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NEXT GENERATION SOLUTION FOR RED HAT OPENSHIFT CONTAINER PLATFORM

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Hewlett Packard Enterprise

HPE Next Generation Solution for Red Hat Openshift Container Platform

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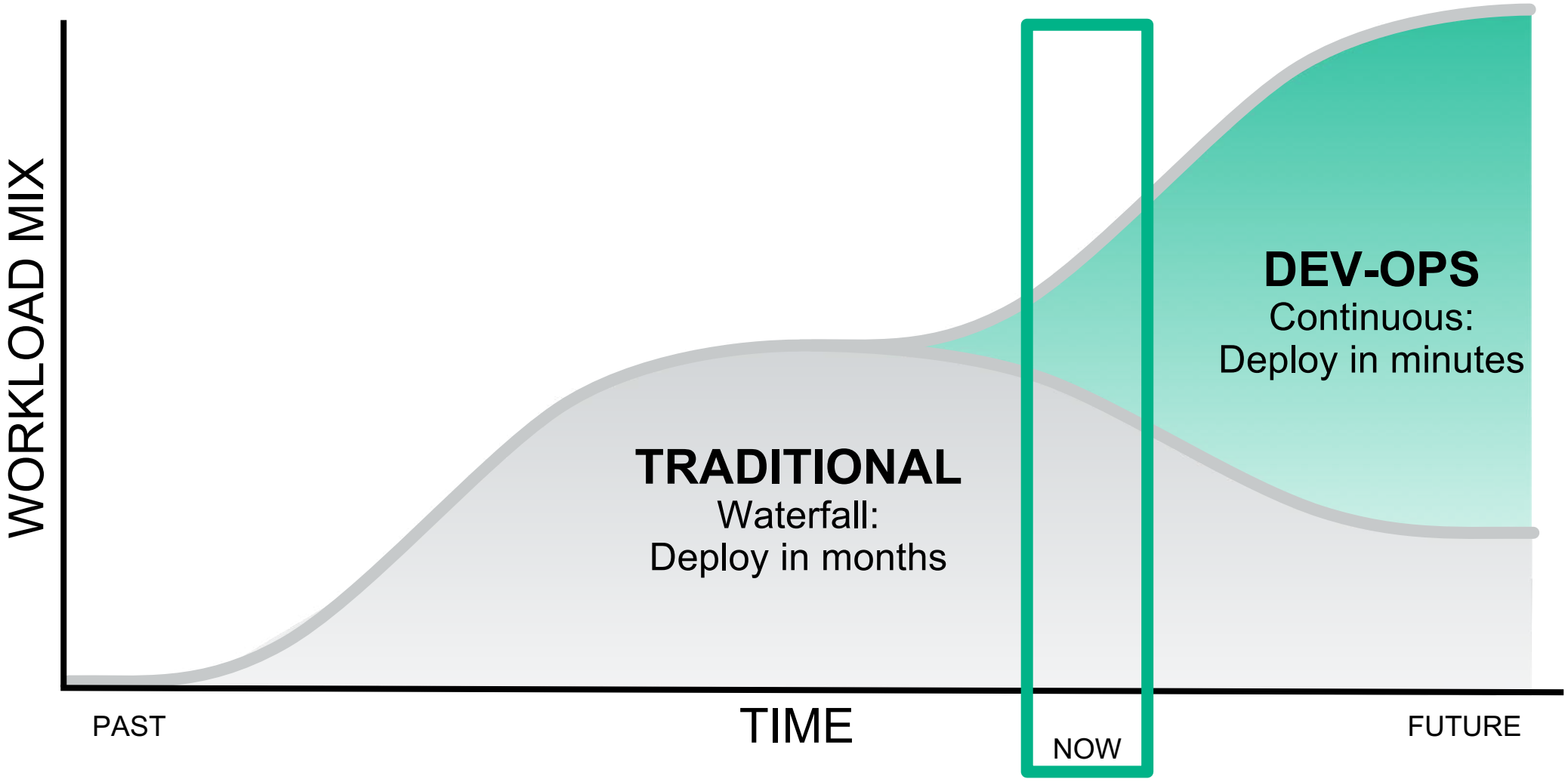
10 September 2019

Why Red Hat and HPE together ?

Shifting on-prem workload-mix from static to dynamic



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Red Hat & HPE joint forces

The next generation container solution added value

Accelerate container adoption and deployment from POC to production

Cloud-like experience: fast deployment & scale, secure, easy manage

Complete solution that is adaptable to customer operational preferences

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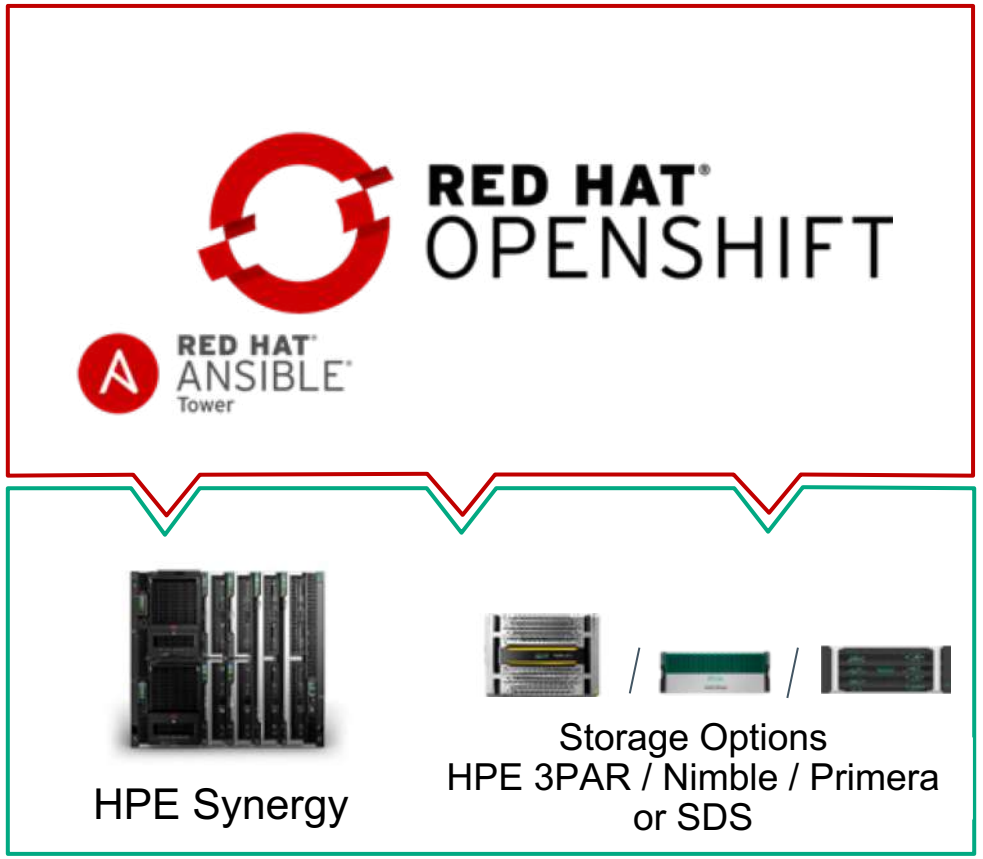
Next Generation Solution for Red Hat OCP

Integrated and can be tailored instantly, on demand, to meet business needs.

