Red Hat Storage Day Copenhagen

November 2018

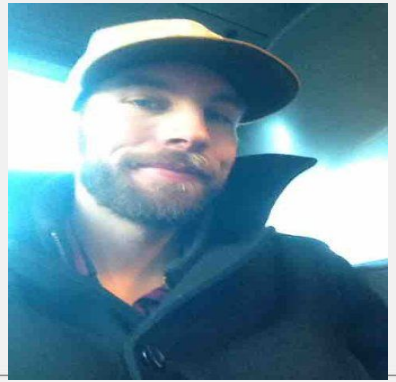
Goals of today

Minimum of slides
Maximum discussions
As much demos as possible

Who will perform these demos?

Tero Ahonen

Magnus Glantz



Johan Robinson

RED HAT®
HYPERCONVERGED
INFRASTRUCTURE

AGENDA

Welcome and Red Hat Intro	13:00
Red Hat Storage and Hyperconvergence - what is the connection?	13:10
Red Hat Hyperconverged Infrastructure for Virtualization	13:30
Break	14:00
Red Hat Openshift and Containerised Storage	14:30
Putting it all together - Cloudforms	15:00
Automation in a Hyperconverged world - Ansible	15:30
Q&A	16:00
Beers and Wraps	16:30

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Who are Red Hat?

Andreas Bergqvist
2018

OUR BUSINESS

Red Hat is an *enterprise-class software company*
with an open source development model

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COMMUNITY PROJECTS > ENTERPRISE PRODUCTS

RED HAT PRODUCT PROCESS

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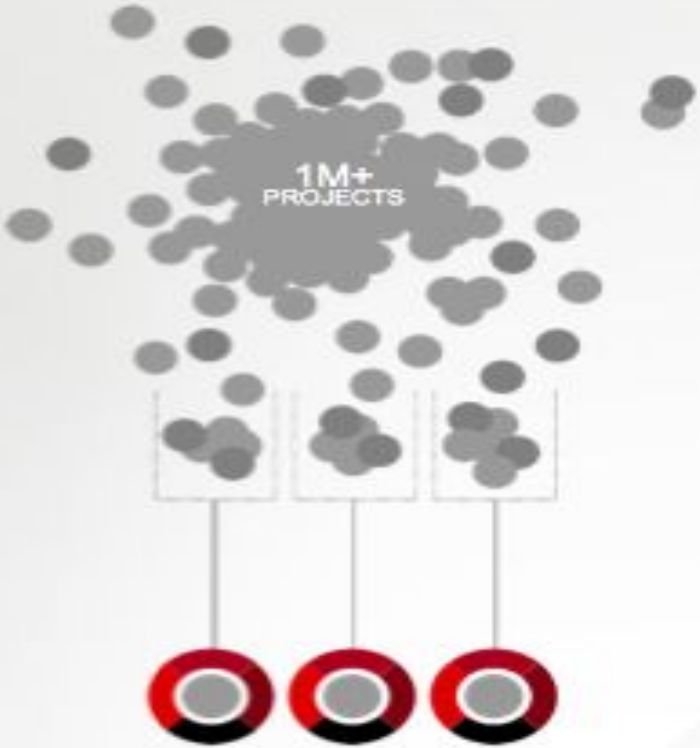


PARTICIPATE
(upstream projects)

We participate in and create community-powered upstream projects.

INTEGRATE
(community platforms)

We integrate upstream projects, fostering open community platforms.

STABILIZE
(supported products platforms, and solutions)

We commercialize these platforms together with a rich ecosystem of services and certifications.

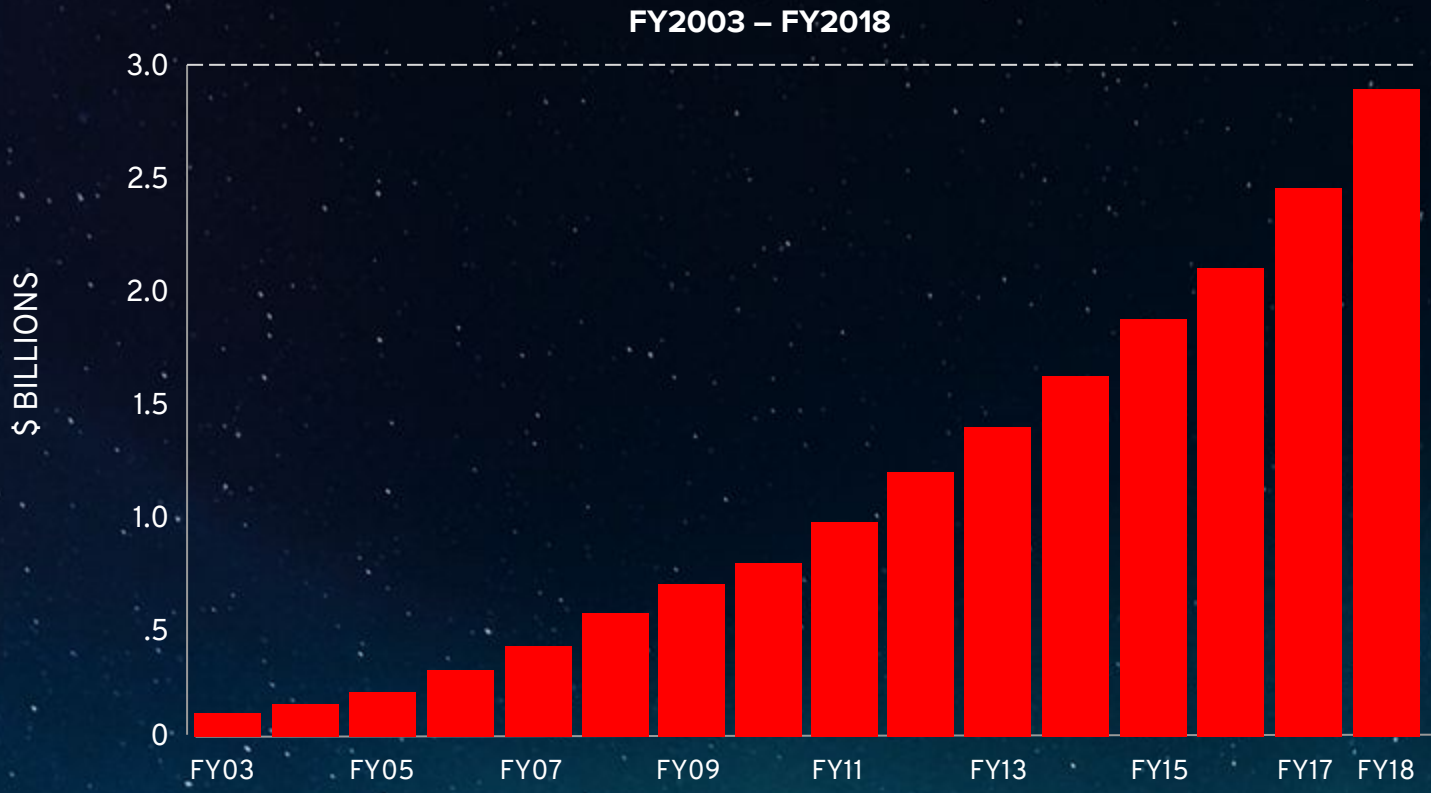
We enable software and hardware partners, customers, and academia to participate at every stage of development.

AMD IBM FUJITSU SAP intel ca bmcsoftware TIBCO CISCO HITACHI

"The combination of Red Hat Enterprise Virtualization and the Cisco UCS platform allows us to provide financial service providers with a highly available, scalable, and secure SAP environment in the cloud. —MARIO BRUGNERA, head of SAP Competence Center, FI-TS

finanz informatik technologie service

THE MODEL WORKS



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The future is hybrid and multicloud

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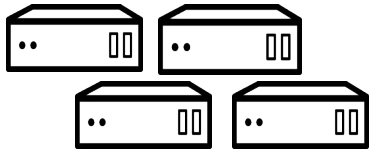
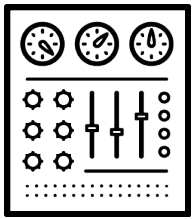
WHAT IS RED HAT STORAGE



