OpenShift Roadmap

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Red Hat

Fully managed cloud service or self-managed platform

Managed Red Hat OpenShift Services - Fully managed, start quickly

aws	Azure	IBM Cloud	Google Cloud
Red Hat OpenShift Service on AWS (ROSA)	Azure Red Hat OpenShift (ARO)	Red Hat OpenShift on IBM Cloud	Red Hat OpenShift Dedicated (OSD)

Self-Managed Red Hat OpenShift - Customer managed, for control and flexibility

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On **public cloud**, on-premises on **physical** or **virtual** infrastructure, or at the **edge**

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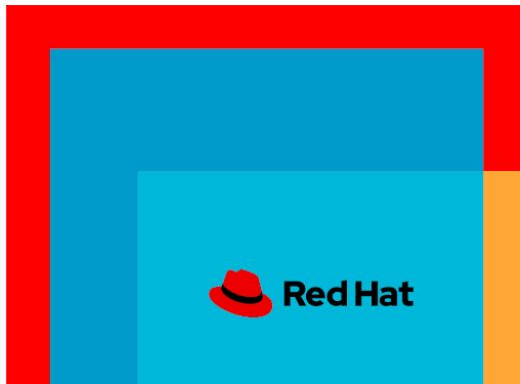
OpenShift 4.14



What's new in Red Hat

OPENSHIFT 4.14

Red Hat OpenShift

ENHANCED SECURITY

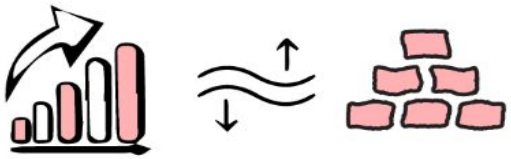
- SCC Preemption prevention
- ConfigMaps and Secrets sharing across namespaces (GA)
- Azure managed identity
- Secret Store CSI Driver Operator (Technology Preview)

OPTIMIZE TCO VIA HOSTED CONTROL PLANES (HCP)

- Self-managed HCP on baremetal (GA)
- Self-managed HCP on OpenShift Virtualization (GA)
- Heterogeneous clusters with HCP
- x86 control plane with Power data plane for HCP on bare metal (Technology Preview)

CORE AND FLEXIBILITY

- 24 months OpenShift lifecycle for ARM, Z, and Power
- CgroupV2 default
- OVN optimization
- VMware vSphere CSI migration
- External platform type for partner integration



What's New in Red Hat OpenShift 4.14 Infographic by Sunil Malagi

red.ht/whatsnew

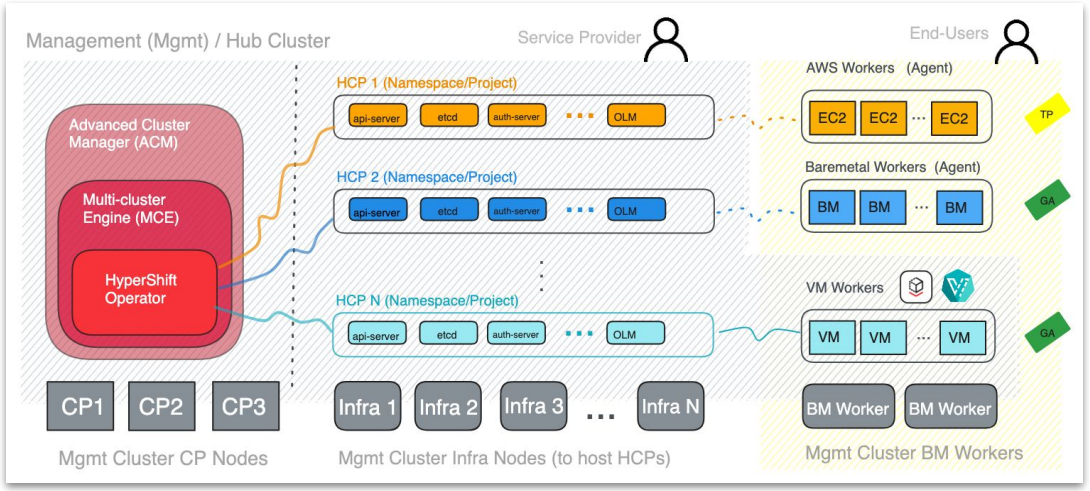
Longer lifecycle for Multi Architectures for EUS Releases

What	Match existing x86 lifecycle with additional 6 month of Extended Update Support (EUS) phase on **even numbered** OpenShift (OKE, OCP, OPP) releases and a subset of layered operators for multiple architectures ▸ Arm, IBM Power, and IBM Z
Who	Those with **Premium subscriptions**, [or Standard subscriptions + an **add-on SKU**]
When	Starting with **OpenShift 4.14** and applying to subsequent even numbered releases of OpenShift.
Why	▸ Support customers and partners struggling to maintain pace with 4.y cadence ▸ Align approach and offering rules of OCP EUS to RHEL's program rules
Note	▸ EUS to EUS upgrades continue the same behaviour. ▸ Layered operators/operands and products will continue to have their own lifecycle. ▸ Layered operator lifecycles are available on the OpenShift lifecycle page.