Powered by Red Hat OpenShift Container Platform on HPE Synergy

- Complete out-of-the-box container solution that deploys fast and brings immediate value
- Ideal for environments where scalability, security, persistent storage and easy management are required
- Focus on Enterprise and Medium Business customers



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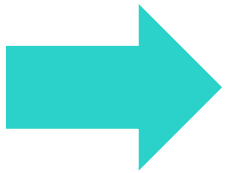
HPE solution approach to containers

Reference Architecture*

Deployment guide*

Services

Ansible playbooks*



Production ready solution

(HA, security, data protection, disaster recovery)

Openshift Master & infrastructure nodes	**Openshift Worker nodes**
RedHat or VMware Hypervisor	Hypervisor or / and Bare Metal OS

HPE Synergy
Composable Infrastructure

Storage Choice: **HPE 3PAR / Nimble / Primera / SDS / RHCS**

HPE PointNext and HPE Financial Services
Consulting/support/education
HPE Flexible Capacity / HPE Technology Refresh

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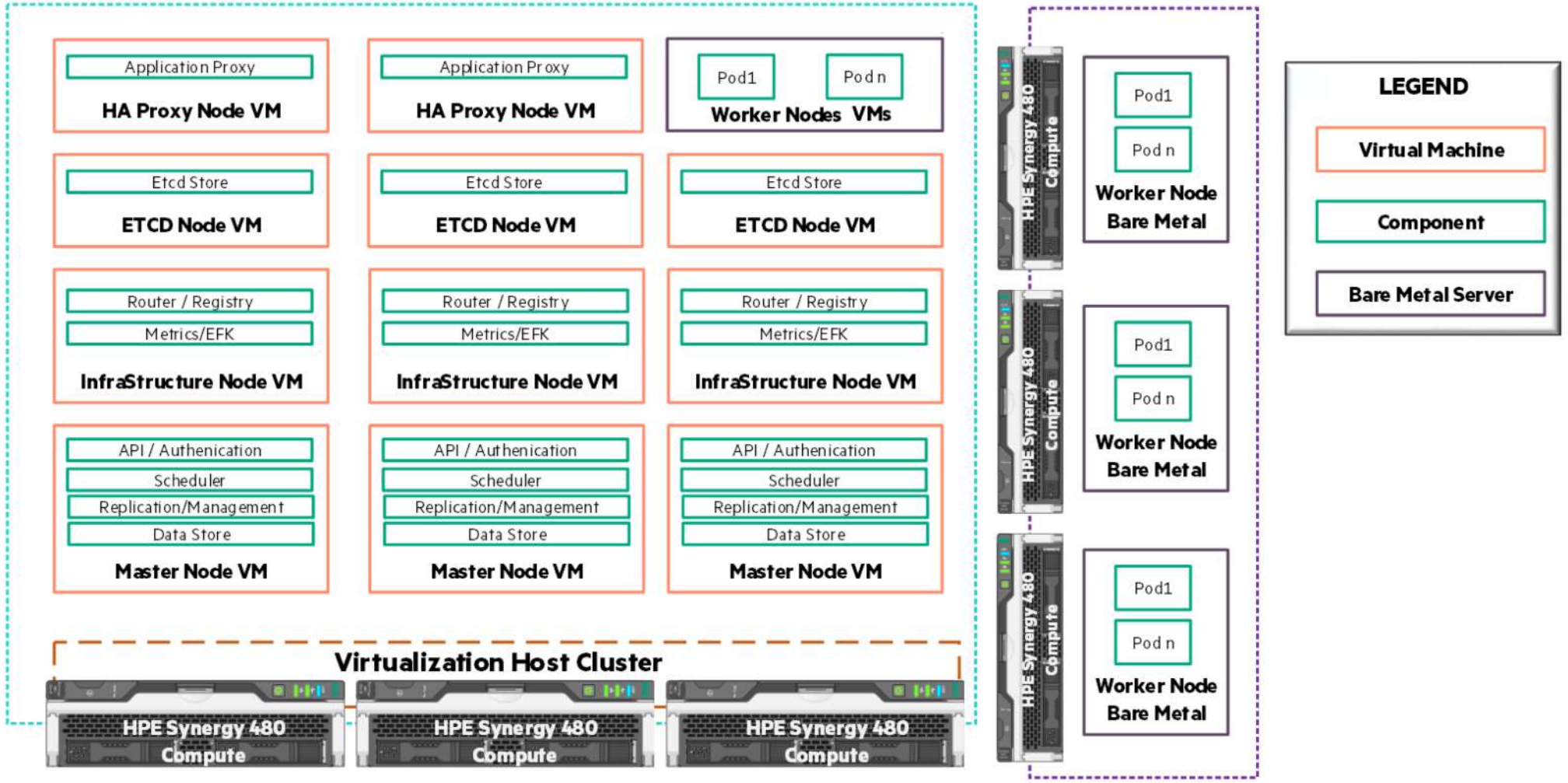
* Free for use, available at: https://github.com/HewlettPackard/hpe-solutions-openshift/tree/master/synergy/scalable

Solution overview - compute layout

The deployment automation allows adaptability to specific customer needs



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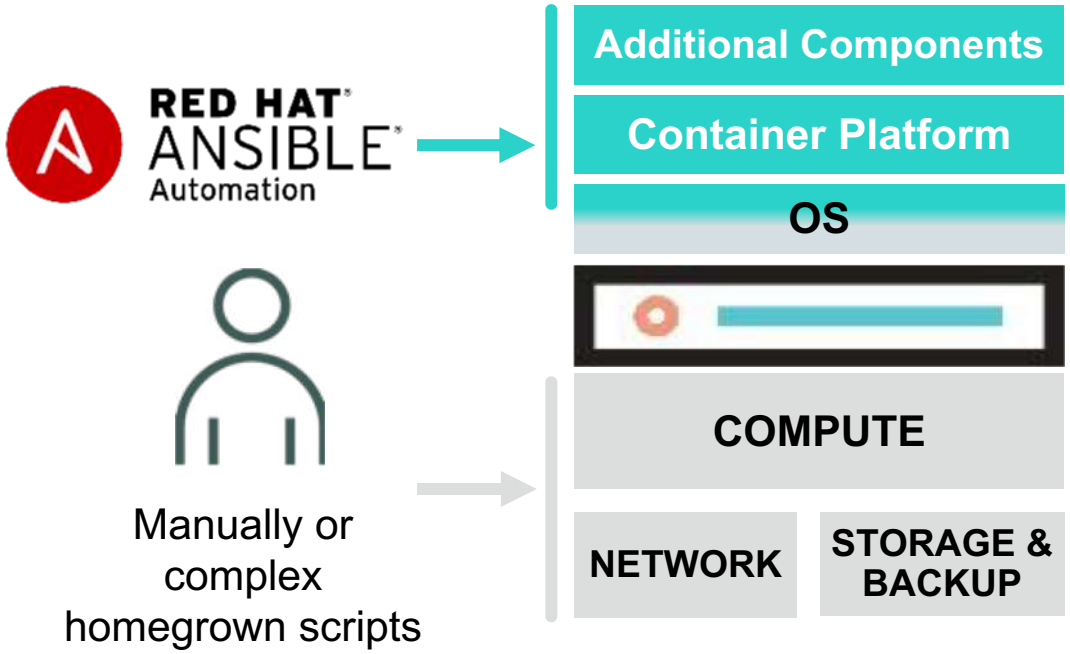
Programmable physical infrastructure

