Red Hat
Enterprise Linux 10

Red Hat Enterprise Linux

Reimagining a Linux platform

Red Hat

Speaker introduction

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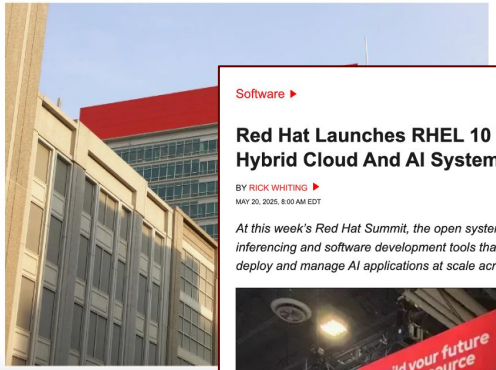
How Red Hat just quietly, radically transformed enterprise server Linux

RHEL 10 becomes the first major enterprise Linux distro to discard traditional packaging and embrace immutable. See how we got here.

Written by **Steven Vaughan-Nichols,** Senior Contributing Editor
June 2, 2025 at 11:02 a.m. PT



/ related

Software ▶

Red Hat Launches RHEL 10 With New Capabilities For Hybrid Cloud And AI Systems

BY RICK WHITING ▶
MAY 20, 2025, 8:00 AM EDT

At this week's Red Hat Summit, the open systems software giant also debuted new AI inferencing and software development tools that the company said will make it easier to bu deploy and manage AI applications at scale across hybrid ecosystems.

theCUBE Coverage from SiliconANGLE's livestreaming video studio

UPDATED 11:05 EDT / MAY 23 2025

INFRA

From AI to quantum-ready security, RHEL 10 brings the future to enterprise IT

BY BRIAN NJUGUNA

Red Hat Enterprise Linux continues to distinguish itself as a trusted business operating system, delivering enterprise-ready infrastructure tailored for mission-critical workloads. Now, RHEL 10 is emerging as the next-generation foundation for innovation and reliability in modern IT environments.

RHEL 10 introduces comprehensive enhancements in security, artificial intelligence integration,

InfoWorld

Red Hat Enterprise Linux 10 adds AI-powered management

News
May 21, 2025 • 2 mins

Cloud Management | Configuration Management | Generative AI

Lightspeed is an AI-powered service that allows users to build, deploy, and manage Red Hat's Linux using simplified commands.

Czedit: Michael Vi/Shutterstock

TECHZINE EU

3 MIN • INFRASTRUCTURE

Red Hat launches RHEL 10 with intelligence and security for hybrid cloud

BERRY ZWETS
20 May 2025, 14:45 CEST

Red Hat has released version 10 of Red Hat Enterprise Linux (RHEL). This new platform offers companies an intelligent and secure foundation for hybrid cloud environments and AI workloads. RHEL 10 introduces AI-driven management technology, post-quantum cryptography, and a container-native approach to operating systems and applications.

One of the most notable innovations in RHEL 10 is the integration of AI into the management of Linux environments. With the new Red Hat Enterprise Linux Lightspeed functionality, administrators can access generative AI built directly into the operating system. This system provides context-aware guidance and recommendations through a

Introducing Red Hat Enterprise Linux 10

Address the Linux skills gap
With decades of Red Hat's Linux knowledge and expertise

Contain drift and accelerate delivery
With container tools and technologies

Make better decisions at build time
When it's typically easier and cheaper to make changes

Resist security attacks from hackers
When Quantum computers become prevalent

Leverage RHEL as a trusted AI foundation
With an extensive ecosystem of trusted partners and tools

New Marquee Features

1. Image Mode

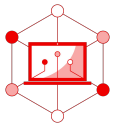
Image Mode moves from “Tech Preview” to a GA, fully supported feature.

2. Command Line Assistant

AI augmented assistant (RAG model with Watson X, no additional licensing needed)

3. Post Quantum Encryption Capable

Technologies and framework for applying post quantum requirements when they become available



4. Insights Advisor in Satellite

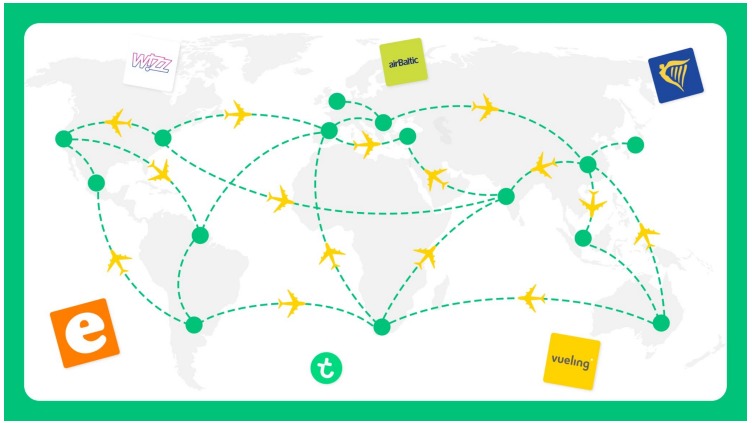
Proactively analyze and remediate availability, performance, and security risks in disconnected environments

Standard Operating Environment –

From the Air to the Data Centre

Significant Growth of Low-Cost Carriers

- 2023, LCCs accounted for approximately 35%
- Where did they come from ?
- How did they break into such a high barrier to entry market?



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Standard Aircraft Environment

- **Cost Savings:**
  Airlines can save money on maintenance, training, and spare parts by using the same aircraft models. This reduces the need for specialized equipment and personnel.

- **Operational Efficiency:**
  Standardization simplifies scheduling and operations. Pilots and crew can easily switch between aircraft, reducing downtime and increasing productivity.

- **Improved Security :**
  Uniformity in aircraft models can lead to better safety outcomes. Crews become more familiar with the aircraft, leading to fewer errors and quicker responses in emergencies.

Emirates
https://www.emirates.com › media-centre › emirates-mo...

Emirates moves to an all Airbus A380 and Boeing 777 fleet

— The Emirates story started in 1985 when we launched operations with just two aircraft. Today, we fly the world's biggest fleets of Airbus A380s ...

Red Hat

Standard Operating Environment

- **Cost Savings:**
  Lower maintenance costs with consolidated environment, less extended support, higher volume discount

- **Operational Efficiency:**
  Centralised management for entire estate via red hat insights , autonomous patching at scale with less down time with in place upgrades,

- **Improved Security :**
  Easier anomaly detection via insights,
  Consistent security policies with less configuration drift,

Red Hat Enterprise Linux

Red Hat

Use cases for the hybrid cloud

Consistency across all runtime environments

Public cloud

Accelerate cloud workload migrations and reduce provisioning time with build and push capabilities to AWS, Azure, and Google Cloud Platform.

Private cloud

Standardize private cloud infrastructure with consistent, streamlined images specifically optimized for virtual environments.

Physical & Edge

Save time and make the most of existing and future application investments by creating customized OS “Gold” images to deploy across physical systems.

Standard Operating Environment

Reduce complexity with Red Hat Enterprise Linux and its management ecosystem

Red Hat Satellite

Unified life-cycle management

- Content and patch management
- Small- and large-scale operations
- Standardized operating environment (SOE)

Red Hat Ansible Automation

Centralized automation governance

- Centralized control
- Team and user delegation
- Audit trail

Red Hat Insights

Proactive, automated resolution

- Continuous insight
- Verified knowledge
- Proactive resolution

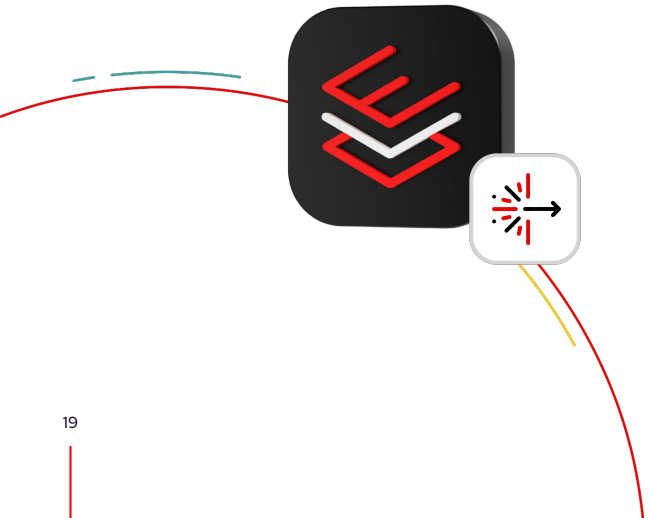
Red Hat Enterprise Linux

Red Hat

Address the Linux skills Gap

With decades of Red Hat's Linux knowledge and expertise

Red Hat Enterprise Linux Lightspeed vision and goals



Artificial Intelligence

Harnesses the power of AI to help increase productivity

Unlock Red Hat’s expertise

Provide Red Hat's decades of Linux experience to help your workloads succeed

Level up skills

Makes Red Hat Enterprise Linux easier to use, secure, tune, and troubleshoot for both new and experienced users

Proactive guidance

Proactively provide relevant information and guidance

Red Hat

RHEL Lightspeed features

Image builder package recommendations

Command line assistant

Red Hat

RHEL Lightspeed features

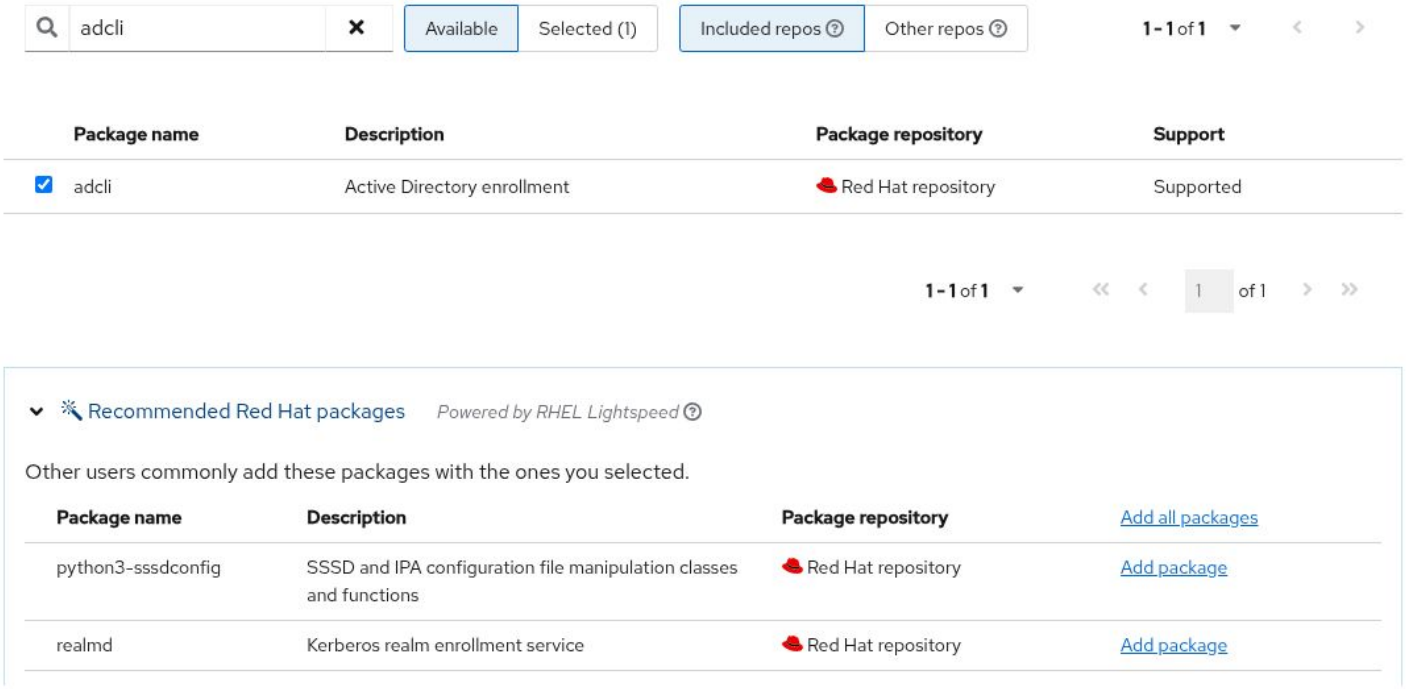
Image builder package recommendations

Command line assistant

Recommendations

Image Builder analyzes selected packages and recommends related, relevant packages to also be included