Hosted Control Planes for Red Hat OpenShift

What's new (w/ MCE 2.4)

- Baremetal with the Agent Provider (GA)
- OpenShift Virtualization Provider (GA)
- AWS provider [Continuation] (Tech Preview)
- Arm CP and x86 NodePools on AWS (Tech Preview)
- IBM Power/Z NodePools (Tech Preview)



Why it matters

Optimize your economics, Increase your Margins, and Meet your Eco-Friendly Goals (💰 🍀)

- ~30% infra savings, ~65% for SREs/Operations savings.
- ~60% time-saving for devs (⬆️ Productivity), ~50% reductions in power & facility costs.

Streamline Role Management & Segmentation (🔐)

- Persona Decoupling no more clashing concerns between admins and users.
- Fewer mis-configuration errors 💥.

Reduce Multi-cluster Overhead (🔋)

- Solve for Multi-cluster, build on a efficient grounds.
- Build your Cluster-as-a-Service on top for speed and efficiency (check the cluster-template-operator)

Tailor the setup to your needs with high Flexibility (🛠️)

- Bare Metal (Agent), VM workers (OpenShift Virtualization), or even on the cloud (AWS)
- Mixed Architecture between CP/DP (Arm, Power/Z)

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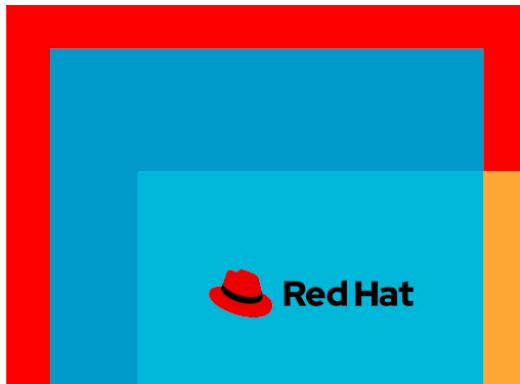
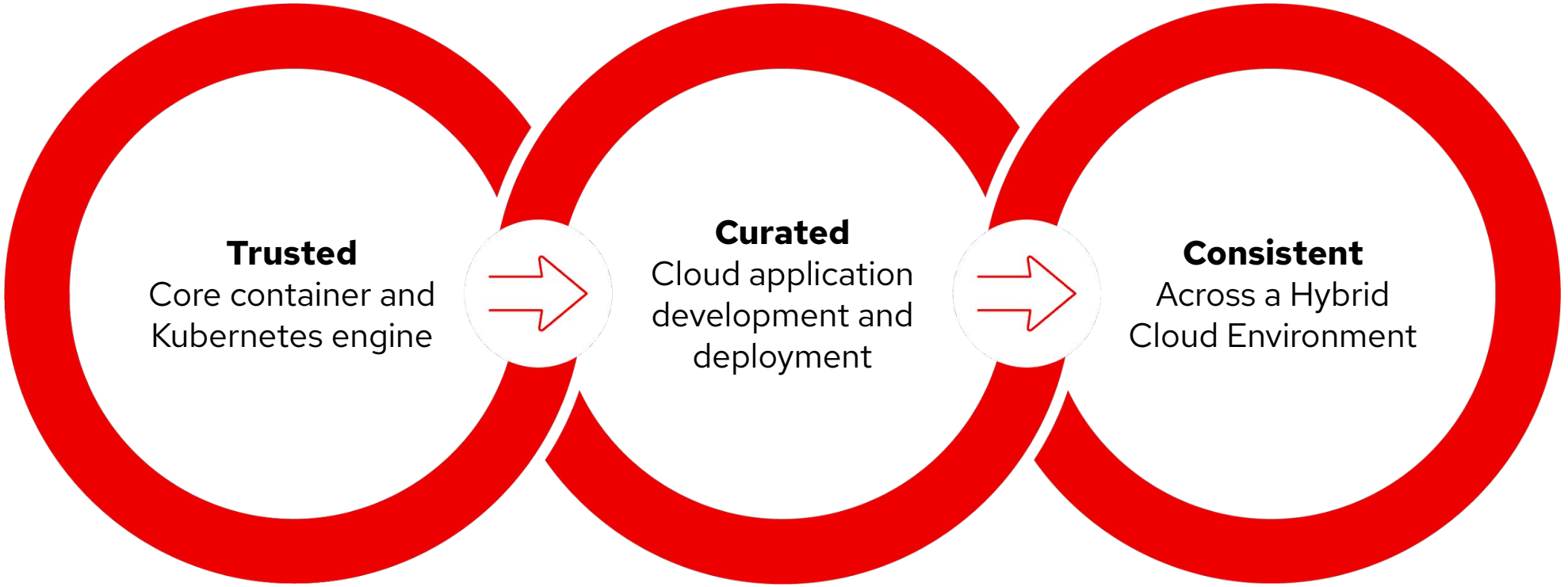
OpenShift Update and What's Next



