Red Hat OpenShift

What's New in Red Hat OpenShift 4.19

Jun 16, 2025

OpenShift Product Management

red.ht/whatsnew

Red Hat

Red Hat OpenShift and Open Hybrid Cloud

Red Hat AI

AI Capabilities
Model Development | Serving
Lifecycle | Agentic | RAG | Fine Tuning

Red Hat Application Foundations

Middleware
Application Servers | Integration | Messaging

Red Hat Advanced Developer Suite

Advanced Development Capabilities
Internal Development Portal | Secure Software Delivery | Developer Tools

Red Hat OpenShift Platform Plus

Advanced Management & Security
Multicluster Management | Cluster Security Global Registry | Cluster Data Management

Red Hat OpenShift Container Platform

Foundational Application Platform Capabilities
Service Mesh | Serverless | Builds | Pipelines | GitOps |Tracing | Log Management | Cost Management

Red Hat OpenShift Kubernetes Engine

Kubernetes
Run Containers and Virtual Machines | Run Virtual Machines Only

Red Hat OpenShift Virtualization Engine

Red Hat Enterprise Linux

Linux
host operating system

Physical — Virtual — Private cloud — Public cloud — Edge

Red Hat OpenShift Cloud Services

- Red Hat OpenShift Service on AWS
- Azure Red Hat OpenShift
- OpenShift Dedicated
- Red Hat OpenShift on IBM Cloud

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Kubernetes 1.32

"Penelope"

Notable Stable Features

- Custom Resource field selectors
- Dynamic sizing of memory-backed volumes
- StatefulSet PVC Cleanup
- Bound service account token improvements
- Structured authorization configuration
- Job creation timestamp added to CronJob annotations

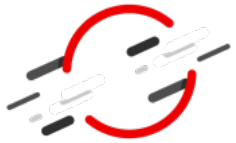
Notable Beta Features

- Restrict anonymous auth for configured endpoints
- ManagedBy field for Jobs
- Label and field selector authorization
- Volume expansion failure recovery
- Dynamic resource allocation enhancements (Alpha)

CRI-O 1.32

Kubernetes 1.32

OpenShift 4.19



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Notable Top RFEs and Components

Top Requests for Enhancement (RFEs)

- Dynamic Management of External DNS names and KubeConfig generation in Hosted Clusters - RFE-5751
- Enable OpenShift Routes to use TLS certificates stored as Secrets - RFE-4669
- nmstate can modify /etc/resolv.conf in disconnected environments - RFE-5528
- Enable selection of subnet for AWS LoadBalancerService when creating ingresscontroller - RFE-1717
- Support the External Secrets Operator (TP) - RFE-3988
- Support bring your own OIDC authentication (TP) - RFE-3929

OpenShift 4.19 Spotlight Features

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Red Hat OpenShift 4.19 Highlights

Core

- Gateway API via OpenShift Service Mesh 3 for cluster ingress (GA)
- OVN-Kubernetes BGP support
- OpenShift Lightspeed (GA)
- Dynamic accelerator slicer (TP)
- Red Hat build of Kueue
- On-cluster image mode for OpenShift

Security

- Cert-manager support for routes certificates
- OpenShift on Confidential Nodes on Google Cloud (Intel TDX and AMD SEV-SNP)
- OpenShift on Confidential Nodes on Azure (AMD SEV-SNP)
- Confidential containers for IBM Z via IBM Hyper Protect Services

Virtualization

- Storage class migration
- OpenShift Virtualization on ARO (Preview) and OSD (Preview)
- Simplified installer for OpenShift Virtualization Engine
- OpenShift Virtualization hardening guide

OpenShift Platform Plus

- RHACS 4.8: policy as code, compliance scanning and external IPs
- RHACM 2.14 on-demand from AWS Marketplace
- Regional DR support multiple ODF storage classes

GA: Generally Available
TP: Technology Preview
VM: virtual machines

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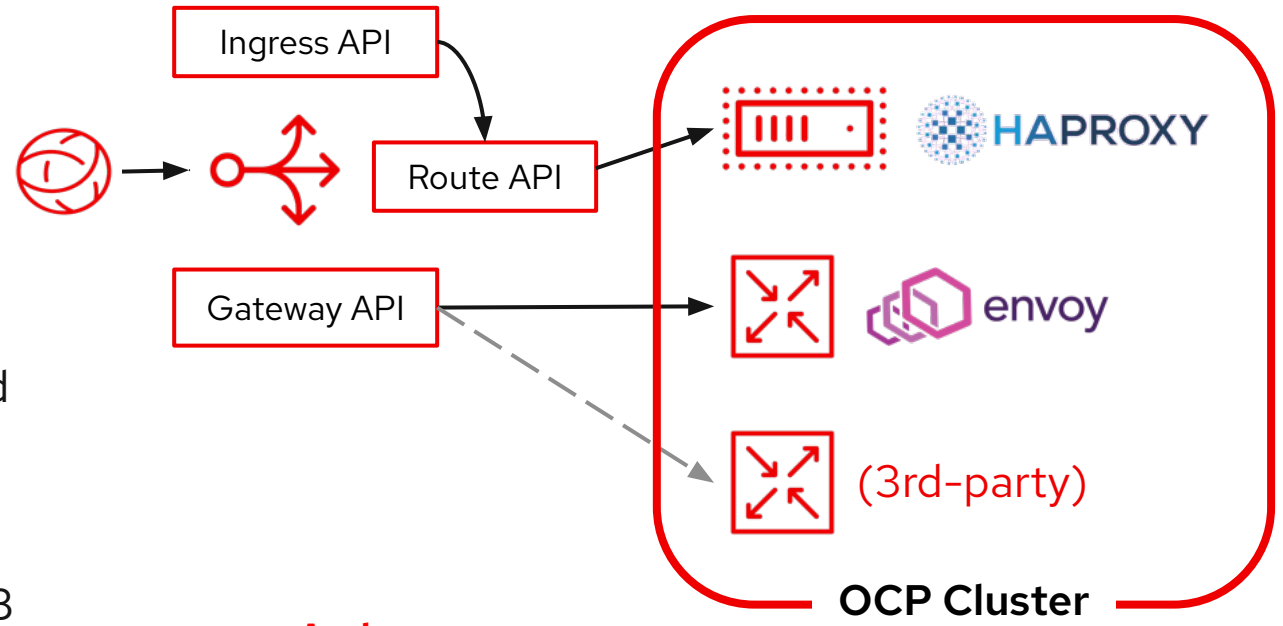
Gateway API on OpenShift

Kubernetes' next-generation standard for service networking

- GA of Ga**teway API at OCP 4.19 with OSSM 3.0**
- Installed side-by-side with HAProxy
  - 10+ years of proven stability, performance
- OCP will support all methods of K8s ingress:
  - Route API
  - Ingress API
  - Gateway API
- OpenShift Ingress operator will support installation and management of Gateway API via OSSM
- Enabling Service Mesh is not required
- OCP platform will provide out-of-the-box DNS and LB support



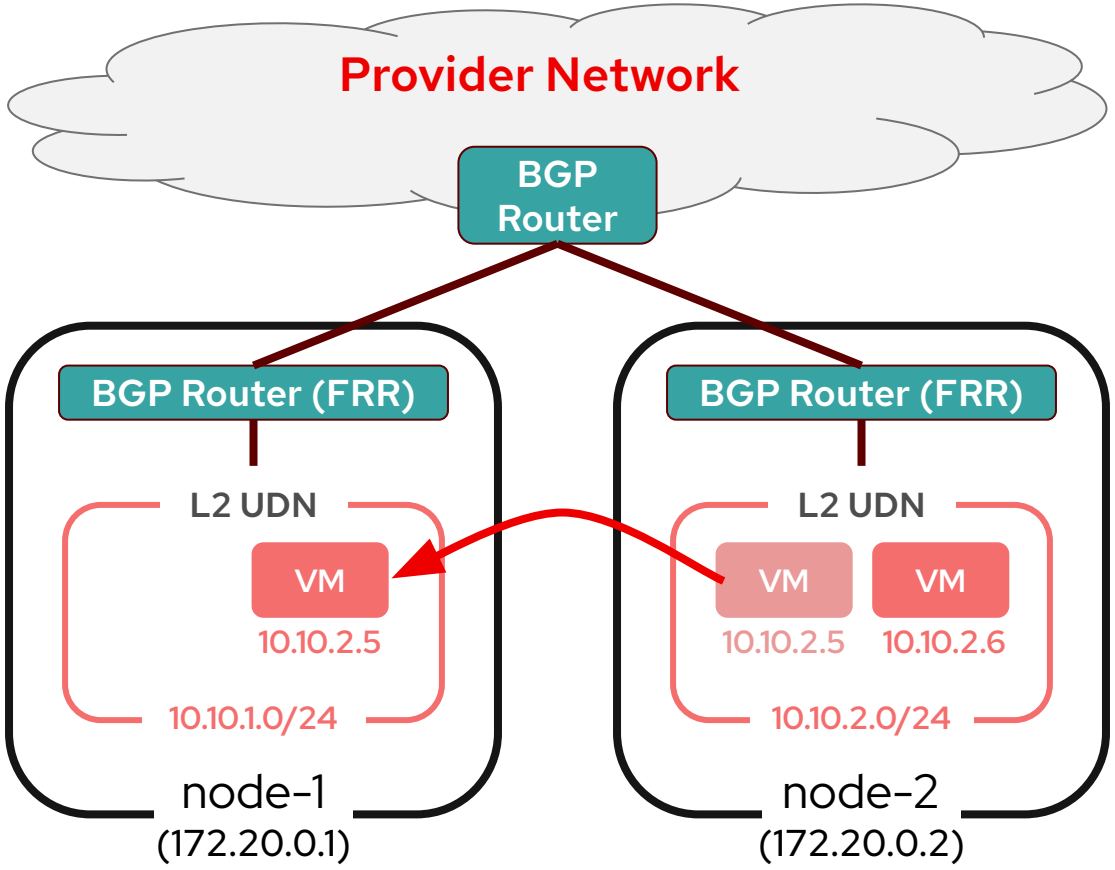
Analogs:
Istio : OpenShift router
Envoy : HAProxy
Gateway : IngressController
HTTPRoute : Route

BGP Support in OVN-Kubernetes

Generally Available in an early 4.19.z-stream release

BGP with OVN-Kubernetes (KEP)

- Adds to MetalLB BGP support already available today
- Cluster Admin privileged Primary UDN advertisements
- Import/Export of routes enabled independently
- BFD is supported
- Expose pod networks directly in the provider network, supports both default and UDN networks
- EgressIP supports L3 topology for node network
- Import routes from the provider network to default pod network or designated UDN (VRF)
- VRF-Lite extends UDN tenant isolation via VPN integration with the provider network



ROADMAP

- No-overlay support
- EVPN support

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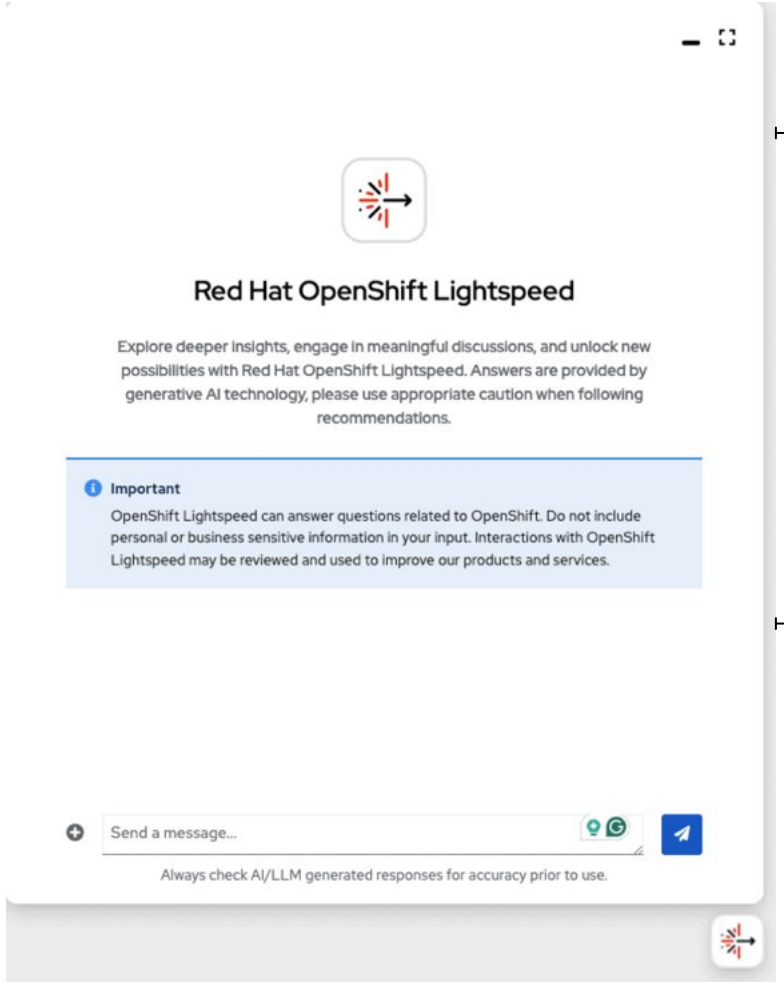
What's next

OpenShift Lightspeed

Generative AI based chat assistant



Available Now (GA)

- Operator install Chat UI in OCP console
- Interactive OpenShift documentation/help
- Attach feature to explain pod yaml, and debug log and alerts
- Flexible LLM architecture
  - Watsonx, Azure AI, OpenAI, Red Hat OpenShift AI, RHEL AI
- Disconnected deployment supported

What's Next

- Cluster-interaction (Tech Preview)
- BYO knowledge (Tech Preview)