Insights image builder package recommendations



Red Hat

RHEL Lightspeed features

Image builder package recommendations

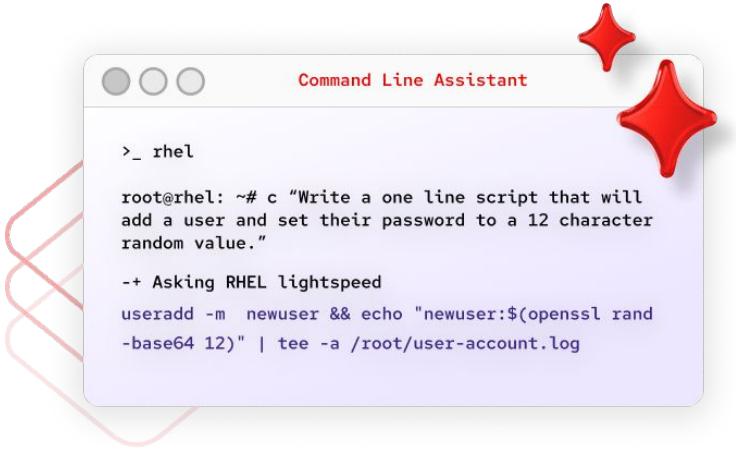
Command line assistant

Experience an AI enabled command line

The command line assistant is an optional generative AI assistant available directly in the RHEL command line interface. It can help you more easily manage, troubleshoot, and work with your systems.

With the command line assistant, you can:

- Ask and receive answers to RHEL-related questions in plain language.
- Gain access to information from the RHEL documentation and Red Hat knowledgebase
- Get assistance with troubleshooting configuration issues, deciphering log entries, and more.



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Why use the command line assistant?

Solve problems faster

Learn and improve your skills

Help address Linux skills gap

Red Hat

Why use the command line assistant?

Solve problems faster | Learn and improve your skills | Help address Linux skills gap

On call assistant

It's 2am and there's a problem.

The command line assistant is there with you, providing recommendations and actionable guidance to help you

Help with deciphering logs and errors

Run in to an error you haven't seen before? See something confusing in a log? Ask the command line assistant for help

Access Red Hat knowledge

The command line assistant incorporates knowledge from resources such as the RHEL documentation and Red Hat knowledgebase

Why use the command line assistant?

Solve problems faster | **Learn and improve your skills** | Help address Linux skills gap

What's the command for that again?

Use the command line assistant to to help refresh your memory of commands you don't frequently use

Learn new skills

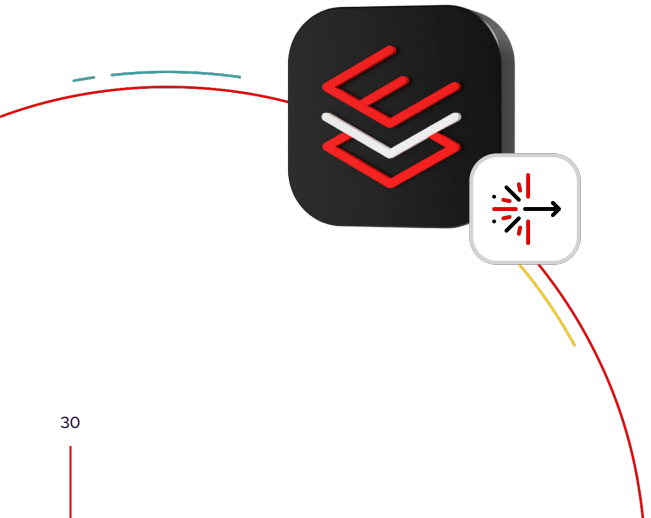
Ask the command line assistant if there are other methods to complete a task that might be more efficient

Why use the command line assistant?

Solve problems faster | Learn and improve your skills | **Help address Linux skills gap**

According to a Red Hat-sponsored IDC study[1] "*organizations [are] struggling to hire the Linux skill sets they need to operate and support their expanding fleet of distributions, which opens them up to further risk around security, compliance and application downtime.* "

Resources available to RHEL Lightspeed that help it with answering questions



RHEL documentation

RHEL 9 documentation and release notes

Red Hat knowledgebase

RHEL 9 verified knowledge base solutions

CVE info

RHEL 9 related CVE's

Errata info

RHEL 9 related errata

What you need to use the command line assistant

RHEL Lightspeed is included as part of the value of a RHEL subscription

RHEL 10.0+ / 9.6+ system

The command line assistant is available on 9.6 and 10.0 or later systems

RHEL subscription

Registered system with active RHEL subscription

Connectivity

Ability to use a connected experience

Use-cases

How to access the command line assistant

The speed of light is denoted with the “c” character

The RHEL Lightspeed command line assistant is accessed with the “c” command

Red Hat

Contain Drift, and Accelerate Delivery

With container tools and technologies

Infrastructure & organizational complexity

is still a problem...

Common challenges that involve the OS

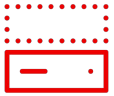
- Different platforms require different tools, teams and expertise
- Testing and validation are time consuming
- Application support matrix
- No one budgets for maintenance and upgrades
- Negotiating between stakeholders
- Drift between images, instances, and runtime
- Immutable aspirations vs. mutable realities
- Image inventory, versioning, and pruning
- Let’s not forget security!

Outcomes

What does image mode fix today?

Less risk

Reduce the risk associated with updates with atomic transactions and rollbacks



Better builds

Improve the composability and repeatability of standard builds through layering

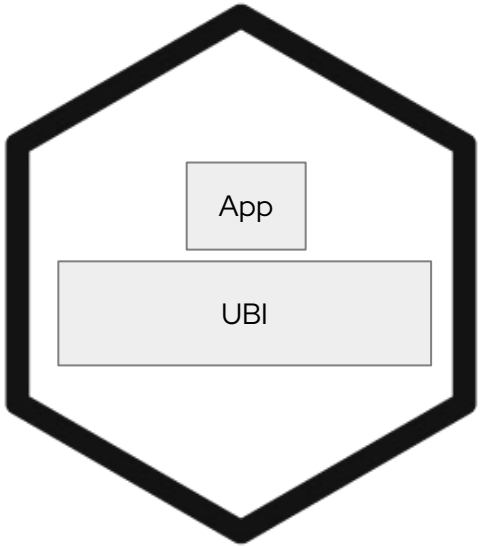
Move faster

Increase the speed of experimentation

Streamline process

Simplify end to end management with a single process for OS and applications

Containers revolutionized application deployment

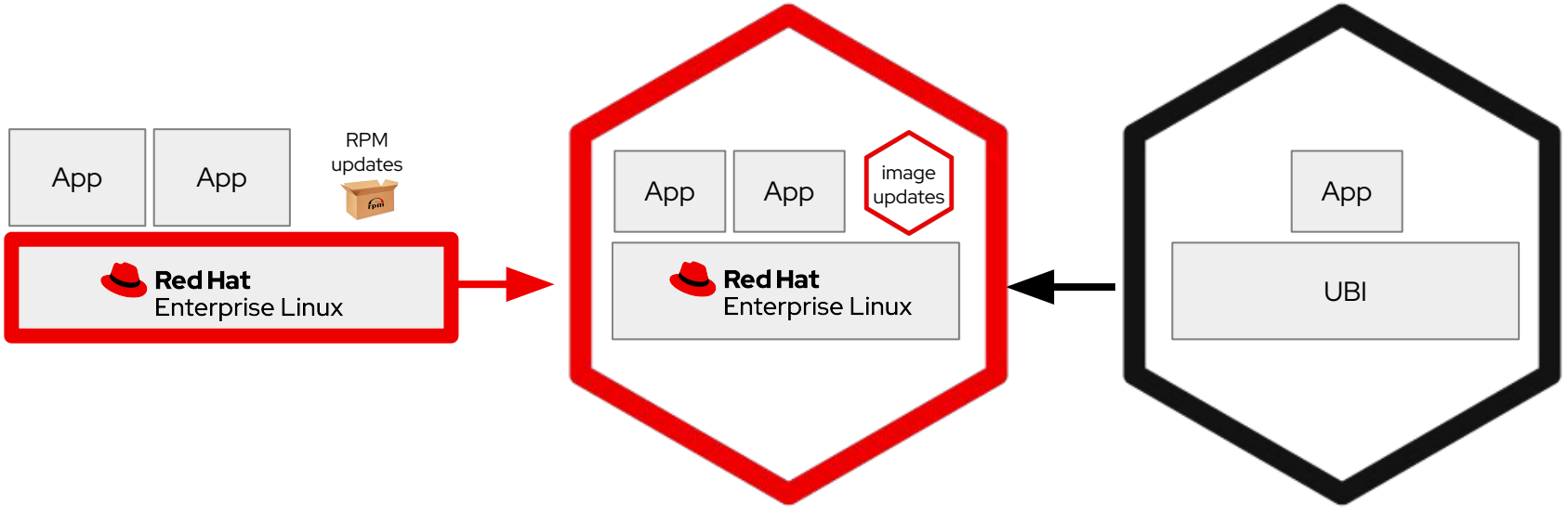


- Standardized packaging via OCI image format
- Standardized delivery via OCI registry
- Clarity and transparency with the container file
- Deployment portability & predictability
- Rich ecosystem of security, automation, & orchestration tooling
- Rapid adoption and pervasive

...and they will also become the language of modern IT

Introducing image mode for Red Hat Enterprise Linux

Combining the power of RHEL with the benefits of containers



One RHEL, two modes

	Package mode	Image mode
Image creation	Image builder	Container tools
Updates	Packages (`dnf`)	Images (`bootc`)
Update distribution	rpm repository	Container registry
Management	Red Hat Insights, Satellite*, Ansible*	
Deployment footprint	Bare metal, VM, cloud, edge	

* On image mode roadmap

Image mode for Red Hat Enterprise Linux

Simple. Consistent. Anywhere.