OpenShift and themes that drive our roadmap



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What's Next for **Running the Applications**?

Multi-arch and multi-cluster support across the application platform including ARM64 support for Service Mesh and Serverless

Networking Improvements with Gateway API east-west enhancements and dev preview support for dual stack IPv4/IPv6 in Service Mesh

Better Helm Workflow Support in ArgoCD with enhancements including support for dynamic value lookup

Improved Canary Deployments with Argo Rollouts support in OpenShift GitOps

Automate Updating GitOps Repos with Image Updater and new push to image registries

Operators in Multi-Tenant Clusters

New lifecycle model that enables cluster tenants to have their own operator instance

What's Next for **Developer Self-Service**?

Developer Hub 1.0 GA based on Backstage enables self-service capabilities for end-to-end developer workflows, with golden paths and plugins

Hyperscaler Marketplace Support for Developer Hub

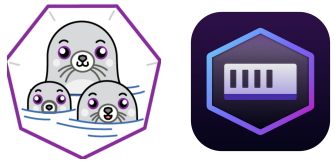
Additional Developer Hub Plugins

Keycloak, ArgoCD, Tekton, Quay, Multi Cluster View, JFrog Artifactory, Nexus Registry, Azure Container Registry, GPTs

OpenShift Local run OpenShift on the desktop to debug applications easily

Developer Sandbox provides rapid access to a hosted private OpenShift environment, seeded with curated tools and services for developers

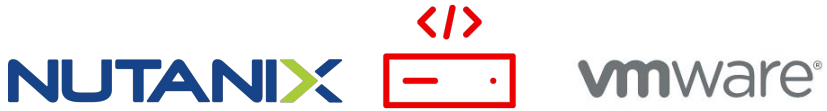
Create and Deploy Templated Functions with additional Serverless Functions support for Wasm (DP) and Python



Podman Desktop provides a user-friendly interface for containers developer workflows and enabling smooth transition to OpenShift from a local workstation.

What's Next for **Infrastructure Teams**?

- **Additional Regions and Providers**
  - AWS regions in the middle-east
  - Azure Regions in China
- **AWS Wavelength Zones**
- **AWS Outpost**
- **OpenShift Virtualization on Oracle Cloud Infrastructure (OCI)**



- **Deploy & Distribute OpenShift Cluster across multiple vSphere Clusters**
- **Simplify adding nodes as day-2** with Agent-Installer regardless of their installation method
  - Bare-metal
  - vSphere
  - Nutanix
  - Oracle Cloud Infrastructure/OCI (external)
  - Platform "none"

What's Next for **Platform Teams**?

Seamless Windows Integrations for disconnected environments

Streamlined credential management with Group Managed Service Accounts (gMSA)

Enhanced Monitoring with a unified monitoring experience for both Windows and Linux nodes

Cross-Platform Support with Windows Containers for ARO & ROSA platforms

Optimize Scheduling Workloads on Multi-arch Environments make the best use of the OpenShift's Multi-arch environment

Extend IBM Power/Z clusters with x86 nodes on day-2

Heterogeneous control-planes and node pools with Hosted Control Planes (HCP)

Expanding Hosted Control Planes with more Providers like vSphere and Nutanix

Enhanced experience for running layered Operators in HCP

What's Next for **Security Teams**?

Towards Zero Trust

- **User Namespaces**
- **Pod Security Admission (PSA)** Enforcement mode
- **Admin Network Policy** allows cluster-admin to define cluster-wide Network Policies to restrict egress, pod and namespaces traffic
- **Zero-Trust Networking** encrypting North-South/East-West traffic from cluster to external network endpoints

Multi-Cluster Identity

- **BYO OIDC Identity** enables the configuration and integration with OIDC IDPs like KeyCloack, and Azure IDP
- **Cross-Cloud Identity with Unified SSO** powered by SPIRE enables workloads from one cluster to securely communicate with a workload on a different cluster

What's Next for **Networking Teams**?