Enterprise class iteration of the open source Ceph and Gluster projects

Reduced Infrastructure Cost

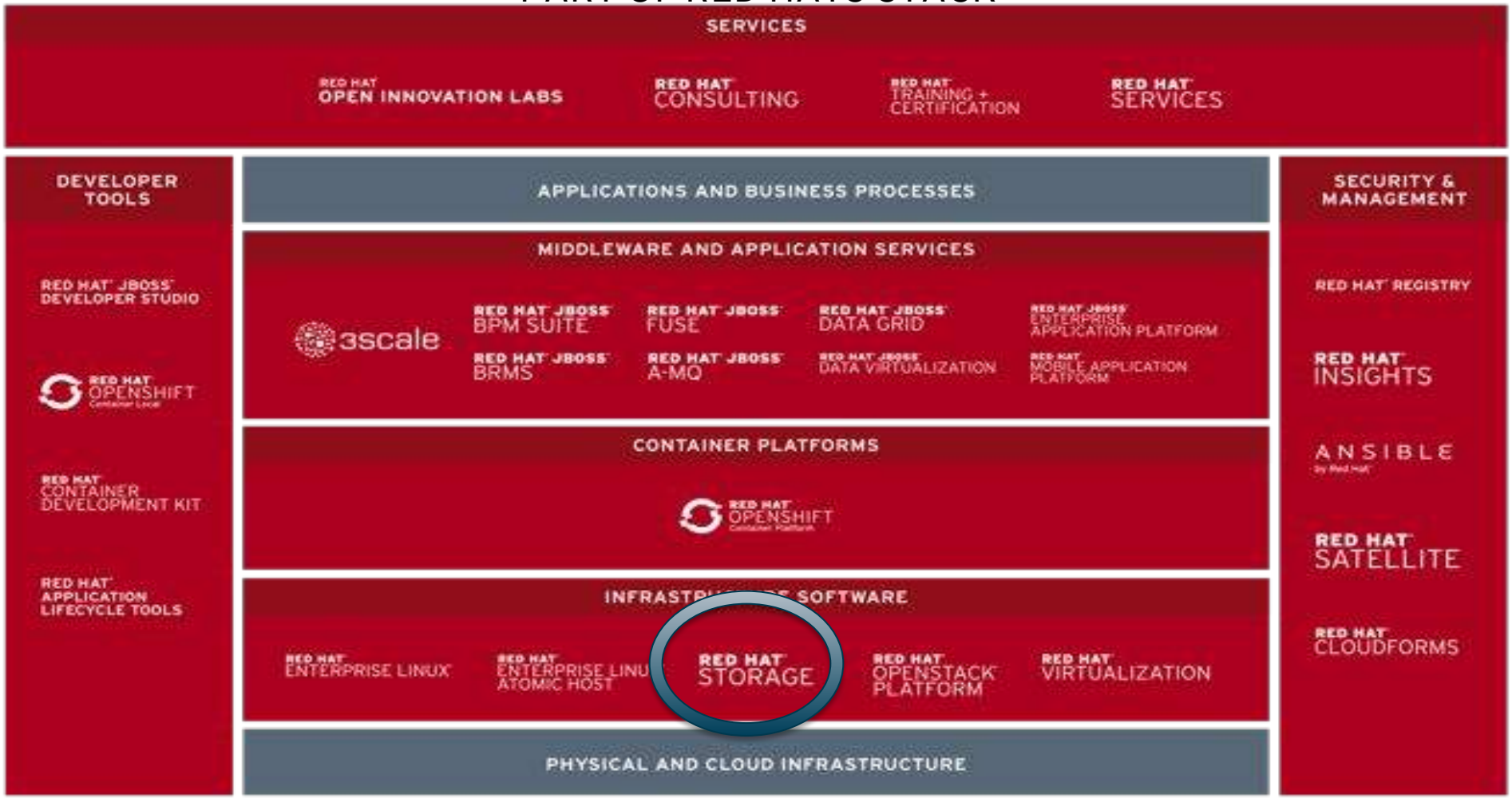


All-inclusive feature set

Extremely resilient, performant and secure

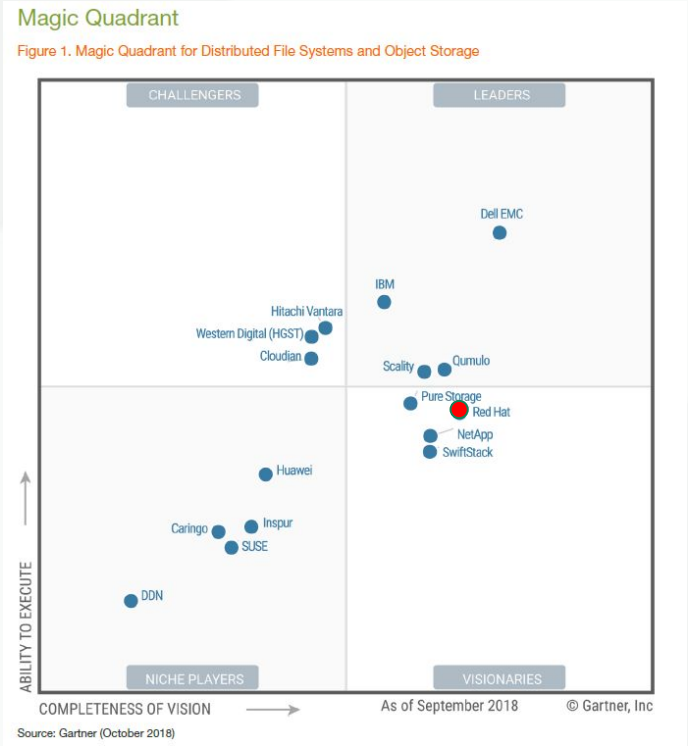
Red Hat Confidential - NDA Required

PART OF RED HATS STACK



Gartner Names Red Hat a Storage Visionary

Three Years In a Row



Red Hat Storage continues to lead competitors like NetApp and SuSe on both ability to execute and completeness of vision.

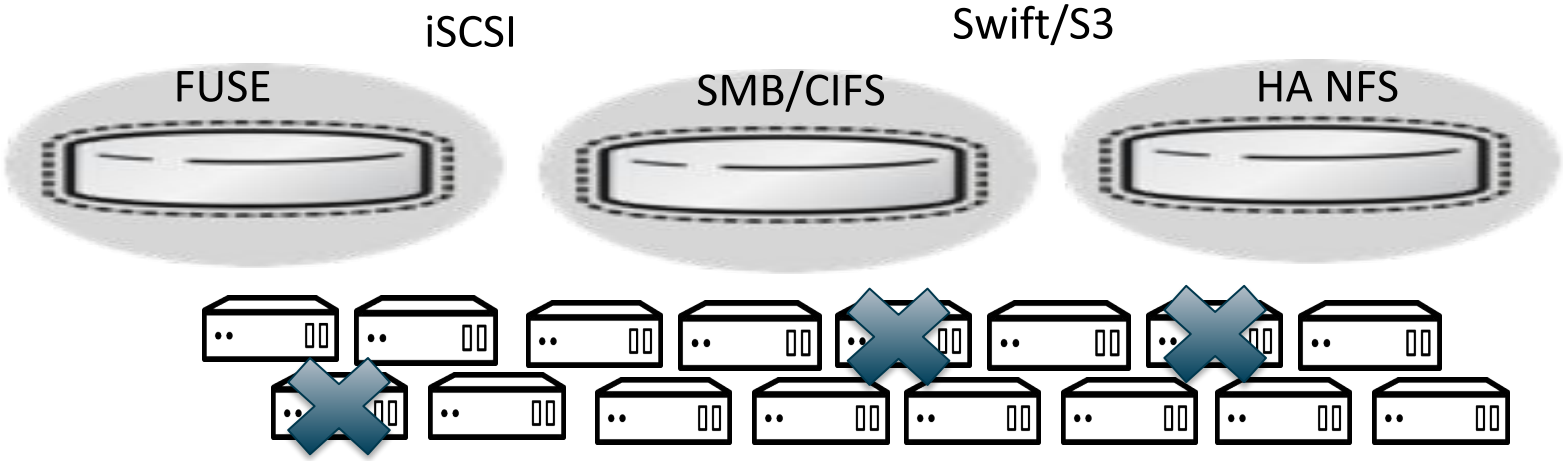
Red Hat Storage is second only to Dell/EMC on completeness of vision, and the only open source vendor listed as a visionary

Gartner on the Red Hat Storage Portfolio

- Hardware independence and open-source model, full-stack infrastructure solutions
- Versatile and tightly integrated with Red Hat Platforms and Kubernetes, in hyperconverged and disaggregated form factors
- Certified across a broad spectrum of server hardware, with reference architectures available from leading server OEMs

This graphic was published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request from https://www.gartner.com/doc/3891780/magic-quadrant-distributed-file-systems