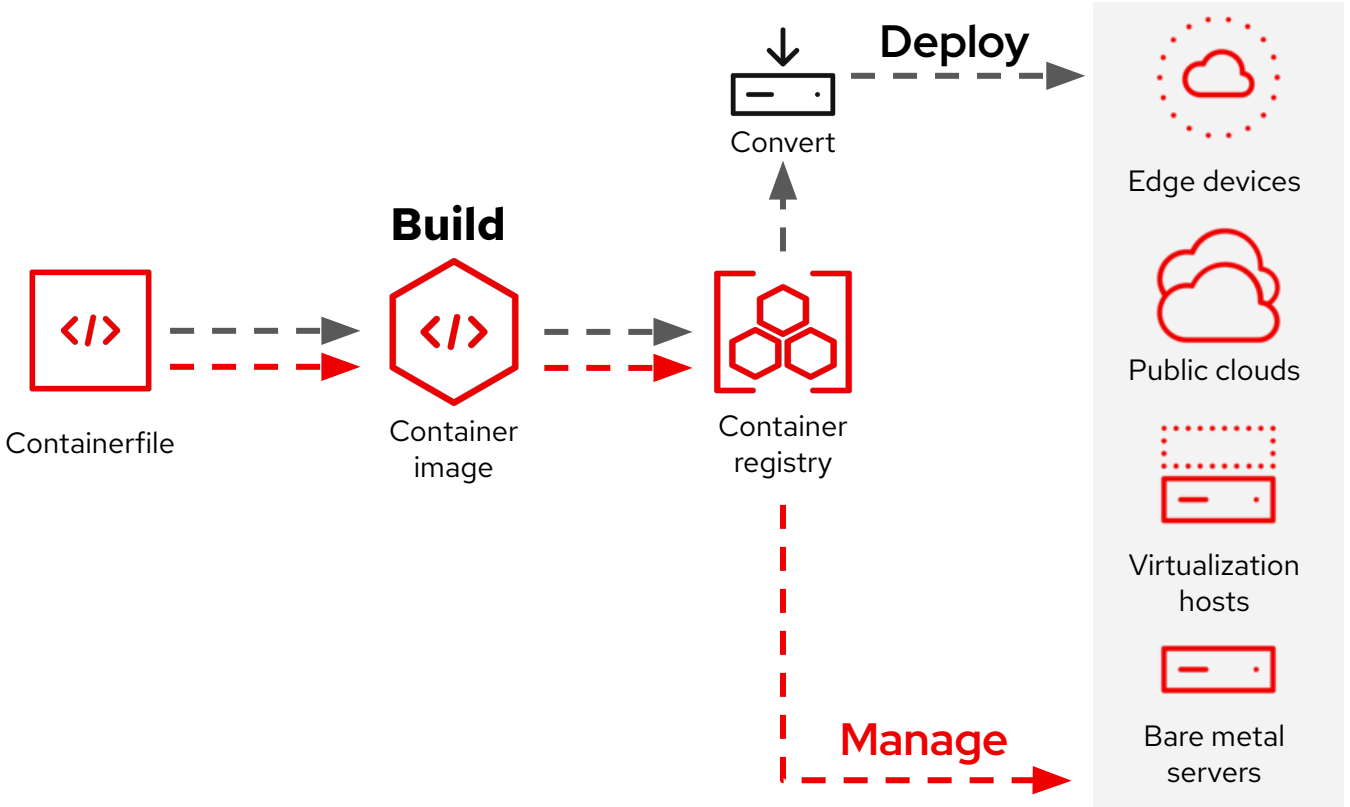
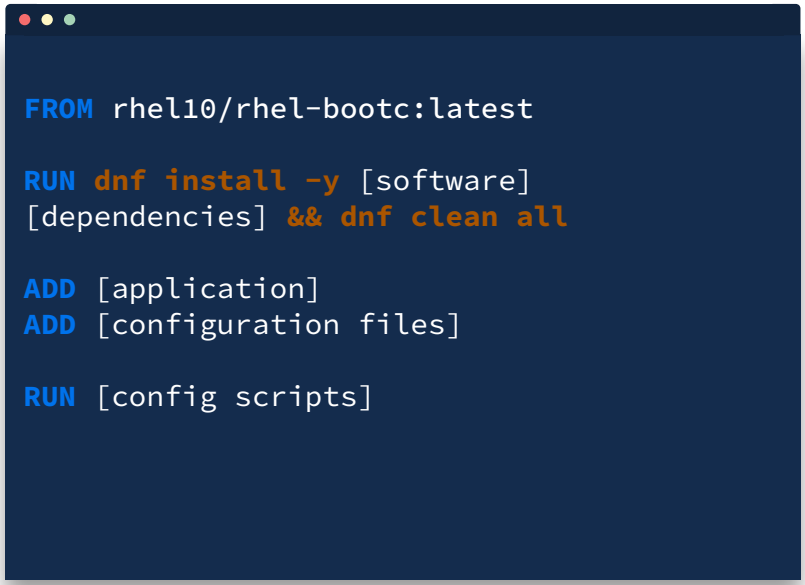


Image mode for RHEL

A container-native workflow for the life cycle of a system



Build

A *bootc* base image & container file is all that's needed to describe a system, applications, and dependencies. Use your existing container tools or pipelines to quickly create and test images.

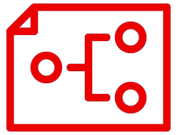
Deploy

Easily convert to a VM/cloud image or deploy on bare metal using RHEL's installer. The container image includes full hardware drivers, but not cloud agents by default.

Manage

Designed for modern GitOps & CI/CD driven environments. Systems will auto-update from the container registry by default. More advanced control and automation is available via custom rollouts (e.g. Ansible). Intelligence via Insights and on-prem content curation via Satellite are planned for the future.

Build



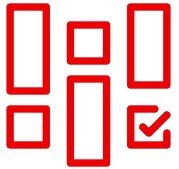


Image mode for RHEL

Encapsulate differences in a sequence of builds

```
# Derive standard operating environment
FROM rhel9/rhel-bootc:latest

RUN dnf install -y [system agents]
[dependencies] && dnf clean all

COPY [unpackaged application]
COPY [configuration files]

RUN [config scripts]
```

```
# Derive database server from SOE
FROM corp-repo/corp-soe:latest

RUN dnf install -y [database]
[dependencies] && dnf clean all

COPY [configuration files]

RUN [config scripts]
```

registry.redhat.io/rhel9/rhel-bootc

The RHEL bootc image is available in technology preview

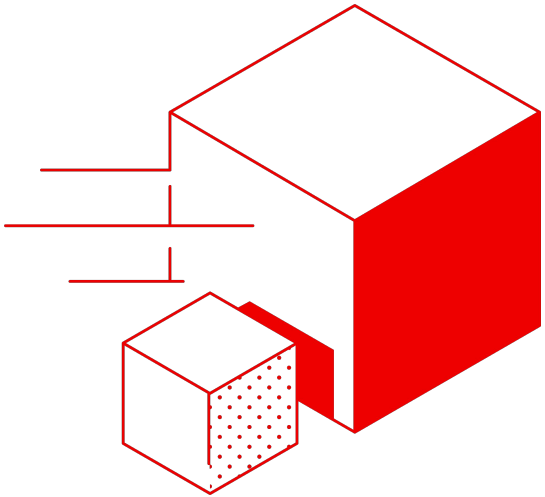


Image Specs:

- 439 rpms
- ~785M compressed
- ~2.2G on disk

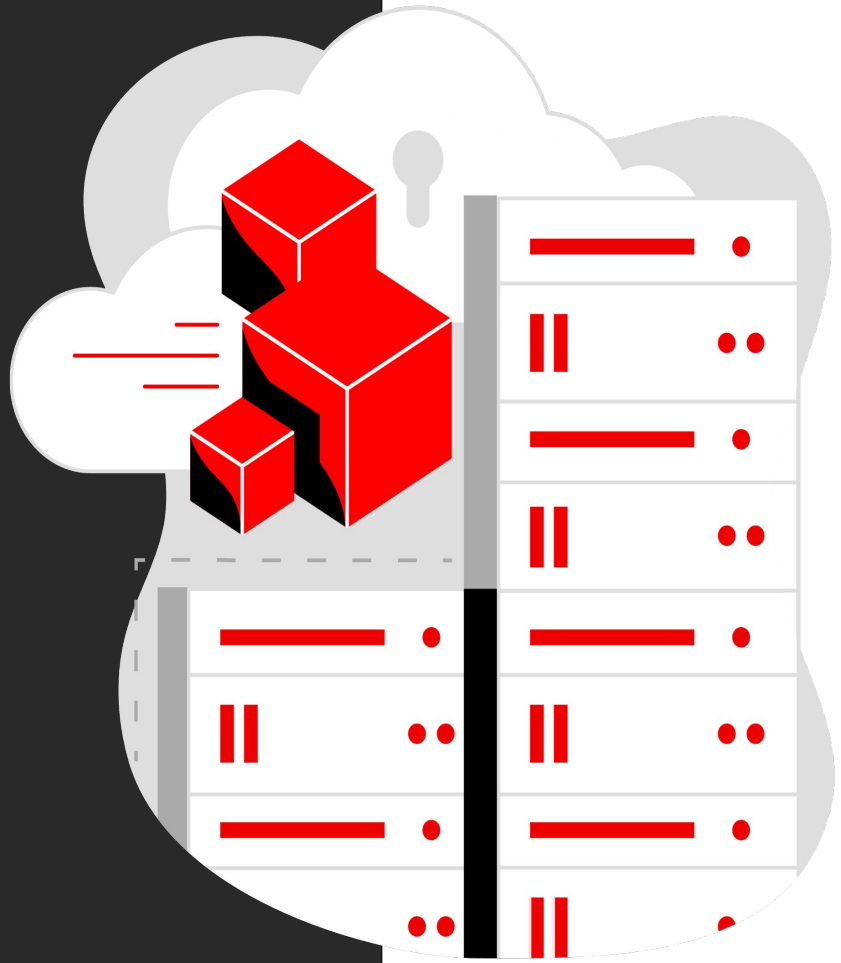
Primary contents:

- systemd, kernel, bootc
- rpm-ostree[1]
- linux-firmware
- NetworkManager
- podman
- python
- Misc CLI tools: jq, sos

No cloud-init or virt agents

Documentation

Deploy



Install via Kickstart

Deploy container images to bare metal using installation media

```
lang en_US.UTF-8
keyboard us
timezone Etc/UTC --isUtc
text
zerombr
clearpart --all --initlabel
autopart
reboot
user --name=admin-user --groups=wheel
sshkey --username=admin-user "ssh-rsa
AAAAB3Nza……..."

ostreecontainer --url quay.io/myimage:latest
```

NEW

Use existing provisioning workflows

- Red Hat Enterprise Linux boot media (isos)
- PXE & HTTP Boot for network based deployments

Kickstart and Anaconda are used for disk layout and select configurations

- `%packages` is ignored
- ostreecontainer will fetch the container image from a registry and write it to disk.

`%pre` and `%post` used for configuration

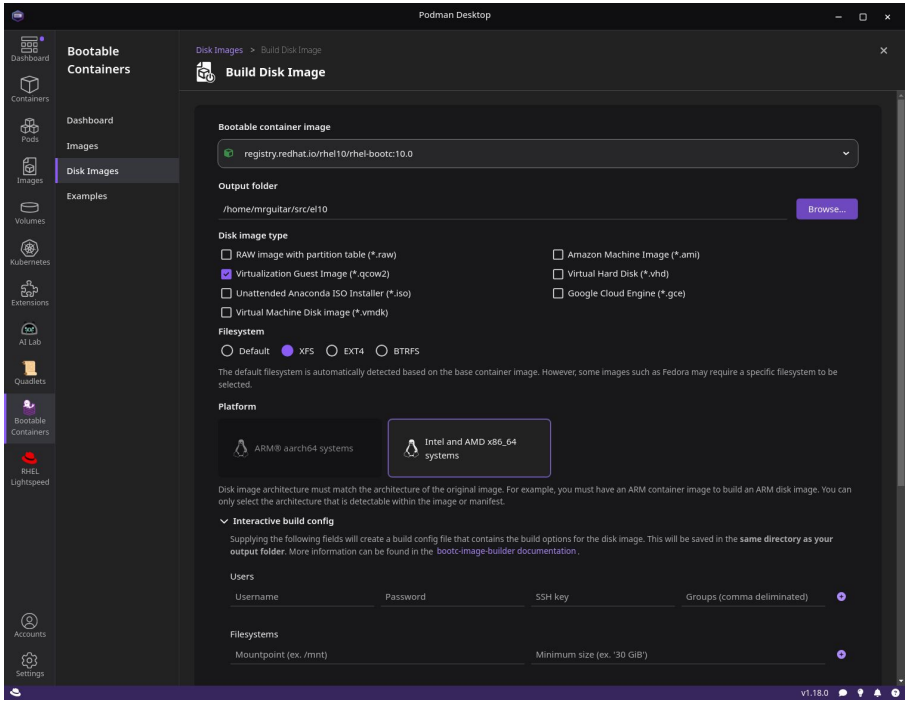
Bootc image builder

Create **bootable container images** for bare metal to AWS and everywhere in between

The Podman Desktop you love - *simplified container management and intuitive UI* - now extends to your RHEL workflows and available by default in the Extension Channel.