Enhancements to OVN for linear scalability with node count

Improved Stability with the isolation of node lost to affect just that node instead of the whole cluster network

Improved Security now nodes don't need to know the networking of other nodes, or communicate their own

Optimize Azure Outbound traffic by disabling SNAT for enhanced scalability using Azure NAT Gateway the default for outbound traffic management

Extend dual-stack IPv4/IPv6 to public cloud OpenShift deployments

GCP Private & Restricted API Endpoints by leveraging Private Service Connect with OpenShift

Enabling GCP Shared VPC (XPN) for secure and efficient communication between a Host project and the Service projects

Red Hat **Advanced Cluster Security** for Kubernetes

Improving collection with new runtime collection for enabling secured clusters on top of various Linux kernel versions.

Extending support to Hosted Control Planes (HCP), Red Hat Device Edge

Multi-arch support for OpenShift and xKS on ARM

Export/Import SBOMs

Integration with Paladin Cloud for full-stack cloud-native protection for applications

Enhanced Vulnerability and Alert Management with the integration to ServiceNow Vulnerability Response and Alerts

Hosted Control Planes (HCP) for OpenShift

HCP Economics (Savings)

30% Infrastructure

65% Mgmt Costs

50% Power & Facility

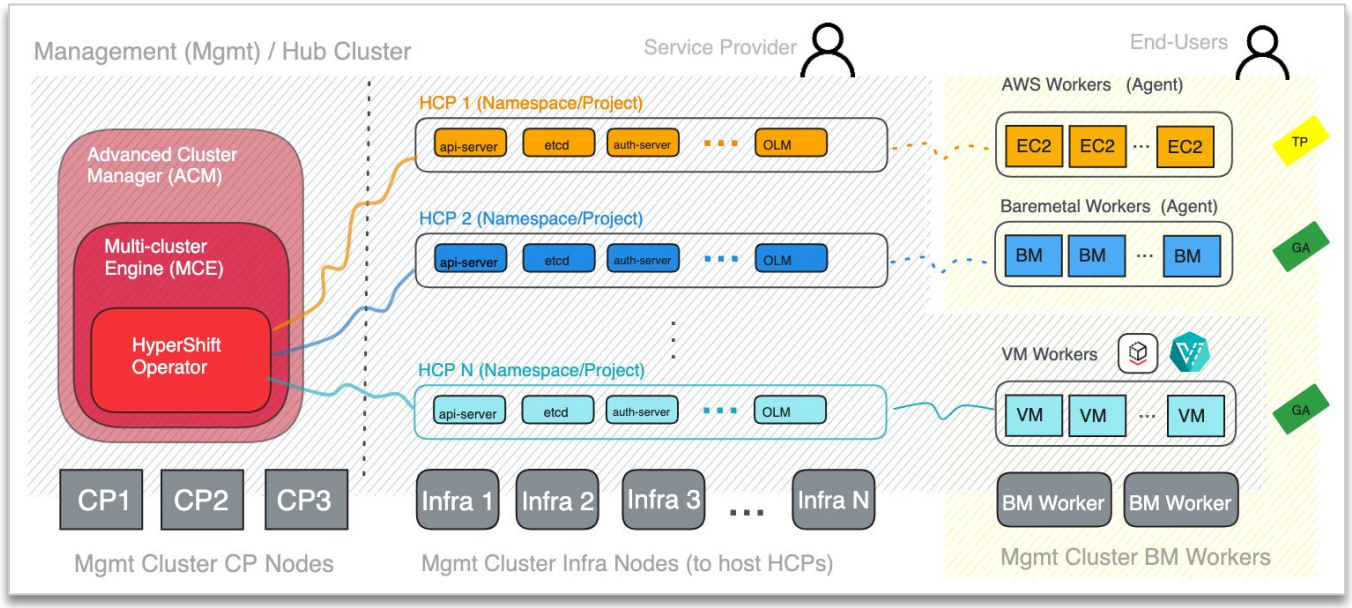
Baremetal with the Agent Provider (GA)

OpenShift Virtualization (GA)

Improved AWS (TP)

ARM CP and x86 NodePools on AWS (TP)

IBM Power/Z NodePools (TP)