Subscriptions

- OKE (VM only) ,OVE ,OCP ,OPP

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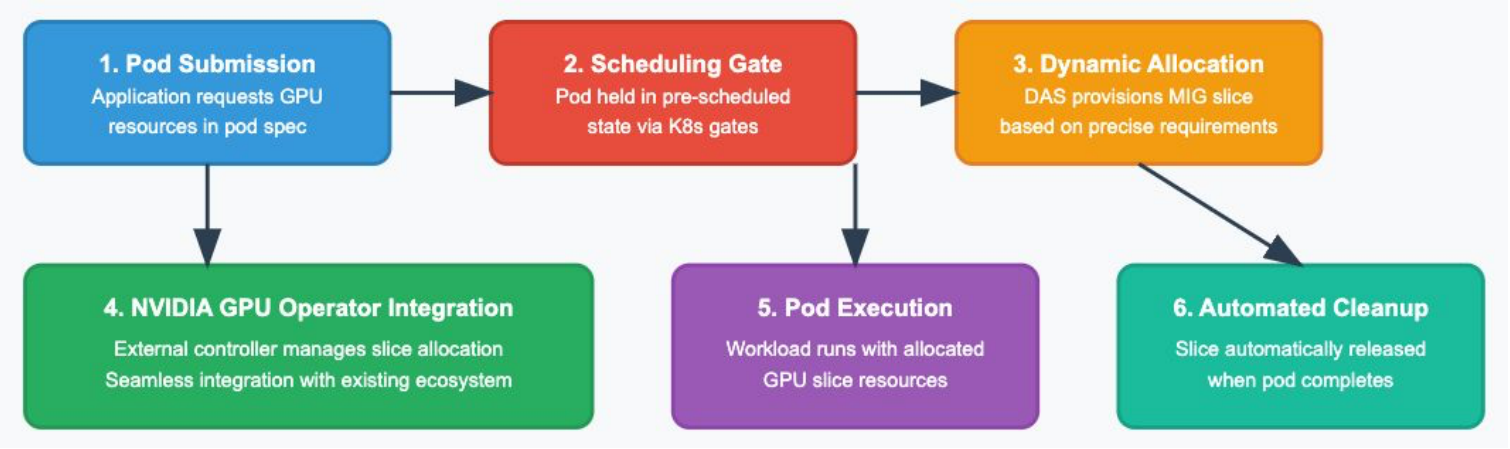
Dynamic Accelerator Slicer (DAS)

Technology Preview coming soon

NVIDIA GPUs offer a method to pre-slice the GPU for multiple workloads, this approach can lead to resource waste if the slicing does not align with the actual workload demands. DAS dynamically slice the GPU based on the specific requirements of each workload, ensuring optimal utilization and minimizing resource waste.



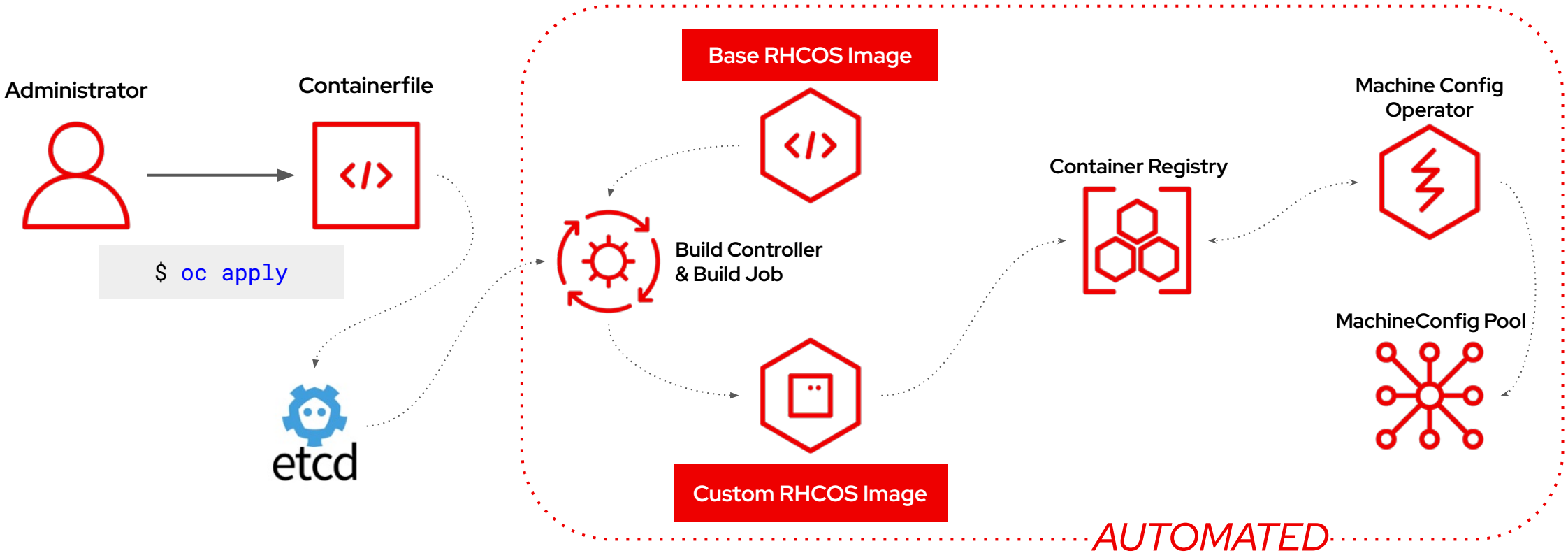
Key Benefits

- Efficiently use GPU slices without reserving entire GPUs
- Reduce cost by only paying for actively used resources

Source: The benefits of dynamic GPU slicing in OpenShift | Red Hat Developer
https://github.com/openshift/instaslice-operator

On-cluster image mode

RHEL CoreOS - ready to respond at scale



More at [Customize your Red Hat OpenShift nodes and keep them updated]

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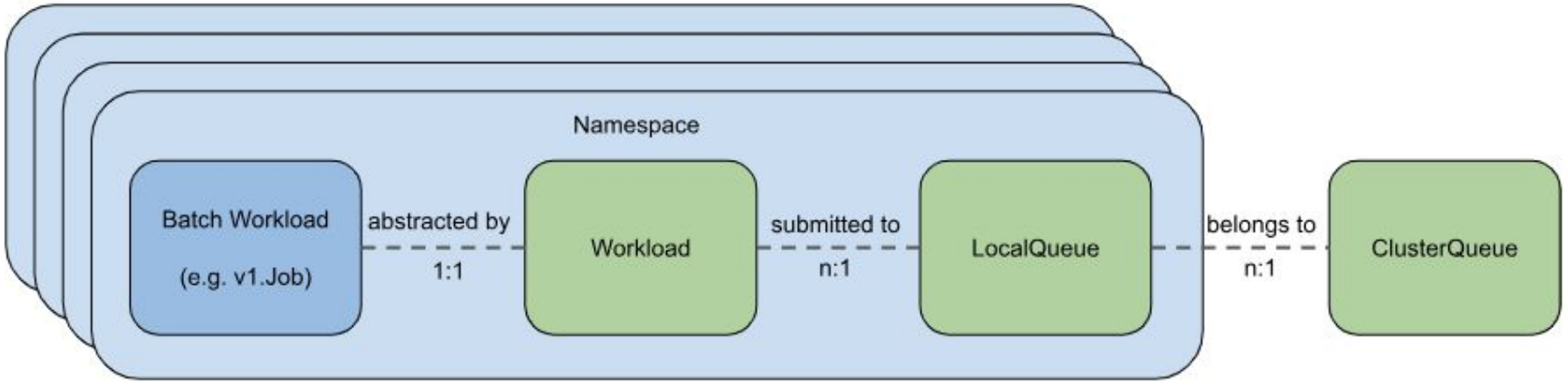
Red Hat Build of Kueue

General Availability coming soon

Job queue management system that creates queues where group of jobs wait until resources to run those jobs are available in the cluster



Common Use Cases

- **ML training pipelines:** GPU scheduling optimization
- **Data processing:** process large datasets
- **Multi-tenant clusters:** fair resource allocation
- **Cost optimization:** efficient resource sharing

Key Benefits

- **Fair Resource Sharing**
- **Optimal Job Placement**
- **Gang Scheduling**

OpenShift Virtualization Highlights

Modernize your operations with comprehensive lifecycle and infrastructure management

Flexible Infrastructure

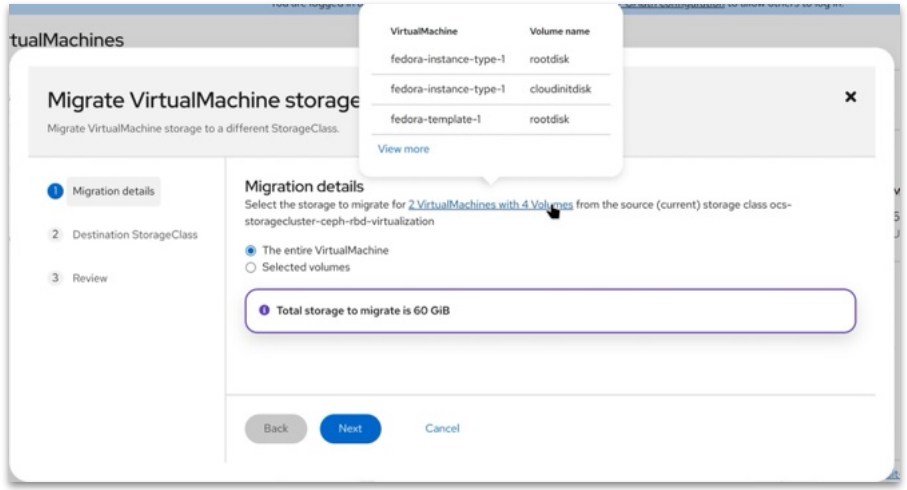
- Support additional public clouds ARO (TP), GCP and OSD (TP), OCI (TP)
- Single stack IPv6 (TP)
- Connect your VMs to the underlay network using OVN-K localnet
- Dynamically reconfigure VM storage with Storage LiveMigration

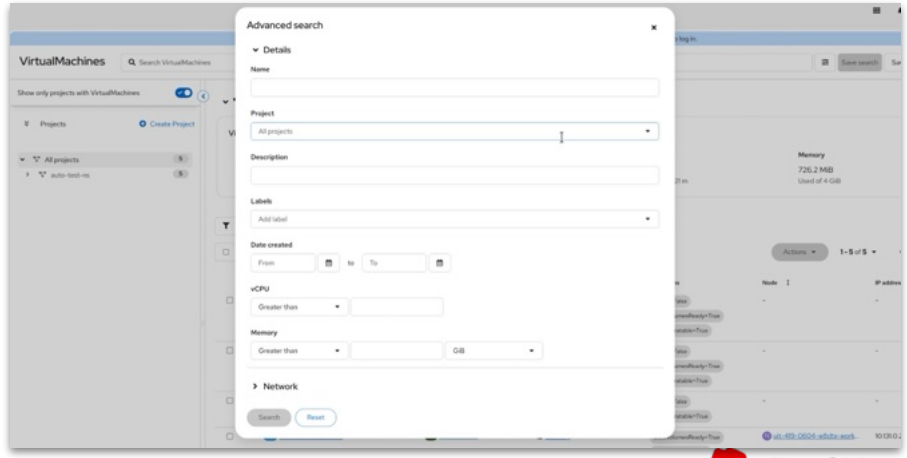
Improved infrastructure optimization

- Automatic VM workload balancing based on CPU resource utilization [TP]

Simplified VM Management

- Tree-view GA - enhanced with right-click for VM operations
- Advanced VMs search [TP]
- Protect VM from accidental deletion
- Multi-language support





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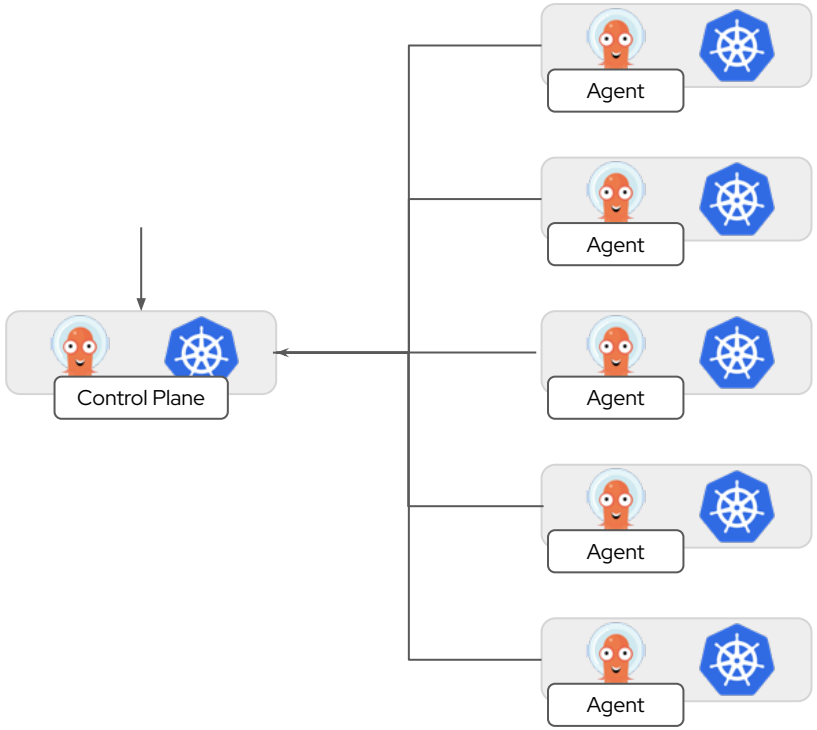
Multi-cluster GitOps with Argo CD Agent