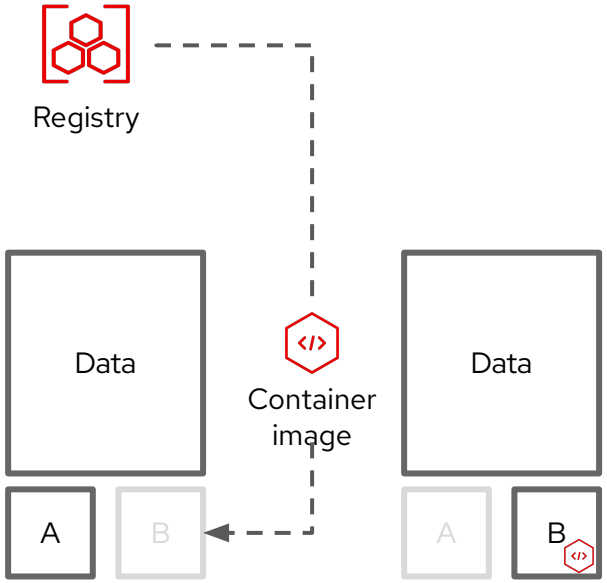
- **Standardize Container Environment:** Developers use a consistent set of tools and practices, making it easier for IT/Ops to manage and deploy containers in production.
- **Cross-Platform Consistency:** familiar experience across Windows, Mac and now RHEL.

`qcow2`	QEMU Disk Image
`ami`	Amazon Machine Images
`vmdk`	Virtual Machine Disk Image (vSphere, etc.)
`vhd`	Azure / Hyper-V disk image
`gce`	Google Compute Engine image
`raw`	Raw disk image GPT partition table
`anaconda-iso`	Bare Metal installer



Bootc: Image-based updates perfected

Immutable by default - secure by design



Transactional updates (A → B model)

Bootc uses composefs and ostree to convert the container image into the root filesystem on the host..

Roll forward or backwards

Updates are staged in the background and applied when the system reboots. The transactional model enables rollbacks for additional assurance

Upgrades have never been easier

While there are some limits, bootc enables moving between minor releases of RHEL (9.4 → 9.5), as well as major releases (9.4 → 10.0)

Tech Preview

bootc

A/B booting of container images

`bootc upgrade`
Download and stage an updated container image.

- Automatic updates on by default. Configurable using bootc-fetch-apply-updates.timer

`bootc rollback`
Rollback to the previous state. Staged updates are discarded

`bootc switch`
Change to a different reference image

`bootc install`
Install container image **`to-disk`** or **`to-filesystem`**

- Man page
- https://github.com/containers/bootc
- https://github.com/containers/podman-desktop-extension-bootc

Filesystem Layout

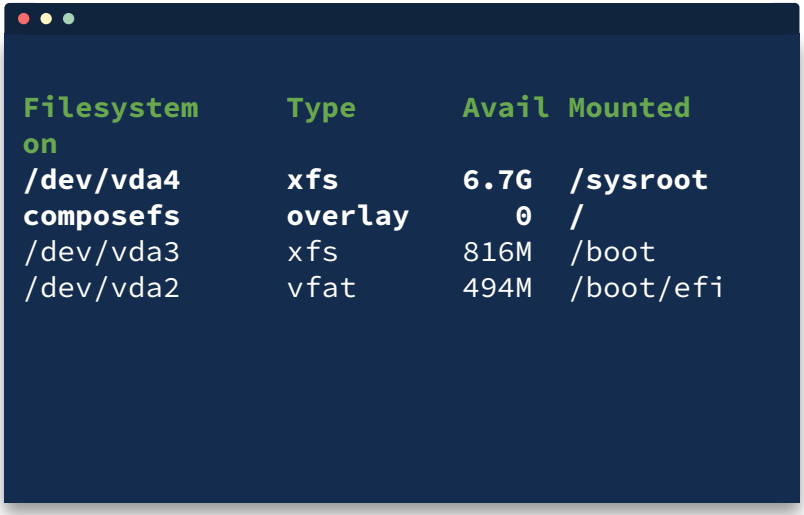
Similar to previous ostree setups - but better!!

Build Time
Everything is writable. e.g. /usr, /etc, /opt, ...

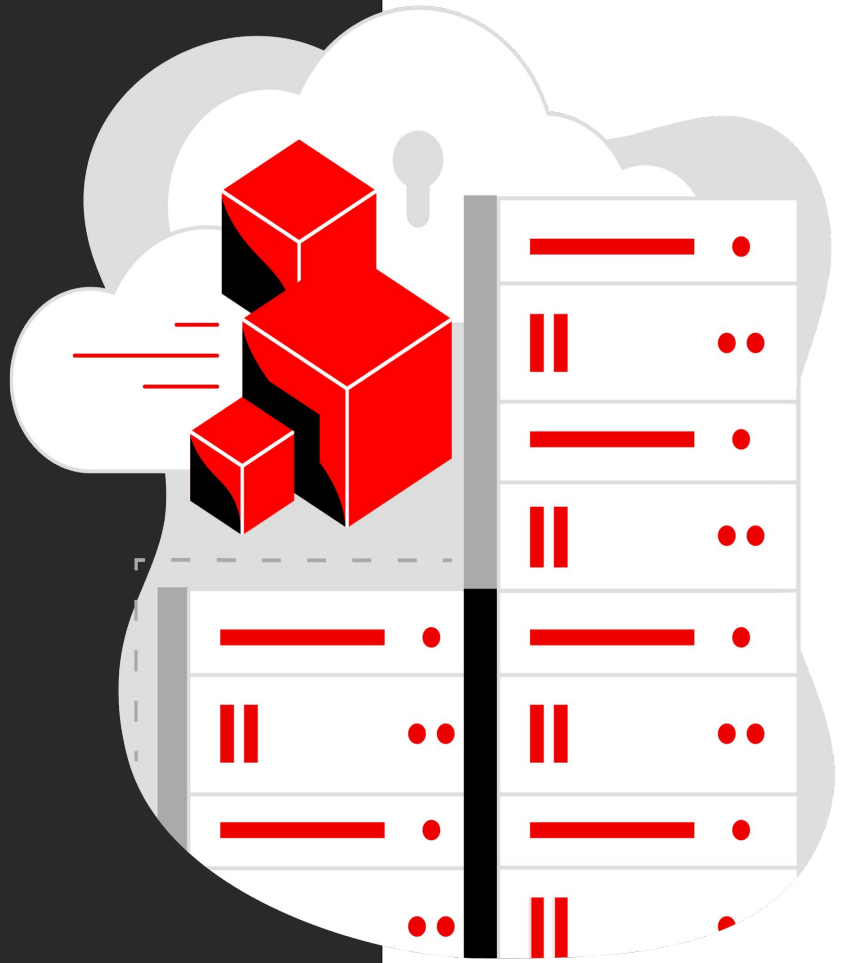
Run Time
All image content is read only

/var - RW, instance persistence. Not updated post install

/etc - RW, 3-way merge like RHEL CoreOS. Machine local state (hostname, static IP)

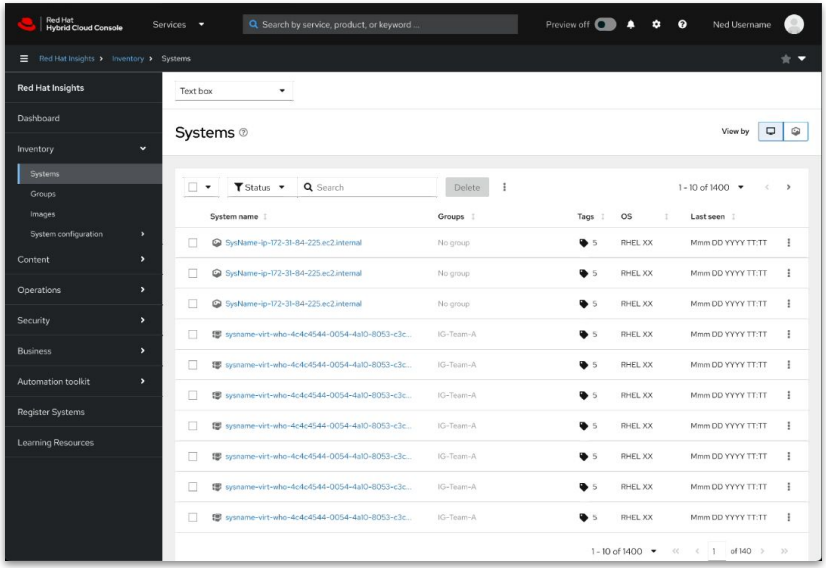


Manage



Flexible Management

Leverage your preferred management system



Red Hat Insights

Red Hat Insights

Image mode systems can be scanned for security and operational recommendations, and image updates.

Red Hat Satellite

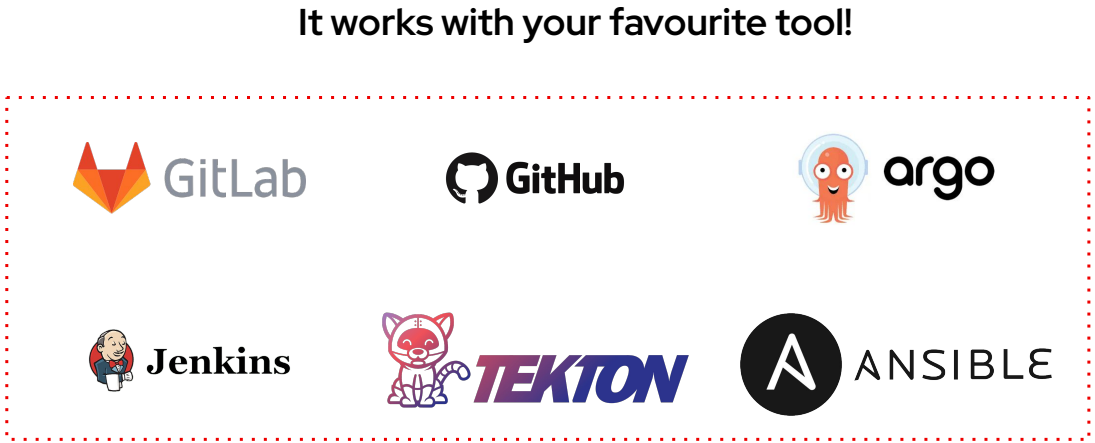
6.17 brings image mode support across provisioning, client management, and an included container registry.

Ansible Automation Platform

Ansible can control content and configuration during build time and configuration at runtime. The community bootc collection simplifies client control.

Red Hat

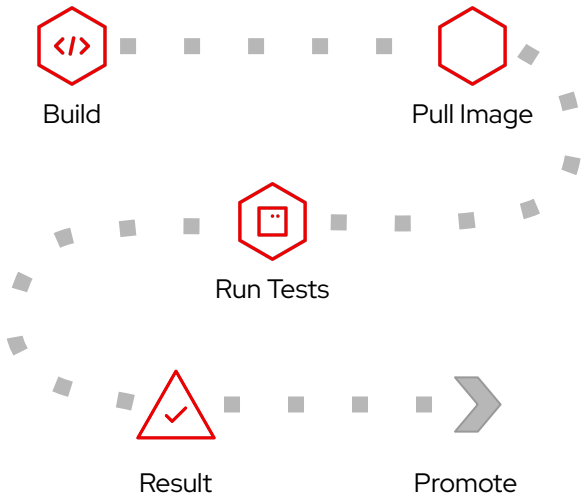
CI/CD and Automation tools



- Example templates available!
  - https://gitlab.com/redhat/cop/rhel/rhel-image-mode-cicd

Validating OS updates has never been easier

CI pipelines used for apps now work with the OS



Test/validate as a container

Bootc images can run as bare metal, VMs, **and containers**. This enables faster and lighter weight testing/validation of each build's userspace.