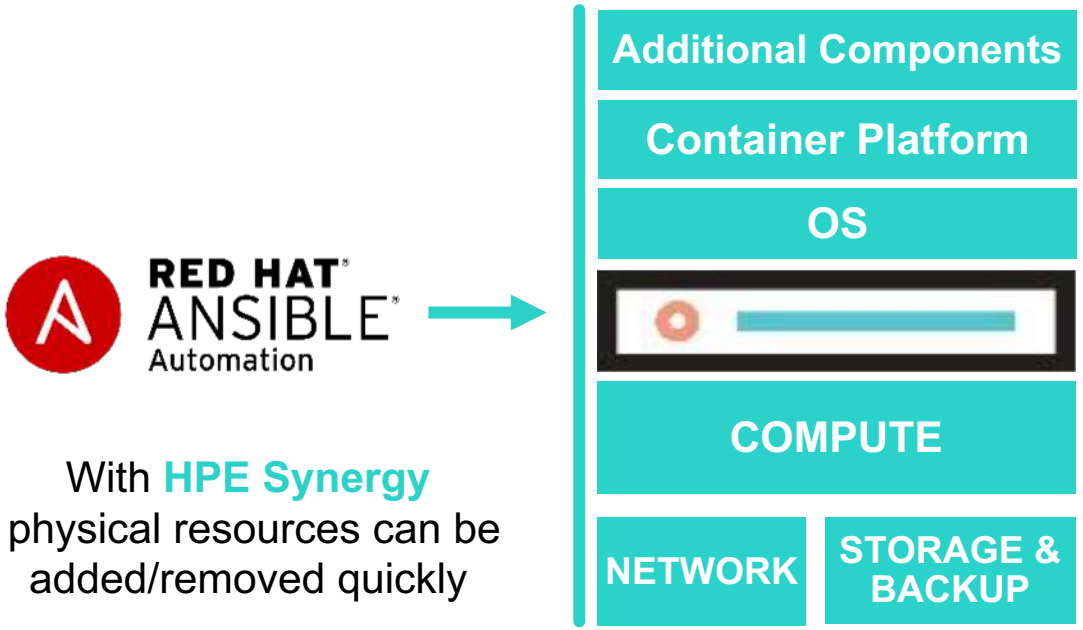
Conventional

Complex Infra Deployment and Lifecycle Management



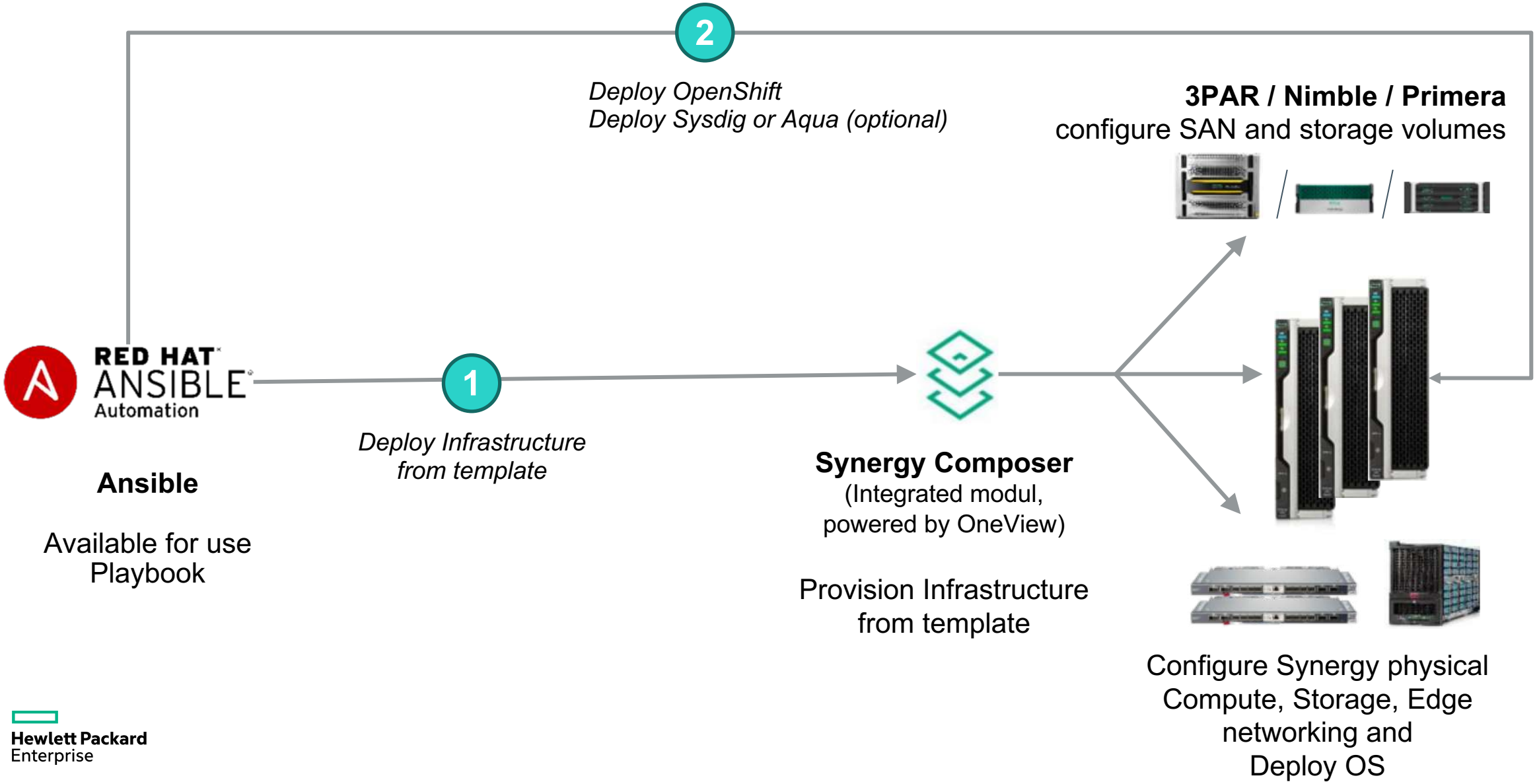
Next Level of Automation

Automate All



HPE OneView Ansible Module Repository:
https://github.com/HewlettPackard/oneview-ansible