Tech Preview

- Available in OpenShift GitOps 1.17.0
- Soon available as an RHACM Add-On

- One way communication Agent -> Control plane
- Reduce the footprint of hub and spoke clusters
- Resilient and flexible network connectivity



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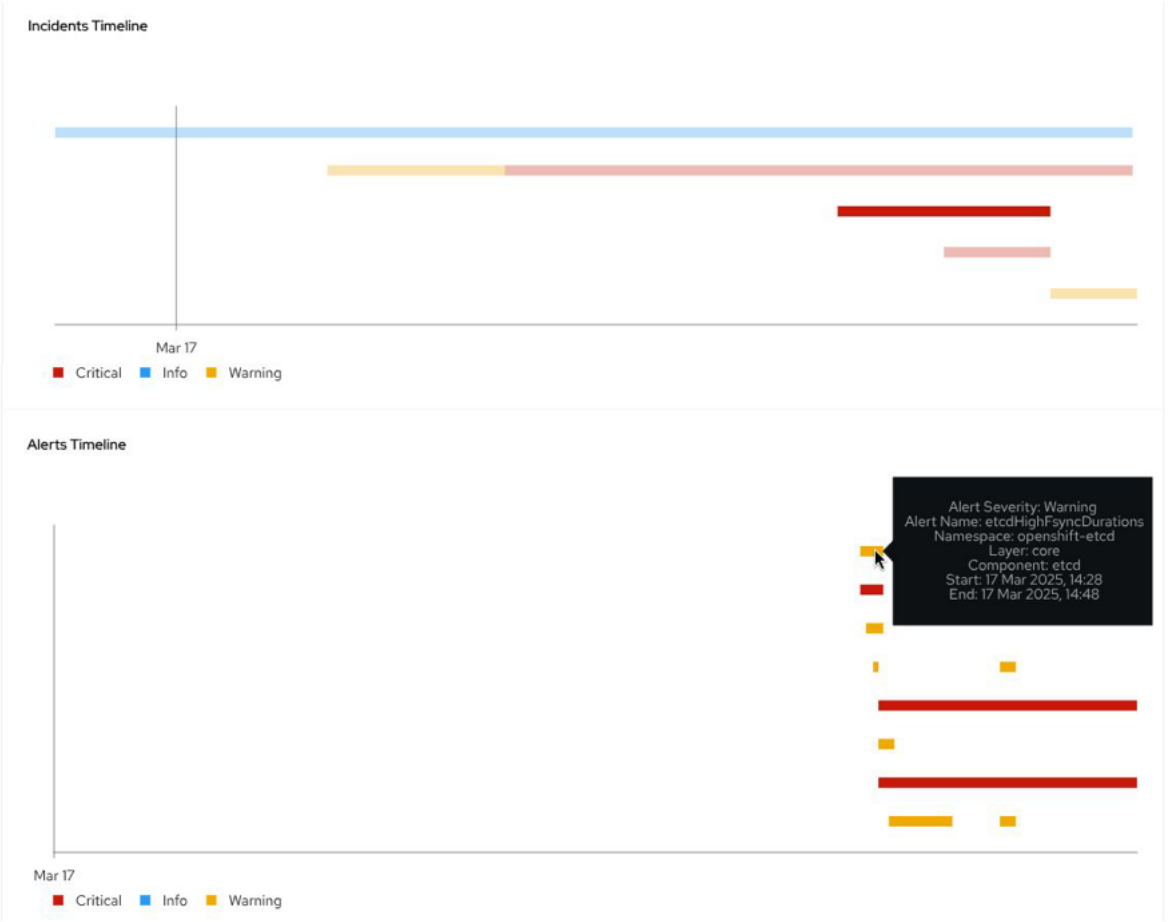
Intelligent OpenShift

Incident Detection

Enhanced Technology Preview with **COO 1.2**

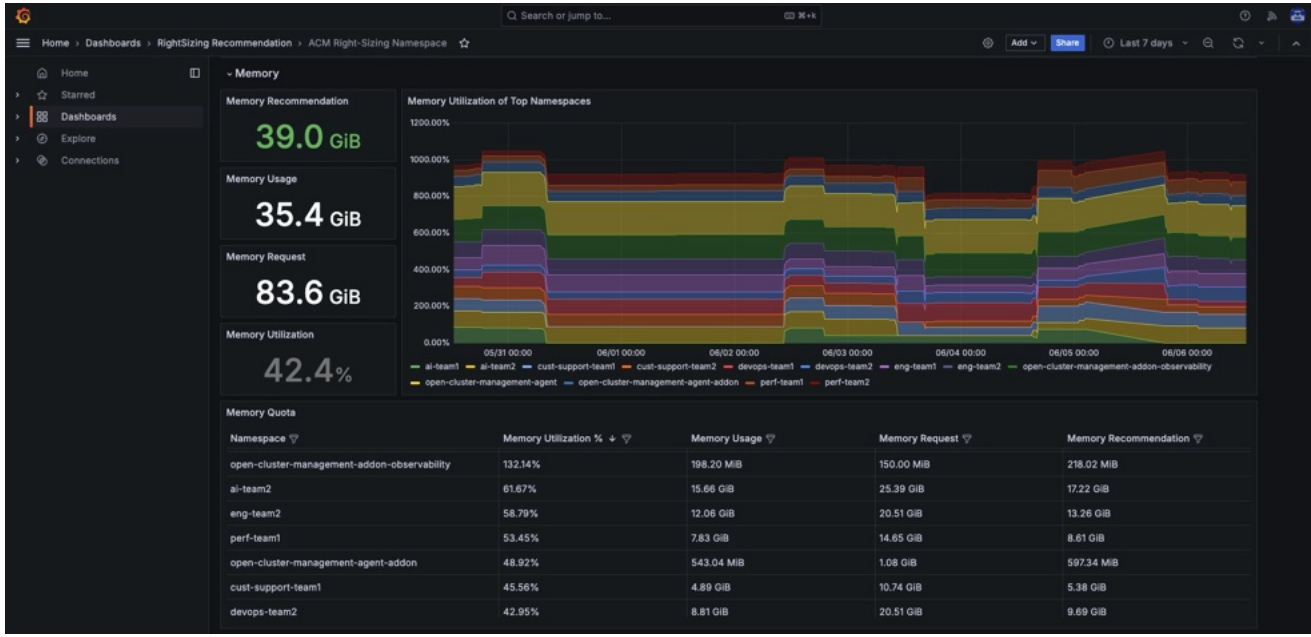
- **Manage alert noise effectively**
  Incident detection groups related alerts into incidents
- **Alert groupings**
  Currently based on the temporal correlation between events
- **Cluster observability operator (COO)**
  Install COO 1.1+ to make use of a dedicated Observe>Incidents UI in the OpenShift web console
- **Use it together with (Observability) Signal Correlation** to find the root cause of issues faster!
- Incident detection is also available as **developer preview with ACM 2.14** ('Incidents' in Grafana)
- **Curious to learn more?**
  A dedicated blog is available



Right Sizing Recommendations / namespace & cluster

Technology Preview with **Red Hat Advanced Cluster Management 2.14**

- **Right sizing recommendations at the namespace & cluster level**
  Policy-driven architecture using **PrometheusRule**
  Customizable data filtering via **ConfigMap**
  Feature works with OpenShift **labels** & **namespace** filters
- **Optimize workloads effectively**
  Identify underutilized and/or overprovisioned resources across managed clusters (CPU & Memory)
- **Multicluster observability operator (MCO) required**
  Make use of a dedicated Grafana dashboard in RHACM console



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AI Accelerator Ecosystem

- **NVIDIA Blackwell GPU support**
  NVIDIA **B200** and NVIDIA **RTX PRO 6000 Blackwell** Server Edition are supported with the NVIDIA GPU Operator 25.3.0. And OpenShift 4.19.
- **NVIDIA DGX H200 and DGX B200**
  HGX B200 and **DGX B200** systems are certified in the Red Hat catalog.
- **NVIDIA Multi-node, Multi-GPU**
  Red Hat has documented the full end-to-end configuration for **GPUDirect RDMA**.

- **OpenShift support for AMD MI325X GPUs**
  AMD supports the newly announced **MI325X GPU** with OpenShift and containers.
- **AMD GPU Health Monitoring**
  The AMD GPU Operator performs real-time health checks using a metrics exporter. It also integrates with the Kubernetes Device Plugin to automatically remove unhealthy GPUs from the schedulable resources of compute nodes.

All supported AI Accelerators

- **Unified AI accelerator telemetry dashboard**
  The **dashboard** in the OpenShift web console is providing built-in visibility into GPUs/AI accelerators performance and power usage.

Manage at Scale

Hosted Control Planes

ARO with HCP roadmap in motion

Ongoing development towards releasing ARO with HCP in 2026. Progress during OpenShift 4.19:

- Integration with AKS secrets/identities
- Scaling up to 500 nodes
- AKS network optimizations

AWS Capacity Blocks Support

Guarantee access to reserved EC2 instances requiring specialized hardware such as GPUs

CNI Certification for HCP

New workflow certification guide including HCP (along with OCP Virt and Service Mesh). Cilium and Calico in the pipeline for certified CNIs for HCP

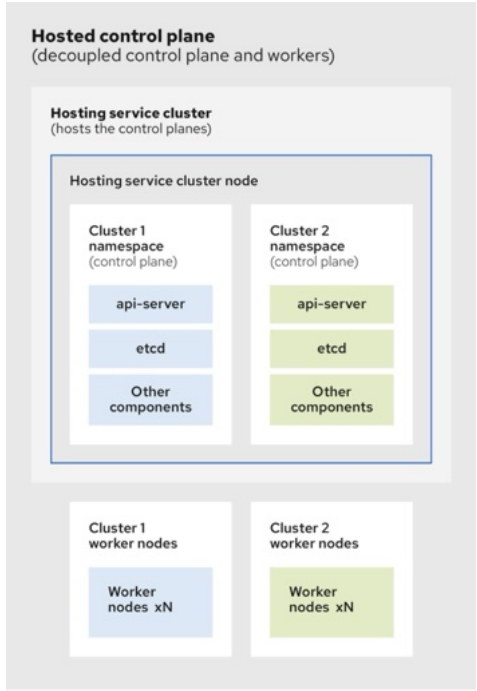
OADP Integration for Hosted Control Planes

Backup and restore hosted control planes from the Management Cluster with the OpenShift API for Data Protection, including restoring a hosted control plane in a different Management Cluster

Update Hosted Clusters API DNS on Day 2

Access your Hosted Clusters' API from a new name by updating at any time your DNS

HyperShift will regenerate your kubeconfig and console login command output



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Red Hat Advanced Cluster Management for Kubernetes

Fleetwide OpenShift Virtualization Management Made Easy

Fine-grained RBAC for virtual machines (TP).

Secure

OCPV

Control

New Advanced VM Actions: Snapshot, restore, & more.

OCPV

RHACM

OCPV

Enhanced Observability for OpenShift Virtualization.

Observe

OCPV

Scale

True cloud native multicluster virtualization management **at scale**.

Red Hat

Red Hat Advanced Cluster Management for Kubernetes

Advanced Cluster Operations Made Easy

KEY UPDATES

CAPI Operator - Cluster Lifecycle

- Create, manage, and grow your ROSA HCP clusters with the CAPA provider
- ClusterAPI for Metal3 & Agent with CAPOA provider

Reliable application rollouts (TP)

Progressive sync and pull model integration

Test policies before deployment

Policy dryrun command line flag makes policy rollouts safer

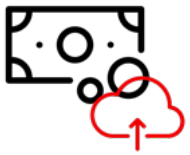
MORE FEATURES

Customised hub naming

Choose any name you want for your hub - fit with company requirements or just add some fun!

Gatekeeper updated

Stay current with community updates and provide support for the latest in 3.19



RHACM now on AWS Marketplace

PAYG single billing for RHACM on ROSA and pay only for actively managed cores

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Red Hat Advanced Cluster Security for Kubernetes

4.8 highlights

KEY UPDATES

Policy as Code
Manage RHACS policies as Kubernetes Customer Resources

External IP Visibility
Understand outbound connections

Keyless Sigstore Integration
Policy dryrun command line flag makes policy rollouts safer

MORE FEATURES

Scanner v4 becomes default

OpenShift Infrastructure Compliance
Stay current with community updates and provide support for the latest in 3.19

Red Hat

Red Hat Quay 3.15

Important improvements and fixes for AI and Supply Chain Security

Improved Google Cloud Storage Support

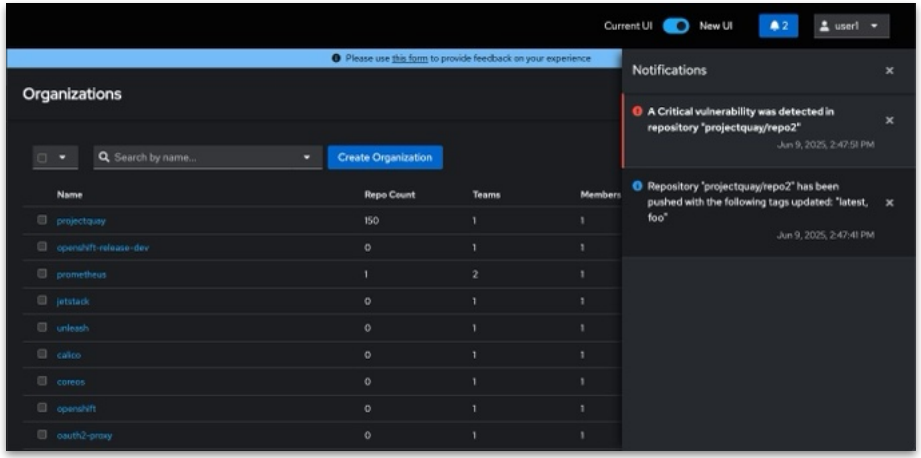
Uploads with layers larger than 4 GiB (e.g. LLMs as OCI artifacts) no longer time-out or consume excessive memory thanks to multi-part upload support