Easy pipeline integration

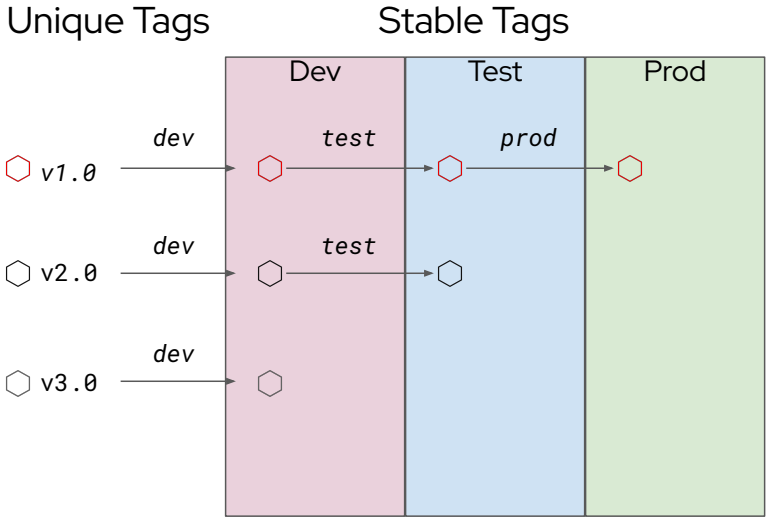
Containers have broad support across Github, Gitlab, Gitea, Circle CI, Jenkins, etc for the common container related tasks and testing. Use any system you like..

Simple promotion through registry tagging

Tags are a powerful tool to identify dev → test → prod promotions.

OS Updates via Container Registries

Tagging is powerful to version and promote updates



Tags offer simple versioning and visibility

Tags are simple to automate and use for promotions. Bootc will default to updating from a `repository:tag`.

Control updates via tagging

Combine tagging with the optional automatic updates to control fleets of systems via registry tags.

Standardized & scaleable infra

Container registries scale very well and any standard registry can be used.

Red Hat Edge Manager

Comprehensive fleet management

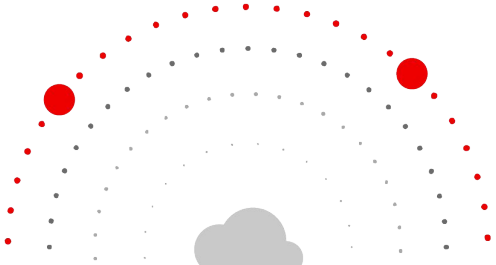
Simple

Intuitive edge operations

Bridge the IT skills gap at the edge with a user-friendly environment designed for ease of use and simplified management.

Flexible management options

Choose the deployment model that fits your strategy, with on-premises management offering comparable or superior value to cloud alternatives.



Scalable

Policy-driven deployment

Implement a desired-state configuration model for both applications and infrastructure, enabling consistent and scalable deployments, maximizing operational efficiency.

Resilient agent architecture

Use a robust agent-based architecture for scalable device management, maintaining connectivity and control even in challenging network conditions, without complex network configurations.

Built for edge

Hardened device communications

Employ mutual Transport Layer Security (mTLS) for robust and authenticated agent service communication. Establish a consistent security posture even for re-connected devices through rigorous identity verification.

Proactive device insights

Monitor critical device compute, memory and disk resources. Capture essential metrics and logs for effective issue remediation and operational awareness.

Lifecycle management

Provides secure onboarding, upgrades and decommissioning of applications and OS.

Agent-based architecture

Network resilience

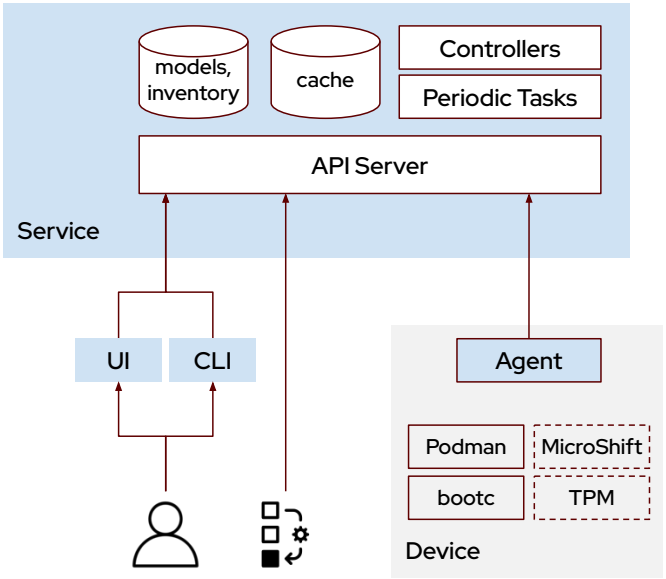
- Agent “calls home” when it has connectivity, so works with private, cellular, and intermittent networks. Without VPN.
- Can provide remote access when SSH cannot.

Safer, scheduled updates

- Downloads in background before making any changes.
- At scheduled time, transactionally updates operating system (if supported by OS) and host configuration.

Active status and progress reporting

- Reports update progress and changes to device and app health.



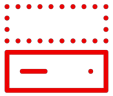
Use Cases

Where does image mode fit?

Use Cases Blog

AI/ML Stacks

Perfectly version app dependencies from kernel, GPU & accelerator drivers, frameworks, runtimes, etc



1:1 App/Host

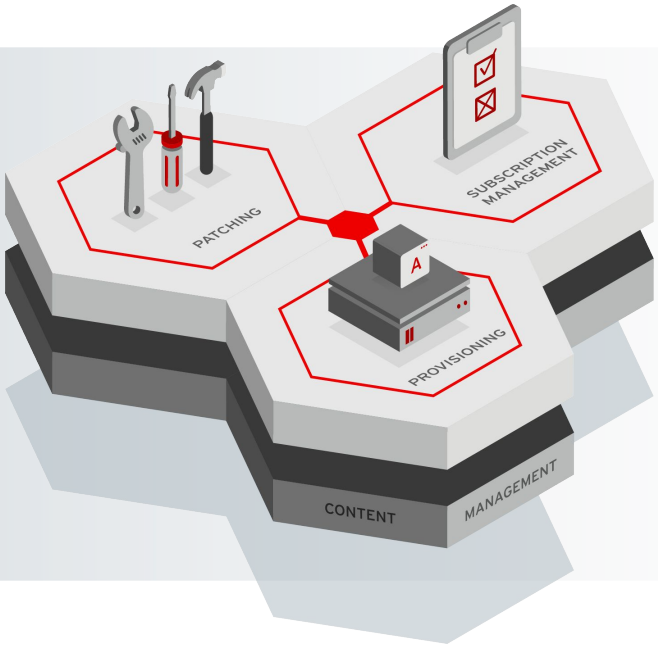
Manage the OS AND app as a single unit

Edge appliances

Easily manage a fleet of systems with registries and auto-updates

Standalone container hosts

Use common toolchains and pipelines to build containerized applications and the hosting OS



Red Hat Satellite

Red Hat Satellite 6.17

Support for Red Hat Enterprise Linux 10

Inventory and manage systems running Red Hat Enterprise Linux 10

Image mode support

New support for provisioning, client management, and registry distribution for systems created with image mode for Red Hat Enterprise Linux

Support for Flatpak content

Simplify importing, managing, and deploying updates via containers with support for Flatpak content, including both custom packages and Red Hat-provided applications

Secure boot support

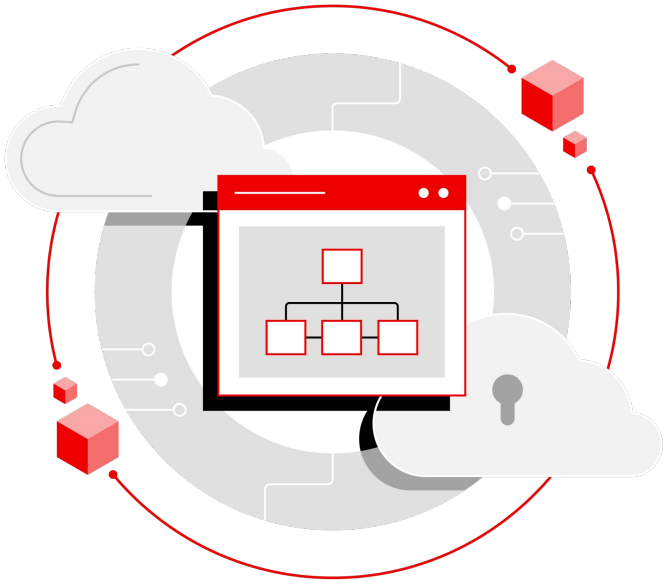
Enhance security during provisioning workflows on bare-metal, VMware vSphere, and Libvirt platforms

IPv6 support

Deploy Satellite in an IPv6 environment to help address the limitations of IPv4, including improved network efficiency and security

Red Hat Insights advisor

Get proactive risk detection and configuration recommendations without connecting directly to the internet via an on-premise extension (now available in tech preview)

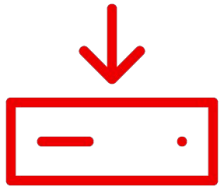


Red Hat Insights advisor in Satellite

Proactively **analyze** and **remediate** availability, performance, and security risks in disconnected environments using business rules and logic codified from decades of RHEL expertise

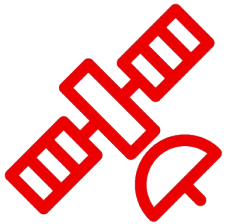
- **Shipped** as a plugin for Satellite in Tech Preview with no additional platform components
- **Topologies** include connected and disconnected environments
- **Monitors** system configurations, **detects** risks, and **prescribes** remediations without sending data off-premise
- **Proactive recommendations** catch problems early, minimizing downtime
- **Separation, minimal access, and ultimate control** for highly regulated industries and geographies
- **Updates** are shipped as a single package for code, rules, and remediations
- **Downtime** is acceptable during upgrades

Red Hat



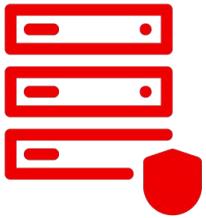
How are updates provided?

The Insights advisor in Satellite container image will be updated approximately monthly with new recommendations.



Is Insights advisor in Satellite included as part of my subscription?

Insights advisor in Satellite will require an active subscription for Red Hat Satellite.



Does Insights advisor in Satellite send any data to the cloud?

No – All processing is done locally within your own deployed Satellite environment.

Roadmap

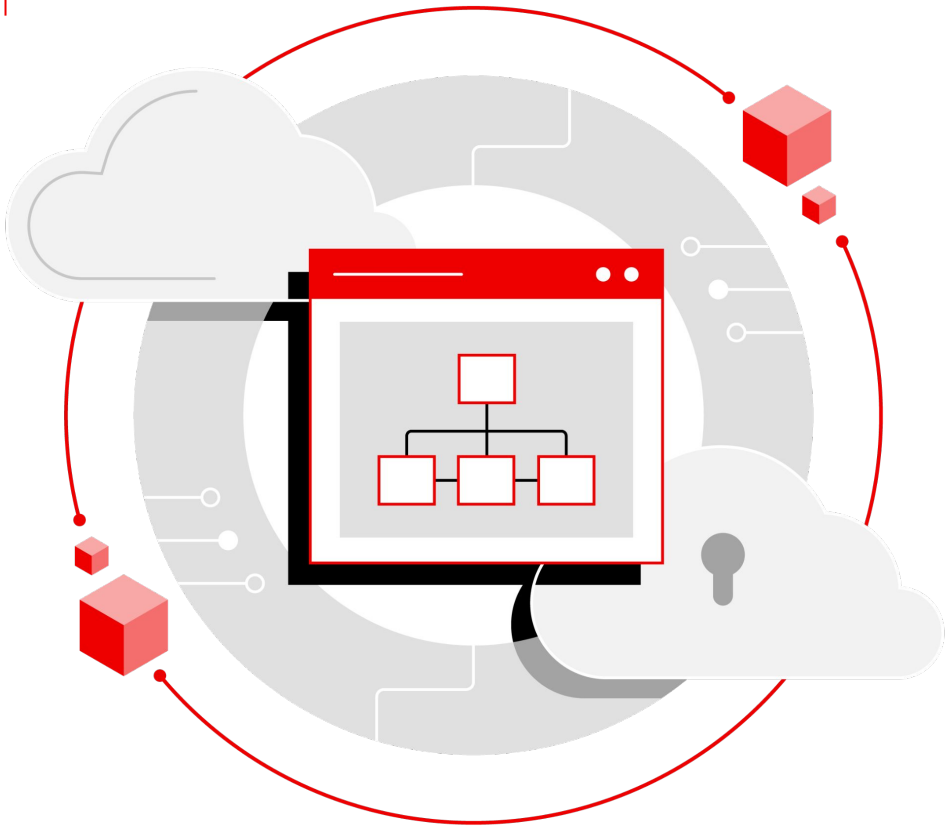
Unlock the full value of the RHEL subscription with Insights, even with limited or no connectivity to Red Hat hosted services.

