Business benefits of Red Hat Storage

Andreas Bergqvist
Specialist Sales Storage
Nordic Region
abergqvi@redhat.com
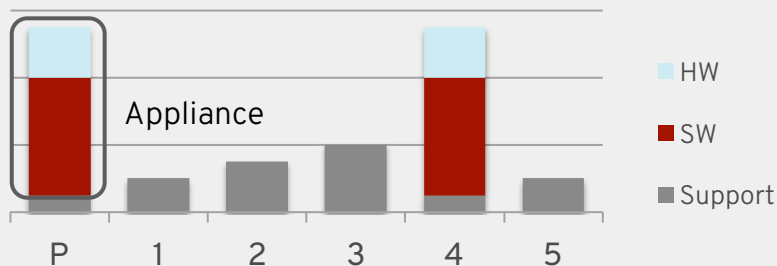
Why Software Defined Storage?

Natural evolution – decoupling the Storage Software from Storage Hardware

- Brings freedom from HW vendor lock in
- Brings down cost due to use of standard hardware
- Brings up the level of automation due to API based management
- Brings up the innovation due to flexibility to adjust to new technology
- Brings up the innovation due to flexibility to adjust to new demands

= Massive savings due to **no HW lock in, more flexibility and less admin.**

TRADITIONAL APPLIANCE VS SDS ECONOMIC MODELS

APPLIANCE-BASED STORAGE

Appliance

HW
SW
Support

P 1 2 3 4 5

Purchase Appliance every 3-5 years
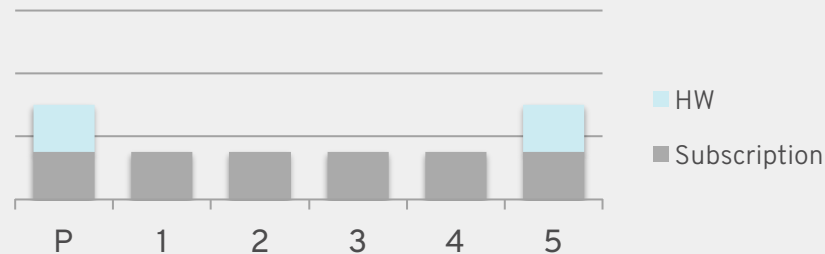*Proprietary* HW + SW
Software is basically *repurchased* with refresh
Appreciating Support YoY
To incent HW+SW refresh
Proprietary HW

SOFTWARE-DEFINED STORAGE

HW
Subscription

P 1 2 3 4 5

Decoupled SW & HW
Software Transfer
Single Subscription
Consistent Subscription payments
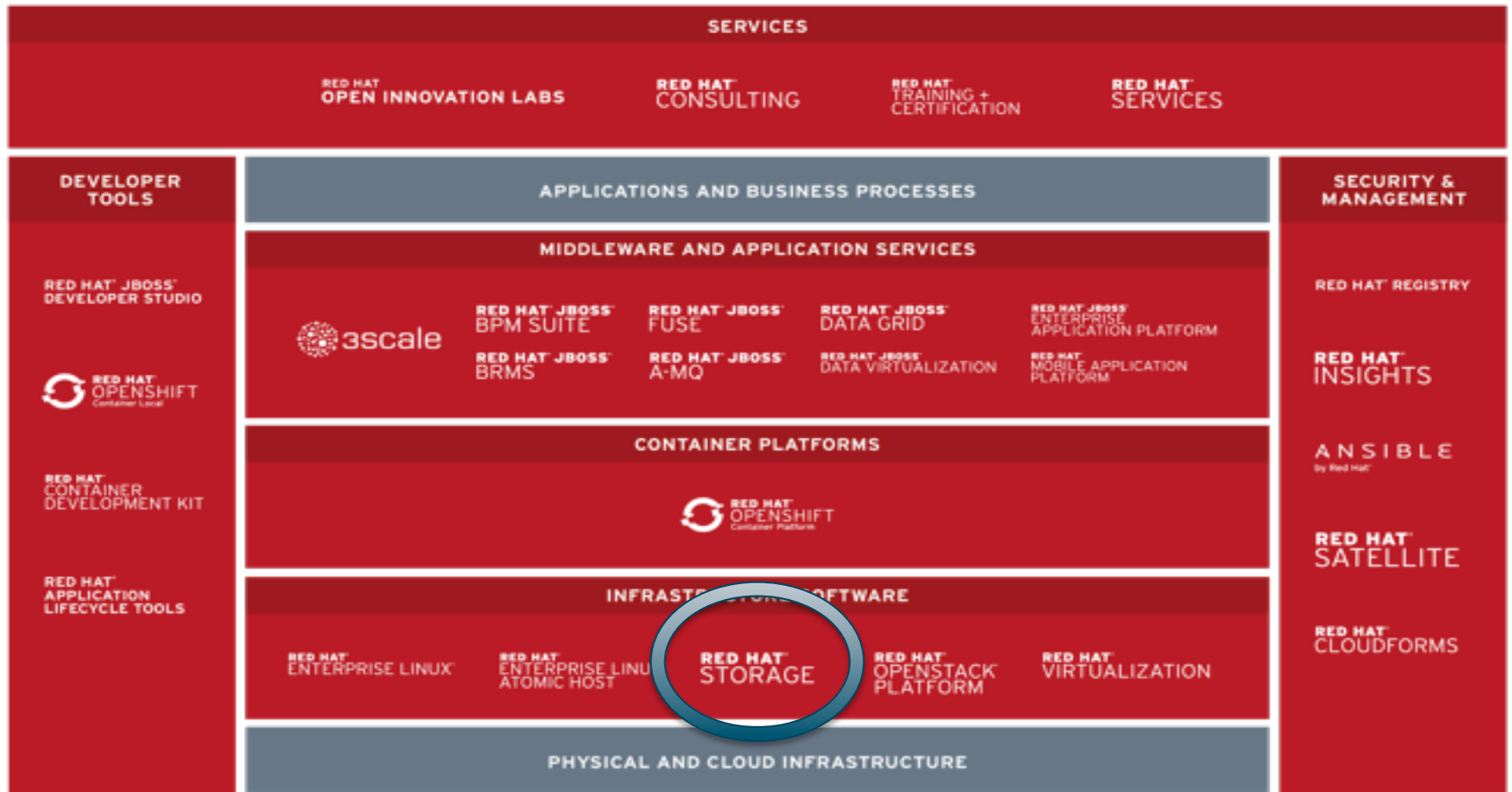Year 1 = Year 3 = Year 5
Best of Breed HW
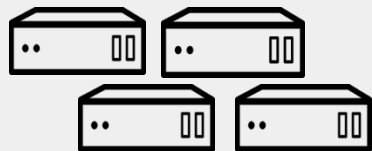Purchase HW only as needed