Reliable Vulnerability Scans for images partially pulled through a cache

Upon pull-through Quay now pulls all layers of the requested regardless to enable Clair vulnerability scanning

UI Improvements

We are adding UI notification support and improve the performance of listing all repositories available to a user



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Observability & Sustainability

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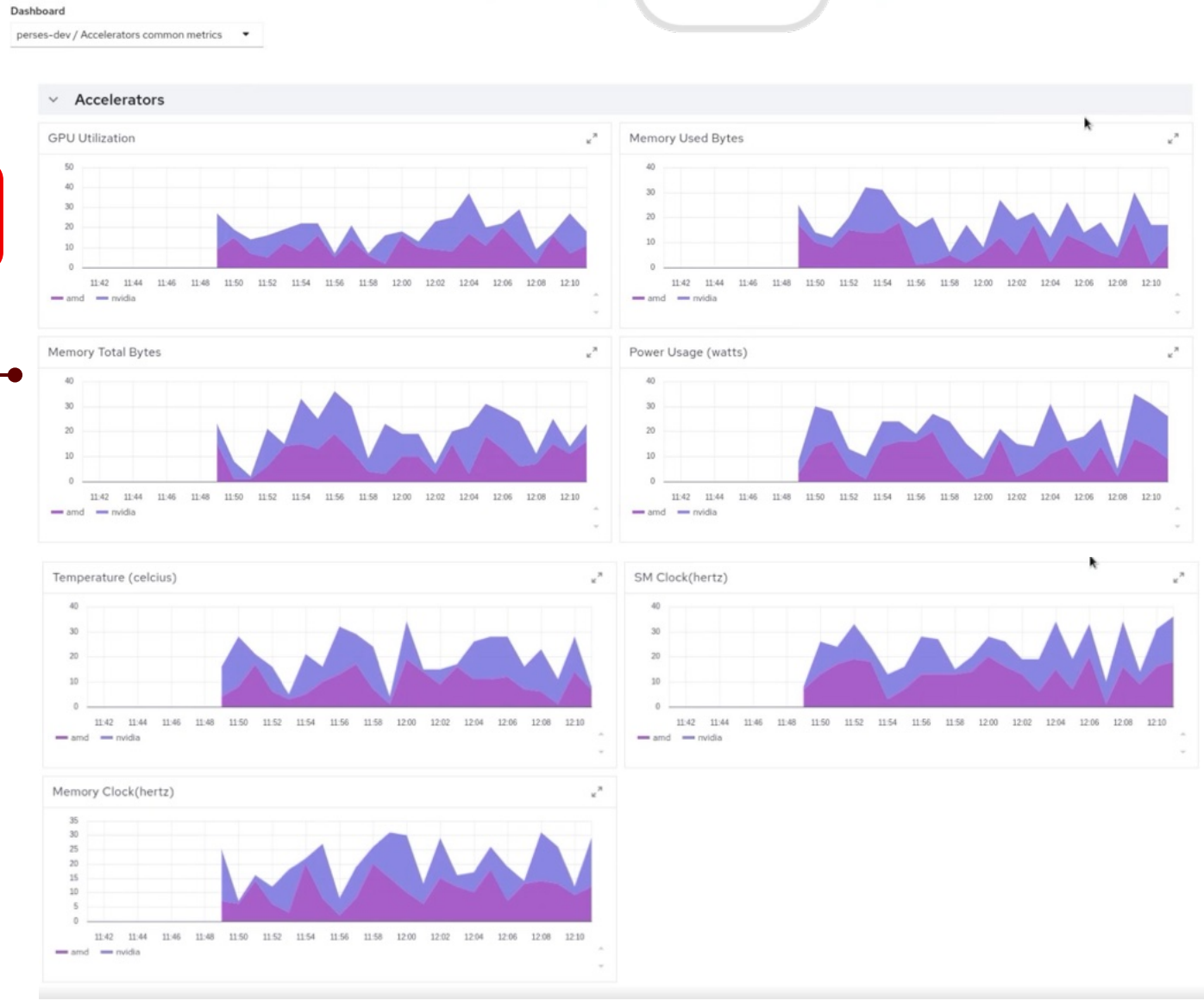
Observability

COO 1.2

Cluster Observability Operator

New Features

- Dashboards UI: **Accelerators** Dashboard
- Traces UI **GA**: Scatter Plot, Trace Table & Gantt Chart
- Traces UI: **Advanced** Filtering
- Logging UI: **OTEL** Support
- Enhancements in **Incident Detection** (TP)
- Enhancements in **Signal Correlation** (TP)



Observability

OpenShift Monitoring

OpenShift 4.19

New Features

- Prometheus **3.x** integration
- Promoted scrape profiles to GA
- Configuring external Alertmangers with proxy_url

Improvements

- **Alert** updates
  - Minor improvements, more runbooks
- Monitoring stack **components** updated
  - Alertmanager: 0.28.1
  - Prometheus Operator: 0.81.0
  - Prometheus: 3.2.1
  - kube-state-metrics: 2.15.0
  - node-exporter: 1.9.1
  - thanos: 0.37.2

Observability

OpenShift Logging

Logging 6.3

Log Collection

- Cluster Logging Operator will expand the available Splunk metadata keys for easier log management
- Cluster Logging will support multiple CloudWatch outputs with STS authentication

Log Storage

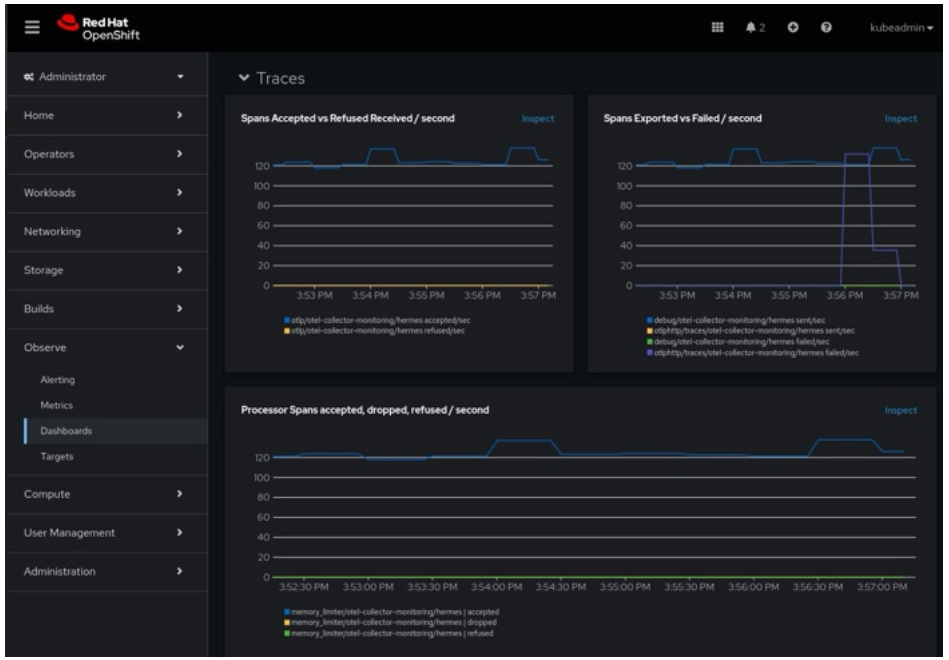
- Loki will allow virtual host style configuration
- [Tech Preview] Loki will introduce resource limits

Observability

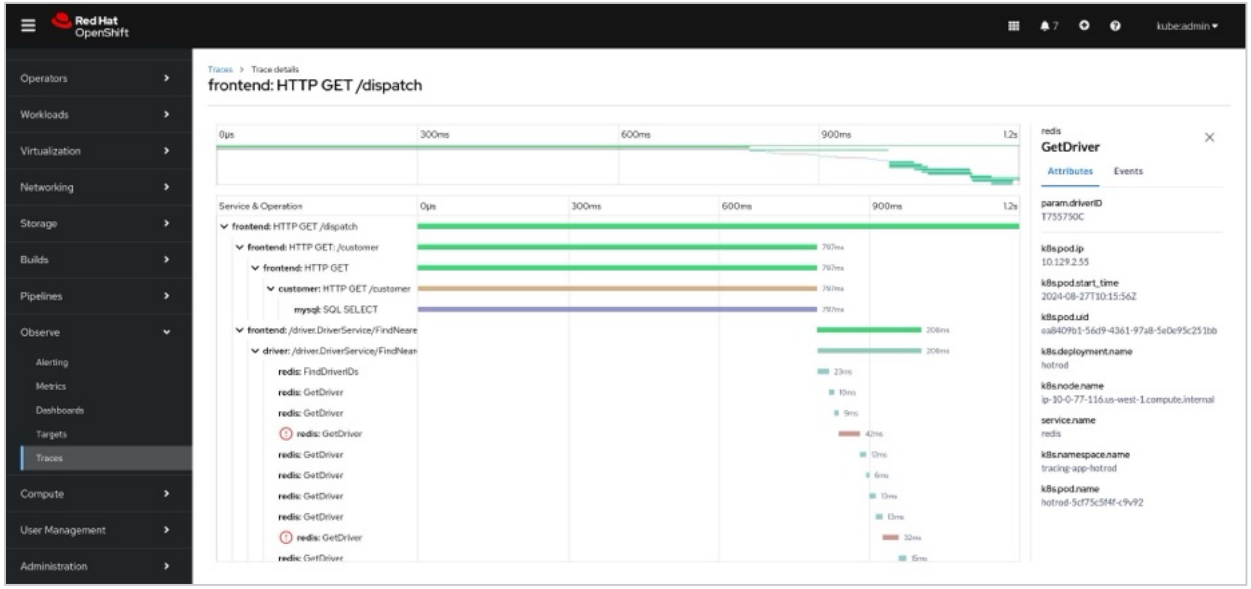
Application Observability & Integrations

Red Hat build of OpenTelemetry

- Components going **GA** in this release:
  - Prometheus Receiver
  - Attributes/ResourceAttributes Processor
  - Kafka Exporter
- [Tech Preview] **Tail Based Sampling** Processor



Distributed tracing



- **Fine Grained RBAC** for stored Tracing data
- Short Lived Token support for **Tempo** in **GCP** and **Azure**

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Observability

Power Monitoring

Upcoming - Power monitoring 0.5 (2nd half July) - TP

Supports 4.17 → 4.19

Re-written core
Modular

- **Kepler** 0.10.0
  - Modular design
  - Improved accuracy
  - kepler-operator 0.17.0
- GA planned for Q4 2025

- **Supports (Bare-metal)**
  - Node
  - Pods
  - Containers
  - VM (Consuming)
  - Process

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Observability

OpenShift Observability

AI ready

OpenTelemetry support for Large Language Models + integration with Dynatrace

- Uncover insights to optimize and refine performance of **generative AI** (gen AI) and **large language models** (LLM) workloads with **Red Hat OpenShift AI.**
- Enhance cloud operations and **ensure security posture compliance** for Center for Internet Security (CIS), Digital Operational Resilience Act (DORA), National Institute of Standards and Technology (NIST), and other standards
- **Assess, manage, and take action** on misconfigurations and compliance violations for regulatory compliance standards.

https://www.dynatrace.com/hub/detail/red-hat-openshift-ai/

https://developers.redhat.com/articles/2025/05/21/implement-llm-observability-dynatrace-openshift-ai

Console

Console

Console: Unified Perspectives

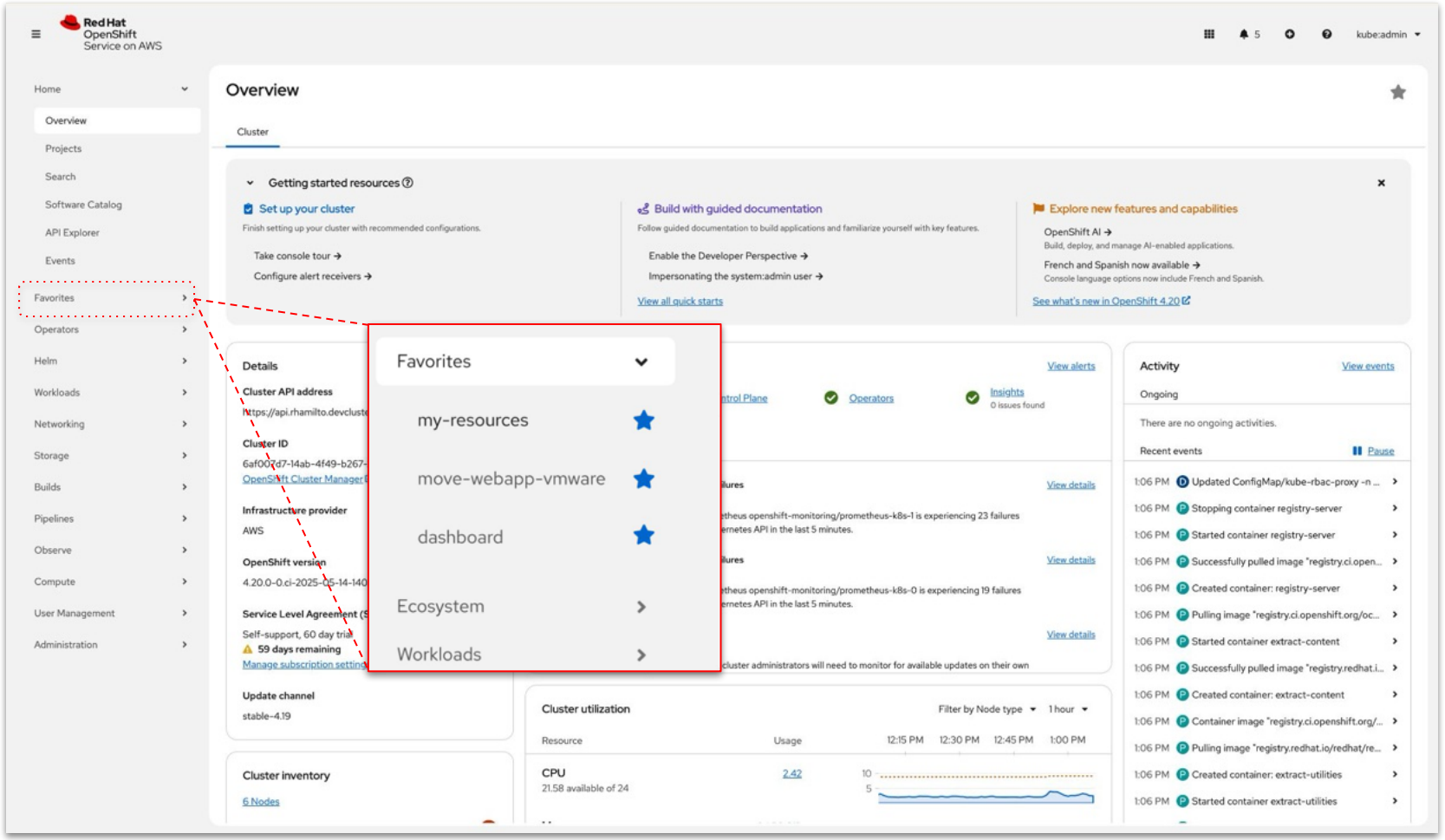
Admin & Dev views merged into a single view, streamlining the Openshift Console

Designed to...