2025

- Self-managed advisor recommendations surfaced in Satellite
- [Tech preview] Self-managed security-focused vulnerability analysis surfaced in Satellite

2026 +

- Self-managed security-focused vulnerability analysis **and management** surfaced in Satellite
- Self-managed security-focused management of policy-based compliance surfaced in Satellite
- Self-managed subscription reporting in Satellite



Support for RHEL 10

Satellite 6.17 supports systems running on RHEL 10, including the following functionalities:

- **Sync and publish RHEL 10 content** with content management
- **Register and gain entitlements** with subscription management
- **Launch remote execution jobs to RHEL 10 and CentOS 10 systems** with remote execution management.

Flatpak content

Import, manage, and deploy flatpak content in Satellite, including both custom content, and content originating from Red Hat. Flatpak content is atomic, which reduces risk during app installation and update processes.

- **Hammer-cli** required to point satellite organizations to flatpak remotes, scan them and mirror any repository you need. WebGUI under construction.
- **Flatpak content stored in container repos in Satellite** and the flatpak index is served with lifecycle environment filtering on Satellite and without filtering on capsules.
- **OCI format** - Supported sources are Red Hat Registry and Fedora Registry. Flathub support will be included in a future release.

Secure boot provisioning

Enhance security during provisioning workflows on bare-metal, VMware vSphere, and Libvirt platforms with secure boot provisioning

- **Report** on hosts that need updates, fixes, or enhancements
- **Group** homogeneous systems so that you can easily work with them
- **Respond** quickly to patching requirements using scalable automation

Source:
Insert source data here
Insert source data here

Image mode support

Simplify RHEL management workflows for both containers and traditional OS with a single, consistent set of tools. Image mode also helps streamline transitions to containerized environments.

- **Overview** of booted container images via:
  - API
  - Hammer
  - UI
- **Distinguish** image mode from package mode hosts
- **Searchable** bootc details on hosts
- **bootc** remote execution category

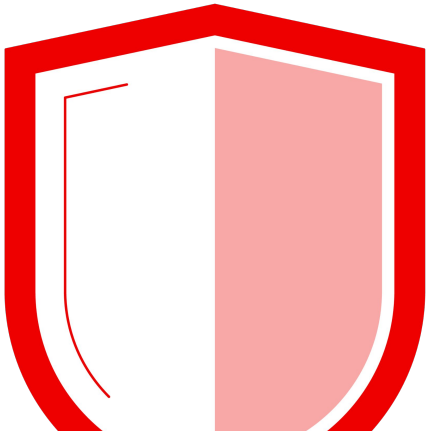
Make better decisions at build-time

When it's typically easier and cheaper to make changes

Compliance hardening for image mode for RHEL

Enhance the security architecture, promote immutability, and reduce the attack surface

Improved security practices within the DevSecOps framework



Improved cybersecurity

Minimize the challenges organizations face while trying to execute best-practice cybersecurity measures

Reduced barriers

Reduce common barriers of time constraints, resource limitations, and knowledge gaps

Improved capabilities

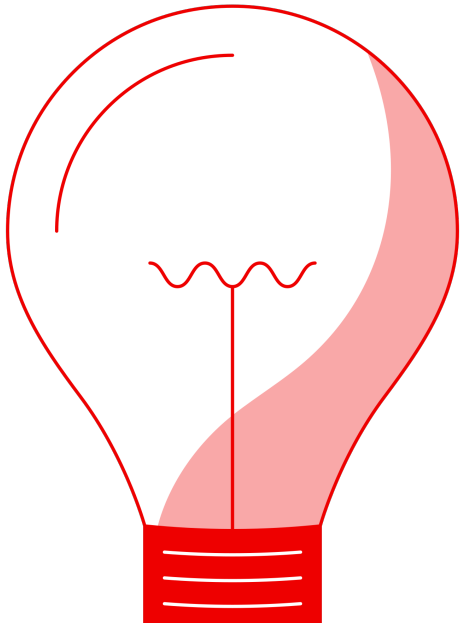
Provide organizations with the necessary capabilities to leverage security expertise within diverse environments

Red Hat Insights planning for RHEL

Plan ahead for RHEL and AppStream lifecycle updates, and gain insights into the RHEL roadmap

Gain access to lifecycle information, and plans for upcoming minor releases.

Centralizes roadmap and lifecycle details for AppStreams and RHEL minor releases - allowing administrators to proactively plan upgrades, maintain support, and anticipate the impact of upcoming feature releases and deprecations..

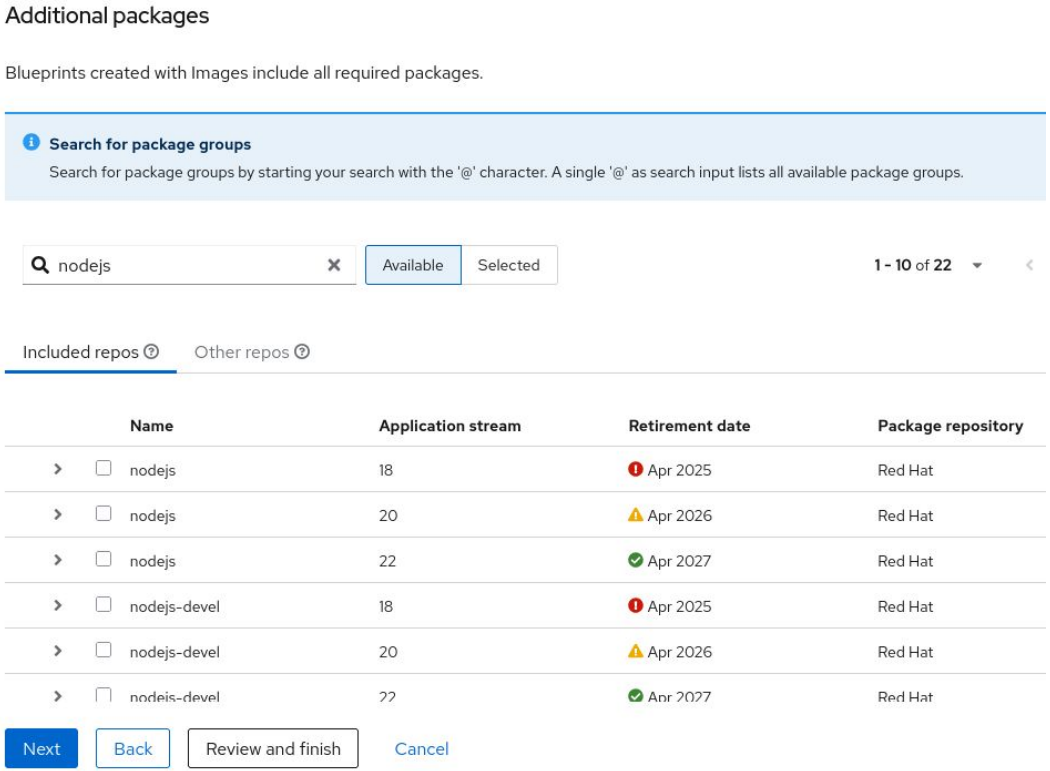


RHEL and AppStream life cycle information

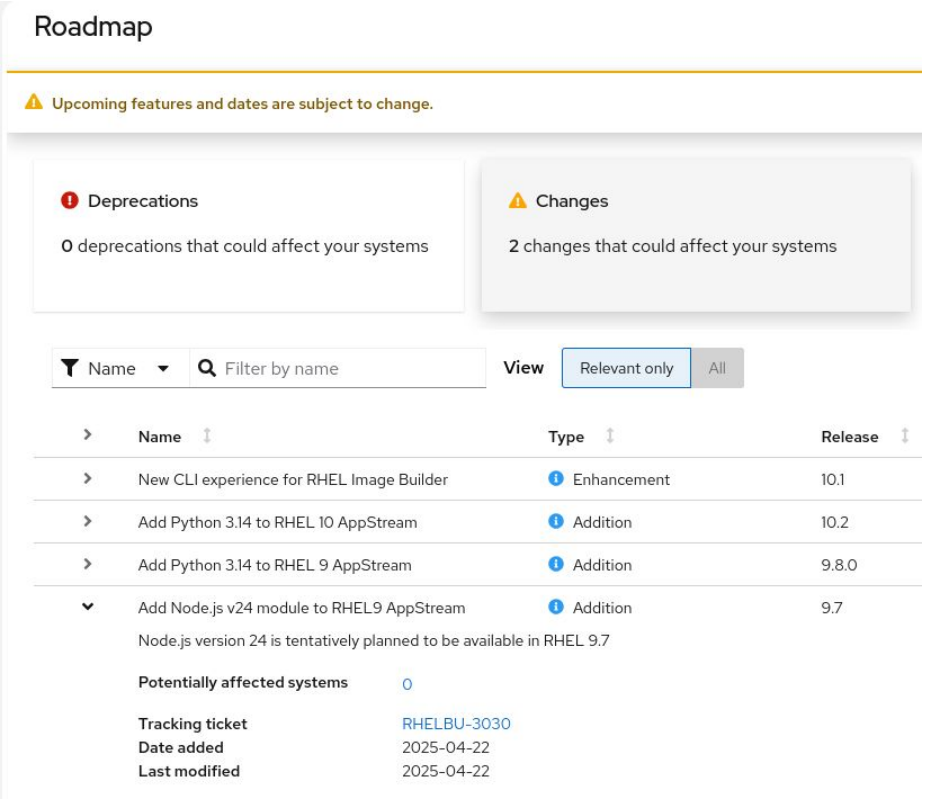
Life Cycle

⚠ Dates are approximations and subject to change.