SDS gives huge savings (50%+) in TCO due to **no migration**, **no hw lock in** and **less admin**

Why Red Hat Software Defined Storage?

Part of and integrated to RED HATS STACK
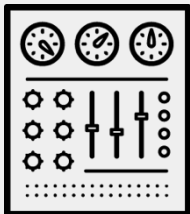
WHAT IS RED HAT STORAGE

Enterprise class iteration of the open source **Ceph** and **Gluster** projects

Reduced Infrastructure Cost

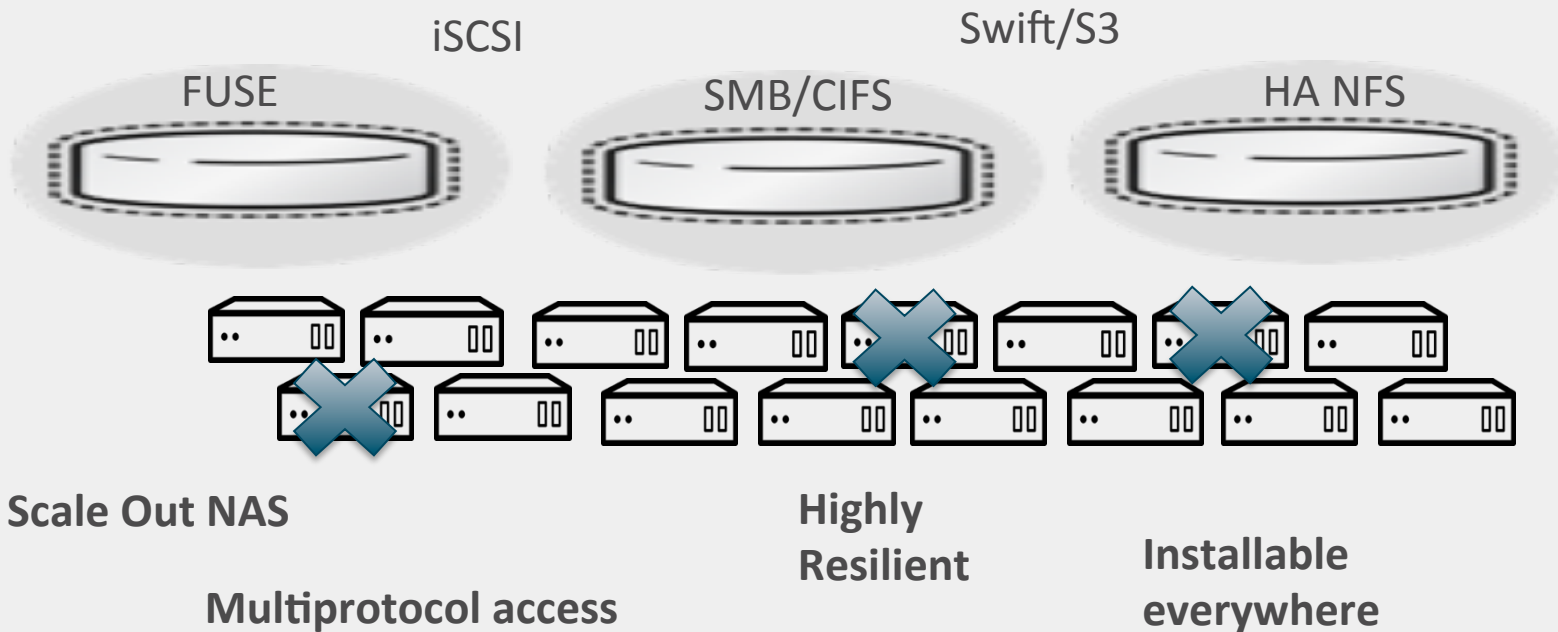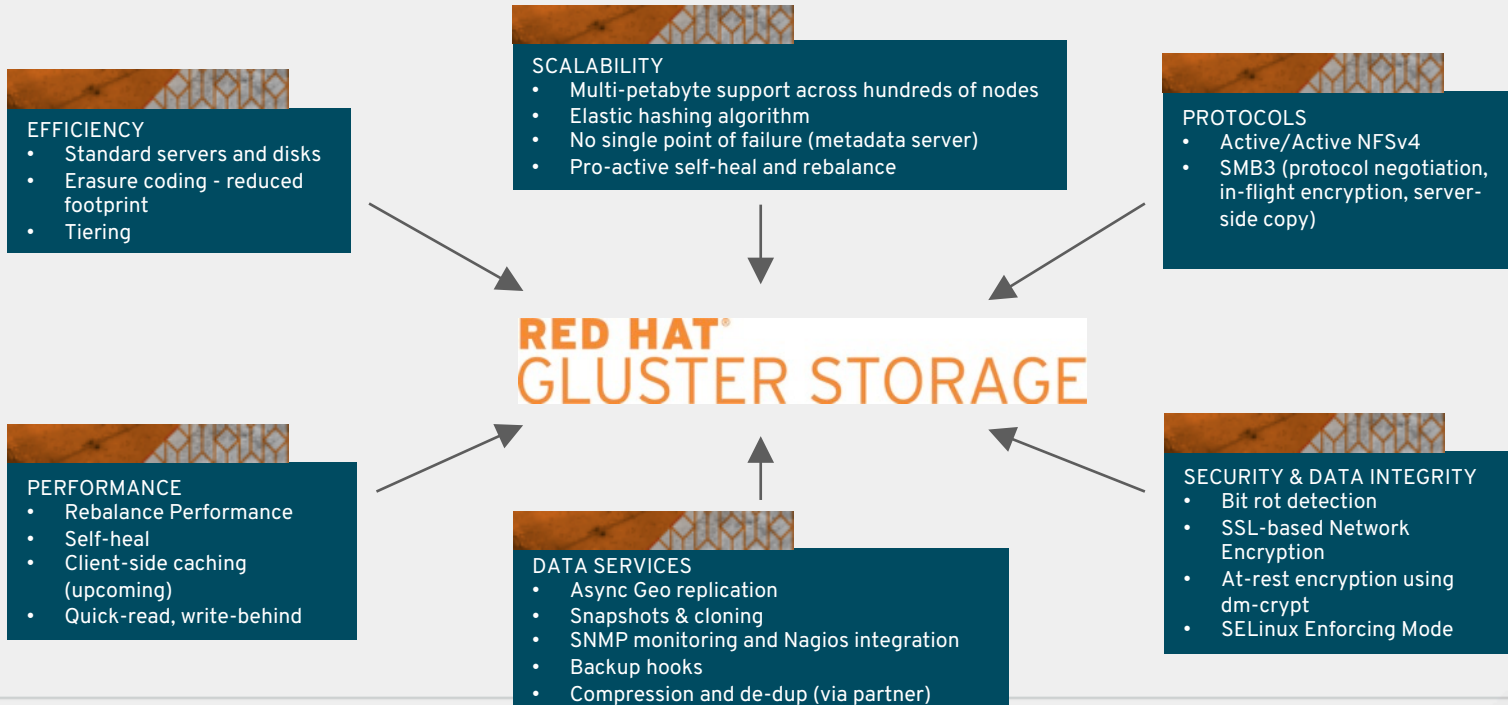All-inclusive feature set

Extremely resilient, performant and secure

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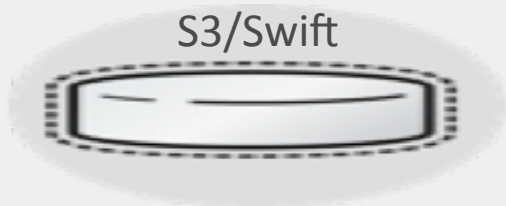# Red Hat Gluster Storage

iSCSI

Swift/S3

FUSE

SMB/CIFS

HA NFS

Scale Out NAS

Highly Resilient

Installable everywhere

Multiprotocol access

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Glusters RICH FEATURE SET

EFFICIENCY
- Standard servers and disks
- Erasure coding - reduced footprint
- Tiering

SCALABILITY
- Multi-petabyte support across hundreds of nodes
- Elastic hashing algorithm
- No single point of failure (metadata server)
- Pro-active self-heal and rebalance

