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CONTAINER NATIVE STORAGE

Red Hat Forum Vienna

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Gregor Wolf
Storage SSP - DACH

gregor.wolf@redhat.com

AGENDA

- Storage Is Changing
- Red Hat Storage Overview
- Storage for Containers
- What Users Say
- Red Hats Stack
- Container Native Storage

STORAGE IS CHANGING

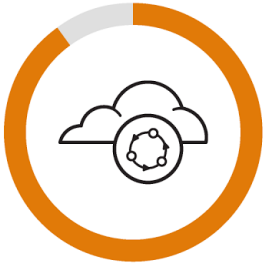
THE INDUSTRY IS RETHINKING STORAGE

38%

of IT decision makers report ***inadequate storage capabilities*** as one of their top three weekly pain points

70%

of IT decision makers admit that their organization's current storage ***can't cope with emerging workloads***



98%

of IT decision makers believe ***a more agile storage solution could benefit their organization***

Bourne Ltd: Storage limitations, frustrations, and coping ıre needs, Red Hat Storage research results, June 2016

STORAGE NEEDS VARY

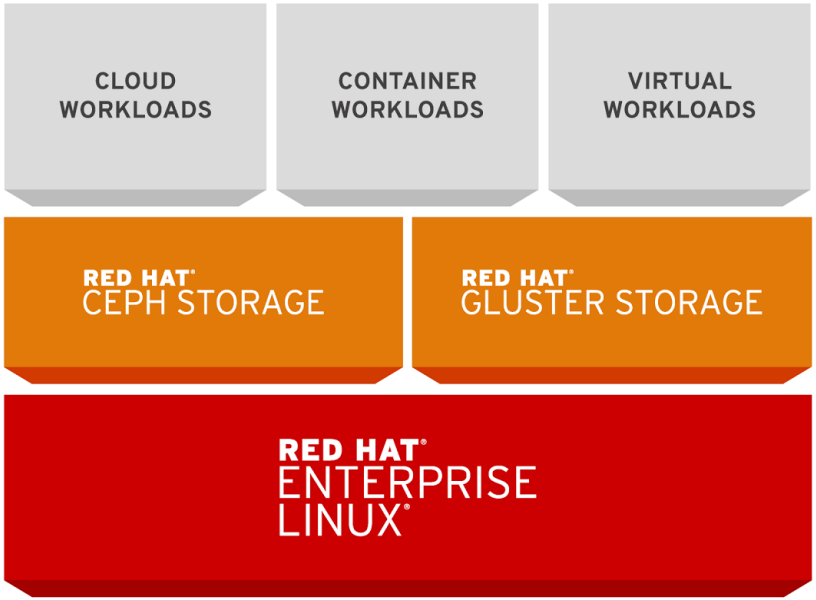
Not All Storage Workloads Come In The Same Size and Shape