What is Red Hat Gluster Storage



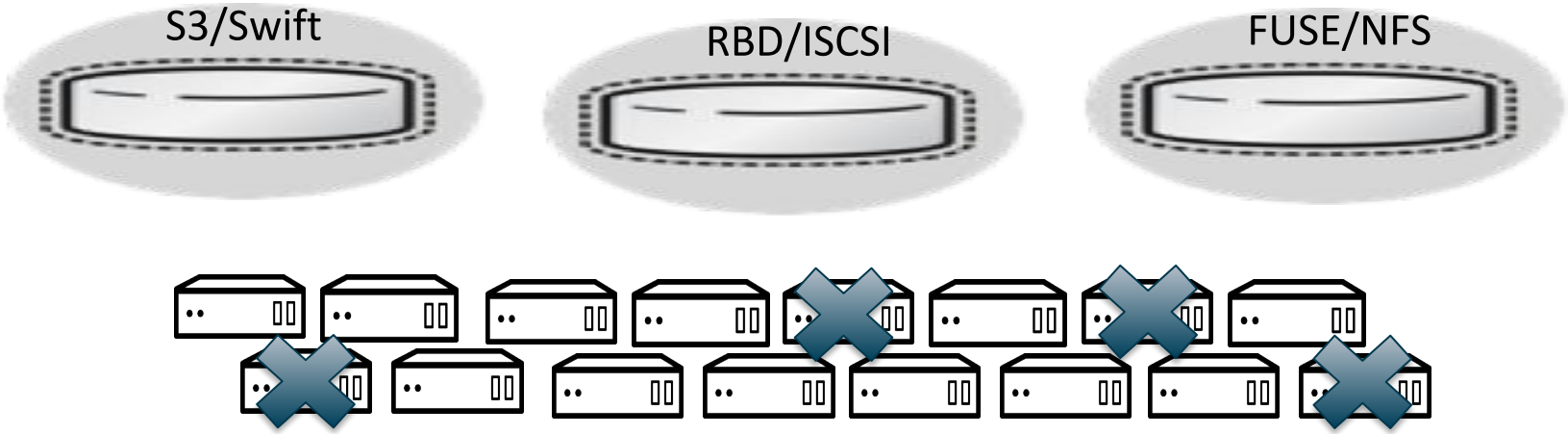
Scale Out NAS

Multiprotocol access

Highly Resilient

Installable everywhere

What is Red Hat Ceph Storage



Scale Out Object storage

Multiprotocol access

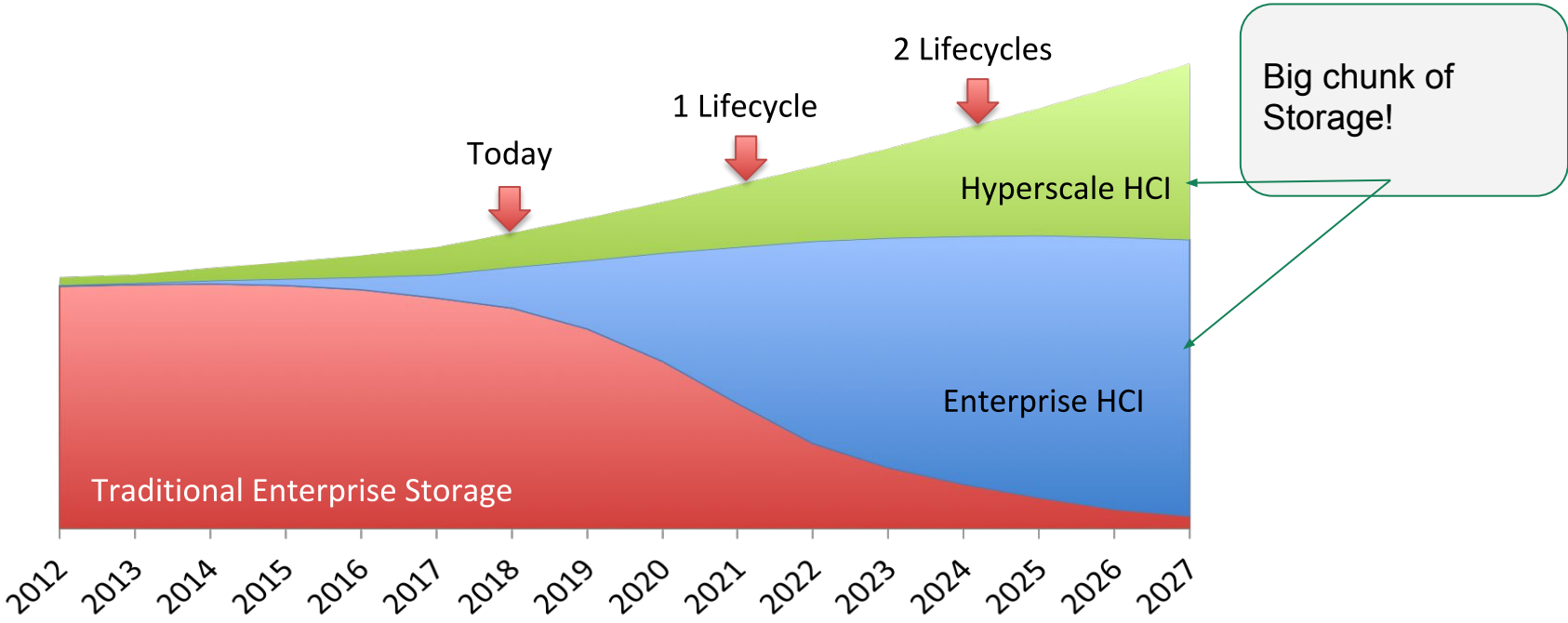
Highly Resilient

Extremely scalable

TARGET WORKLOADS – USE CASES

OPENSHIFT CONTAINER STORAGE	Scalable, flexible persistent storage for, and in, containers
PRIVATE CLOUD INFRASTRUCTURE	Elastic storage for OpenStack virtual machines and tenant applications
ELASTIC DATA LAKES	Massively scalable storage enabled for big data analytics frameworks
HYPERCONVERGENCE	Compute and storage tightly integrated for ROBO, edge, and IoT
MEDIA REPOSITORY	Cost effective, scale out storage for rich media and content delivery

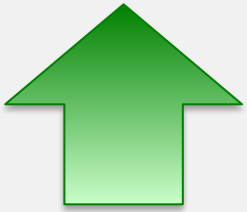
HYPERCONVERGENCE IS IMMINENT



Source: [Wikibon 2015]

TECTONIC SHIFT IN INFRASTRUCTURE

- Declining siloed infrastructure
  - Declined 16.7% in 2017[1]
  - Expected to half 2020-2021[2]



- Growing hyperconverged infrastructure
  - 76% YoY, $10B to $28B by 2022[3,4]

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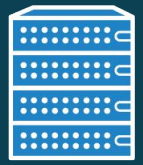
FEEDBACK FROM IT DECISION MAKERS



35% satisfied with vendor experience; 34% satisfied with solution flexibility

82% believe investing in storage without considering quality of consulting services and global support is short-sighted

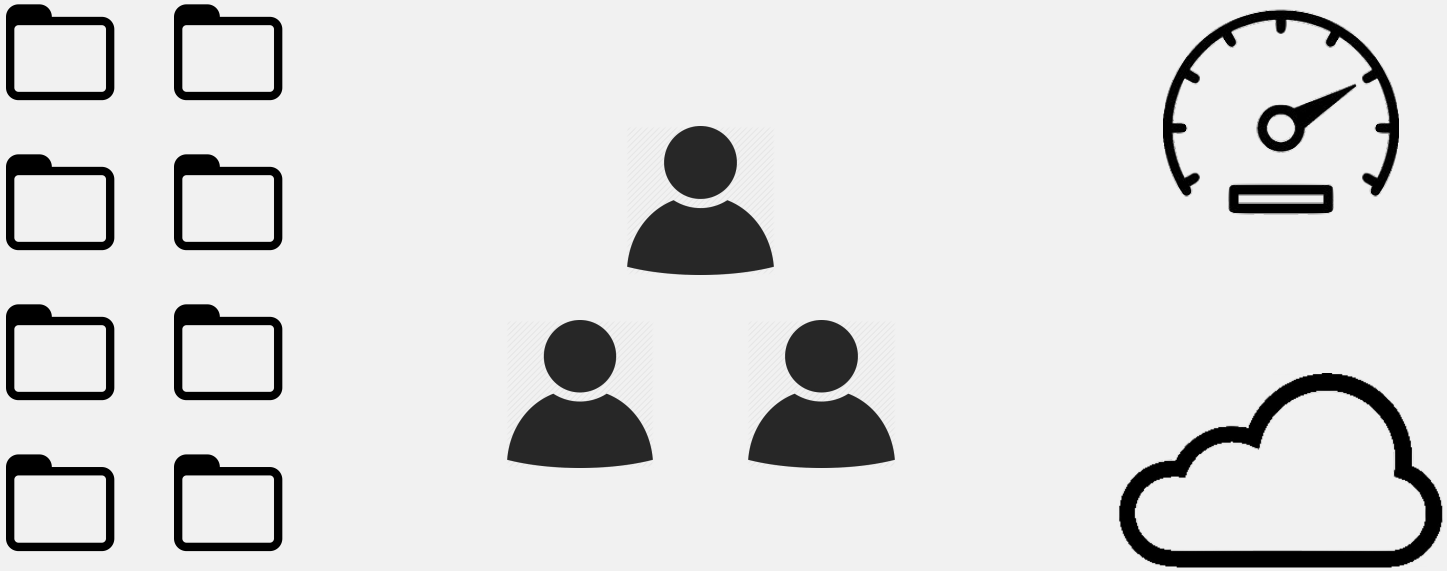
95% believe more agile storage solution could benefit organization