PROTOCOLS
- Active/Active NFSv4
- SMB3 (protocol negotiation, in-flight encryption, server-side copy)

RED HAT® GLUSTER STORAGE

PERFORMANCE
- Rebalance Performance
- Self-heal
- Client-side caching (upcoming)
- Quick-read, write-behind

DATA SERVICES
- Async Geo replication
- Snapshots & cloning
- SNMP monitoring and Nagios integration
- Backup hooks
- Compression and de-dup (via partner)

SECURITY & DATA INTEGRITY
- Bit rot detection
- SSL-based Network Encryption
- At-rest encryption using dm-crypt
- SELinux Enforcing Mode

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Red Hat Ceph Storage

KEY FEATURES

EFFICIENCY
- Standard servers and disks
- Erasure coding - reduced footprint
- Thin provisioning
- Traditional and containerized deployment

SCALABILITY
- Multi-petabyte support
- Hundreds of nodes
- CRUSH algorithm – placement/rebalancing
- No single point of failure

APIs & PROTOCOLS
- S3, Swift, S3A plug-in
- Cinder block storage
- NFS
- POSIX (tech preview)
- iSCSI (tech preview)

RED HAT® CEPH STORAGE

PERFORMANCE
- Client-side caching
- Server-side journaling
- BlueStore (tech preview)

DATA SERVICES
- Snapshots, cloning, and copy-on-write
- Global clusters for S3/Swift storage
- Disaster recovery for block and object storage

SECURITY
- Pool-level authentication
- Active Directory, LDAP, Keystone v3
- At-rest encryption with keys held on separate hosts

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TARGET WORKLOADS – USE CASES

|	
CONTAINER-NATIVE 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

Container Native Storage

What is it and what does it give?

- Solution for creating a suitable storage backend for Openshift.
- Runs **on any existing storage**: DAS, SAN, NAS, Cloud storage.
- Automates the workflow for both developers as operations – very little human intervention needed in daily operations

Business benefits:
- Low TCO due to SDS (50% savings compared to traditional appliances)
- Fully integrated in Openshift – runs where Openshift runs=Massive operational savings
- Protects also Openshift internal processes – makes the whole environment HA
- Makes it possible to create HA solutions also on the storage level in the cloud

CONTAINER-NATIVE STORAGE
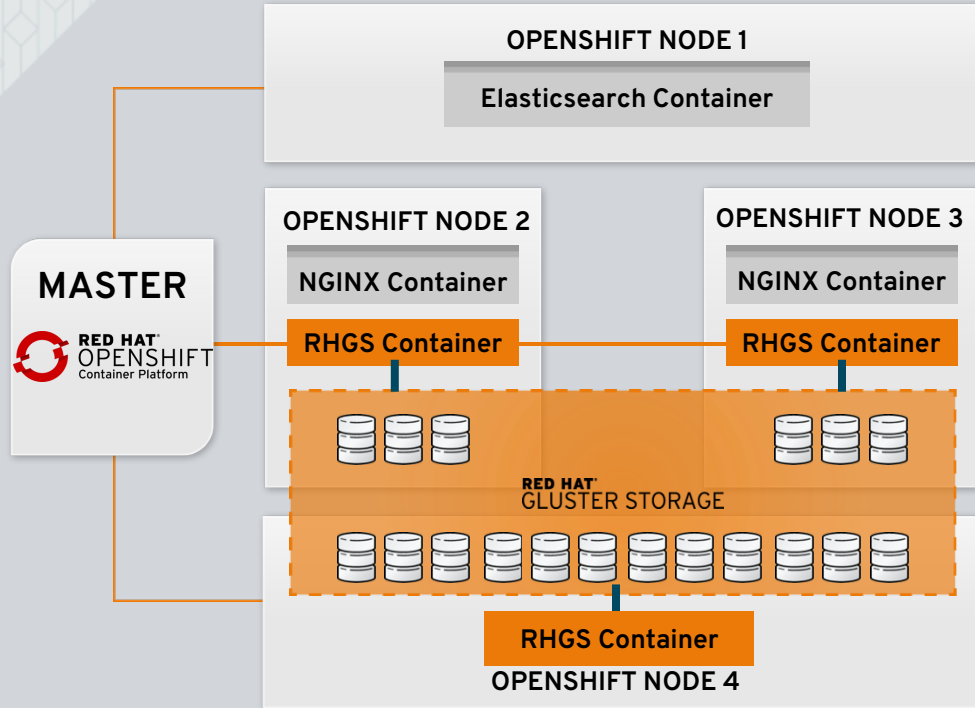
Gluster helps you create Kubernetes controlled tiers from existing storage!

GlusterFS
Ceph RBD
Amazon EBS
Fiber Channel
GCE
iSCSI
NFS
GlusterFS

AUTOMATED CONFIGURATION

SINGLE CONTROL PANEL

CHOICE OF PERSISTENT STORAGE

Private Cloud Infrastructure

What is it and what does it give?

Complete On premise cloud solution for automated provisioning, management and lifecycle handling of IT resources
Red Hat Software Defined Storage is deeply integrated in Red Hats cloud solutions.