Platforms like OpenStack and OpenShift are unpredictable

Backups require petabyte-scale at a low cost

Data and media lakes require elasticity and performance

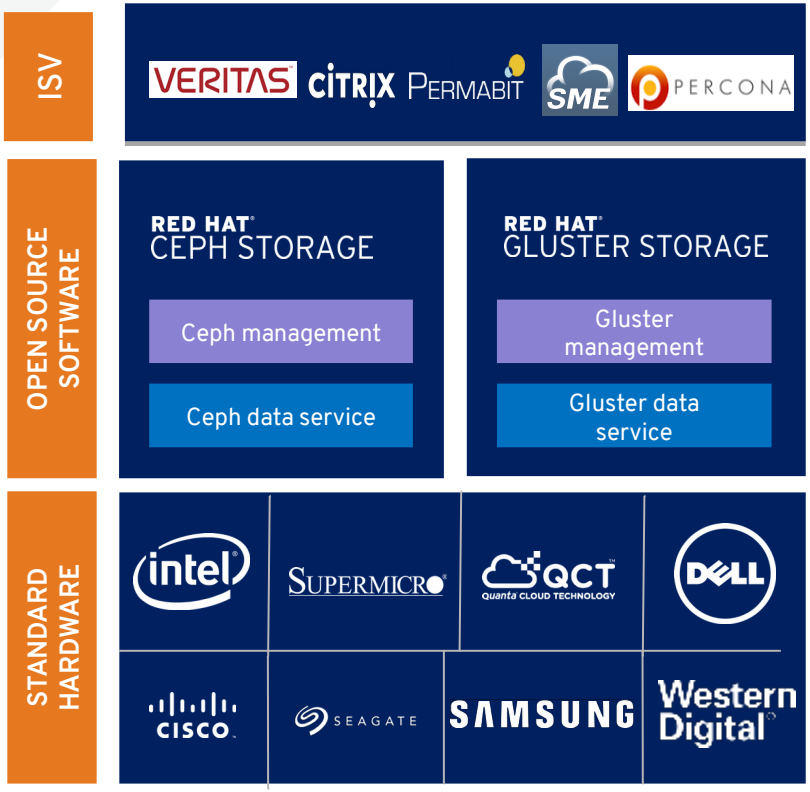
STORAGE IS ESSENTIAL



Every solution we deliver to customers requires an operating system and durable, flexible storage.

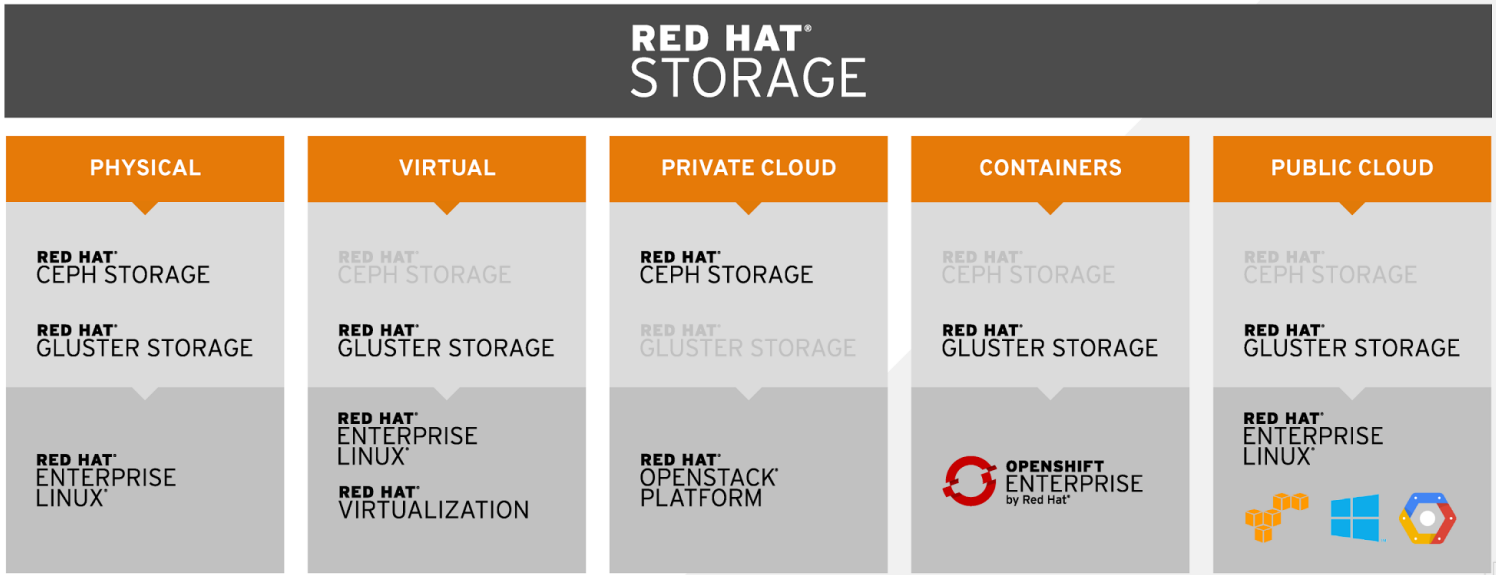
RED HAT STORAGE

RED HAT STORAGE ECOSYSTEM



- Share-nothing, scale-out architecture provides durability and adapts to changing demands
- Self-managing and self-healing features reduce operational overhead
- Standards-based interfaces and full APIs ease integration with applications and systems
- Supported by the experts at Red Hat