Solution automated deployment & scale out



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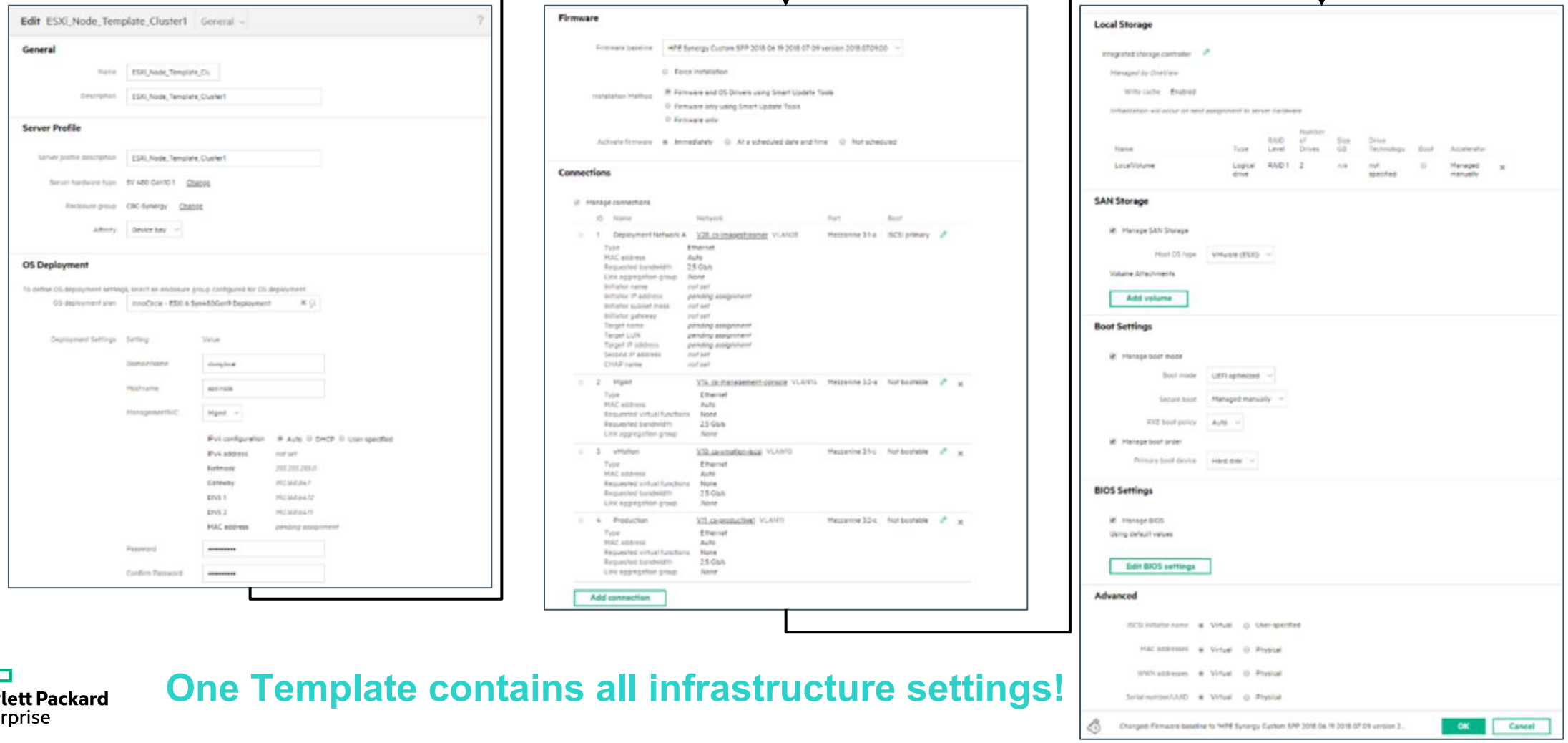
Automated deployment and scale out – overview 1/2

Create Server Profile Template from Synergy Composer GUI/API following the Solution deployment guide



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One Template contains all infrastructure settings!

Automated deployment and scale out – overview 2/2

Ansible Automation for Synergy node deployment from Template

```
vars:
  - config: "{{ playbook_dir }}/oneview_config.json"
  - sp_template: RHOCP Template Worker Node
  - sp_name: RHOCP Cluster 1 Worker Node1

tasks:
  - name: Create a Server Profile from a Server Profile Template
    oneview_server_profile:
      config: "{{ config }}"
      auto_assign_server_hardware: true
      data:
        name: "{{ sp_name }}"
        serverProfileTemplateName: "{{ sp_template }}"
```

Input Data

Provision Server from Server Profile Template.

Simpler Playbook = more reliable behavior & lower operation cost

Why did Experian go with HPE Synergy and Red Hat OCP?

Experian is a multinational consumer credit reporting company that collects and aggregates information on over one billion people and businesses

Jonathan Deeming (Vice President PaaS CoE at Experian):

- **Composer**
  - Pervasive automation embedded at the frame-level, including coordination across multiple frames.
  - Allows the scripted configuration of the setup of an enclosure, reducing time-to-configure and the risk of manual configuration errors or missing process steps.
- **Fabric**
  - Network connectivity managed at frame level
- **Storage**
  - Local storage capabilities
- **Compute**
  - HPE firmware.

+

- **Enterprise Kubernetes**
- **Led on security**
  - TLS by default
  - Embedded SELinux
- **Run their own cloud**
  - Pen-testing for real!
- **Continued investment**
  - CoreOS acquisition
  - Upstream contributions e.g. RBAC

Partnership

Rolling your own is hard work!

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HPE Synergy ROCKS!

Delivers business benefits for customers from execution to superior economics

More than **3,300** customers

Automate everyday operations

Increase productivity and control across the data center

8x

Improvement in deploying O/S and application workloads

Deploy at cloud-like speed and scale

Optimize application and service delivery

10x

Reduction in provisioning of infrastructure

One infrastructure for any application

Eliminate silos, free up resources and simplify IT operations

15%

Saving on both CAPEX and OPEX

Develop apps faster and smarter

Accelerate your business with a developer-friendly infrastructure

94%

Faster delivery of compute resources

Storage Options for Openshift from HPE

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HPE Plugin for container persistence storage

Certifications and Community Contributions

Docker Certified Volume Plugin

Dynamic Provisioner FlexVolume Driver

Open Source Projects Dory

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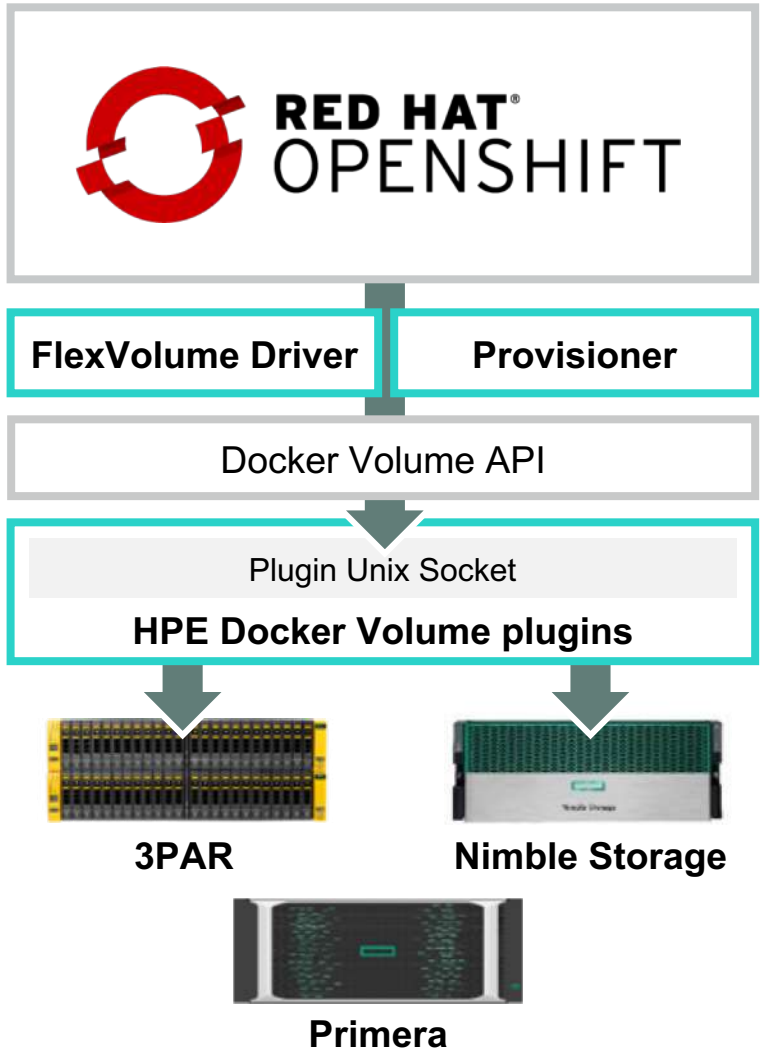
HPE Persistent Storage platform for Red Hat OpenShift