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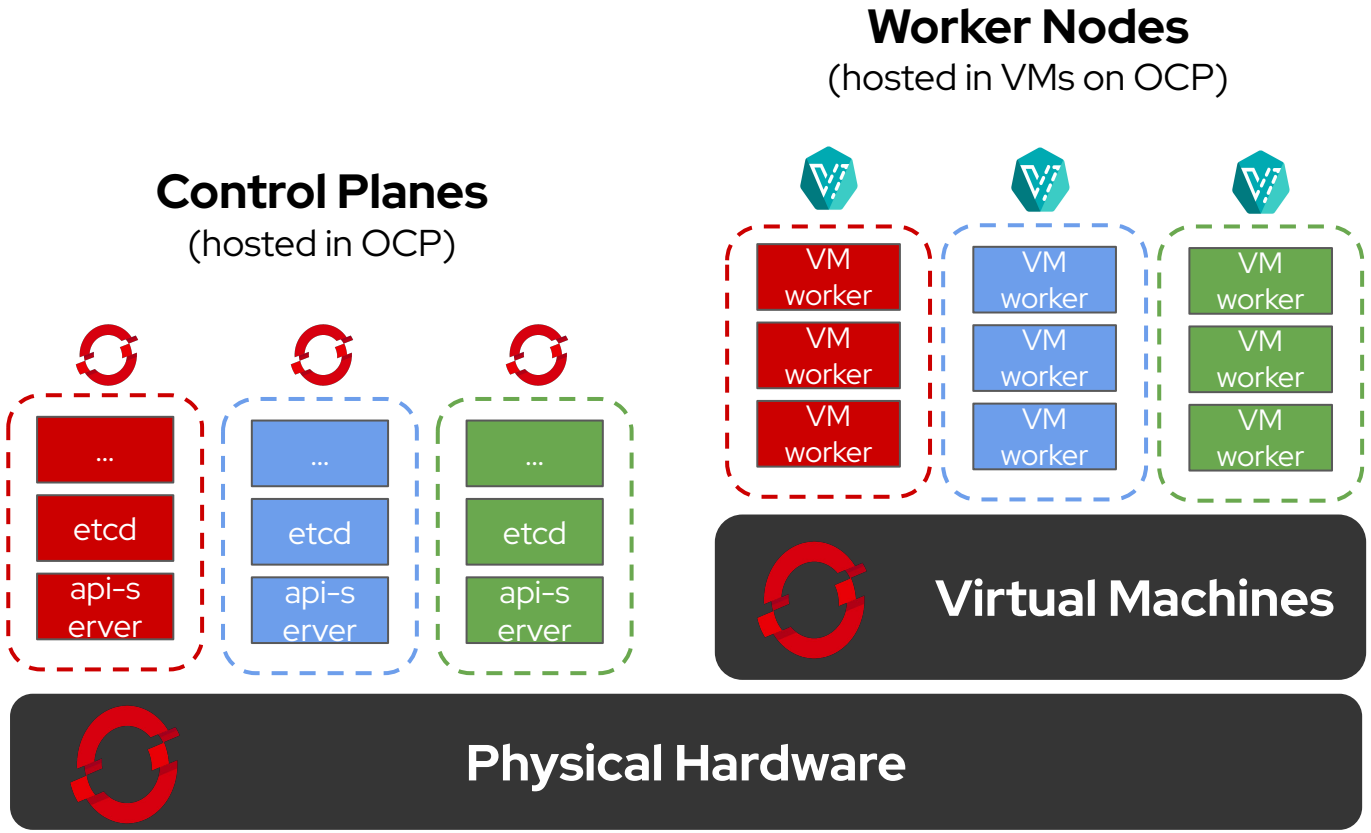
OpenShift **Clusters** with **OpenShift Virtualization**

Increase Utilization of Infrastructure by consolidating multiple control planes into the same nodes.

Increase physical host utilization by hosting virtual worker nodes for multiple clusters

Eliminate dependencies on legacy hypervisors for hosting containerized infrastructure.



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Red Hat Device Edge & MicroShift

Red Hat Device Edge with MicroShift is a Kubernetes distribution derived from OpenShift Container Platform that is designed for optimizing small form factor devices and edge computing.