AppStream life cycle information also available in Insights image



Red Hat Enterprise Linux roadmap



RHEL 10 Image Builder

Build for the cloud, on-premises, or even for WSL

Improved User Interface

More closely matches the Insights Image Builder feature set and UI

Expanded formats

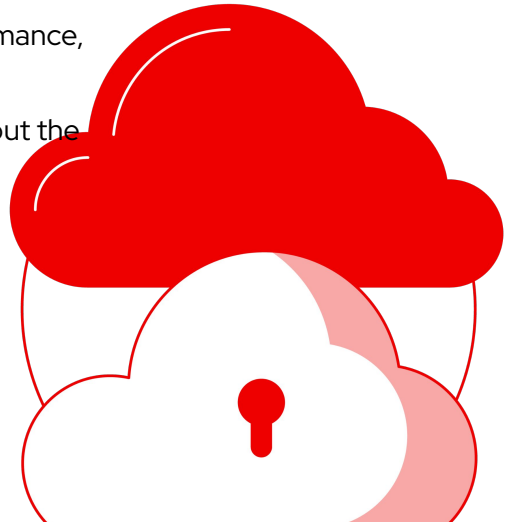
Supports public cloud, bare metal, virtual machines, and WSL

Cloud-optimized Red Hat Enterprise Linux

Accelerate cloud adoption

Focus on initiatives that move your business forward, rather than spending time on operational functions

- Benefit from seamless integration with the cloud provider's services
- Leverage integrated management tools to speed operations
- Apply built-in cloud-specific configurations that ensure performance, integration and observability for your cloud-based workloads
- Deploy a stable surface to build on without having to worry about the underlying technology



Hyperscaler optimized cloud offerings:

- Red Hat Enterprise Linux for AWS
- Red Hat Enterprise Linux for Azure
- Red Hat Enterprise Linux for Google Cloud

RHEL for AWS

Features that make RHEL even better on Amazon Web Services

- Integration with CloudWatch using OpenTelemetry
- Ensured Network performance with Elastic Network Adapter
- Aws CLI

RHEL For Microsoft Azure

Improving your RHEL Experience on Azure

Red Hat

Microsoft Azure

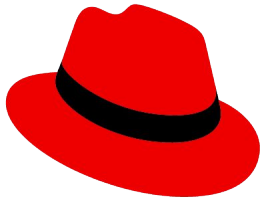
- Integrations with Azure Monitor
- Azure Confidential VM (CVM) support for confidential computing
- Azure CLI

Red Hat and Microsoft continue to work together to improve performance for RHEL on Azure

RHEL for Google Cloud

Making Google Compute Platform even more flexible

- Integrates with Google Cloud Observability using OpenTelemetry
- Network performance improvements using IDPF drivers
- Google Cloud CLI



Red Hat

Google Cloud

Red Hat and Google continue to work together to improve performance for RHEL on GCP

Resist security threats

When Quantum computers become prevalent

Y2Q

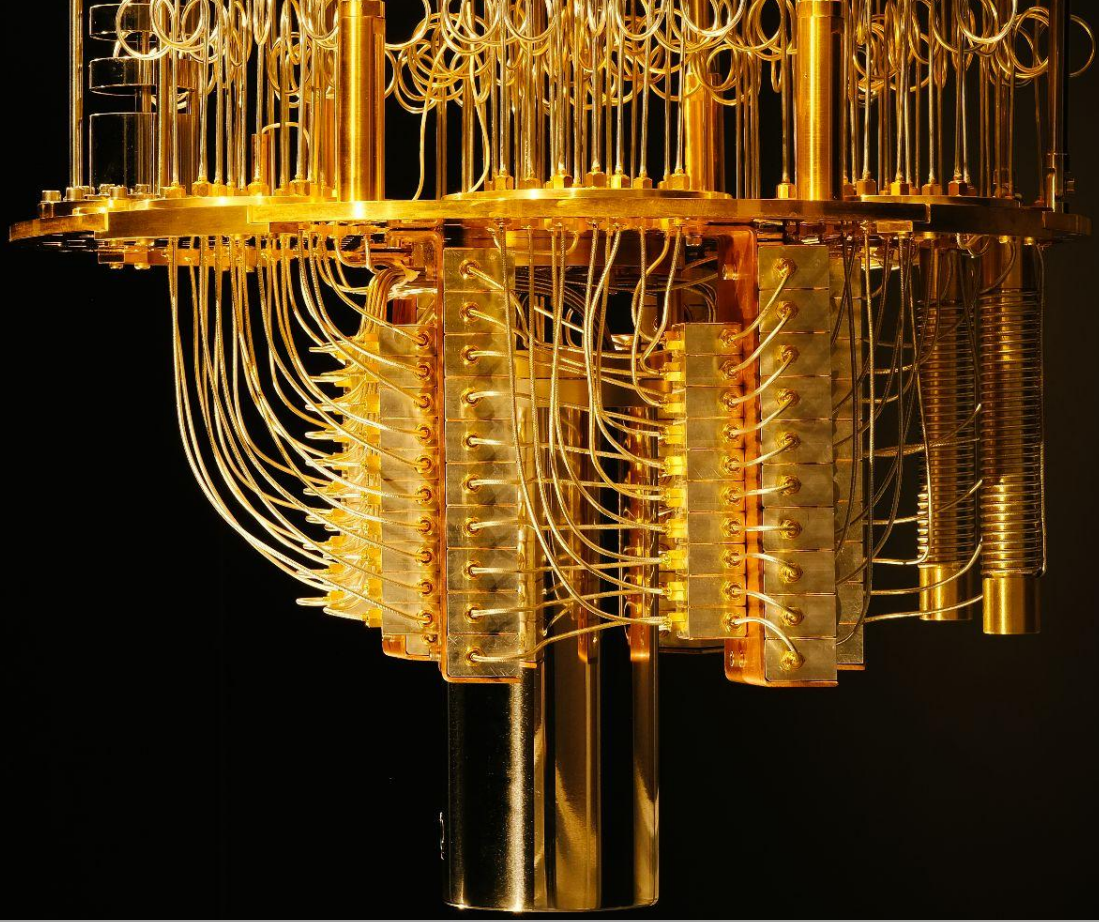
RHEL 10 includes

Key Exchange

ML-KEM

Digital Signatures

ML-DSA

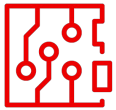


Post Quantum Cryptography (PQC) simplified

POST

After...

QUANTUM



Refers to quantum computers which will be able to crack[1] today's security algorithms

CRYPTOGRAPHY

Refers to the process of protecting content and communications, keeping material authentic for intended users

***Therefore**, PQC simply refers to the ability to protect information after quantum computers become available.*

1: Superposition, Parallelism, Entanglement, and Synchronicity are the Quantum computing capabilities that allow for full use of Shor's algorithm, used for solving prime numbers critical to asymmetric cryptography.

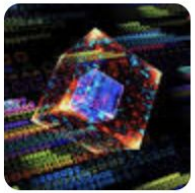
It is already happening...

In the news 25th of June 2025

Earth.com

China breaks RSA encryption with a quantum computer, threatening global data security

1 day ago



The420.in

The End of RSA Algorithm? China's Quantum Breakthrough Sparks Global Panic

17 hours ago

What cryptography is at risk ?

Asymmetric (Signatures, Encryption, Key Exchange)

Schemes that depend on classical hard mathematical problems where public / private key pairs are used.

At Risk

Symmetric Encryption

Ciphers that use a secret key to both encrypt and decrypt data.

Safe (with large enough keys)

Hashes, HMACs[1]

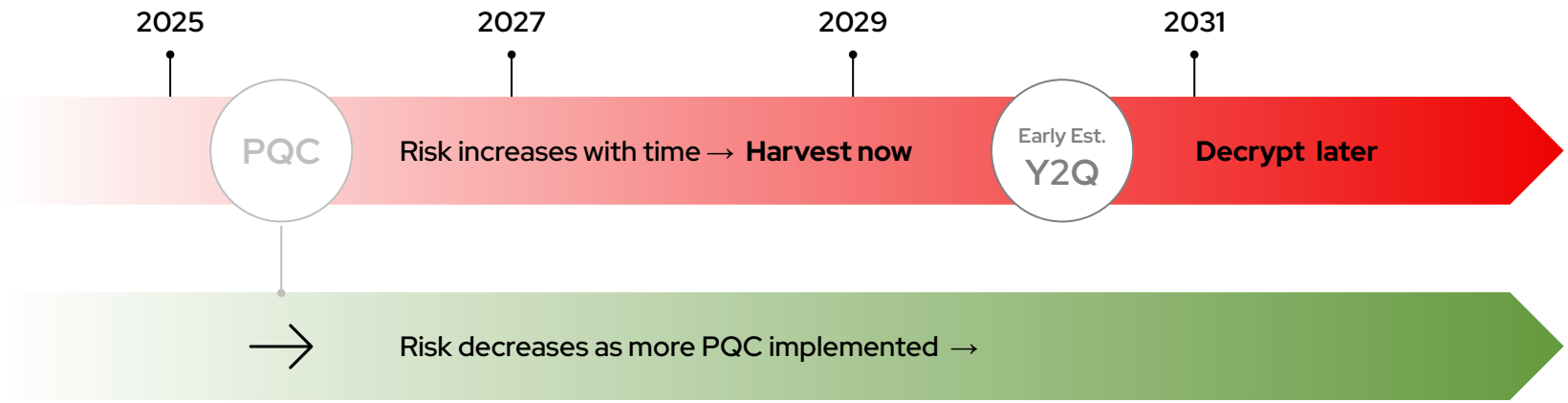
Digest algorithms that are used for fingerprinting and compressing data into a short ID.

Safe (with large enough keys)

1: Hash-based Message Authentication Code

Why should organizations care about this now?

PQC is a future challenge, but the threat is already here



Organizations adopting PQC today are protecting their data now **and in the future**

Y2Q Year when quantum starts defeating current encryption | **PQC** Start of PQC adoption

PQC will be part of compliance mandates

Currently no one global cryptographic authority exists

Most countries and compliance bodies rely on the new standards defined by National Institute of Standards and Technology (creators of the Cyber Security Framework) as of September 2024

NIST
encouraging transitioning asap

ANSSI
encouraging transitioning

ETSI
now requires trust service providers to begin migration

CNSA[1]
multiple dates, specific cryptographic capabilities, 2025- 2033

PCI-DSS 4.0
Is mandatory for some organizations as of March 31, 2025

ENISA
encouraging organizations to start transitioning

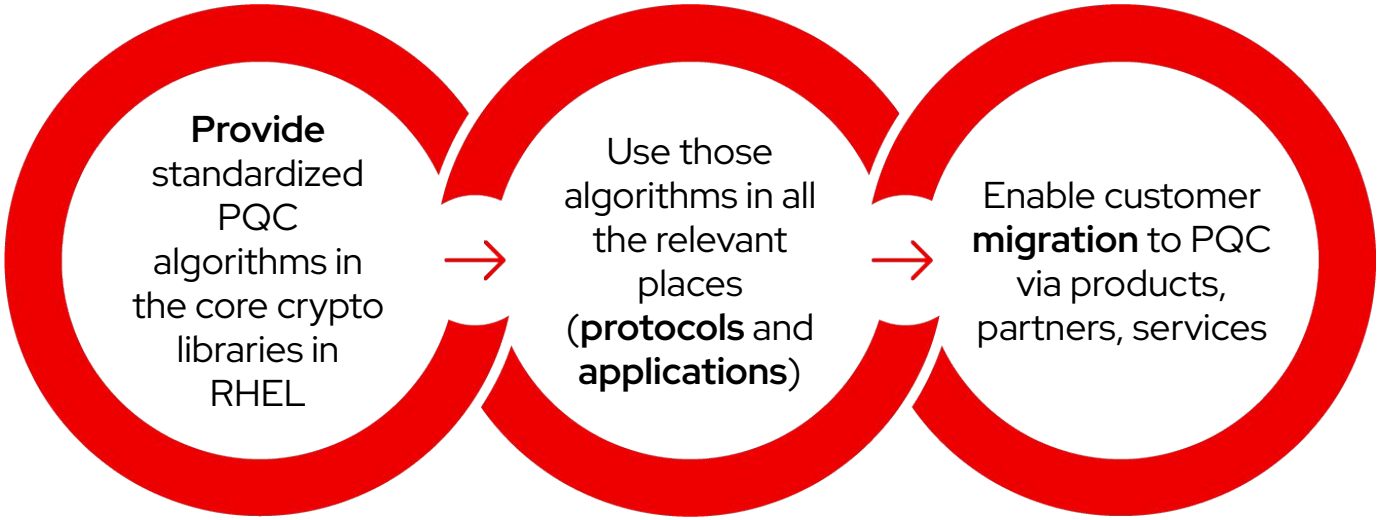
CSA
encouraging now and expected to release firm guidelines this year

1 These are the timelines that Red Hat is working towards as it is the most comprehensive, particularly consider delays in implementation

What is Red Hat doing?