Open APIs + HPE Storage open-source software*

Platform specific integration

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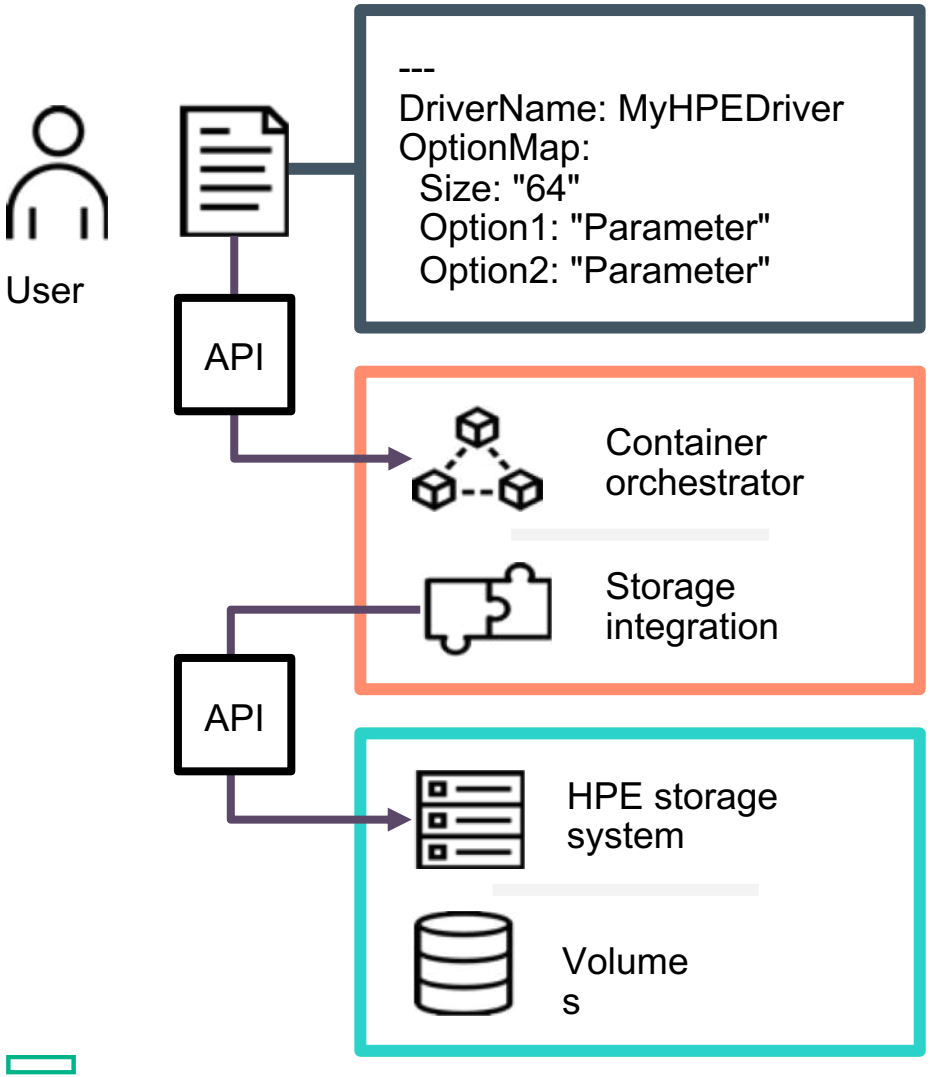
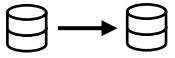
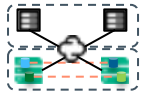
*https://github.com/hpe-storage/dory

Common ecosystem controls for persistent storage



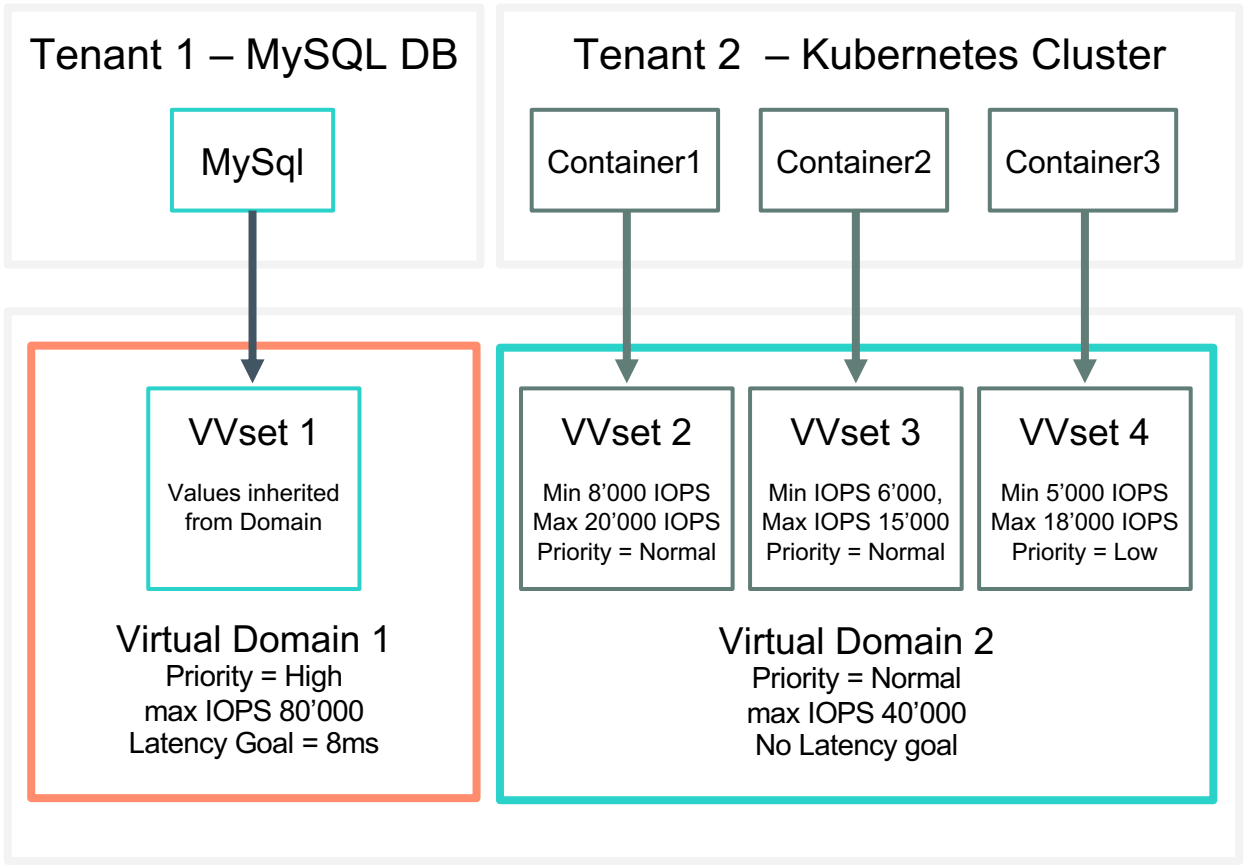
HPE 3PAR parameters	
	flash-cache: “enabled"
	qos-name: “vvset_iops” qos-name: “vvset_throughput” qos-name: “vvset_latency”
	provisioning: “thin“ crovisioning: “full”
	dedupe: “true” compression: “true”
	virtualCopyOf: “Volume“ expirationHours: “8” retentionHours: “8”
	cloneOf: “Volume_Clone"
	Remote Copy and Peer Persistence