70% admit that their organization's current storage can't cope with emerging workloads

VansonBourne

Vanson Bourne Ltd: Storage: limitations, frustrations, and coping with future needs, Red Hat Storage Research results, September 2017

THE PROBLEM: TOO MUCH, TOO FEW, TOO FAST



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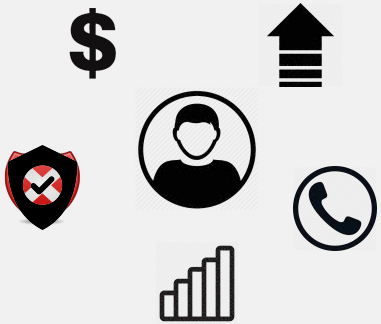
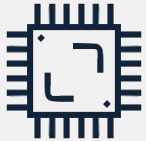
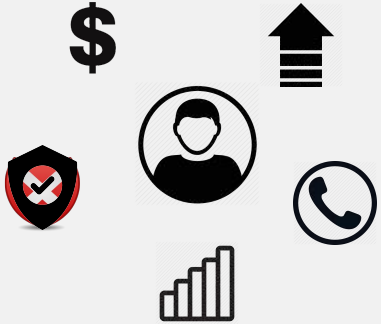
SILOED INFRASTRUCTURE INEFFICIENT

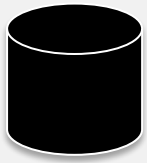
Virtualization



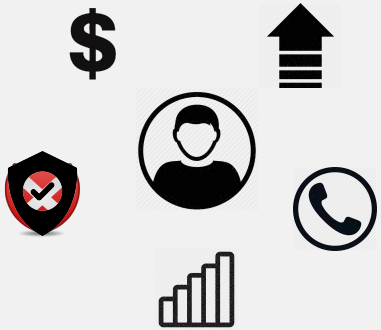


Compute





Storage



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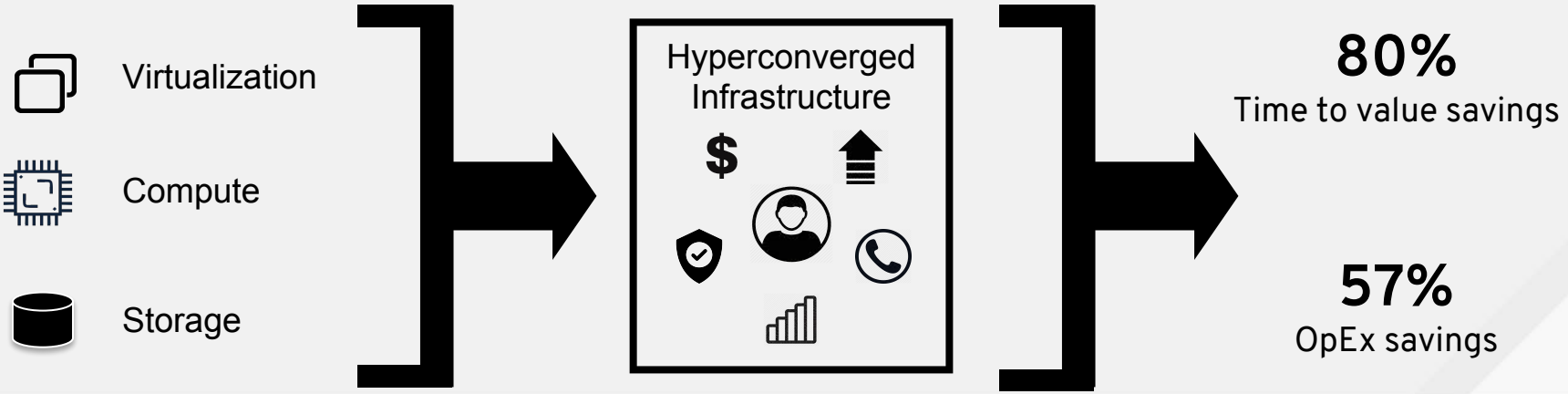
WHY DO OUR CUSTOMERS CARE ABOUT STORAGE?

HYPERCONVERGED INFRASTRUCTURE

RED HAT HYPERCONVERGED INFRASTRUCTURE

- Increased flexibility and operational efficiency by converging Compute, Network and Storage and breaking siloed IT Infrastructure



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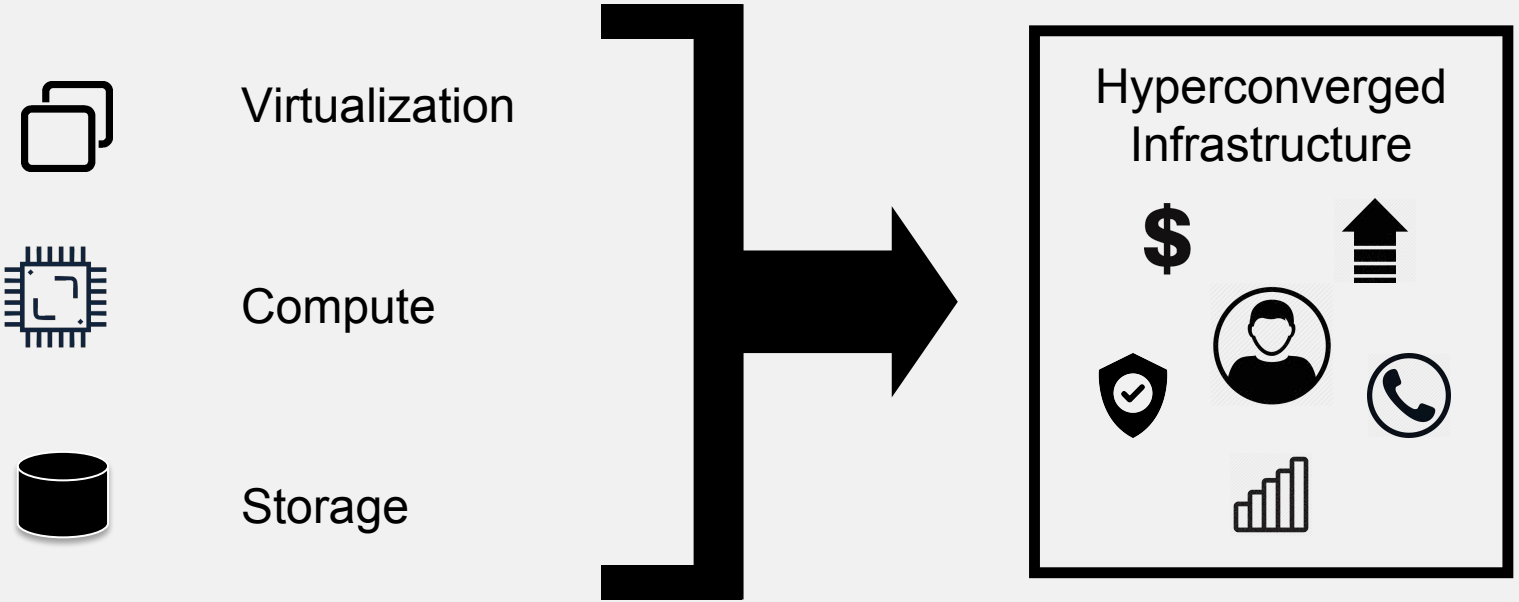
THE NEED: HYPERCONVERGED INFRASTRUCTURE



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BENEFITS OF HCI VS. ROLL YOUR OWN

80%

Time to value savings

Time to production decreases from 1 year to ~10 Weeks

57%

OpEx Savings

Each admin can manage 2.33x the infrastructure

Source: Wikibon 2018

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Summary

Red Hats goal is to support your journey to the Hybrid cloud via Open Source products = Freedom of choice, lower costs

HCI is for many a first step by providing lower costs by standardisation, consolidate management and is a fundament for automation.

We want to hold your hand all the way!