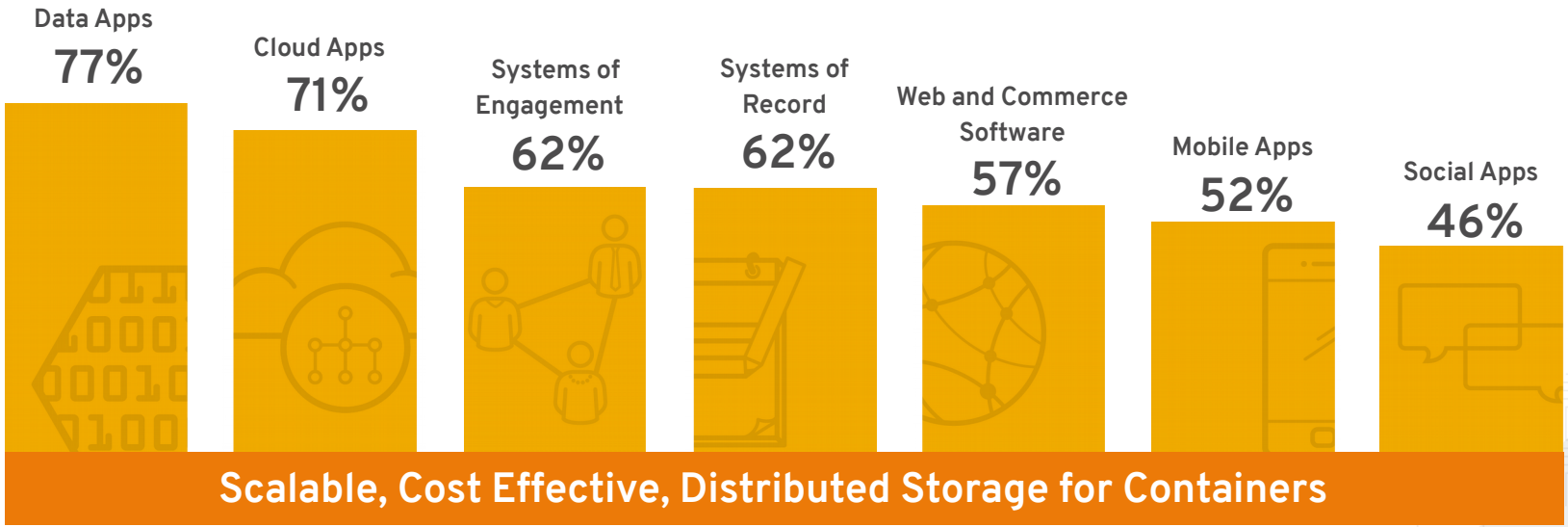
OUR STORAGE IS DEEPLY INTEGRATED



STORAGE FOR CONTAINERS

WHY PERSISTENT STORAGE FOR CONTAINERS?

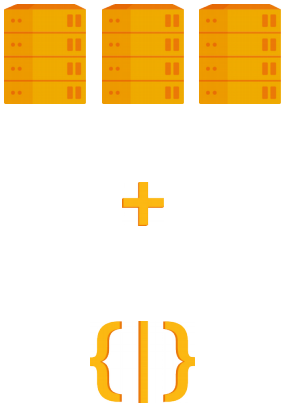
"For which workloads or application use cases have you used/do you anticipate to use containers?"