General Availability

Updateability

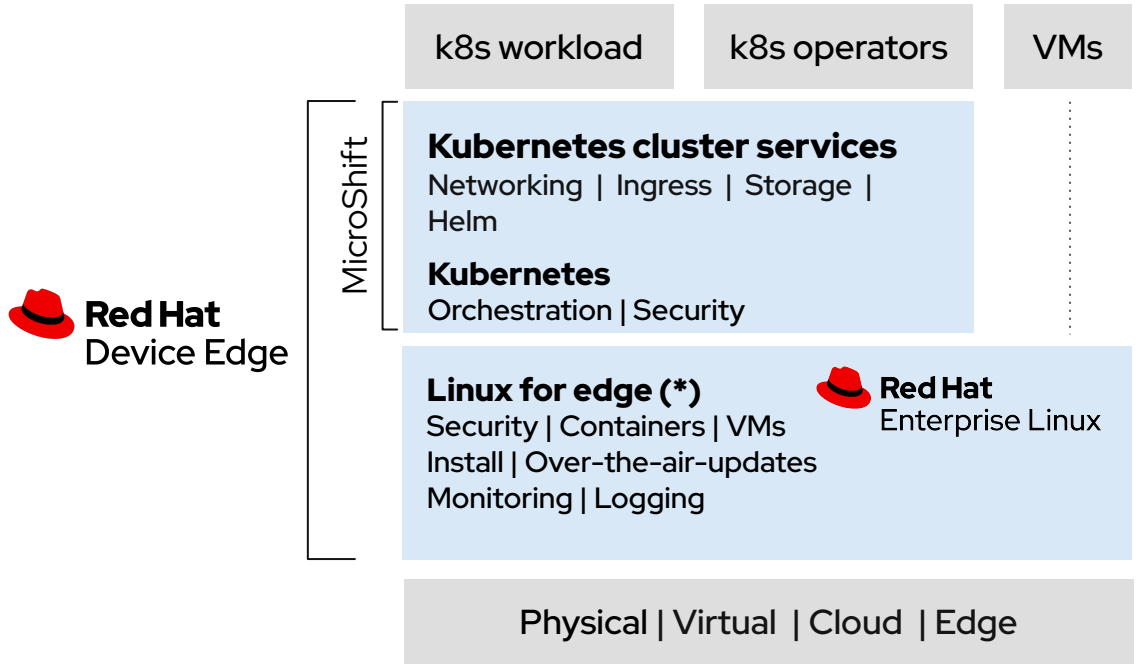
Automatic rollback with rpm-ostree

Manual backup and restore

CSI Snapshots

CNCF certification

Networking enhancements (full offline)



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Hybrid MLOps Platform: OpenShift AI

Model development

Conduct exploratory data science in JupyterLab with access to core AI/ML libraries and frameworks including TensorFlow and PyTorch

Lifecycle management

Create repeatable data science pipelines for model training and validation and integrate them with devops pipelines for delivery of models across your enterprise.

Model serving & monitoring

Deploy models across any cloud, fully managed, and self-managed OpenShift footprint and centrally monitor their performance.