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INFRASTRUCTURE FOR VIRTUALIZATION
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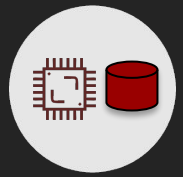
RHHI FOR VIRTUALIZATION - *THE BASICS*



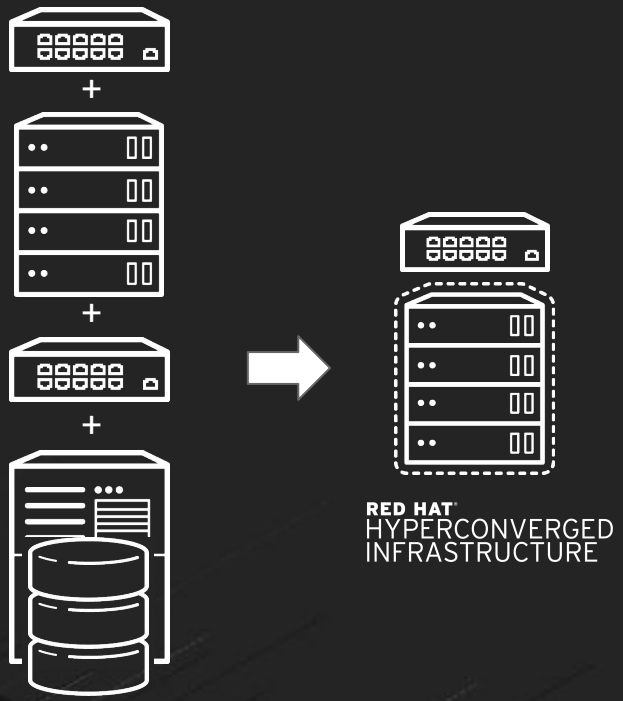
Open HCI

Subscription model

Simplified management

Security & automation

INFRASTRUCTURE CONSOLIDATION & OPERATIONAL EFFICIENCY



Traditional Architecture

- Single budget for compute & storage
- One team to managing infrastructure
- Simplified planning & procurement
- Streamlined deployment & management
- Single support stack for compute and storage

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ADVANTAGES OF SUBSCRIPTION MODEL

	RHHI	HCI appliance	Proprietary SW HCI
SW portability (across HW or cloud)	✔	✖	✔
No feature degradation at expiration	✔	✔	✖
All-inclusive license/subscription	✔	✖	✖
No HW or SW lock-In	✔	✖	✖

✔ Ability/Common ✖ No Ability/Uncommon

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SIGNIFICANT COST SAVINGS

Medium-sized environment

- 9 nodes, production support
- 3 years, 25% discount
- Must support encryption

VMware & vSAN (Source/Source/Source)

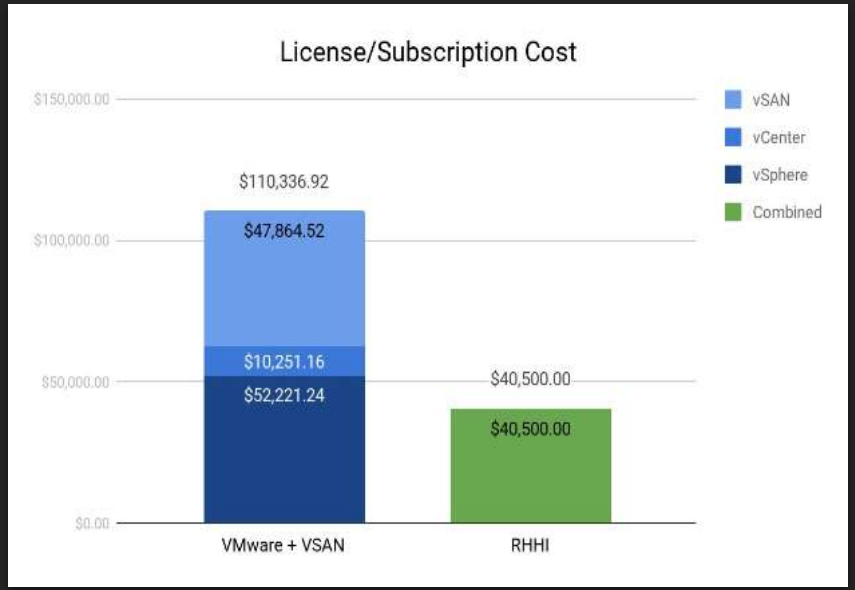
- Cost - $110,337

RHHI4V - $40,500

- VMware 172% more expensive

Open HCI = Lower dev costs

→ Customer savings



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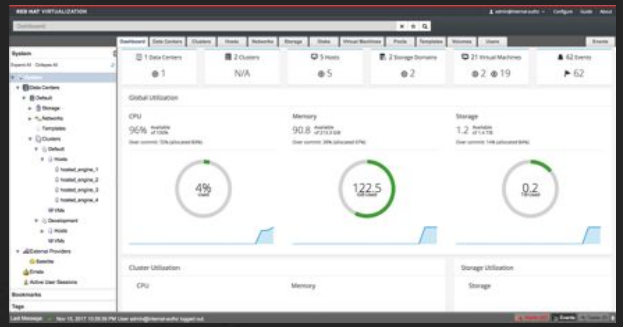
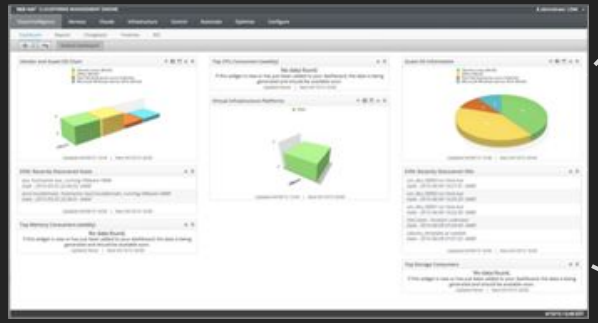
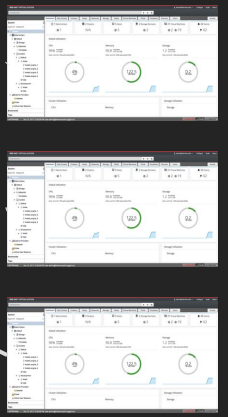
SIMPLIFIED ADMINISTRATION

RED HAT VIRTUALIZATION MANAGER



RED HAT CLOUDFORMS (optional)

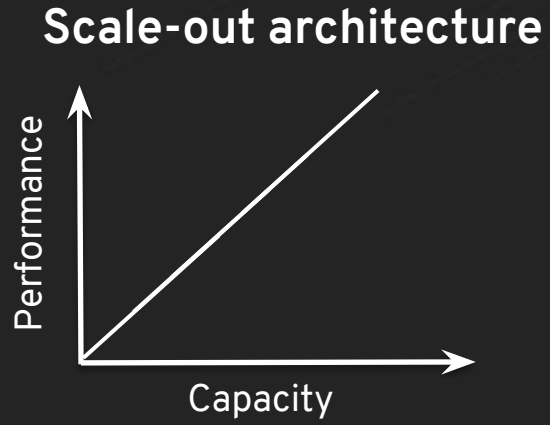


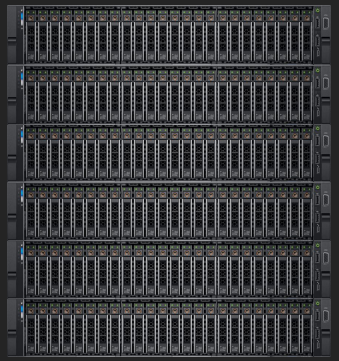


SIMPLIFIED GROWTH

- Easily add nodes
  - Linear scale-out of compute and storage

- Mix and match nodes
  - Among HW vendors
  - Across media types
- Remove nodes
- Online w/out downtime





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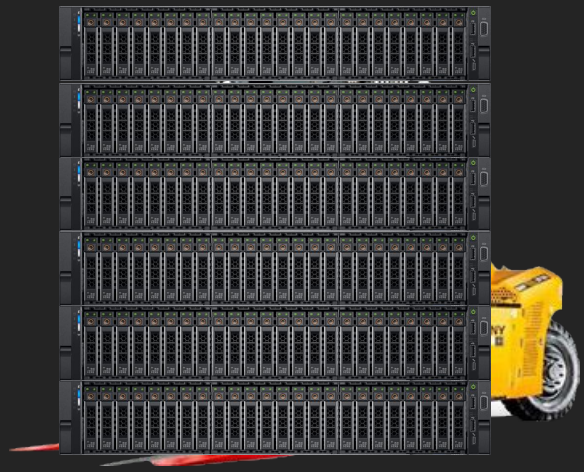
SIMPLIFIED MIGRATIONS

WIKIBON

data migrations at 31% of 4-year storage array and support cost

- Buy new arrays early
- Migrate - SW, labor, downtime
- Keep old array for failback