Tested and developed in collaboration within Red Hat Openstack Team

Business benefits:

Brings down TCO by massive automation possibilities
Scale out solution both on compute and storage
Gives the possibility to create on premise cloud with services comparable to public clouds

Ex of savings: 500 Hypervisors of common brand vs 500 Hypervisors under OSP:
2M$ lower cost over 3 year without taking STORAGE savings into consideration, just compute.

RED HAT CEPH STORAGE FOR CLOUD INFRASTRUCTURE

Supporting file, object and block storage

- Proven for large-scale, modern workloads

- Open, massively-scalable, software-defined

- Flexible, scale-out architecture on clustered industry standard hardware

- Efficient, unified storage platform (object, block, file)

- User-driven storage lifecycle management with 100% API coverage

- Integrates easily and tightly with OpenStack Cinder, Glance, Nova, Keystone, and Manila
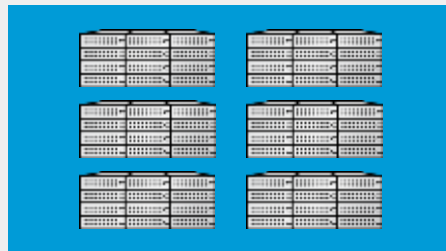
RED HAT® OPENSTACK® PLATFORM

RED HAT® CEPH STORAGE

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Elastic Shared Data Lakes

What is it and what does it give?

Complete On premise cloud solution adjusted and optimized for analytics workload
Red Hat Software Defined Storage is deeply integrated in Red Hats Shared Data lake solutions.
Tested and developed in collaboration with the Red Hat Openstack Team

Lower CapEx
No need to purchase excess storage capacity to maintain extra copies of data sets on multiple stand-alone HDFS islands which need shared access
Cost of purchasing 3x storage capacity vs. 1.375x storage capacity.
Cost of overprovisioning HDFS nodes in order to get more processing cores when additional HDFS storage is not needed

 Lower OpEx
Time/risk costs of missed SLAs due to over-crowded multi-tenant Spark/Hadoop clusters (larger number of smaller clusters orchestrated via RHT infrastructure for big data provides more agility than smaller number of larger cluster).
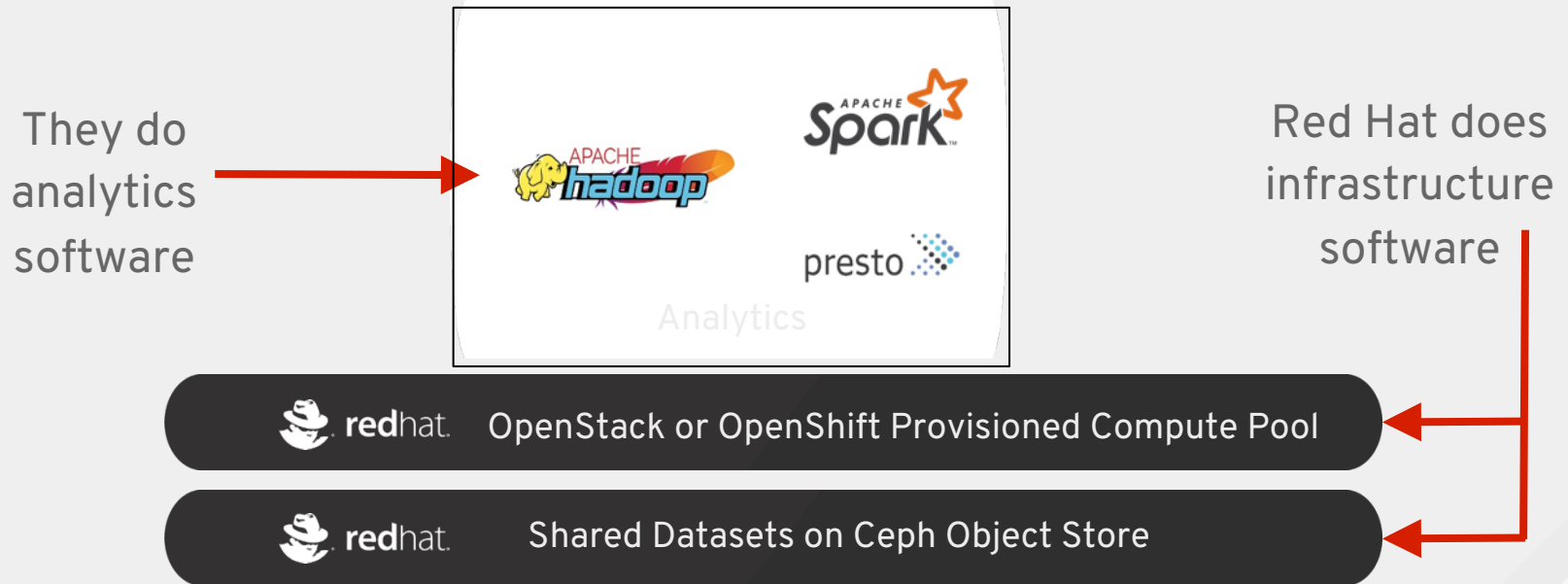Time/risk costs of maintaining scripts to copy datasets between multiple stand-alone HDFS islands which need shared access.
Time/risk costs of hydrating HDFS data store for every new Spark/Hadoop cluster that is spun-up.
Time/risk costs of de-staging HDFS data for ever Spark/Hadoop cluster that is spun-down

Hyperconvergence

What is it and what does it give?