3PAR Priority Optimization (QoS) with Docker Volumes

Protect your production container applications

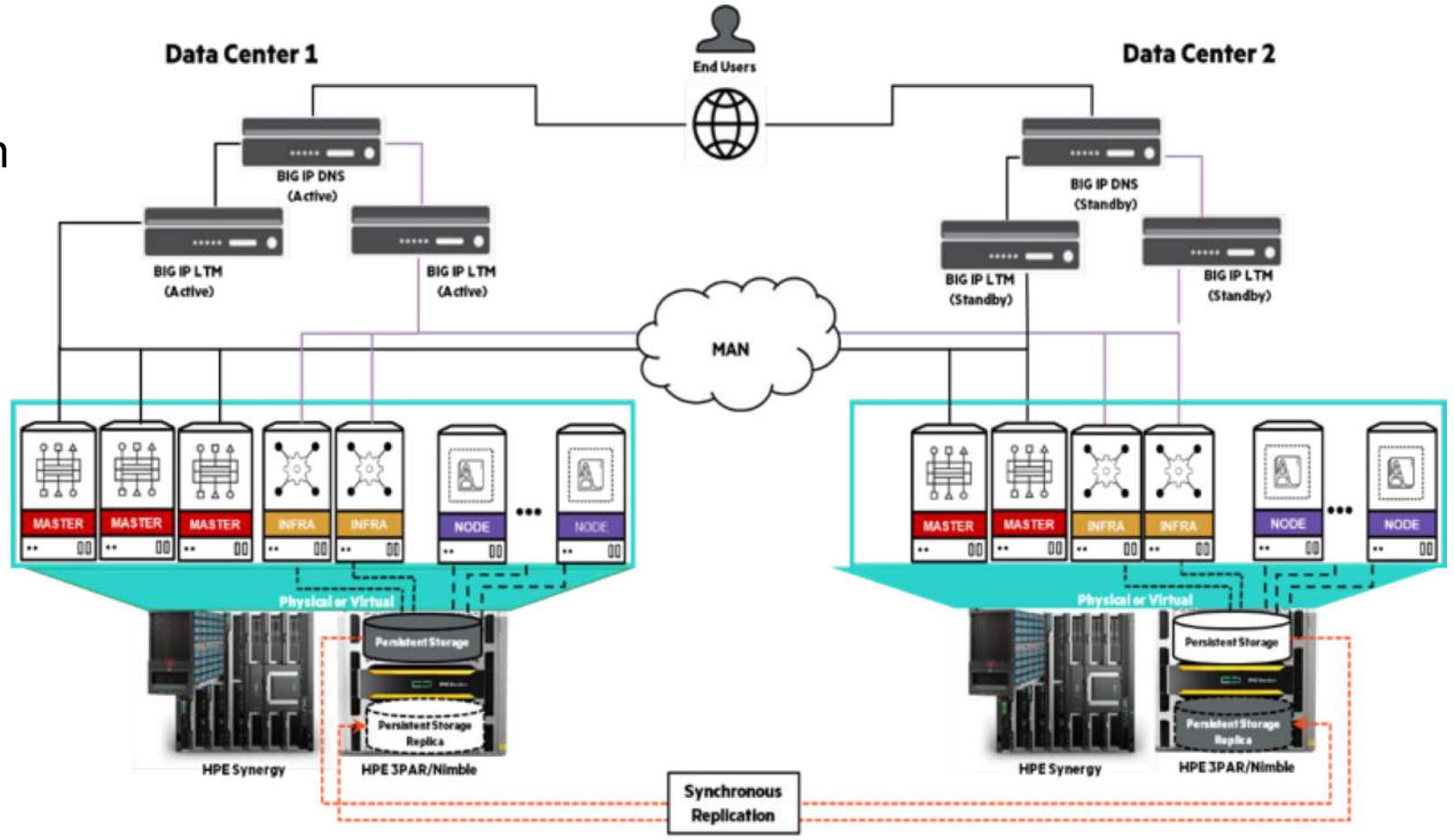
Assure tenant/application level QoS by assigning priorities, targets and caps to VV sets and/or Virtual Domains

- Max limit – IOPS or bandwidth per object
- Min goal – Min floor for IOPS or bandwidth
- Latency goal – Service level target for an object
- Priority level – throttle order for object



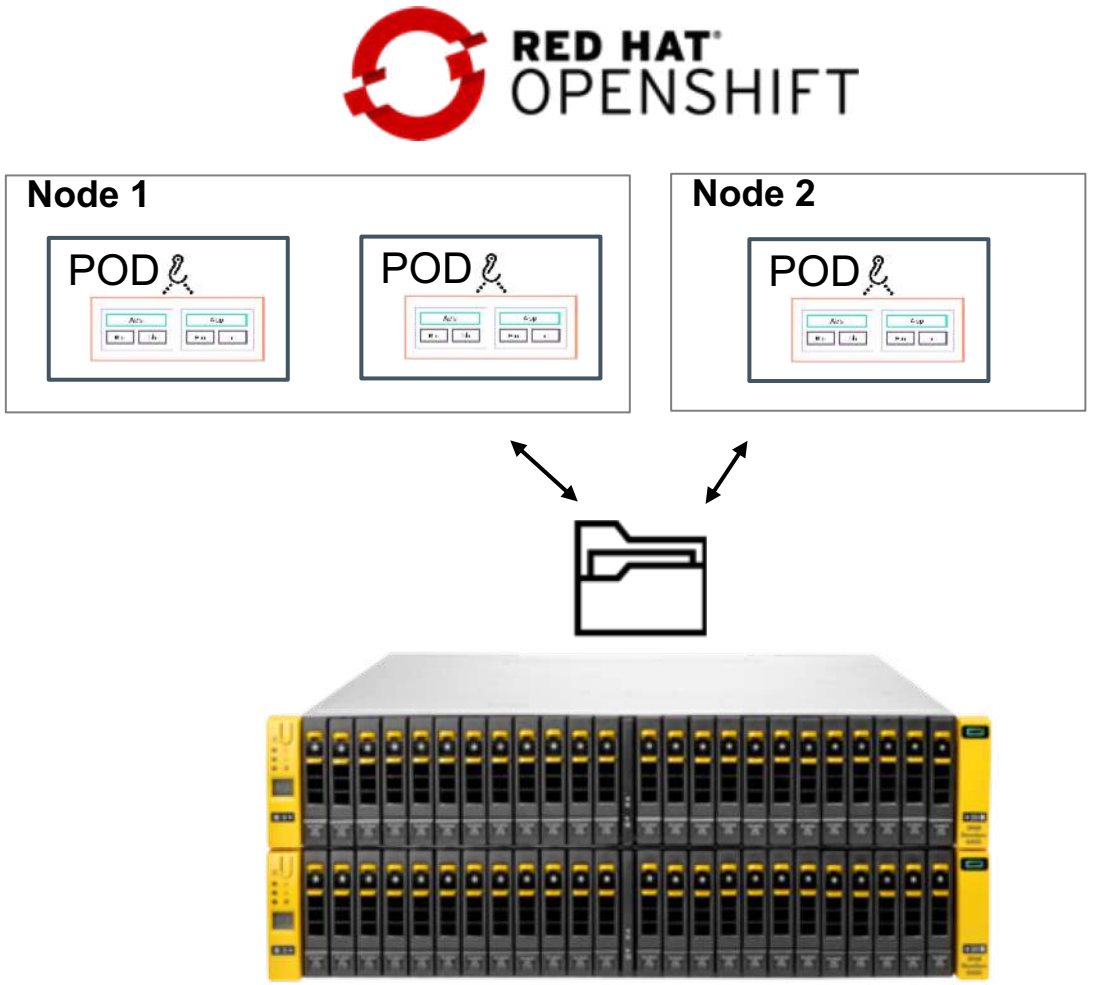
DR – OpenShift on stretch cluster MAN/Campus network