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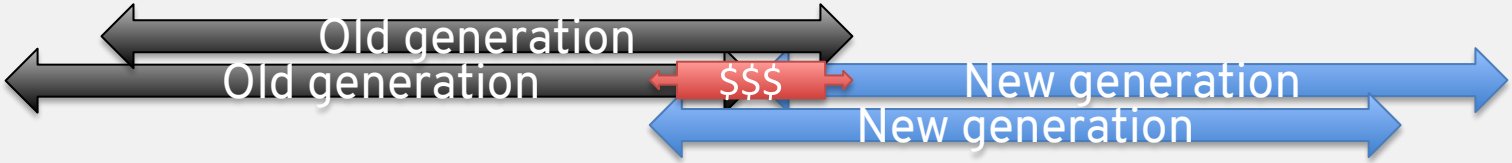

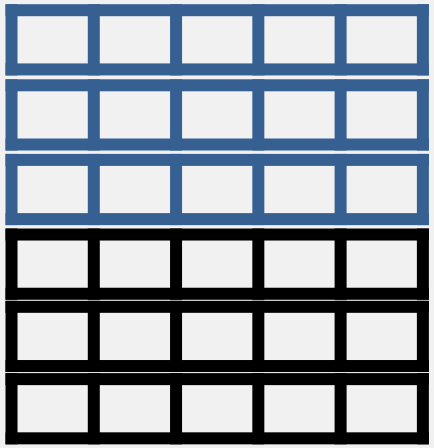

- Per Wikibon, data migrations at 31% of 4-year storage array and support cost[1]

For $300K array, $216K support -> migration $163K

Buying new array early (5 months)	$54k
Migrating data: software, labor, downtime etc.	$77k
Retaining old array as fail back (3 months)	$32k

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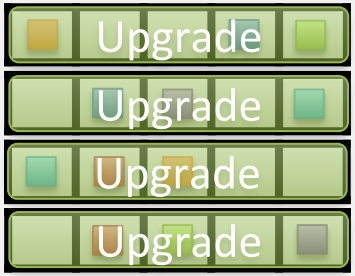
SIMPLIFIED UPGRADES

- Upgrades
  - Node by node
  - For entire stack
  - No SPOF during upgrade
  - Non-disruptive



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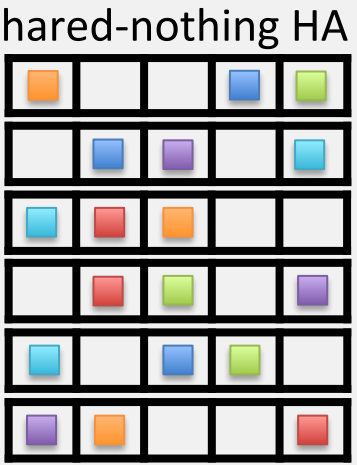
SHARED-NOTHING HIGH AVAILABILITY

- Resiliency against multiple:
  - Drive failures
  - Network failures
  - Node failures
  - Easier recoveries
- For full stack



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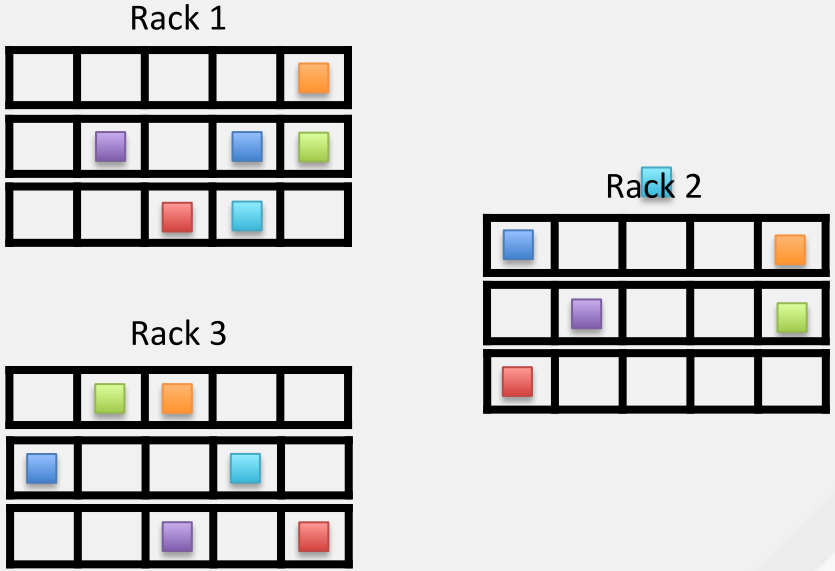
RACK AWARENESS

- Highest level of redundancy
- Setup of failure domains
  - Nearby site or rack
  - Easier recoveries
- Remote replication
- Snapshots



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WHAT'S NEW IN VERSION 1.5

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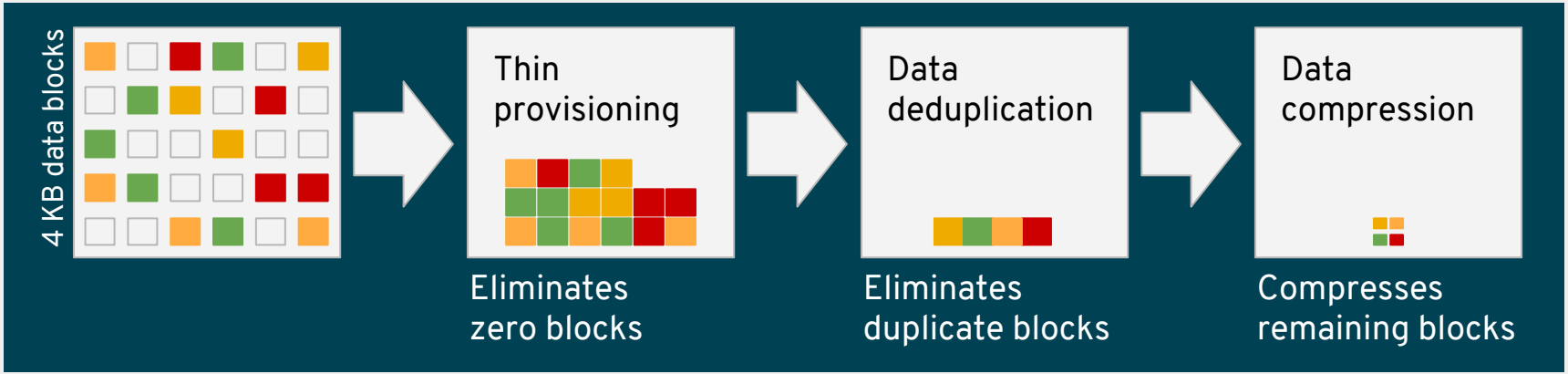
STORAGE EFFICIENCIES THROUGH THE OS

COMPRESSION WITH PERMABIT VDO AND INTEGRATED MANAGEMENT



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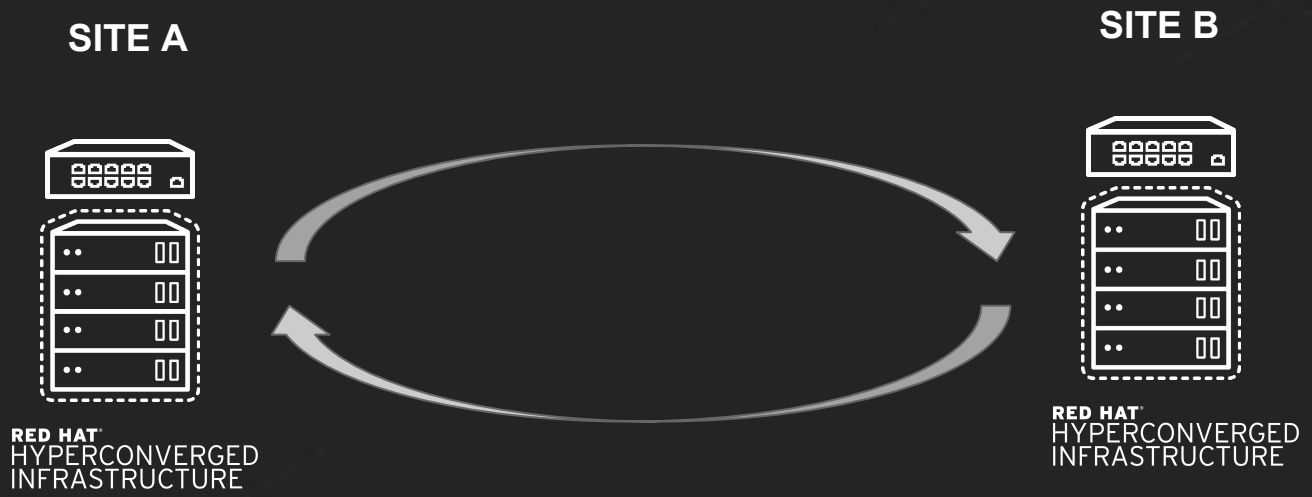
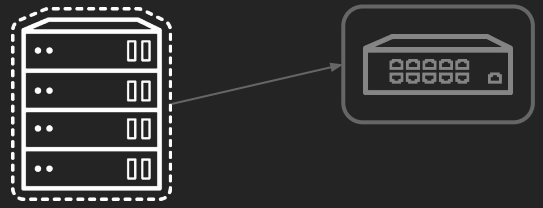
FAILOVER AND FAILBACK D/R BETWEEN SITES