Brings consolidation of compute and storage to the same physical hardware possible.
Savings comes from removal of proprietary FC SAN solutions to Ethernet, from removal of dedicated SAN arrays and from dedicated staff only looking after compute or storage.

Is the combination of Red Hat Virtualization and Red Hat Gluster Storage. Can also be the combination of Red Hat Openstack and Red Hat Ceph Storage.
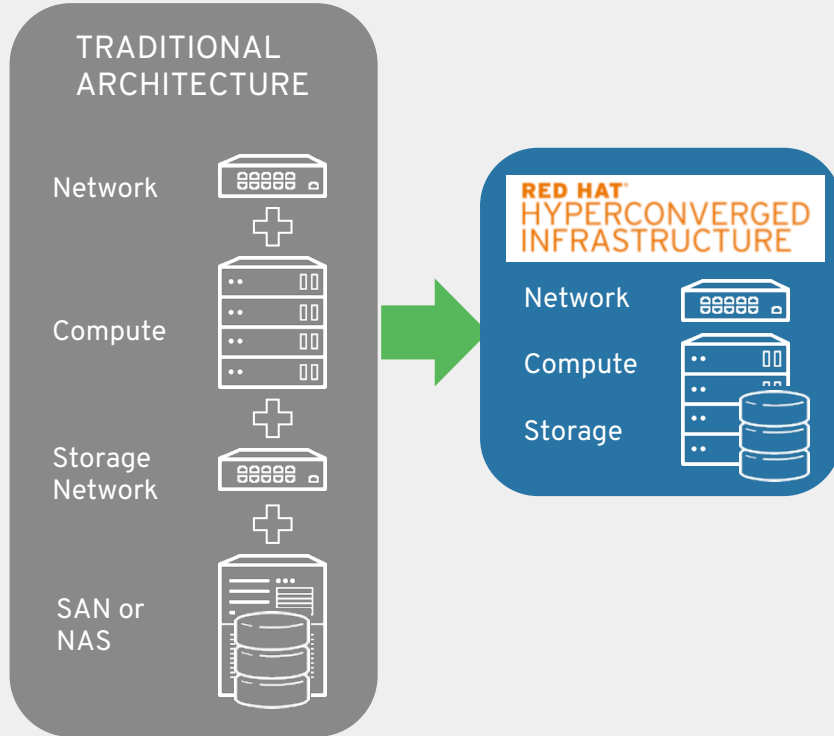
Take advantage of multiple mechanisms for savings:
Hypervisors at a fraction of the cost (30-70% savings)
Software Defined Storage at lower cost compared to traditional appliances (50%+ savings)
Less datacenter space (30-50%)
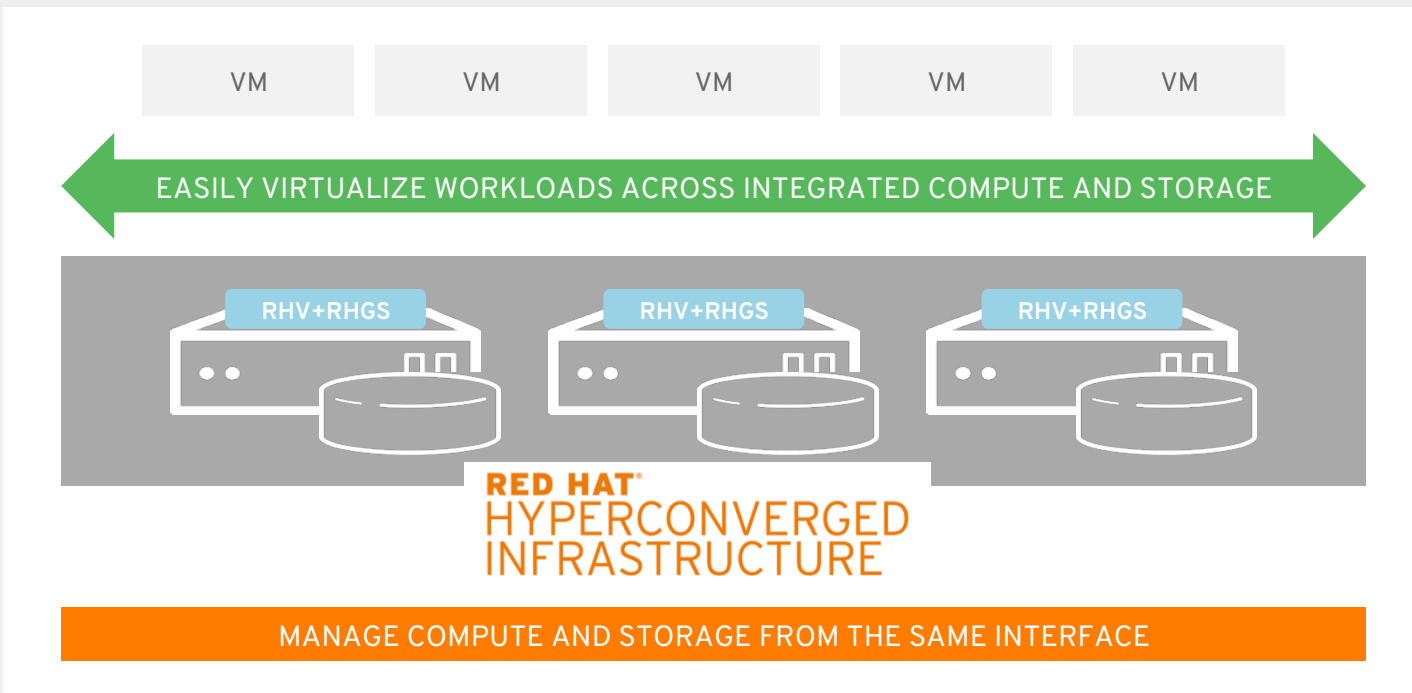Automated workflow gives savings of FTEs needed to manage solution.