- Reduce context switching, allowing users to complete end-to-end workflows without toggling views.
- Support hybrid roles, like Platform engineers, and reduce redundant workflows.

Comes with...

- New Guided Tour
- New favoriting Feature
- Improved Navigation
- Updated Design(Pattern Fly 6)
- Ability to re-enable Dev-only View



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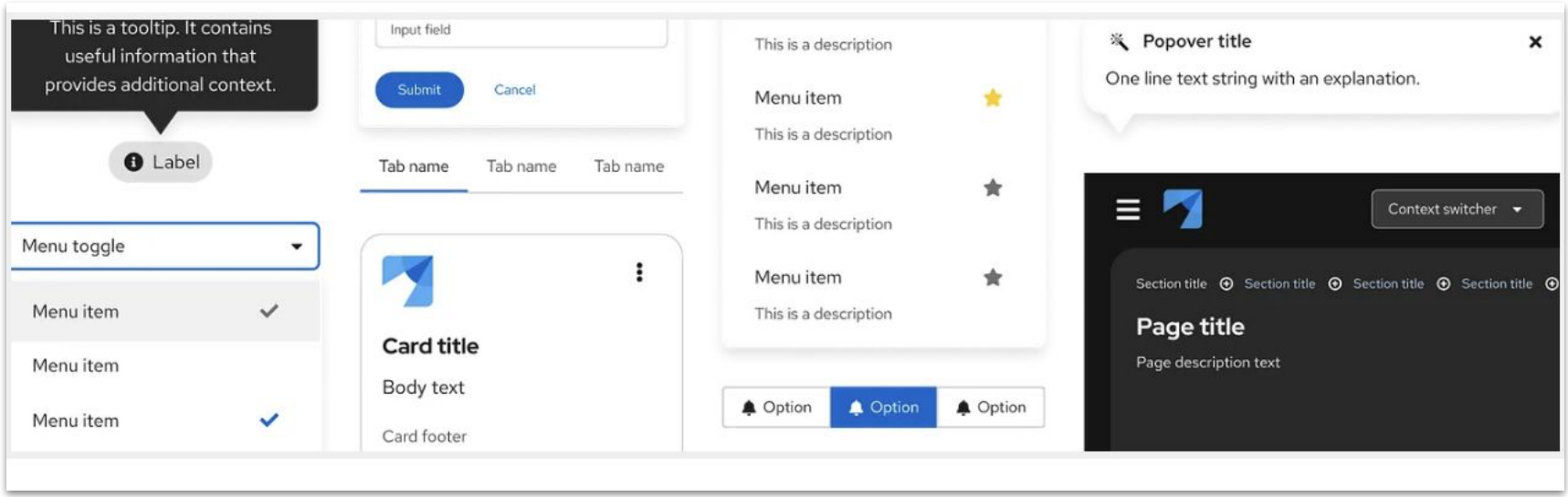
Console

Dynamic Plugin Updates

Build your own native integration with the Openshift Console

- Upgraded to Pattern Fly 6
  - Example Repos have been updated
    - Template
    - Crontab
    - Demo
- Pattern Fly 4 Deprecated
- Content Security Policy is now Active



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Console **RFEs** "Customer Happiness"

- RFE-1971 - Add customFaviconFile to consoles.operator.openshift.io/cluster
  - Ability to set light and dark themed favicon
    - PR show examples: https://github.com/openshift/api/pull/2177

- RFE-7041 - Enhance OpenShift Web Console with Identity Provider **Deletion** Capability.

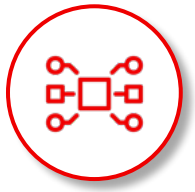
- RFE-1068 - When using VerticalPodAutoscaler have the recommended values shown to the developer in the UI

Developer Experience

OpenShift Dev Spaces

Version 3.21 is now available

Red Hat OpenShift Dev Spaces 3.21 is based on Eclipse Che 7.102



Connect Your Local JetBrains IDEs via JetBrains Gateway (Tech Preview)

You can now use JetBrains Gateway to connect your local JetBrains IDE (IDEA Ultimate, PyCharm, WebStorm, RubyMine, and CLion) to a remote Dev Spaces instance.

Customize settings, extensions, and product.json through a configmap

Administrators can now customize the settings.json, extensions.json, and product.json for VS Code using a configmap making editor customizations quicker and easier.

Configure two GitLab OAuth providers simultaneously

You can now configure two Gitlab OAuth providers on a single Dev Spaces instance which is especially useful for developers working on codebases hosted on both GitLab SaaS and on-premises

Configure user namespaces with an OpenShift Template

Admins can now leverage the OpenShift Template object and replicate the resources defined in it across the namespaces of all users such as: LimitRange, ResourceQuota ,NetworkPolicy, Role, and RoleBinding

Podman Desktop

5.9k !

Accepted as a Sandbox Cloud Native Computing Foundation (CNCF) project.

- **NEW:** Simpler registry mirroring configuration
- **NEW:** Improved Kubernetes Support - more objects are supported (pods, maps, secrets, etc.), new namespace switching and better performance!
- **NEW:** Search in Logs
- **NEW:** Prune only untagged images
- **NEW:** experimental features: status bar, tasks manager, and Kubernetes context monitoring

Extensions! Extensions! Extensions!

- **BootC**: Experiment with bootable containers on your desktop! Allows build, test and deployment of bootable containers.
- **Minc**: Start *MicroShift* in a container for development purposes.
- **RHEL VMs**: Run RHEL in VMs directly from Podman Desktop
- Podman Desktop is now available on RHEL 10

Release Notes

Podman AI Lab

Providing an easy way for application developers to get started with AI

Local Inferencing

- GPU Acceleration Support
- Now leveraging **Ramalama**
- Support for OpenVino

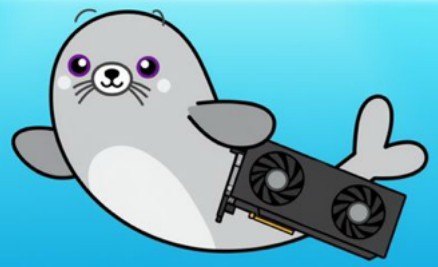
Experimentation Playground

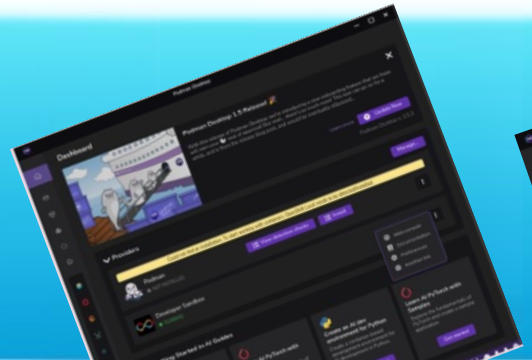
- Expanded Catalog of Recipes
- Access to Open AI API
- **Ollama** API compatibility
- MCP Support in Playground

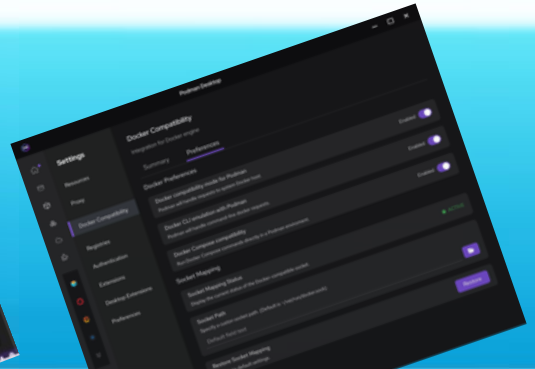
Agentic

- Easy start of **LLama Stack**
- Explore Llama Stack API
- Agents Recipes
- MCP Server Support
- **Podman MCP Server**

Try Podman NOW: podman-desktop.io







OpenShift Developer Experience

IDE Extensions and Cloud Developer Environment

OpenShift Toolkit for VS Code - 1.19.0

- IntelliJ OpenShift is no longer supported and has been removed from the JetBrains Marketplace
- OpenShift Pipeline Tasks in Cluster View has been added to the Application explorer
- Multiple K8s configuration files are supported when configured in KUBECONFIG environment variable

Quarkus Tools for VS Code and IntelliJ - 1.21.0

- Performance improvements in the Qute language server
- Support for Integer operators in Qute files
- Bug fixes/stability enhancements

Language Server Protocol Plugin - 0.13.0

- Many performance improvements
- Language Server Installer API
- Debug Adapter Protocol (DAP) support
- Various LSP implementations

Red Hat Developer Hub

Streamlined DevX and accelerated onboarding using centralized tools and docs.

RHDH 1.5 Highlights:

- High Availability support for **OpenShift**.
- Configurable Global Header & Floating button
- Techdocs add-ons for a richer documentation experience
- Easier RBAC with bulk selection for users, groups, plugins and permissions

RHDH 1.6 Highlights:

- RHDH Local is now available as a Dev Preview
- High Availability support for **AKS**
- Plugin configuration yaml is now featured in the Extensions catalog GUI
- Delegate RBAC control to other teams
- New “End user” docs for the catalog, templates, and techDocs features

Runtimes

Red Hat build of Quarkus

What's New in 3.20 (May '25)

- Enhanced observability with OpenTelemetry Logging
- Full support of the the new WebSocket implementation
- Full support for generation of reflection-free Jackson serializers
- Advanced Security Support for OIDC mTLS
- Switch to defaulting to UBI9 Runtime images
- Removal of RHBQ entitlement from RHEL 10

Quarkus Workshops on RHDP

Quarkus & OpenShift

Use Cases
Java workloads on OpenShift, Spring to Quarkus

Summary
Hands-on workshop introducing Java devs to Quarkus using OpenShift, guiding them through modern cloud-native development practices, app deployment, and migration from Spring

Personas
Java developer

Duration
1 full day

Contacts
Jeff Beck, Daniel Oh, Eric Deandrea

Learn More

MAD (Modern App Dev)

Use Cases
Modernize traditional Java apps

Summary
hands-on experience for developers, operations, and business leaders to learn how Red Hat's technologies help them build, run, and manage their applications in the Hybrid Cloud

Personas
Java developer, architects, operations, business leaders

Duration
1 full day

Contacts
Jeff Beck

Learn More

Java for AI

Use Cases
AI-infused Java apps (modernize & new)

Summary
Hands-on workshop to elevate a Java developers AI skills. Learn how to use next-gen AI and GenAI tools to streamline coding, enhance efficiency, and automate routine activities.