VIRTUAL NETWORKING



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SINGLE NODE CONFIGS

SITE A

RED HAT®
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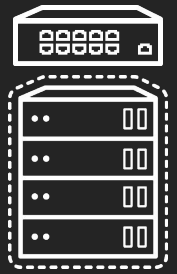
INFRASTRUCTURE

SITE B



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VALIDATED HARDWARE CONFIGS

- *Base*, *Performance*, and *Capacity* configurations
- Built atop trust Red Hat hardware compatibility list
- Accompanying sizing tool for custom settings
- Minimizes guesswork for many workload profiles
- Further simplifies RHHI4V deployment
- Launched with set of HPE DL configs

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RED HAT INFRASTRUCTURE MIGRATION

PROVEN METHODOLOGY TO OPTIMIZE IT USING RHHI FOR VIRTUALIZATION

Planning and platform setup

- Define approach and architecture
- Operationalize alternative platform
- Identify and characterize VMs for migration

Migration tooling and approach

- Develop comprehensive tooling and approach for migrating workloads with key stakeholders to ensure success

Migration execution

- Validate and refine migration approach
- Pilot migration of representative set of workloads
- Set stage to migrate thousands of workloads with strategic approach and proven tools

Red Hat Confidential - NDA Required

SUMMARY

RHHI BENEFITS WHEN MODERNIZING

- Software-defined infrastructure with minimum HW footprint
- Standardized infrastructure for scaling out across different small sites
- Modern infrastructure for traditional workload with HA/DR requirements
- Avoids proprietary technology and reduce overall project cost
- Full control over stack vs. specifying 10s of pages with pre-reqs before
- Ideal starting point for “slow infrastructure modernization project”
    - Bare metal to virtualization migration for consolidation
    - Not yet started with containers or microservices
    - Standardization on open source and single technology stack

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INFRASTRUCTURE

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RED HAT OPENSHIFT
WITH PERSISTENT STORAGE AS A SERVICE
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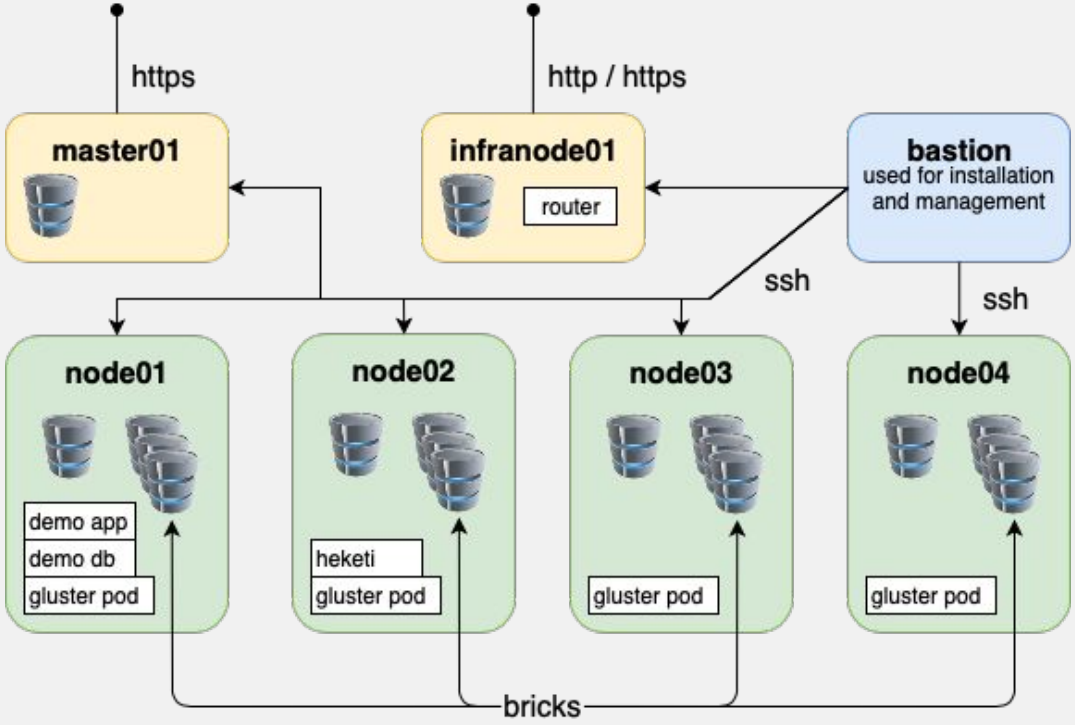
RED HAT®
OPENSHIFT
Container Storage

Use case walk thru

1. For Devs
   a. Developer needs storage to developer, test and run theirs
   b. …and usually no one has a glue how much storage you need…..more data coming in that was planned
   c. Snapshot your data and use it in testing etc.
2. For Ops
   a. All storage backends are the same and different kind of storage has different use cases
   b. Storage is not “until death do us part”, you must be able to change storage backend
   c. Failure, Failure, Failure….you must be able to tolerate failures

Demo env



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Not all container based applications are created equal.

#4dev

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Sometimes you just don’t know what you need or your new app is just too popular

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Even Gluster is really resilient you might want to save your data for later use.

#4devv

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It would be really nice if you could change storage backend without users knowing anything about it?

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Developers are hard to please. Some need resilience, some speed, some red storage or maybe ecologically produced.

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Sometimes things just fail.

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http://bit.ly/2NMI5L7

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RED HAT®
HYPERCONVERGED
INFRASTRUCTURE

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AUTOMATE
~~REPEAT~~ IT

MANAGEMENT & AUTOMATION PORTFOLIO

RED HAT® SATELLITE

Content Delivery
Provisioning
Configuration Management
Remote Execution
Patching
Entitlement

RED HAT® INSIGHTS

Predictive IT Analytics
Risk Assessment
Automated Remediation

RED HAT® ANSIBLE® Tower

Orchestration
Configuration Management
Remote Execution
Application Deployment
Provisioning
Continuous Deliver
Security and Compliance

RED HAT® CLOUDFORMS®

Self service catalogue
Approval process
Quota
Compliance
Chargeback
Reporting
Optimize