Red Hat Virtualization with Red Hat Gluster Storage

TRADITIONAL ARCHITECTURE

Network

Compute

Storage Network

SAN or NAS

RED HAT HYPERCONVERGED INFRASTRUCTURE

Network

Compute

Storage

- **Eliminate** storage as a discrete tier
- **Easily virtualize** business applications, maximizing resource utilization
- **Single budget** for compute & storage
- **Single** team managing infrastructure
- **Simplified** planning & procurement
- **Streamlined** deployment & management
- **Single support** stack for compute & storage

RED HAT HYPERCONVERGED INFRASTRUCTURE
OPTIMIZE, INTEGRATE, MANAGE

| VM | VM | VM | VM | VM |

EASILY VIRTUALIZE WORKLOADS ACROSS INTEGRATED COMPUTE AND STORAGE

RHV+RHGS   RHV+RHGS   RHV+RHGS

RED HAT®
HYPERCONVERGED
INFRASTRUCTURE

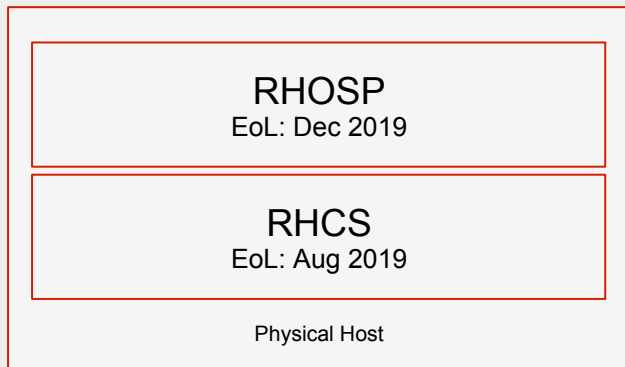**MANAGE COMPUTE AND STORAGE FROM THE SAME INTERFACE**

Red Hat Virtualization and Red Hat Gluster storage as complete offering for Compute and Storage.

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What is RHHI for Cloud?

A new offering for running Ceph Storage and OpenStack Compute functions on the same host.

It combines Red Hat OpenStack Platform and Red Hat Ceph Storage together in a single SKU with a per-node price, supported under a s**ingle, common lifecycle. (EOL dates are examples:))**
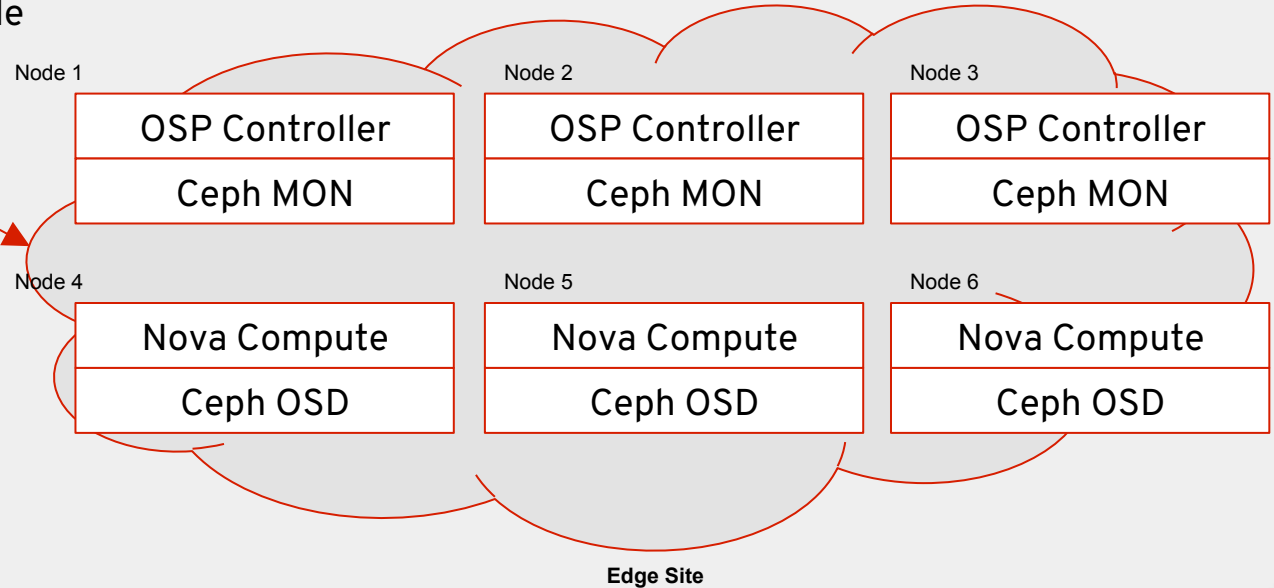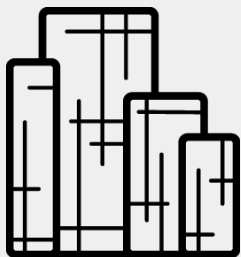
RHOSP
EoL: Dec 2019