Personas
Java developer, architects

Duration
½ day

Contacts
Jeff Beck, Daniel Oh, Eric Deandrea

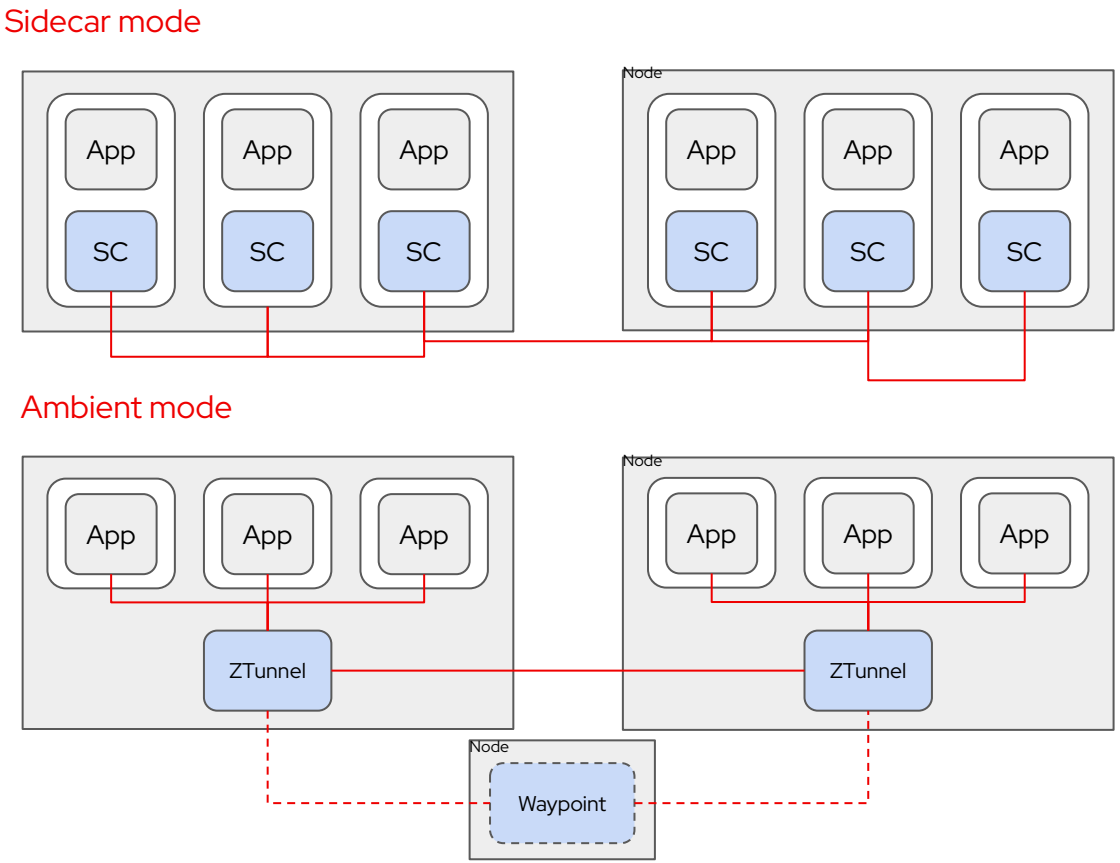
Learn More

Red Hat

Platform Services

OpenShift Service Mesh

- OpenShift **Service Mesh 3.1** is coming soon:
  - Based Istio 1.26 and Kiali 2.11
  - End to end Kubernetes Gateway API support with OCP 4.19+
  - **Istio Ambient mode - Technology Preview**
    - **Easier to adopt - no sidecars!**
    - **Significantly less resource usage**
    - ZTunnel for **lightweight pod to pod mTLS encryption**
    - Independently scalable Waypoints for L7 mesh features.
- OpenShift Service Mesh 3.1 will be supported on OCP 4.14+.



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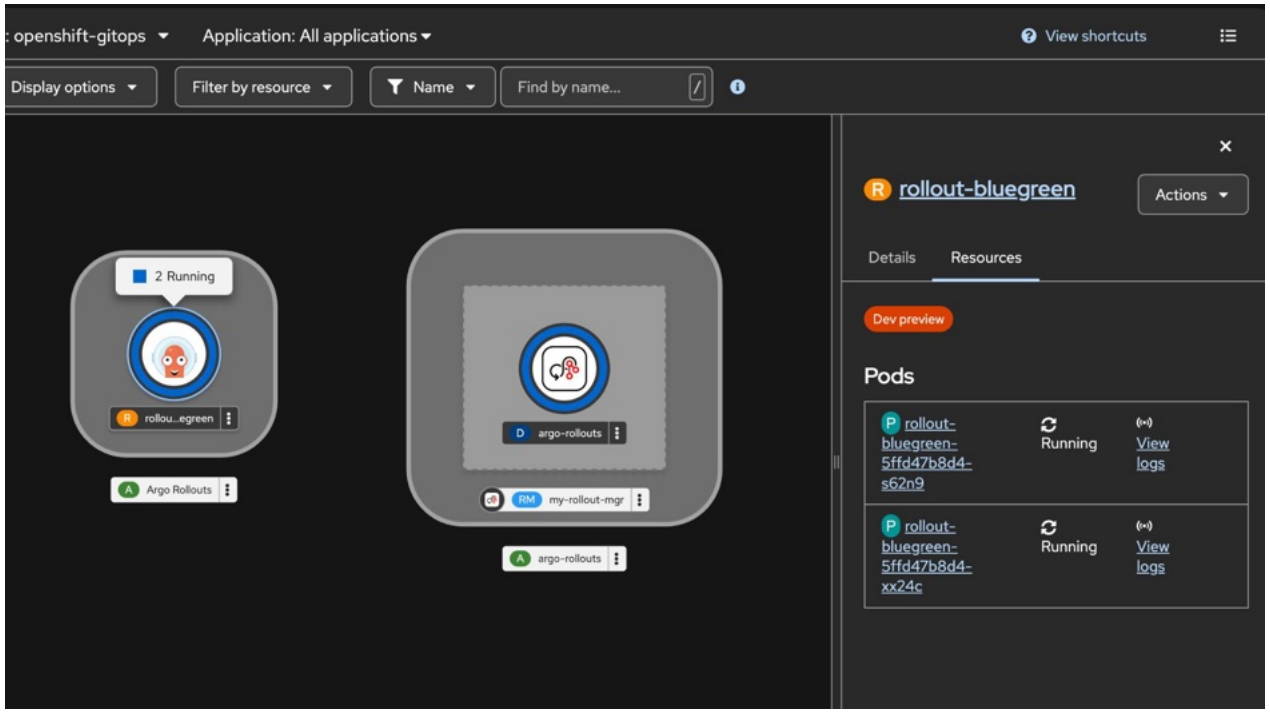
OpenShift GitOps

OpenShift GitOps **1.17** release

- Argo CD 3.0 and Argo Rollouts 1.8.0
- Argo CD Agent Tech Preview
- Argo Rollouts in the OpenShift Console

Customer requests:

- RFE-4607 JSON logging for all components



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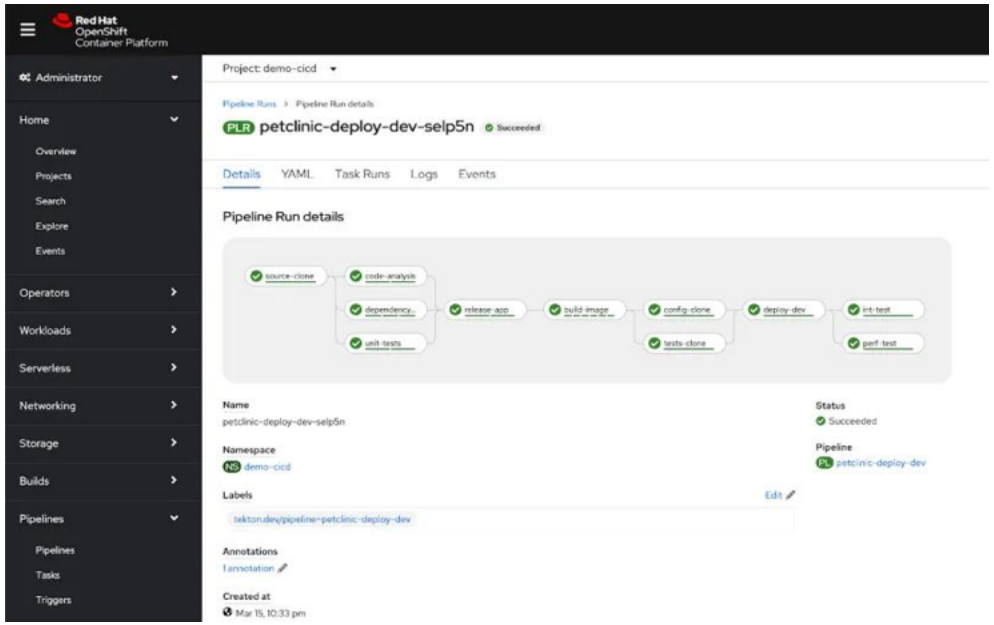
Builds & Pipelines

OpenShift Pipelines 1.18

- Higher control on HA by adding StatefulSet Ordinals (Tech Preview)
- Introduce Tekton cache to optimize the image build time (Tech Preview)
- Pipelines-as-Code (PaC) features:
  - Automatic PipelineRun Cancellation (Tech Preview)
  - Trigger Pipelines by file changes, commit comments and labels
  - Pattern Testing Command (tkn pac info globbing)
- Tekton Results is General Availability (GA)



Builds for OpenShift 1.5

- Buildpacks build strategy (Tech Preview)
- BuildConfigs to Shipwright migration guide

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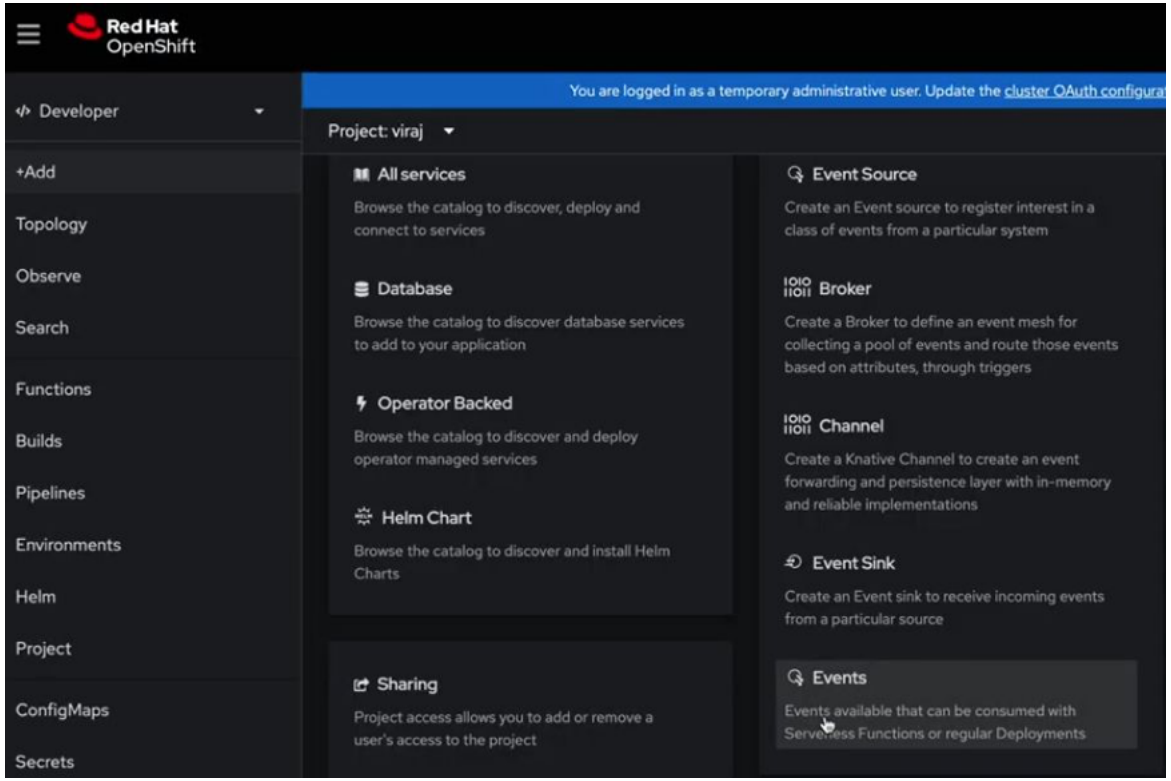
OpenShift Serverless

- Serverless 1.36 release based on Knative 1.16
- Functions Python middleware v2 is now TP
- Integration- Source and Sink is now TP
  - AWS-Connectors (S3, SQS, SNS & DynamoDB)
- EventTransform API is now TP
- Automatic EvenType registration is now TP
- Eventing Transport encryption is now GA
- Eventing AuthN and AuthZ is now DP
- Kn event plugin is now GA
- Long running requests for AI/ML use cases



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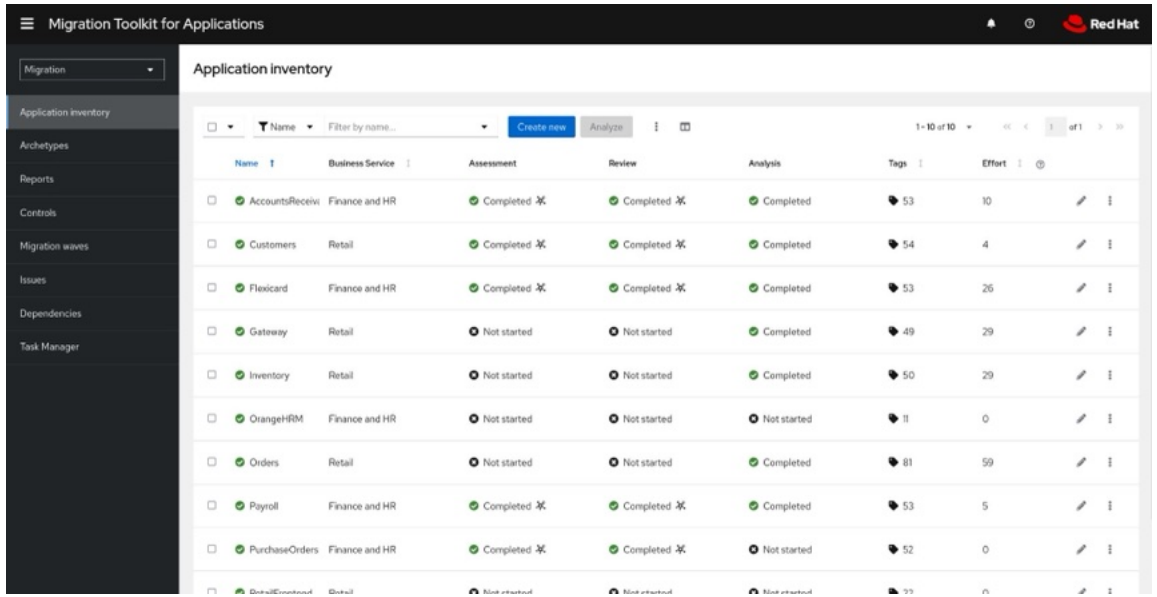
Migration Toolkit for Applications

Migration Toolkit for Applications 7.3

- New Migration Paths: Spring Boot 2 to 3 and Spring Framework 5 to 6.
- Support for Node.js and Python analysis (Tech Preview)
- Assets Generation in the MTA CLI (Dev Preview)
  - Enable MTA to generate all assets required to deploy an application on OpenShift.
  - Integrated with the Helm templating engine
- Upgrade from Red Hat Single Sign On to the Red Hat Build of Keycloak