- OpenShift Master, Infra, and Nodes spans across data center to provide high availability
- Requires
  - < 10ms latency between etcds
  - < 10ms latency for storage replication
- HPE peer persistent facilitates automatic and app transparent failover on persistent volume



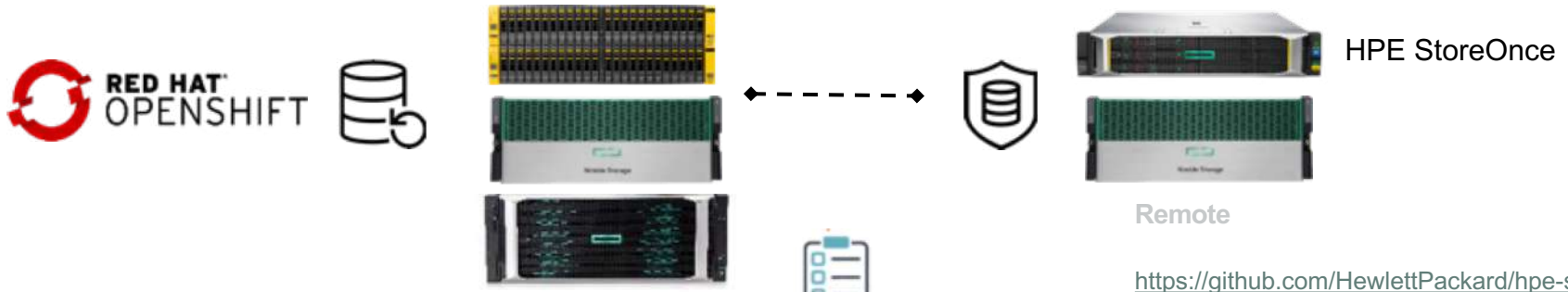
File Support for “Read Write Many” (RWX) access mode

- Supports RWX access mode in Kubernetes
- Default share size of 1TiB (if no size specified)
- Permission setting on File share for selective access
  - UID/GID based mapping
  - ACL or Linux style permission setting on share
- Support for Create, List and Delete file shares from Docker CLI
- Available in 3PAR Volume Plug-in for Docker v3.2 and above
- Supports only 3PAR arrays



OpenShift data protection

Content type	Why protection is needed
App data	App data from stateful containers are critical to your business
Container registry	Storage for your dev, qa, and production container images. Critical for the business to protect these images for the continuous delivery
Container logs, Prometheus time series data	Needed for troubleshooting, performance analysis, capacity planning
Etcd	Stores system configuration, state, and its metadata. Mandatory for recreating OCP cluster during corruption or disaster.
Files on Master host	Master node is responsible for maintaining the desired state of a cluster. It has API, controllers, services, config files, certs, keys, etc.



https://github.com/HewlettPackard/hpe-solutions-openshift/tree/master/synergy/scalable/backup_and_recovery

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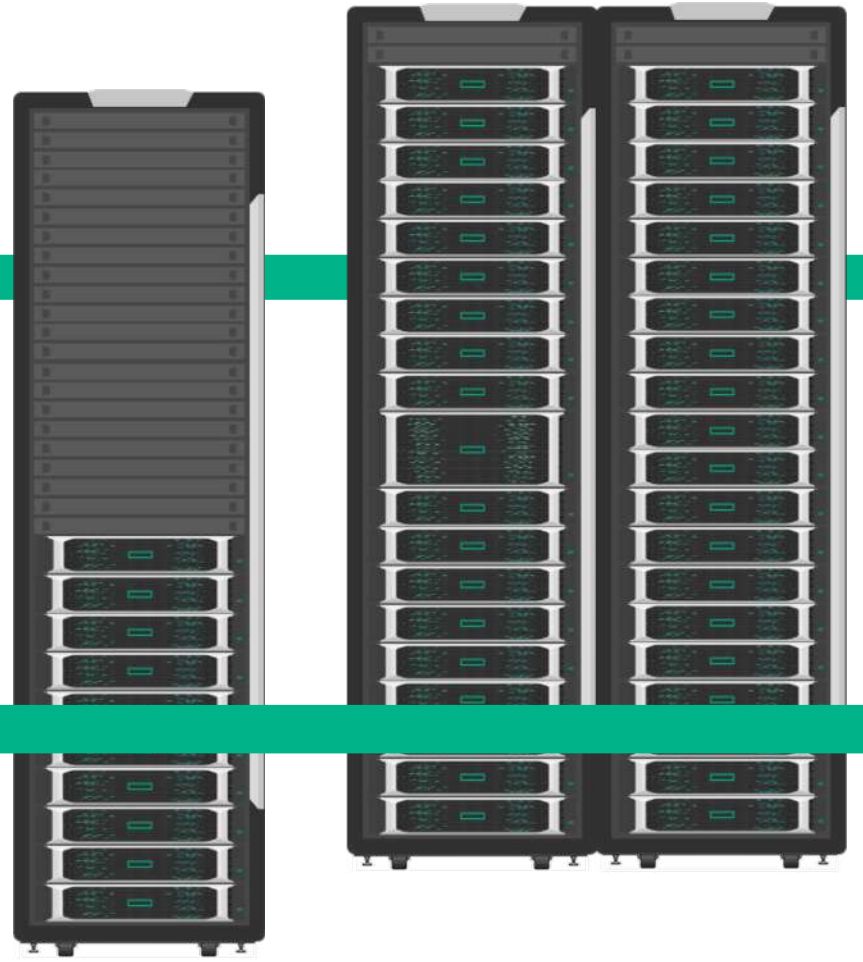
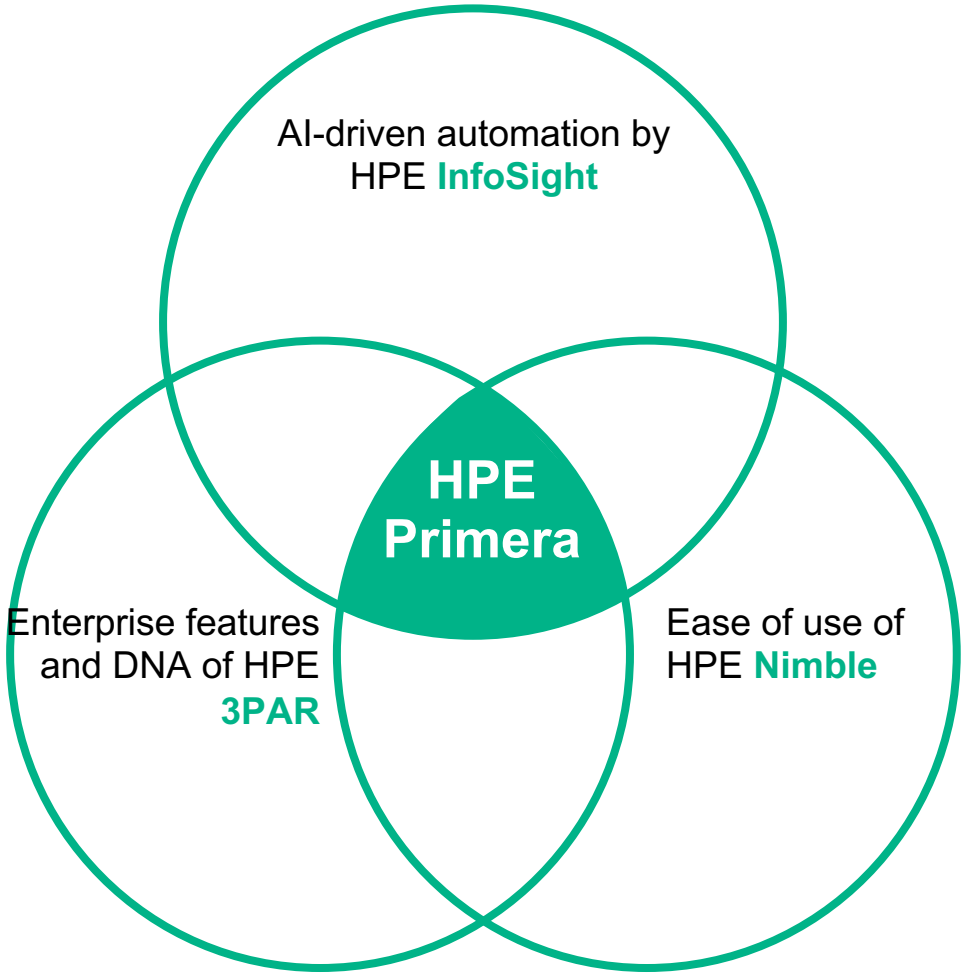
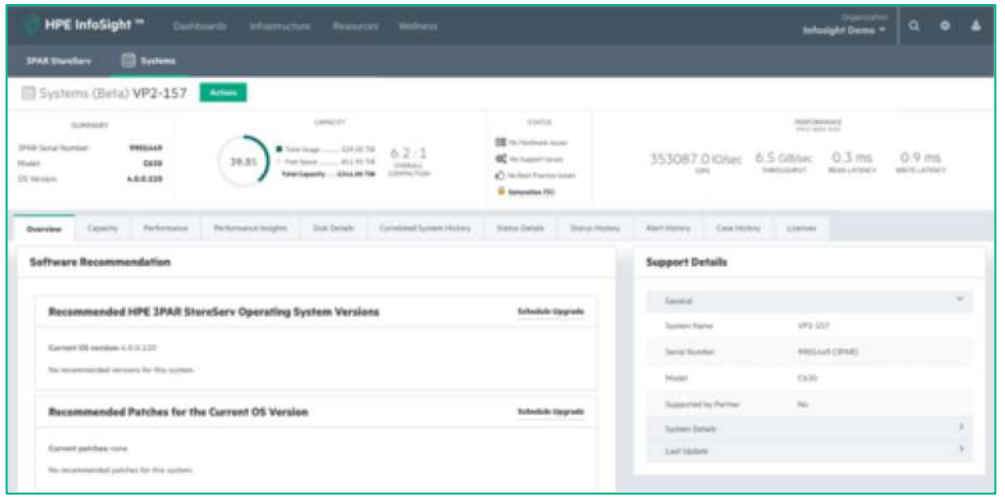