RHCS
EoL: Aug 2019

Physical Host

BEFORE

RHHI for Cloud
EoL: Dec 2019

Physical Host

AFTER

How is it deployed?

New SKU:
Red Hat Hyperconverged
Infrastructure for Cloud, node
based

Node 1
| OSP Controller |
| Ceph MON |

Node 2
| OSP Controller |
| Ceph MON |

Node 3
| OSP Controller |
| Ceph MON |

Node 4
| Nova Compute |
| Ceph OSD |

Node 5
| Nova Compute |
| Ceph OSD |

Node 6
| Nova Compute |
| Ceph OSD |

Edge Site

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What is the target market?
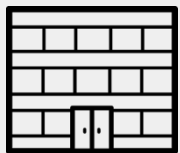
NFVi Core	NFVi Edge	Private Cloud	Not recommended for Public Clouds
✅	✅	*At small scale*	❌

Predictable storage growth with compute growth	Storage Growth > Compute growth

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What are the features?

- OSP director as a single orchestration manager

- CPU resource management via NUMA pinning and memory management via KVM

- Reduces minimum OSP+Ceph cluster size to 6 nodes.

- Scales to 30 nodes (support available on request for larger sizes)

- Full support for Nova and OpenStack Storage services including Nova/Cinder/Glance/RGW

- Container-based deployment model

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Repository for media and unstructured data

What is it and what does it give?

Take advantage of the Scale Out capabilities in both Red Hat Gluster Storage and Red Hat Ceph Storage.

Brings massive consolidation of file systems into one unified namespace.

Red Hat Gluster Storage gives traditional access via NFS, SMB or Swift/S3 with complete feature stack compared to traditional appliances.

Red Hat Ceph Storage provides a bridge from traditional NAS access to object access via NFS Gateways to the Object storage system, making it easier to change access method from file access to object access.

Savings compared to traditional storage appliances are +50% over a three year cycle.

Example: Rich Media

Massively-scalable, flexible, and cost-effective storage for image, video, and audio content

Unstructured image, video, and audio content

Red Hat Gluster Storage Cluster

Red Hat Ceph Storage Cluster

FEATURES	BENEFITS
• Support for multi-petabyte storage clusters on commodity hardware	• Provides massive and linear scalability in on-premise or cloud environments
• Erasure coding and replication for capacity-optimized or performance-optimized pools	• Offers robust data protection with an optimal blend of price & performance
• Support for standard file & object protocols	• Standard protocols allow access to broadcast content anywhere, on any device
• Snapshots and replication capabilities for high availability and disaster recovery	• Cost-effective, high performance storage for on-demand rich media content

Easy ways to find storage cases:

Position CNS to all Openshift customers.

Present RHHI for classic mode 1 workloads and distributed environments.

Help us finding the Large data lake customers (MultiPB, Multiclusters)

Explore the OSP market together with us (Finance next market rising)

Use RH SDS for the large unstructured data use case (Backup, media, large filers, object)

Proof points

Red Hat Gluster Storage for Media workflows:
https://www.redhat.com/en/resources/gluster-media-analyst-whitepaper
The economics of Software Defined Storage:
https://www.redhat.com/en/resources/economics-of-software-defined-storage-idc-whitepaper
Red Hat Storage One – Factory prepared Software Defined Storage
https://redhatstorage.redhat.com/2018/05/03/introducing-red-hat-storage-one/
Red Hat Ceph Storage – what the industry think:
https://redhatstorage.redhat.com/2018/05/09/more-accolades-for-red-hat-ceph-storage/
Inuit Case Study:
https://www.redhat.com/en/resources/intuit-leverages-red-hat-storage-always-available-and-massively-scalable-storage

Climb Case Study:
https://www.redhat.com/en/resources/climb-case-study