Base: 194 IT operations and development decision-makers at enterprise in APAC, EMEA, and North America
Source: A commissioned study conducted by Forrester Consulting on behalf of Red Hat, January 2015

THE NEW FACE OF STORAGE IN APPDEV CENTRIC IT

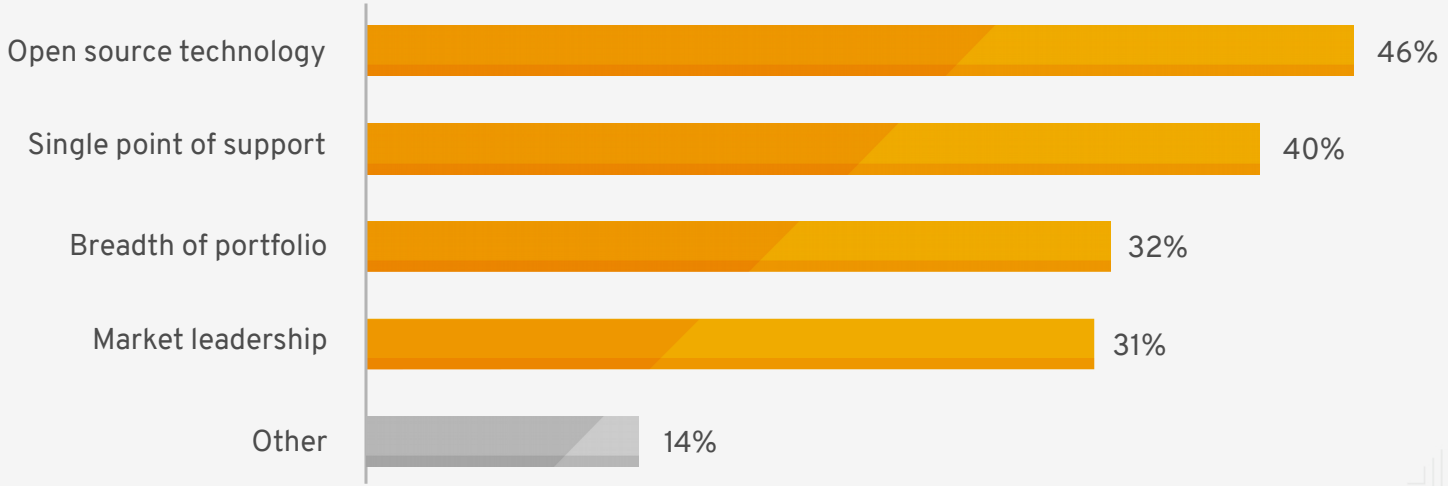
- Software-defined storage is tailored to help customers get the most of containers
- Traditional storage cannot offer the speed and agility required for modern applications



SURVEY SAYS...

CRITERIA FOR SELECTING CONTAINER VENDORS

What is your primary criteria when choosing a container technology vendor?



Source: TechValidate survey of 244 users of Red Hat Storage

SURVEY SAYS...

CONTAINER STORAGE CHALLENGES

What are your biggest pain points with regard to container storage?

Source: TechValidate survey of 255 users of Red Hat Storage

RED HAT GLUSTER STORAGE RUNS EVERYWHERE OPENSHIFT RUNS

RED HAT® OPENSHIFT Container Platform

BARE METAL	VIRTUAL MACHINES	CONTAINERS	PUBLIC CLOUD
RED HAT® GLUSTER STORAGE	RED HAT® GLUSTER STORAGE	RED HAT® GLUSTER STORAGE	RED HAT® GLUSTER STORAGE
RED HAT® ENTERPRISE LINUX®	vmware	OPENSHIFT ENTERPRISE by Red Hat®	

SUPPORTED EVERYWHERE

WHY PERSISTANT STORAGE FOR OPENSHIFT?

- Storage is not the same – characteristics *and* handling *and* options matter
- Static provisioning:
  - NFS – HA (mostly not inline with cloud idea and clunky)
  - Block storage (same as above
  - Pre-provisioning needed – more load to storage admins
  - granularity may be wrong (1, 2, 5, 10 20, 50 GB ?)
  - Mostly difficult to cope with deletions (holes)
  - Users consume mostly the wrong size
  - Reuse of volumes is insecure if data is not properly deleted
  - # block storage volumes blow the number of volumes supported by the platform
- Dynamic provisioning:
  - Must be conform to cloud behavior
  - Must be robust for maintenance and failure
- Customers care about:
  - Easy maintenance
  - Long term technology stable (h/w & s/w)
  - Easy handling to remove load from storage team (only quota, classes)
  - Best case: users can provision on their own