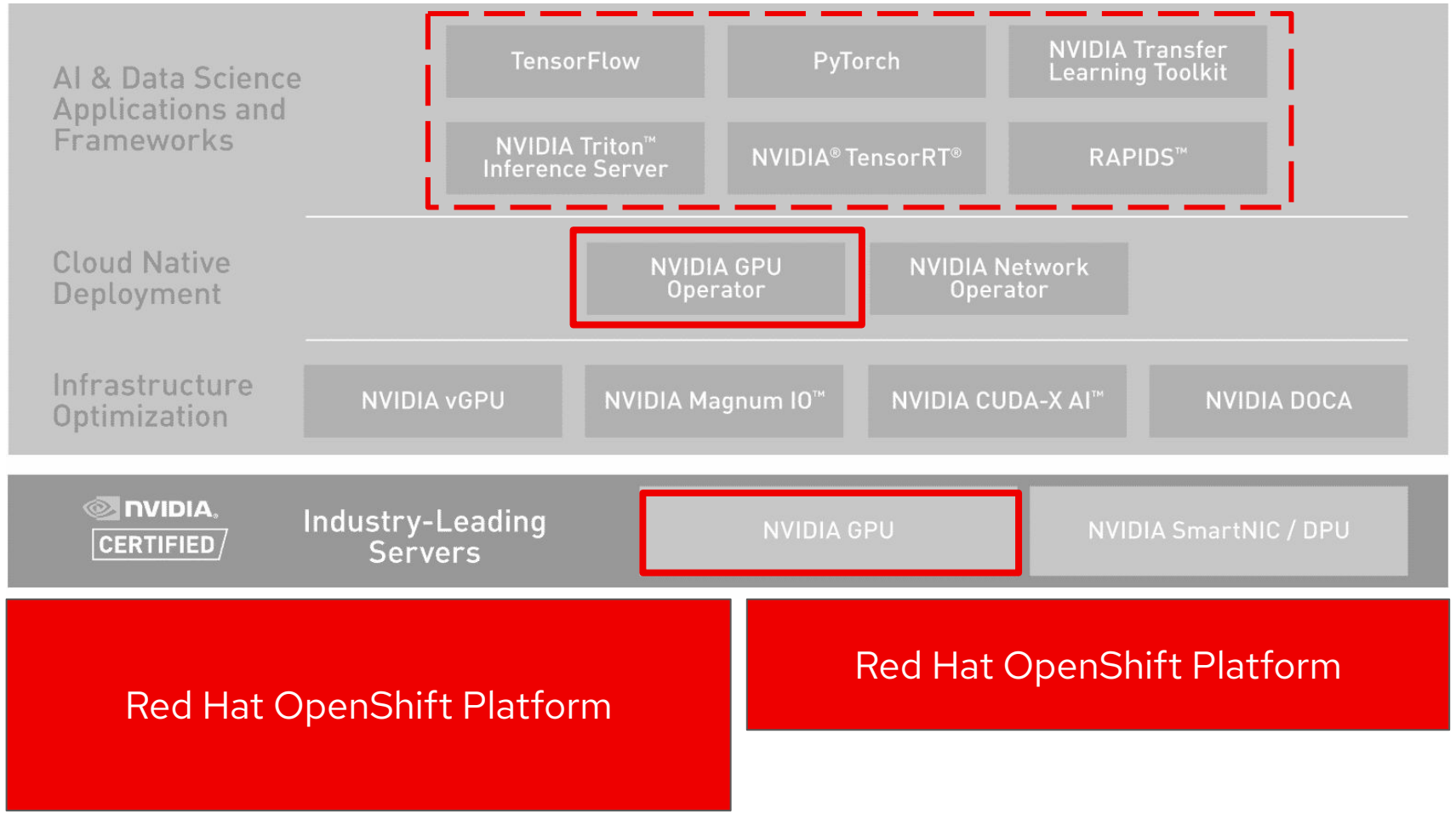
Increased capabilities / collaboration

Create projects and share them across teams. Combine Red Hat components, open source software, and ISV certified software.

AI Stack Red Hat / NVIDIA

Solutions

Infrastructure



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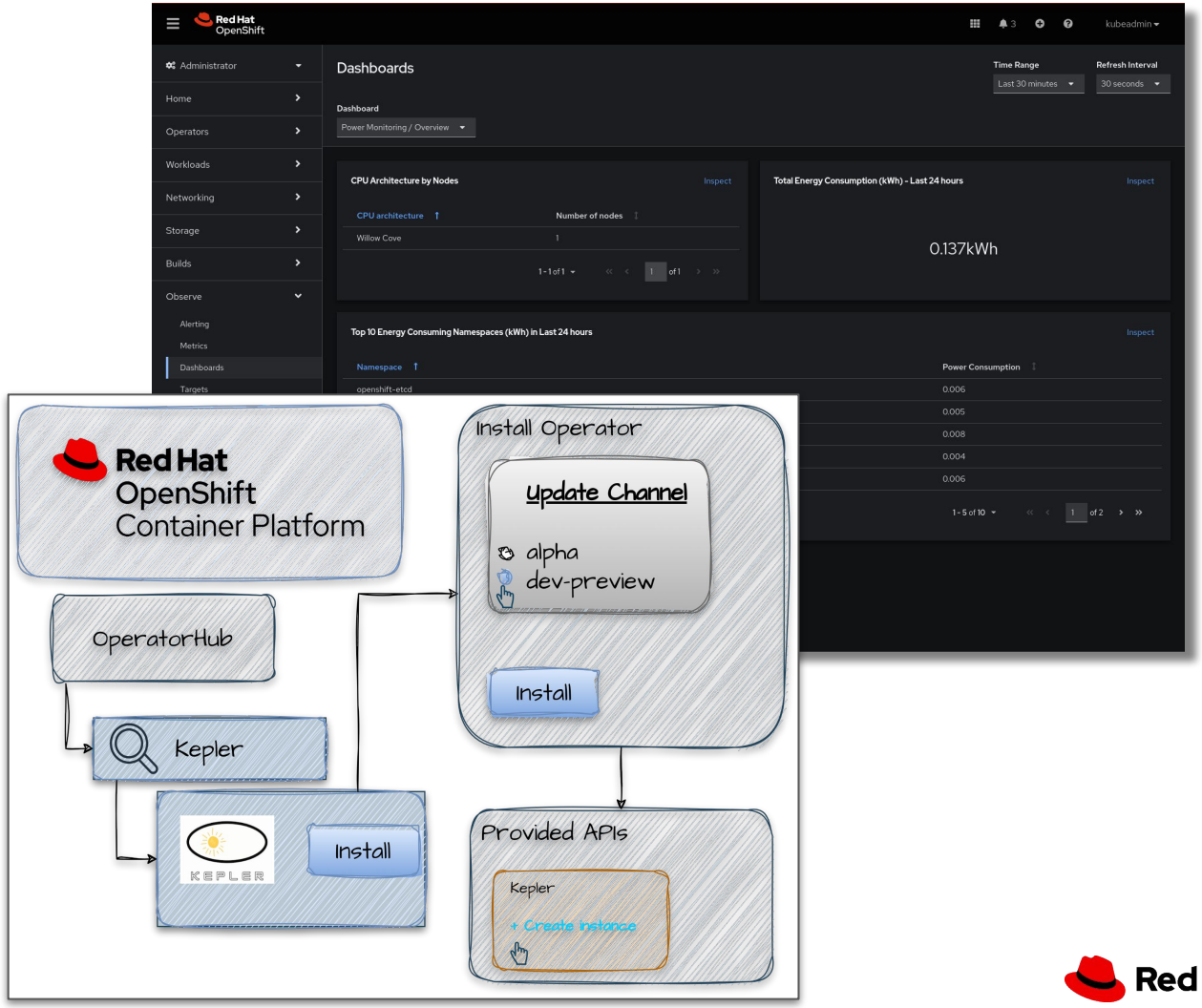
Improve Your Sustainability