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Installation & Updates

OpenShift 4.19 Supported Providers

Installation Experiences

aws
Outposts
Wavelength
Local Zones

Azure
Azure Stack Hub
Alibaba Cloud
(Tech Preview)

IBM Cloud
IBM Power Systems
IBM Z and
IBM LinuxONE

Bare Metal

Google Cloud

vmware vSphere

ORACLE
Cloud Infrastructure

NUTANIX

Red Hat
OpenStack Services
on OpenShift

RED HAT
OPENSTACK
PLATFORM

Automated

Installer Provisioned Infrastructure

- Auto-provisions infrastructure
- *KS like
- Enables self-service

Full Control

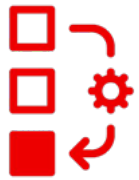
User Provisioned Infrastructure

- Bring your own hosts
- You choose infrastructure automation
- Full flexibility
- Integrate ISV solutions

Interactive – Connected

Assisted Installer

- Hosted web-based guided experience
- Agnostic, bare metal, vSphere and Nutanix
- ISO driven



Local – Disconnected

Agent-based Installer

- Restricted network (disconnected / air -gapped)
- Automatable installations via CLI
- Bare metal, vSphere, SNO
- ISO driven

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Cloud

Installation Highlights for Cloud Providers

aws

- Allocate Load Balancers (API & Ingress) to Specific Subnets
- Add support to Asia Pacific Malaysia and Thailand regions

Google Cloud

- Support Confidential Nodes with Intel TDX
- Support Confidential Nodes with Intel AMD SEV-SNP
- Customer managed external DNS support (TP)

Azure

- Support Confidential Nodes with AMD SEV-SNP
- Add support to Lsv4 and Lasv4 machine series
- Add support to Dxv6 machine series
- Add support to NDs and NVs machine series

Installation Highlights for On-premises Providers

Bare Metal

- Bare Metal as a Service Support for OpenShift (TP)
- Metal3 Support for Network Controller Sideband Interface (NC-SI)
- Bare Metal Cluster API Provider (CAPI) (TP)

vmware vSphere

- OpenShift Zones support for vSphere Host Groups (TP)
- Provide API to disable vSphere CSI (GA)
- vSphere multi-NIC VM creation support in the IPI installer (TP)
- Support vsphere in-tree migrated volume resize (GA)
- MachineSet - Support of more than one disk (TP)

NUTANIX

- Support Nutanix in Agent-based Installer (GA)

IBM Power Systems IBM Z and IBM LinuxONE

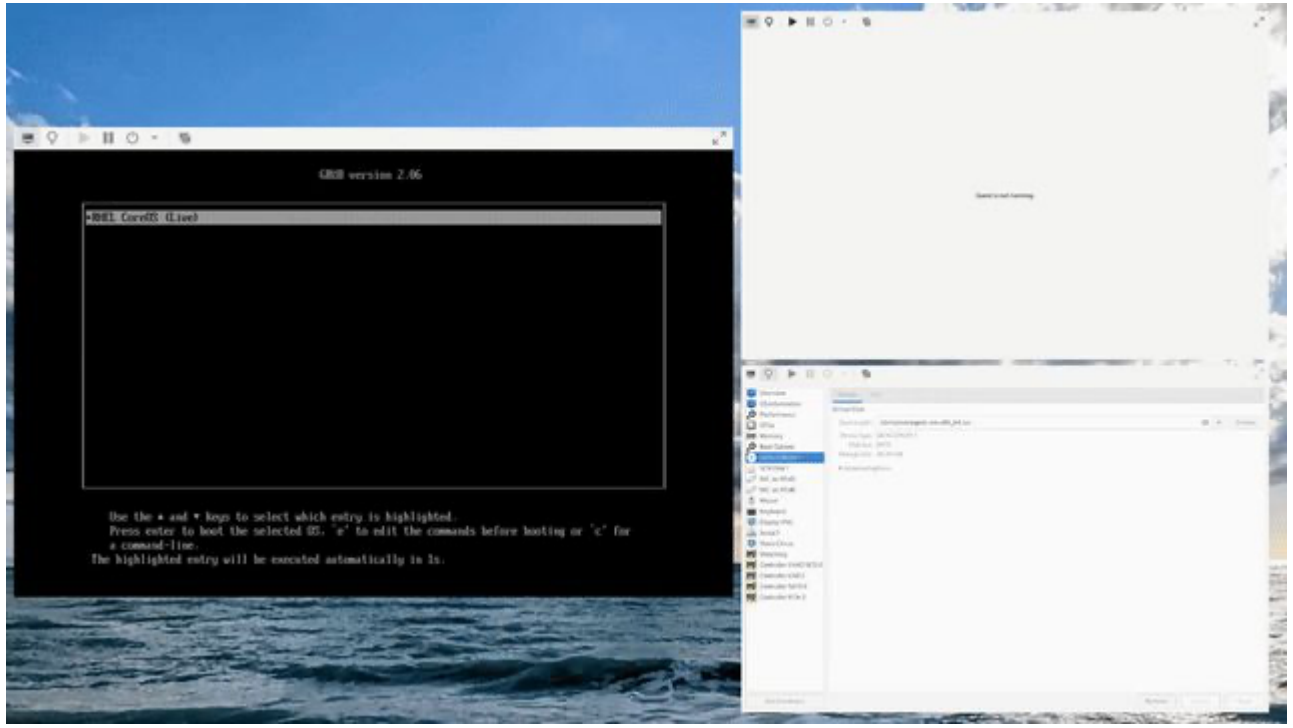
- Support for new IBM Systems
- Differentiate between bare metal and VM nodes
- IBM Z root volume LUKS encryption

Multi- Arch

- Support for Multi-arch in Builds

Streamlined OpenShift Virtualization Onboarding Experience

Developer Preview in OpenShift 4.19.z



Disconnected Installation, No Registry Required

- Install OpenShift Virtualization in fully air-gapped environments without needing a pre-existing image registry
- Leverages Agent-based installer

UI-Driven Workflow

- Removes the need for manual YAML and CLI steps with a guided installer experience

Opinionated Workflow with Pre-Configured Operators

- Pre-configure essential operators for OpenShift Virtualization Engine and minimize external day 1 dependencies

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RHOSO18 and Shift-On-Stack in 4.19

- Openshift on Openstack Key Highlights
  - Enable OpenshiftAI on GPU passthrough in DevPreview
    - Initial verification of the use of OpenshiftAI on a shiftonstack cluster
    - Builds upon previous work done to expose GPUs for AI/ML workloads
  - Improved Topology awareness with Cinder CSI Driver native support
    - Helps mitigate AZ misalignments between computer and storage
    - Better alignment with Nova AZ conversion (the defaults AZs used my almost all customers)
- RHOSO18 Key Highlights (Feature Release 3 July 18th 2025)
  - OpenStack Resource Controller in Tech Preview
    - Ability to manage and generate openstack resources across multiple RHOSO clouds (projects , users, networks flavors and more)
    - K8s native interface
  - MultiRHOSO Deployments Via NameSpace isolation - GA

```yaml
apiVersion: openstack.k-orc.cloud/v1alpha1
kind: Subnet
metadata:
  labels:
    app.kubernetes.io/name: openstacksubnet
    app.kubernetes.io/instance: openstacksubnet-gettingstarte
    app.kubernetes.io/part-of: gettingstarted
  name: subnet-1
spec:
  cloudCredentialsRef:
    cloudName: openstack
    secretName: openstack-clouds
  managementPolicy: managed
  networkRef: network-1
  resource:
    description: |
      Example subnet
    tags:
    - gettingstarted
    ipVersion: 4
    allocationPools:
    - start: 192.168.1.5
      end: 192.168.1.60
    cidr: 192.168.1.0/24
```


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* As measured in Red Hat labs, April 2024

Find issues prior to Performing Updates

Technology Preview

- Use **`oc adm upgrade recommend`** now shows important alerts which can affect upgrades. This allows users to check cluster before an upgrade.
  - read-only command and does not alter the state of your cluster.

```
$ export OC_ENABLE_CMD_UPGRADE_RECOMMEND=true
$ export OC_ENABLE_CMD_UPGRADE_RECOMMEND_PRECHECK=true
$ oc adm upgrade recommend

Failing=True:

  Reason: ClusterOperatorNotAvailable
  Message: Cluster operator monitoring is not available

The following conditions found no cause for concern in updating this cluster to later releases:
recommended/NodeAlerts (AsExpected), recommended/PodImagePullAlerts (AsExpected)

The following conditions found cause for concern in updating this cluster to later releases:
recommended/PodDisruptionBudgetAlerts/PodDisruptionBudgetAtLimit/1

recommended/PodDisruptionBudgetAlerts/PodDisruptionBudgetAtLimit/1=False:

  Reason: Alert:firing
  Message: warning alert PodDisruptionBudgetAtLimit firing, which might slow node drains.
Namespace=openshift-monitoring, PodDisruptionBudget=prometheus-k8s. The pod disruption budget is
preventing further disruption to pods. The alert description is: The pod disruption budget is at the
minimum disruptions allowed level. The number of current healthy pods is equal to the desired healthy
pods.
https://github.com/openshift/runbooks/blob/master/alerts/cluster-kube-controller-manager-operator/PodDisr
uptionBudgetAtLimit.md

Upstream update service: https://api.integration.openshift.com/api/upgrades_info/graph
Channel: candidate-4.16 (available channels: candidate-4.16, candidate-4.17, candidate-4.18, eus-4.16,
fast-4.16, fast-4.17, stable-4.16, stable-4.17)

Updates to 4.16:
  VERSION     ISSUES
  4.16.32     no known issues relevant to this cluster
  4.16.30     no known issues relevant to this cluster
And 2 older 4.16 updates you can see with '--show-outdated-releases' or '--version VERSION'.
```

OpenShift oc-mirror **v2**

Phase 1: Cosign tag-based discovery for SigStore-style signature support

Secure your offline content: oc-mirror v2 now mirrors *SigStore signatures*

- **Expanded security**: oc-mirror v2 in OpenShift 4.19 introduces the ability to **mirror** container images along with their **associated Cosign tag-based SigStore signatures**.
- **Offline verification ready**: This enhancement is crucial for enabling **scalable** and **flexible validation** in disconnected environments, ensuring the integrity and authenticity of your mirrored Red Hat content.
- **Default behavior & control in this 4.19 release**:
  - Signature mirroring is **disabled by default**. Enable it with `--remove-signatures=false`
  - **Granular control** over signature mirroring is available via `registries.d` configuration (**e.g., per registry**, **namespace**, or **image**).

Red Hat

Control Plane & Security

OpenShift Control Plane

Security

TLS 1.3 Support with OpenShift Control Plane

With TLS 1.3 support (the "Modern Profile") in the OpenShift Control Plane, users can now set TLS 1.3 for the kubelet, the API, and the Ingress Controller, increasing the security and of their clusters

cgroup v1 Support Removed in OCP 4.19

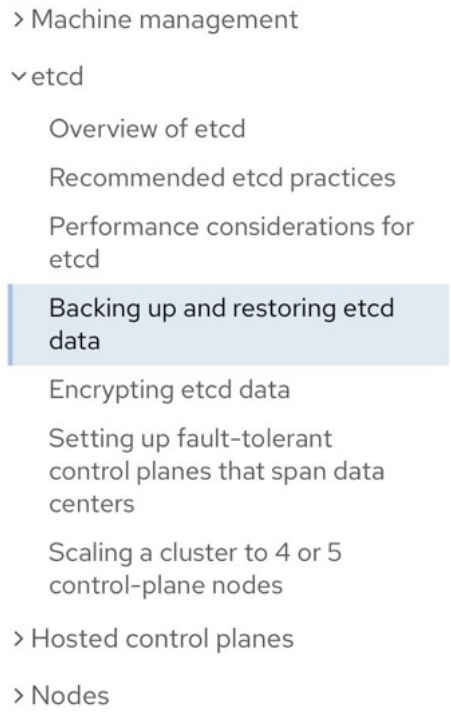
Starting Openshift 4.19, cgroup v1 support is removed from OpenShift.

cgroup v1 was deprecated from OpenShift 4.16, and cgroup v2 was made the default

Documentation

New Control Plane Documentation Section

Consolidate information to manage the OpenShift control plane in one section, adding use cases, feature reference and additional content from articles and other sections related to the control plane management



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Security Highlights for OpenShift 4.19

Increased security for networking, secrets management, cluster stability

Authentication

- BYO External Authentication TechPreview: Direct authentication to APIs using external OIDC IDP
- Zero trust workload identity manager (based on SPIFFE/SPIRE) TechPreview: Multi-Factor Authentication for Workloads

Workload Secrets

- Support Routes certificates managed by cert-manager (GA)
- Support cert-manager and SSCSI in disconnected environments
- External Secrets Operator - Technology Preview

Networking & Routing

Red Hat OpenShift Networking Enhancements

Hardware Enablement

Enabling Data Processing Units (DPUs) within OpenShift [Tech Preview]

- DPU (Data Processing Unit) is a specialized, programmable processor designed to offload and accelerate data-centric tasks such as networking, storage, and security operations, thereby freeing up the CPU to focus on application-specific workloads
- DPU Operator provides vendor-agnostic approach to manage DPU devices and network attachments in your OpenShift clusters

Bare metal deployments

Support for OVS balance-slb bond mode

- Designed to enhance network traffic sharing and load balancing for virtualization workloads, particularly in on-premise environments
- Also supported is migration from existing **S**ource **L**oad **B**alancing configuration
- **balance-slb** mode helps to preserve the source IP address of VMs for egress and ingress traffic

Red Hat

Red Hat OpenShift Networking Enhancements

Software Defined Networking

Support EndPort in MultiNetworkPolicy

- Allow customers to define network policies using port ranges within MultiNetworkPolicy, particularly benefiting those migrating virtual machine (VM) instances to OpenShift Virtualization
- The ability to use **endPort** in the policy specification simplifies configuration and reduces overhead for complex

Support for Ansible playbook for offline openshift-SDN to OVN-K CNI migration on Ansible Automation Hub

Security updates

IPSec stability and quality improvements

- Delivers a seamless IPSec experience across OpenShift traffic flows, simplifying both deployment and upgrade processes.

eBPF

eBPF Program Security & Management [Tech Preview]

- The eBPF Manager Operator, available as a technology preview, allows you to deploy and manage eBPF programs. This Operator works in tandem with the Ingress Node Firewall Operator and Network Observability Operator.