CONTAINER STORAGE PROVISIONING

STATIC PROVISIONING

Admin interactions are required
Less efficient storage usage:
OpenShift Provisioner picks nearest close capacity
Manual housekeeping/cleanup required

DYNAMIC PROVISIONING

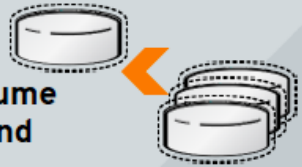
Automated Storage provisioning
Storage capacity precisely delivered, not approximately
Housekeeping complete automated

Static Provisioning workflow

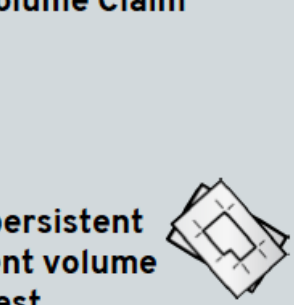
1 Multiple volumes created and registered with OpenShift

2 Submit Persistent Volume Claim

3 An available persistent volume is picked out of the pool and bound to the persistent volume claim



Dynamic Provisioning (CNS)



1 Submit Persistent Volume Claim

2 OpenShift requests volume to be created

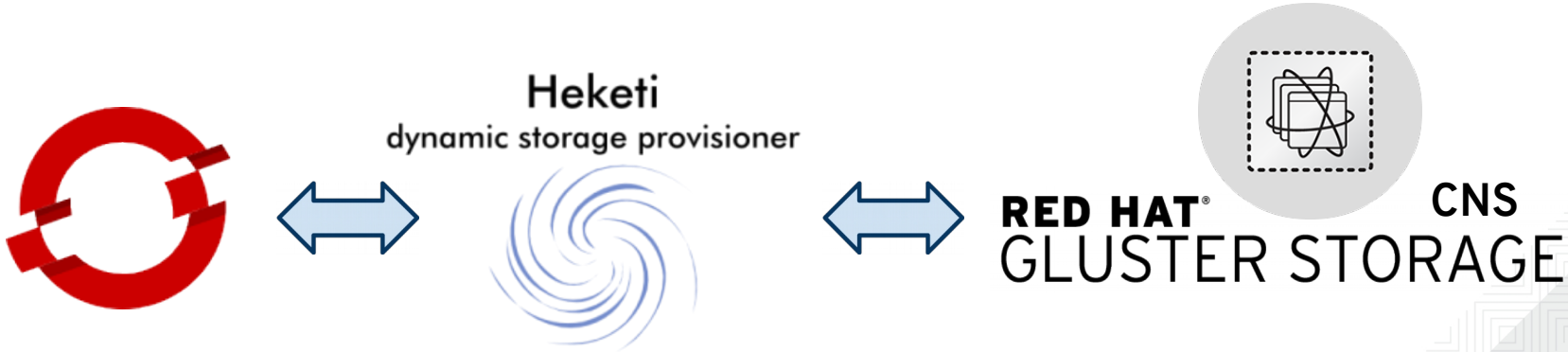
4 OpenShift binds persistent volume to persistent volume claim request

3 Persistent volume is created by storage system and registered with OpenShift

STORAGE PROVISIONER HEKETI

HEKETI

- **Provisioner for persistent storage volumes**
- **RESTful API service**
- **Service Broker between OCP and Gluster CNS**
- **Runs as a container inside OpenShift**
- **BoltDB Database – Safely stored on CNS**



TWO FLAVORS OF CONTAINER STORAGE

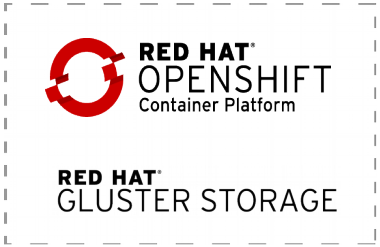
CONTAINER-READY STORAGE

STORAGE **FOR** OPENSHIFT

- Leverages existing investment in traditional storage, managed by storage admin
- Attach to stand alone Red Hat Gluster storage

