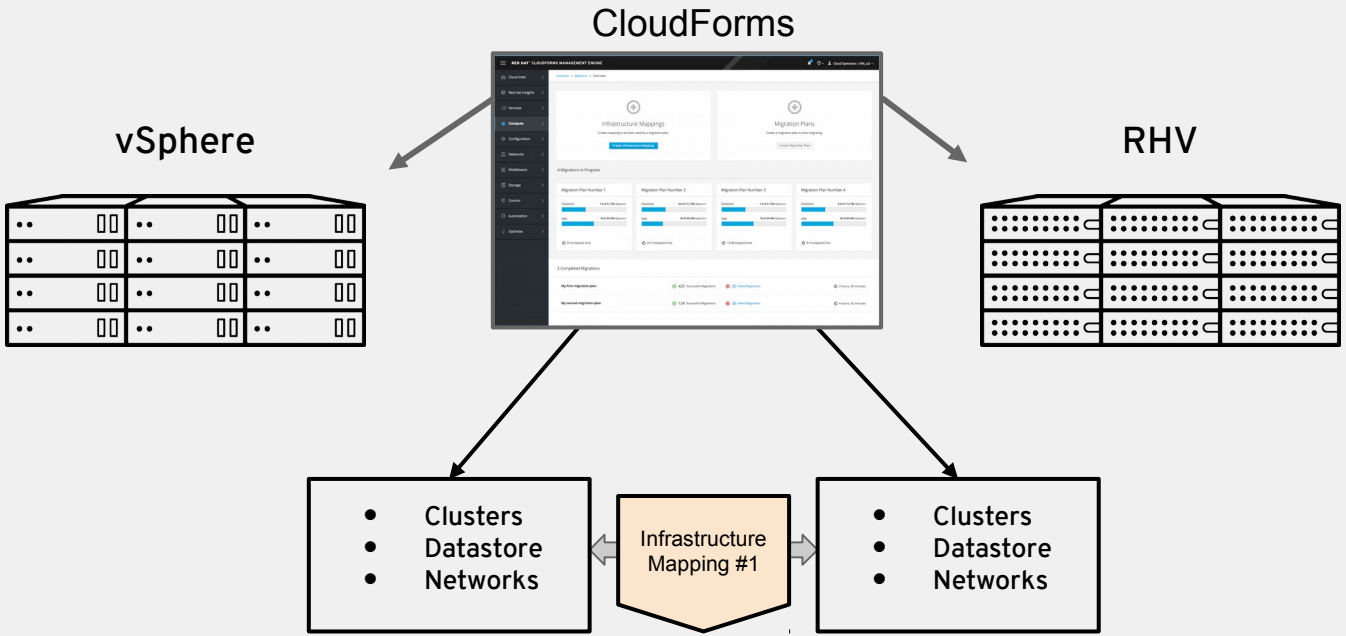
INFRASTRUCTURE MIGRATION SOLUTION

SETUP MULTIPLE CONVERSION HOSTS



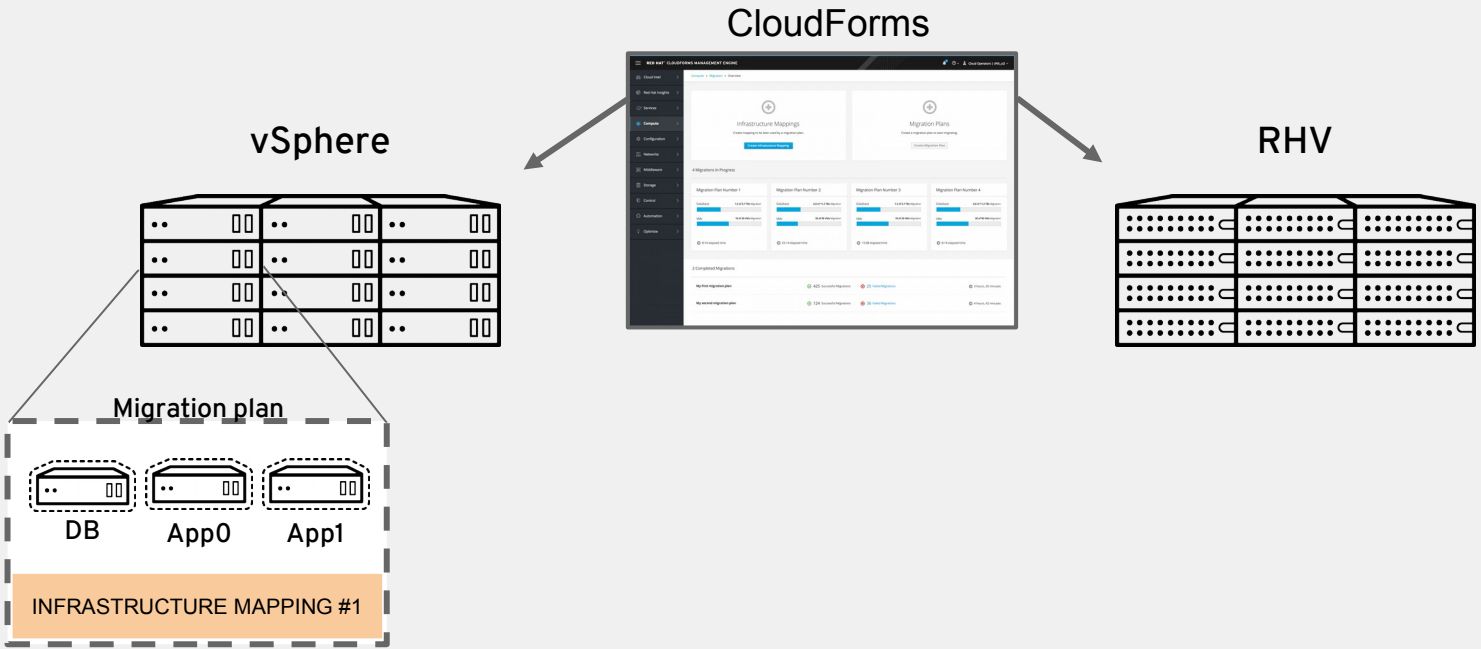
INFRASTRUCTURE MIGRATION SOLUTION

USE THE INFRASTRUCTURE MAPPING WIZARD TO MAP BOTH SOLUTIONS



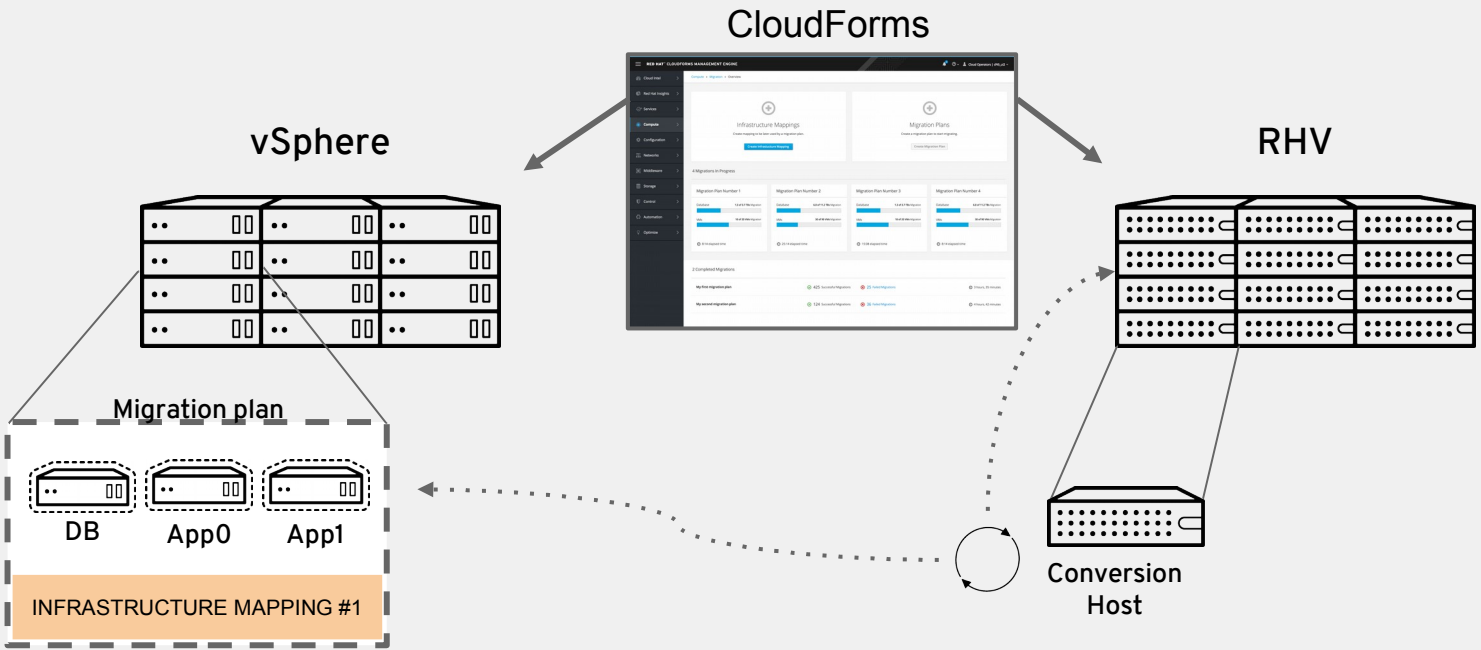
INFRASTRUCTURE MIGRATION SOLUTION

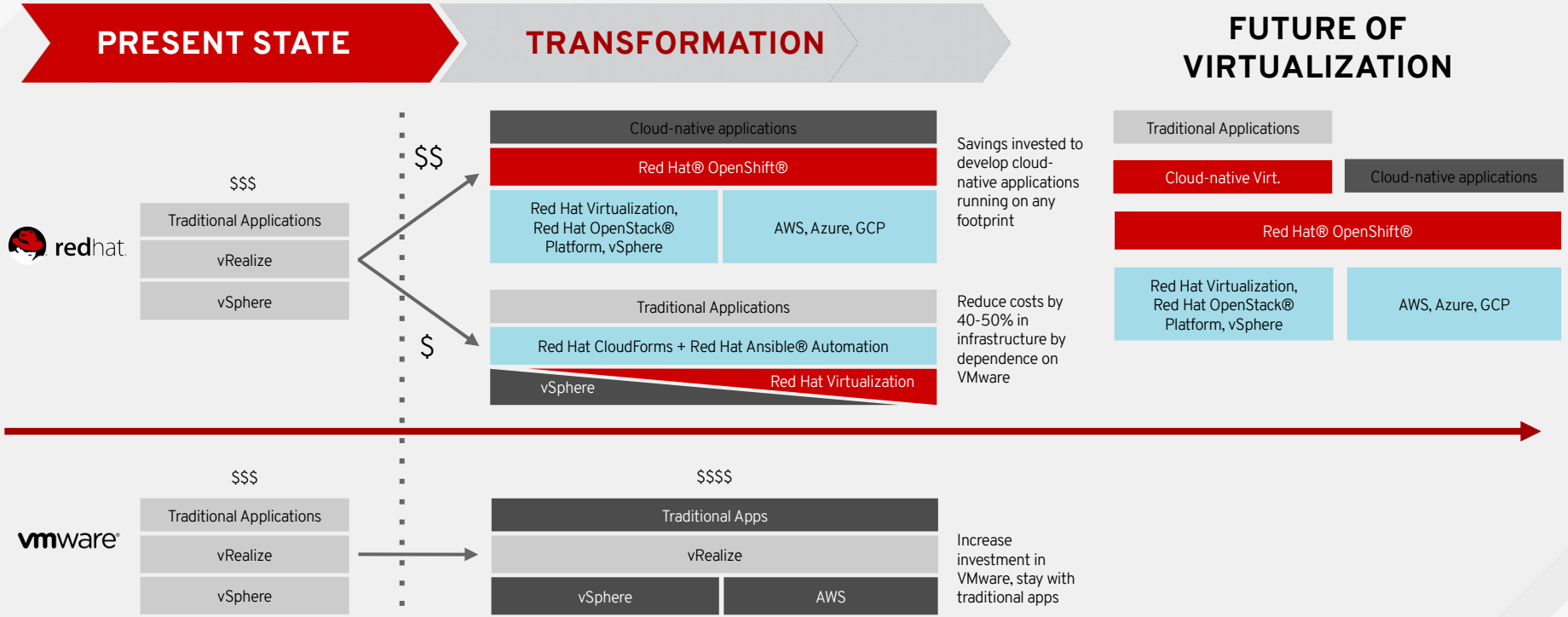
CREATE YOUR MIGRATION PLAN ATTACHED TO AN INFRASTRUCTURE MAPPING



INFRASTRUCTURE MIGRATION SOLUTION

LAUNCH YOUR MIGRATION




PRESENT STATE
TRANSFORMATION
FUTURE OF VIRTUALIZATION
redhat.
$$$
Traditional Applications
vRealize
vSphere
$$
$
Cloud-native applications
Red Hat® OpenShift®
Red Hat Virtualization, Red Hat OpenStack® Platform, vSphere
AWS, Azure, GCP
Traditional Applications
Red Hat CloudForms + Red Hat Ansible® Automation
vSphere
Red Hat Virtualization
Savings invested to develop cloud-native applications running on any footprint
Reduce costs by 40-50% in infrastructure by dependence on VMware
Traditional Applications
Cloud-native Virt.
Cloud-native applications
Red Hat® OpenShift®
Red Hat Virtualization, Red Hat OpenStack® Platform, vSphere
AWS, Azure, GCP
vmware
$$$
Traditional Applications
vRealize
vSphere
$$$$
Traditional Apps
vRealize
vSphere
AWS
Increase investment in VMware, stay with traditional apps

GRAZIE PER L'ATTENZIONE

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