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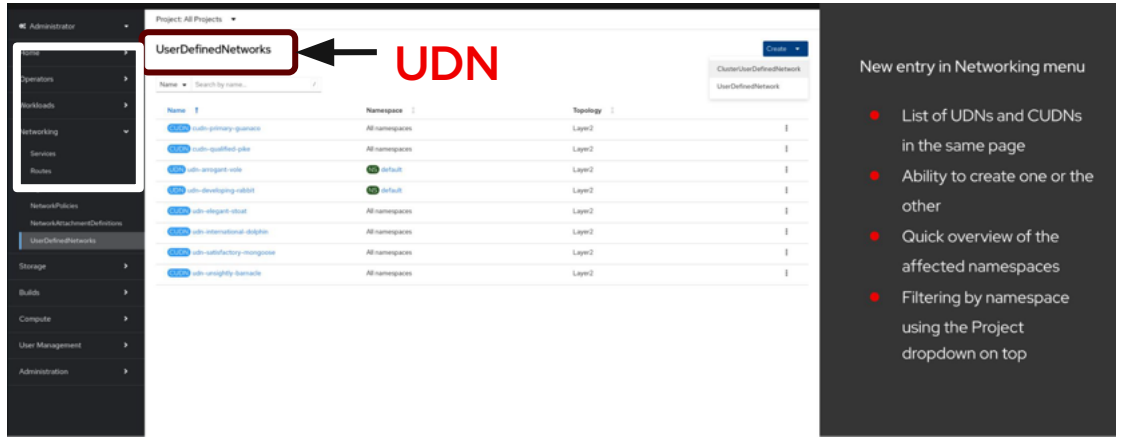
Network Observability

Network Observability Operator

- **New release: v1.9**
- **User Defined Networks Support**
- **IPsec tracking**
- Net Observ CLI improvements
- Improved agent and Flow Processing filtering
- Migrate to Patternfly 5
- OVN Observability Sampling [Tech Preview]
- Network Observability integration with eBPF Manager [Tech Preview]



Syntax: netobserv [flows|packets|metrics|follow|stop|copy|cleanup|version] [options]

CLI

commands:

flows	Capture flows information in JSON format using collector pod.
packets	Capture packets information in pcap format using collector pod.
metrics	Capture metrics information in Prometheus using a ServiceMonitor (OCP cluster only).
follow	Follow collector logs when running in background.
stop	Stop collection by removing agent daemonset.
copy	Copy collector generated files locally.
cleanup	Remove net observ components and configurations.
version	Print software version.

Red Hat Connectivity Link

New Release (v1.1) Featuring:

Core DNS Integration

Today, Red Hat Connectivity Link integrates with the Cloud Service Providers (AWS, Google, Microsoft) allowing advanced management of DNS.

With the Red Hat Connectivity Link plugin for Core DNS we bring all the same features of the Cloud DNS integrations to your local DNS Management solution.

Now you can bring along your CoreDNS backends plugins:

- *InfoBlox*
- *Redis*
- *Cloudflare*
- *Akamai*
- *Blue Cat*
- *And more...*

Additional Capabilities

Red Hat Connectivity Link will be introducing support for Gateway API v1.2 which brings with it:

- *gRPC Routing*
- *Web Sockets*
- *Timeouts*
- *Retries*
- *And More...*

Preparation & logic to support inference serving integrations which will allow for:

- *Token Rate Limiting*
- *Universal Authentication*
- *Enforce Policies for AI Applications*
- *Model Versioning & Deployment*
- *Inference Serving Metrics*
- *And More...*

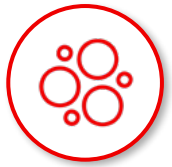
Operator Framework

Operator Framework

Enhancing operator management with **OLM v1**'s latest ***Tech Preview*** features

Preflight **permission checks** for seamless operator installation

- **Preview required RBAC permissions**: Users can now easily see ***all*** **necessary permissions** before **installing** or **upgrading** an operator/extension.
- **Ensures least privilege:** This feature helps **prevent installation failures** by **identifying missing permissions upfront**, promoting secure deployments.
- **Detailed feedback:** Get clear, **actionable insights** on **missing** `namespace`, `apiGroups`, `resources`, and `verbs`.



Broader registry+v1 bundle **support** for **existing operators**

- **Manage** `OwnNamespace/SingleNamespace` **operators**: **Supports operators** packaged in registry+v1 bundles using `OwnNamespace` and `SingleNamespace` **installmodes**.
- **Preserves compatibility & secures workloads**: Enables a **smoother transition** to **OLM v1** for **existing operators**, crucial for Telco customers and our layered products.
- `TargetNamespace` **propagation**: Ensures correct `WATCH_NAMESPACE` **environment variable** propagation for accurate operator behavior.

Storage

OpenShift Storage

Operators & Drivers

- vSphere
  - CNS volume migration (GA)
    - Via vSphere UI/API
  - Disable vSphere driver (GA)
  - Resize migrated in-tree PVs (GA)
  - OCP zone support for vSphere hostgroups (TP)
  - Set max attache volumes per node (TP)
- Azure File
  - Cross subscription attach in the same tenant (GA)

Core Storage

- VolumeAttributesClass (TP)
  - AWS EBS & GCP PD
- Recover from volume expansion errors (GA)

Misc

- Show PVC usage with CLI (TP)
  - `oc adm top pvc -A`
  - `oc adm top pvc -n <namespace-name>`
  - `oc adm top pvc <pvc-name> \ -n <namespace-name>`

Red Hat

OpenShift Data Foundation 4.19

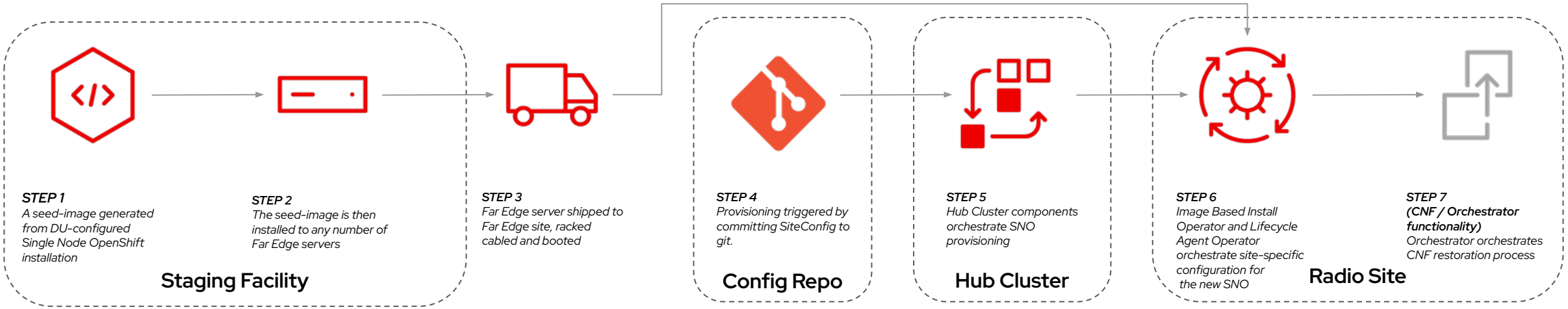
- Regional Disaster Recovery
  - Support multiple storage classes in ACM Managed Clusters
  - Support multi volume containers for RBD
- Multicloud Object Gateway
  - Object browser within OpenShift Console phase II
  - Metadata HA solution
- Automatic scale for storage in vSphere and Cloud

Out of the box support	
Block, File, Object, NFS	
Platforms	
AWS/Azure	Google Cloud (GA)
OpenShift Virtualization	OSP (Tech Preview)
Bare metal/IBM Z/Power	VMWare 7,8 Thin/Thick IPI/UPI
ARO	**ARM (Dev Preview)**
ROSA HCP (GA) with Self managed ODF	IBM ROKS & Satellite - Managed ODF (GA)
Any platform using agnostic deployment mode for self managed OpenShift deployments.	
Deployment modes	
Disconnected environment and Proxied environments	

Telco 5G & Edge

Image Based Break+Fix (IBBF)

Steps to replace a DU-configured Single Node OpenShift using Image Based Break Fix (IBBF)



- Procedurally similar to Image Based Install

Commercial DU site preparation

- Server is shipped to the Far Edge site

Technician Delivers Server

- Procedurally similar to Image Based Install
- Cluster identifiers retained from previous installation to maintain manageability and observability continuity

Commercial DU site upgrade

Activities which should be done before hardware failure.

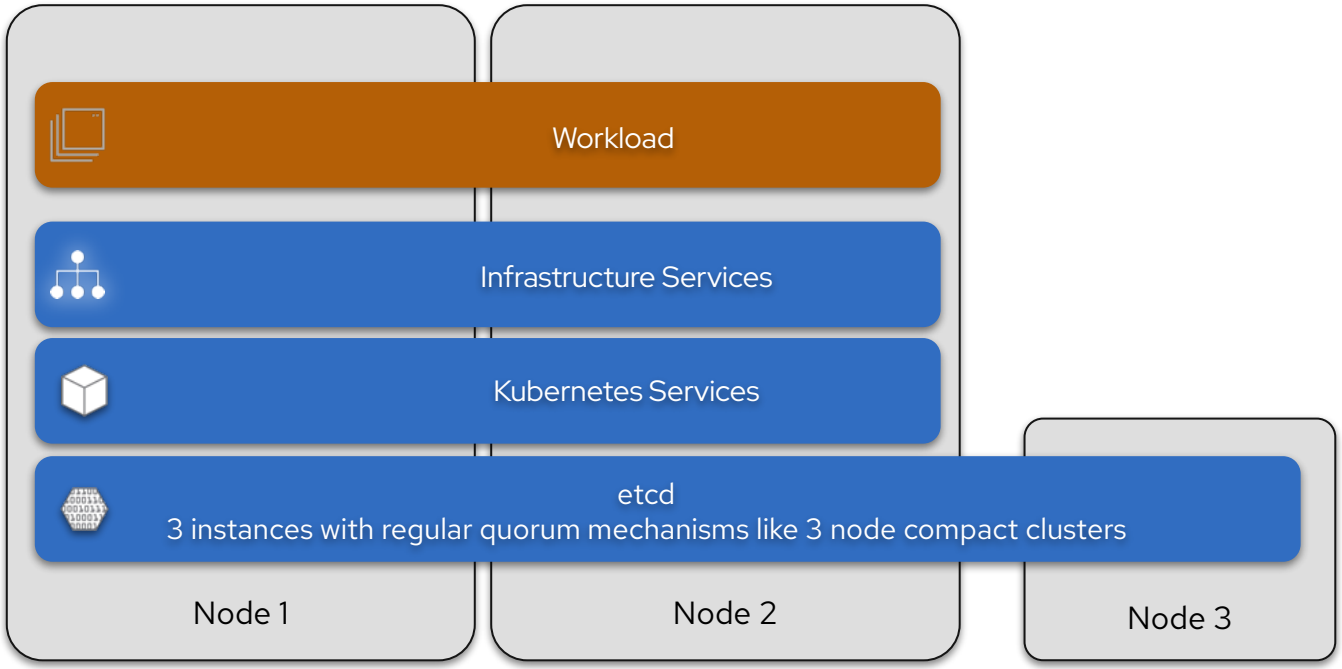
Activities which are done after hardware failure.

Technology Preview

Two Node OpenShift with Arbiter – Tech Preview

What it is:

- Two node solution for cost sensitive customers
- Small arbiter node, running only 3d etcd instance
- Technically a three node cluster
- Arbiter Node is a regular node and could be used to run additional components/workload
- Arbiter node can be co-located (e.g Dell PowerEdge XR4000 with witness sled)
- Arbiter node has to be within <500msec max effective end to end latency (incl. Disc io)
- OCP Virtualization fully supported
- Hyperconverged Storage / SDS via Partners
- X86 and Arm, bare metal only



Tech Preview Scope:

- IPI Bare Metal install only - Agent Based and Assisted Install planned for V4.20
- Arbiter Min Sys Reqs: 4C / 16G / 120G SSD - likely to drop in V4.20

Red Hat Device Edge and MicroShift

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

OpenShift AI Model Serving (TechPreview)

- Uses RHOAI RawDeployment mode based on kserve
- Deploy kserve manifests / models
- Use RHOAI supported ServingRuntimes also on MicroShift

Observability with OpenTelemetry (TechPreview)

- Send observability data like monitoring, events, logs from edge to central core
- Lightweight OTel collector - no local prometheus
- Use any OTLP compatible endpoint
- Allows for local persistent data buffering during dark network periods
- Pre-Defined baseline profiles for small/medium/large data collection

RHEL image mode (General Available)

- Simplify CI/CD by leveraging container tools for workload and the operating system (e.g. an OCI container registry, bootc etc.)
- base image with MicroShift already included available

Enhanced config options

- Use custom certificates
- TLS Security Profiles / Cipher Configuration
- Support Client TLS / mTLS at ingress

Red Hat OpenShift

Thank you

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