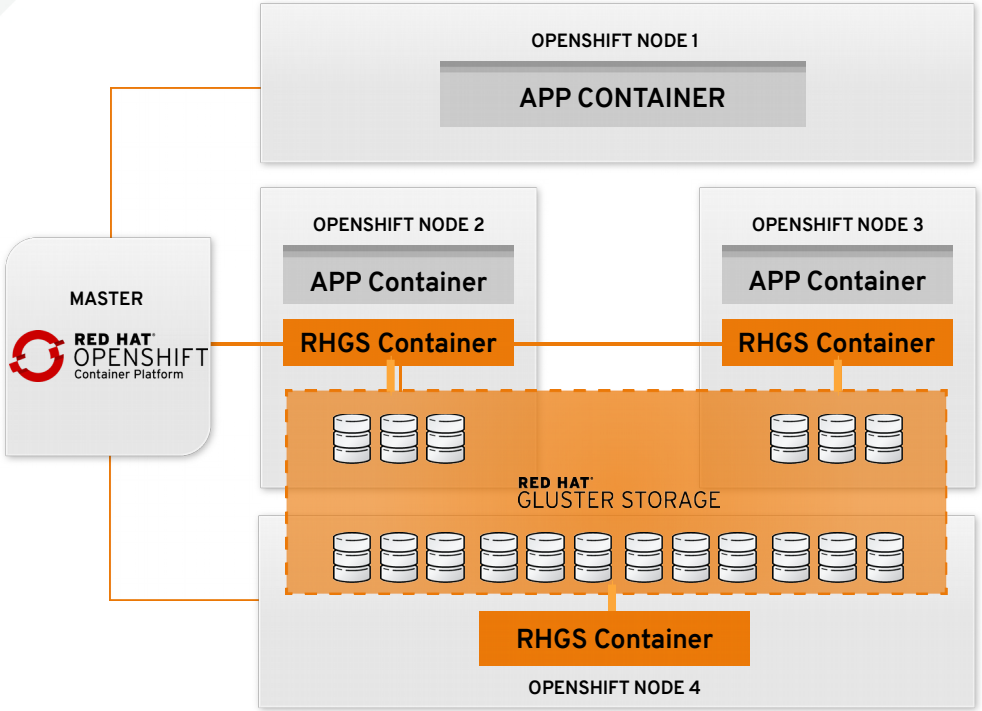
CONTAINER-NATIVE STORAGE

STORAGE **IN** OPENSHIFT



- Highly scalable, enterprise-grade storage, fully integrated into OpenShift Container Platform

CONTAINER-NATIVE STORAGE



- Co-Locate Storage and Apps
- Dynamic Provisioning
- Managed by OpenShift
- Infrastructure-Agnostic

BENEFITS OF CONTAINER NATIVE STORAGE

- **Unified cluster** - Hosts can either run compute, or storage containers or both in a converged environment
- **Unified scheduler** - Use kubernetes to deploy compute and storage containers in “compute-intensive” and “storage-intensive” hosts
- **Unified management pane** - Storage containers are managed and monitored using a single pane of management
- **Consistent upgrade** - Upgrading the storage platform is as easy as upgrading the storage containers
- **Single point of support** – No finger pointing between storage, container host, and orchestration vendors

Vs.

RECENT CUSTOMER WINS

- VPS (Norway Stock Exchange)
- British Columbia Government
- LanBanque Postale
- Amsterdam Schiphol Airport
- Macquarie Bank
- Bank of NZ
- Walmart Labs
- Sabre
- Experian
- BP
- CapitalOne
- Verizon
- Brinker
- SkyTV

Looking for your next CNS steps ?

- Contact the Red Hat DACH Storage team !

Specialized Solution Architect

Matthias Muench

mmuench@redhat.com

Phone us:
+49.172.6144606

Storage Sales DACH

Gregor Wolf

gregor.wolf@redhat.com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