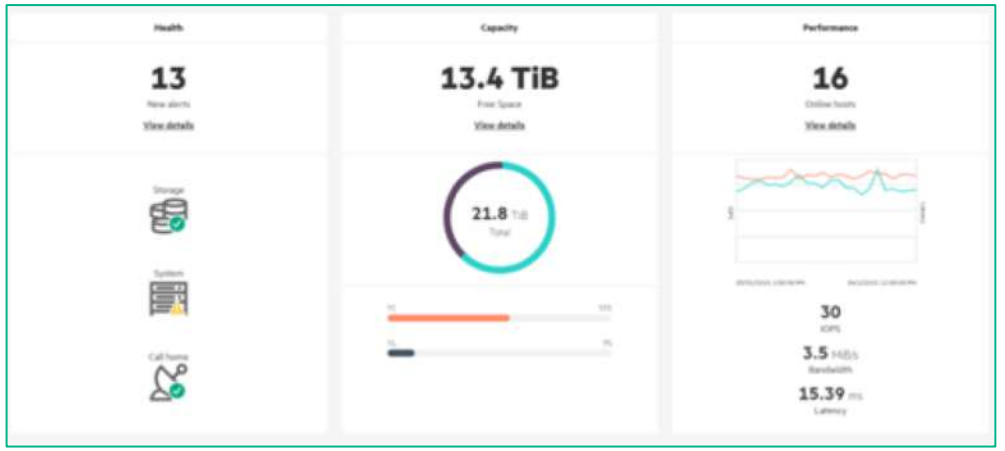
HPE Primera

Primera—The new measure for mission-critical storage

Combines the best technologies of HPE







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Features of the Primera 600 series arrays

- New Primera ASIC
- Powerful Skylake CPU
- Enterprise-class resiliency
- NVMe ready
- 100% Availability Guarantee
- 32 Gb Fibre Channel/25 Gb IP support
- Online node conversion
- Customer self install/update
- All-inclusive software
- Extreme ease of use
- Deep InfoSight integration
- RAID 6 only
- Thin Provisioning or DECO only
- Auto CPG and tuning
- On-node management
- On-node service processor

HPE Primera Timeless Storage

HPE Technology Refresh Service

- Timeless Storage is an optional service that builds on flexible support services from HPE Pointnext (HPE Proactive Care Service, HPE Proactive Care Advanced Service, or HPE Datacenter Care Service)
- Every three years you get system upgrades to the latest available technologies
  - Includes all necessary supporting hardware and software, installed with zero disruption
- The HPE Technology Refresh Service not only lowers your total cost of ownership for storage but brings predictability to storage costs and alleviates perennial concerns of technology obsolescence
- You get a simple, nondisruptive upgrade path to scale resources
  - Do away with traditional storage purchasing cycles to keep your storage modern and do it without traditional forklift upgrades

For details read the Timeless Storage Brochure: https://assets.ext.hpe.com/is/content/hpedam/documents/a00074000-4999/a00074518/a00074518enw.pdf

Delivering container data management that is ….

Developer-*friendly*

- Dynamically provision volumes using K8s StorageClass
- Selectively Override storage attributes of StorageClass
- Attach snapshots or clones to CI pipeline. Auto cleanup when done

Operations-*optimized*

- One-time or scheduled snapshots
- Replicate sync or async for HA/DR
- Per volume QoS (for guaranteed SLA)
- User and group id based volume access controls (RBAC)
- File (RWM) and
  Block (RWO) support FC or iSCSI

Cloud-*inspired*

- Ansible assisted installation < 5 minutes
- Secure multi-tenancy using Virtual domains

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Wrap-up

Why HPE for OpenShift solution?

Comprehensive solution
Hardware, software, services, and support

Service-led approach
Top down vs bottom up architecture approach

Simplified procurement
Solution ordering experience

Attractive purchase and consumption models
Flex capacity, Greenlake managed services

Strategic partnerships
Tier 1 and preferred partners with major ISVs with joint GTM

Key success factors for OpenShift adoption in production

- **Plan** whether to do it yourself or partner
- Implement **Best Practices**
- Have a complete **Solution** in place

Accelerate this path with
HPE + Red Hat

Resources: https://www.hpe.com/us/en/alliance/red-hat.html#Solutions

Key Contacts: Kiril Petsev, Solution Architect kiril.petsev@hpe.com
Peter Reichmuth, Senior Storage Consultant peter.reichmuth@hpe.com

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Questions?

“It is not the answer that enlightens, but the question”
Eugene Ionesco

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Thank you

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AUTONOMOUS DRIVING - FOLLOWING THE DATA

Matthias Lein | Data Science Architect | DXC