Power Monitoring for Red Hat OpenShift is downstream of Kepler project (Dev Preview)

Embedded in the observability stack console, you can easily experiment with Kepler and observe power consumption



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Last Updated 20-Oct-2023

OpenShift Core Platform Roadmap

Near Term
(Q1 2024)

CORE PLATFORM

- External DNS for AWS
- Oracle Cloud Infrastructure with VM (GA)
- Confidential VMs on Azure GA
- AWS Outposts (GA)
- Hosted Control Planes in ACM/MCE KubeVirt (GA)
- Stretched Cluster support on multiple Openstack AZs (GA)
- OpenStack Full Dual Stack support (control & workload) (GA)
- Bandwidth-Aware Scheduler (QoS)
- Gateway API (GA)
- Ingress traffic mirroring/splitting
- Network Policy v2
- Routable IPs for Pods
- ESNI/ECH Support
- Automatic Intelligent Sharding
- Automatic etcd restore
- Kube KMS w/user provided plugin
- CoreOS Layering custom first-boot images
- CoreOS y-stream updated first-boot images
- BYO OIDC Identity provider
- Pod Security Admission (restricted enforcement)
- No auto-generated secrets for SAs
- API and Ingress support for Cert-manager
- Z-stream rollback
- 'oc adm update status' (Dev Preview)
- CSI detach with ungraceful node shutdown (GA)
- BGP Routing Table (VRF) Separation
- IPv6 for Public Cloud Deployments
- Observability Operator
- Power monitoring for OpenShift (Kepler) TP
- Cert-manager API Server, Ingress, Route support
- Secret Store CSI (GA)

Mid Term
(Q2/Q3 2024)

CORE PLATFORM

- External DNS for Azure and GCP
- Oracle Cloud Infrastructure with VM (BM)
- Extended job management
- Openshift CLI manager (via KREW) GA
- SWAP
- Automated Group Sync
- In-Place update of pod Spec and VPA
- Checkpoint/Restore In Userspace
- CRIO support for sigstore
- CAPI migration (TP)
- MachineDeployments for rolling updates for workers
- Etcd automated backups (GA)
- NVIDIA Grace Hopper Superchip enablement
- CSI volume health - additional metrics
- MetalLB BGP Traffic Separation
- Global Load Balancer
- Admin Network Policy (GA)
- Ingress Operator Optional
- Network Visibility for OCP Traffic Mirroring
- Network Tracing
- Network Policy Correlation
- Control Resource Usage of Ingress Pods
- EgressIP Zone Awareness
- Ongoing SmartNIC Integrations
- Resource Consumption Optimization
- Payload aware network observability
- Egress IP zone awareness
- Power monitoring for OpenShift (Kepler) GA
- Peer pods GA (AWS and Azure)
- Multi-cluster SSO
- User namespaces
- Cert Manager Operator istio-csr, ncm integrations

Long Term
(Q4 2024+)

CORE PLATFORM

- AWS with Hosted Control Planes GA
- Azure Confidential Clusters
- GCP Confidential Clusters
- Compute Cloud @ Customer
- Oracle Private Cloud Appliance
- ShiftOnStack hosting ctlplanes
- Bandwidth-Aware Scheduler (QoS)
- Multi dimension pod autoscaler
- Gateway API [GA]
- Custom routes for OVN
- Ingress traffic mirroring/splitting
- No-Overlay Option
- Network Policy v2
- Routable IPs for Pods
- OCP WAF support
- IPsec Offload
- Automatic Intelligent Sharding
- SPOE support
- HAProxy Dynamic Configuration Manager
- FASTCGI support for HAProxy
- Cross-cluster Identity with SPIRE
- CRIO support for sigstore
- Checkpoint/Restore In Userspace
- WASM workload support in OCP
- CoreOS Layering integration with OCP Console
- Adv. network config with Ignition
- More flexible and resilient update rollouts
- Etcd automated recovery of failed control plane node
- Cluster API GA
- Y-Stream worker node rollback
- Multi-arch optimised disconnected support
- HTTP/3 HAProxy Support

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