RED HAT® ANSIBLE® Automation

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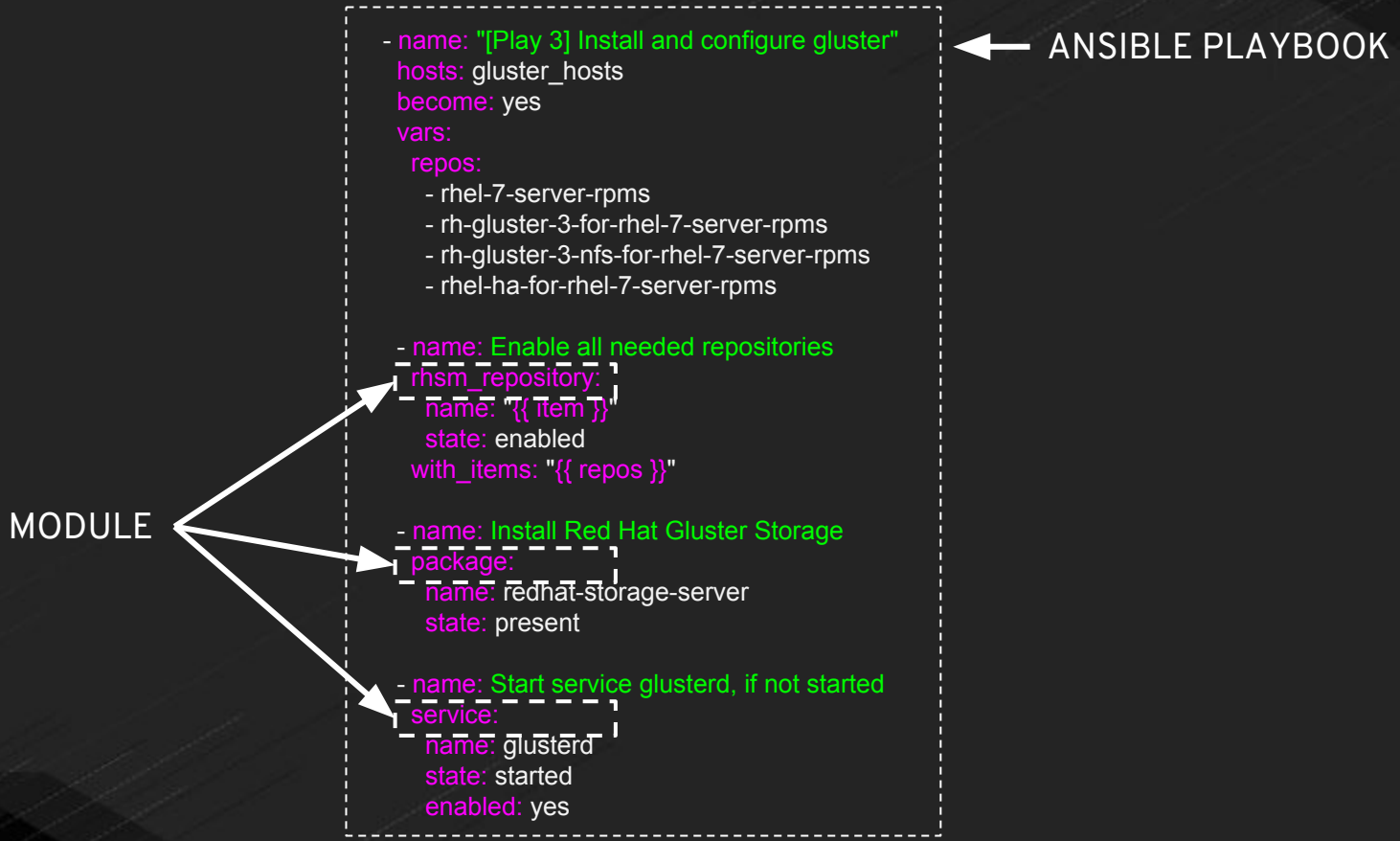
- name: "[Play 3] Install and configure gluster"
hosts: gluster_hosts
become: yes
vars:
repos:
- rhel-7-server-rpms
- rh-gluster-3-for-rhel-7-server-rpms
- rh-gluster-3-nfs-for-rhel-7-server-rpms
- rhel-ha-for-rhel-7-server-rpms
- name: Enable all needed repositories
rhsm_repository:
name: "{{ item }}"
state: enabled
with_items: "{{ repos }}"
- name: Install Red Hat Gluster Storage
package:
name: redhat-storage-server
state: present
- name: Start service glusterd, if not started
service:
name: glusterd
state: started
enabled: yes
ANSIBLE PLAYBOOK
MODULE

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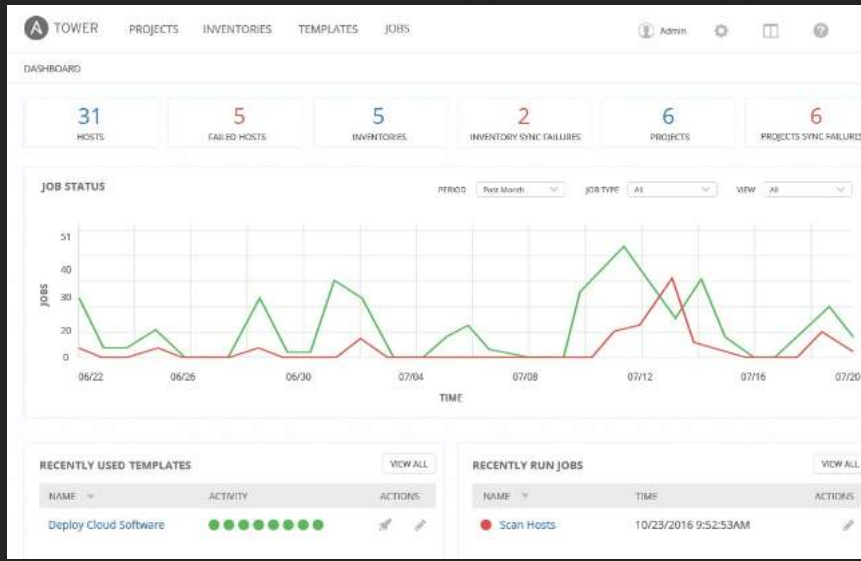
WHAT IS ANSIBLE AUTOMATION ?

Ansible is an open source community project sponsored by Red Hat. It's a **simple automation language** that can perfectly describe IT application environments in **Ansible Playbooks**.

Ansible Tower is an **enterprise framework** for controlling, securing and managing your Ansible automation with a **UI and RESTful API.**



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ANSIBLE
v1 - Set config file to use on boot
v1 - Set config file to use on boot
31,000+
Stars on GitHub
1900+
Ansible modules
500,000+
Downloads a month

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WHY ANSIBLE ?

SIMPLE

Human readable automation

No special coding skills needed

Tasks executed in order

Usable by every team

Get productive quickly

POWERFUL

App deployment

Configuration management

Workflow orchestration

Network automation

Orchestrate the app lifecycle

AGENTLESS

Agentless architecture

Uses OpenSSH & WinRM

No agents to exploit or update

Get started immediately

More efficient & more secure

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WHAT CAN I DO WITH ANSIBLE ?

Automate the deployment and management of your entire IT footprint.

Do this...

Orchestration	Configuration Management	Application Deployment	Provisioning	Continuous Delivery	Security and Compliance

On these...

Firewalls	Load Balancers	Applications	Containers	Clouds
Servers	Infrastructure	Storage	Network Devices	**And more...**

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WHAT CAN I DO WITH ANSIBLE, EXAMPLE 1

FULLY AUTOMATED RHHI INSTALLATION:

1. Get IP addresses from IPAM
2. Add record to DNS
3. Configure FW
4. Provisioning the hypervisors using Satellite 6
5. Setup gluster
6. Setup self hosted RHV Manager
7. complete RHV setup (data centers, clusters, hosts, networks...)
8. install and configure a CloudForms VM appliance on your RHV!

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WHAT CAN I DO WITH ANSIBLE, EXAMPLE 2

ROLLING UPGRADE OF RHV CLUSTER:

1. Live migrate all vms
2. Put hypervisor into maintenance mode
3. Install latest updates
4. Activate hypervisor
5. Repeat steps 1 -4 on all hypervisors in the cluster (one at a time)

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WHAT CAN I DO WITH ANSIBLE, EXAMPLE 3

DEMO TIME

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DEMO

Day 1 - Deployment & Service owners

- Self service catalogue
- Approval process
- Compliance
- Chargeback

Day 2 operations

- RBAC
- Automation service catalogue
- Collaboration
- Secure credential delegation
- Central logging

RED HAT® CLOUDFORMS®

RED HAT® ANSIBLE® Tower

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Peter intro slide

What is Cloudforms?

RED HAT®
HYPERCONVERGED
INFRASTRUCTURE

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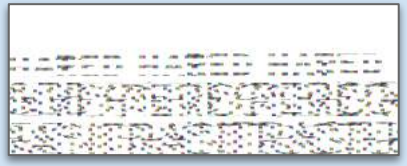
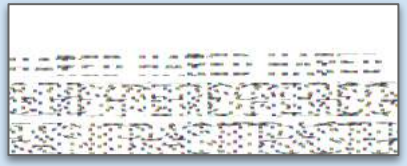
Peter intro slide

What is Ansible?

RED HAT HYPERCONVERGED INFRASTRUCTURE PORTFOLIO

	 3 nodes minimum *for Virtualization*	 6 nodes minimum *for Cloud*
Technology	• Red Hat Virtualization • Red Hat Gluster Storage	• Red Hat OpenStack Platform • Red Hat Ceph Storage
Target Use Cases	DevTest Lines of business & departmental Remote Facilities / ROBO IoT Edge Small datacenter deployments	NFVi Mobile edge Private Cloud
Workloads	Mode 1 applications	Mode 2 applications, VNFs

SOCIAL MEDIA OPTIONS

BLOG	redhatstorage.redhat.com
TWITTER	www.twitter.com/redhatstorage
FACEBOOK	www.facebook.com/RedHatStorage
YOUTUBE	www.youtube.com/user/redhatstorage
SLIDESHARE	www.slideshare.net/Red_Hat_Storage
WEB	www.redhat.com/storage

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WHERE TO GO TO ENGAGE

- Red Hat Subscriptions: https://access.redhat.com/subscription-value
  - *Evaluation*, *Pre-production*, and *Production* contracts available through Red Hat sales
- Red Hat Consulting: http://www.redhat.com/en/services/consulting/storage
- Red Hat Storage training: https://www.redhat.com/en/services/training
- Red Hat Gluster Storage test-drive: http://red.ht/glustertestdrive


THANK YOU
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