Red Hat's Basic Strategy

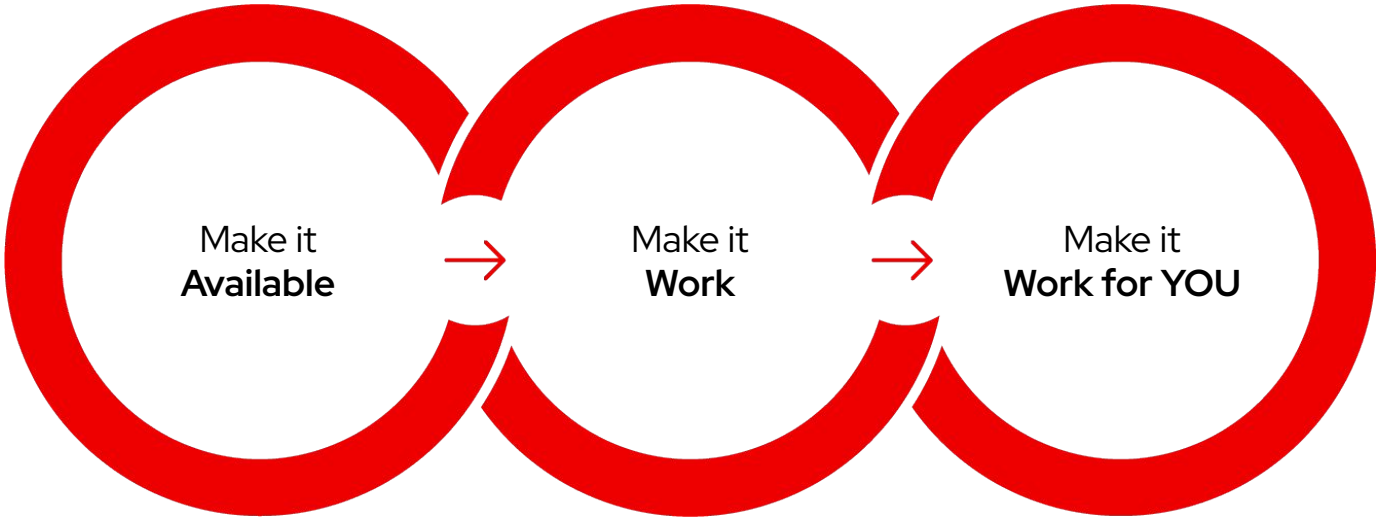
How we will execute the shift to PQC



Source:
RH PQC Strategy team

What does this mean?

This is a journey that will prepare you for the advent of Quantum Computing



Source:
RH PQC Strategy team

Overall Implementation Strategy

Classical

Red Hat products and services use classical cryptography algorithms

PQ-Capable

Red Hat products or services include classical cryptography by default

PQC functions are configurable

Classical and PQC available and both are supported (as available)

PQ-Ready

Red Hat products or services include PQC functions by default

Classical cryptography is configurable

Deprecation and Removal

Classical cryptography algorithms are marked as deprecated

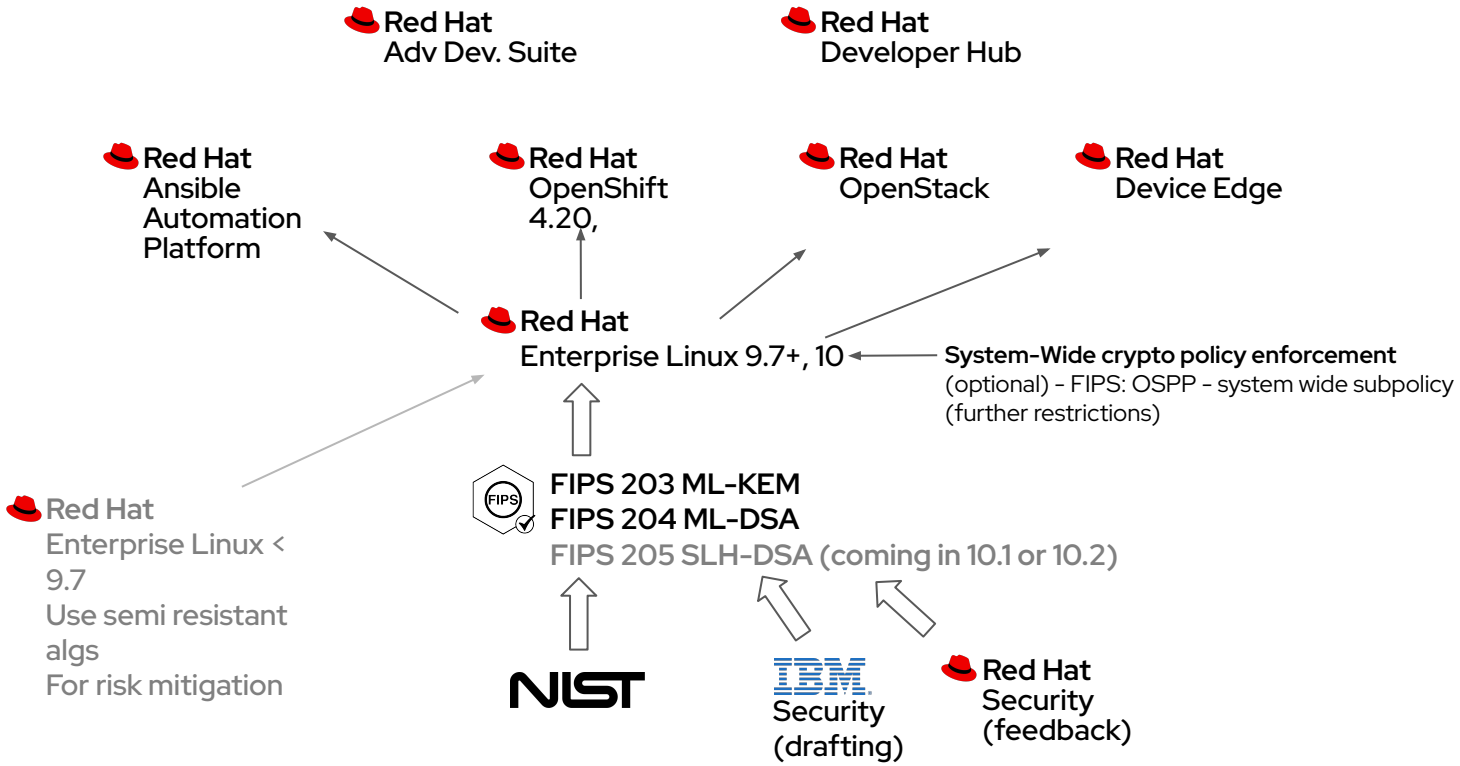
Classical cryptography algorithms are removed

RHEL 10 includes the first installment of QRAs:

- ML-KEM [FIPS 203]
- ML-DSA [FIPS 204]

Red Hat

PQC Influence on Red Hat Portfolio

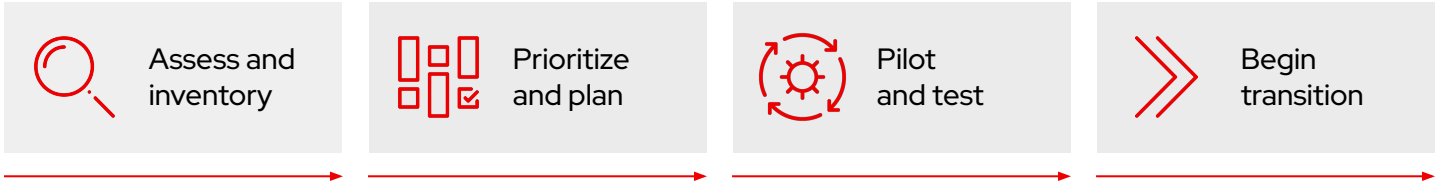


What work can organizations start now?

How to prepare

What steps can you take now?

Team 1:
Feasibility



Team 2:
Information

What advice do you have, where can people get more information?

How to attack prioritization

Day 1 vs long term

Harvest Now Decrypt Later

Leverage the most resistant algorithms available (TLS, LUKS, Key Escrow, etc) - start where you can make the most difference .

- AES in classical
- Transition to PQC algorithms over time
- Use HSM for key storage

Signatures (Software Signing)

Ensure that software is signed with the best tools and algorithms available (SHA2/3)

- OpenPGP (Sequoia, rpm signing)
- Sigstore (Containers, Images - for longer term)

Authentication

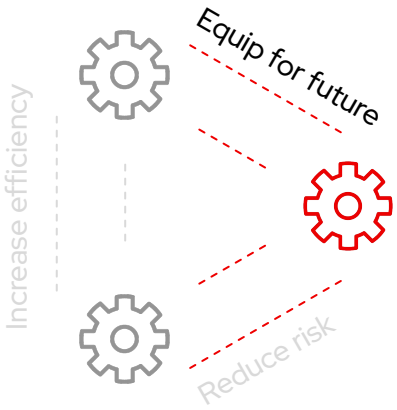
Tend to be real time attacks, risk is lower by comparison. Plan to adopt as technology is ready.

- AES in classical
- Passwordless, mfa
- Zero Trust Architecture

Plan for the Future when considering large hardware purchases or upgrades, ensure PQC capable

Resist security attacks from hackers

When quantum computers become prevalent



The best defense is a strong partner.

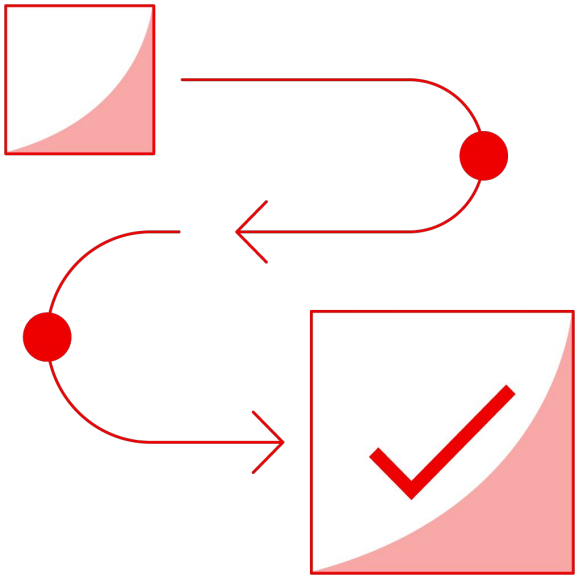
- **RHEL 10 is the first Linux distribution to be post-quantum capable** with new quantum-resistant algorithms (and more to come) so you can prepare now, for future compliance mandates
  - OpenSSL
  - ML-KEM (FIPS 203)
  - ML-DSA (FIPS 204)

Making it easy to use FIPs validated crypto

Maintain compliance

FIPS

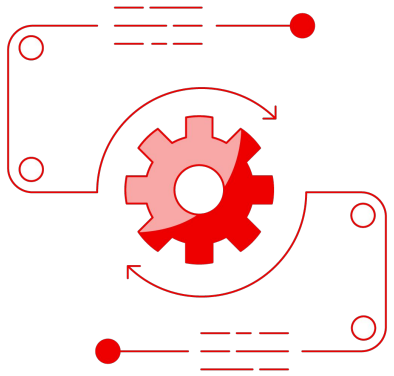
Validate the Federal Information Processing Standards (FIPS) cryptographic standards separately so that any CVE fixes related to Open SSL or crypto libraries can be performed without the need to obtain a new FIPS validation certificate.



RHEL Security Select Add-on

Accelerate the rate at which organizations receive requested RHEL CVE fixes

Increases the rate at which organizations receive requested CVE fixes

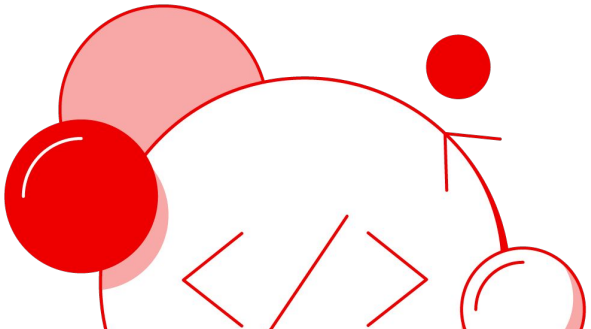


- Organizations can now purchase RHEL Security Select 10-pack Add-On of CVE fixes associated with their ELS or EEUS/EUS subscriptions, allowing for fixes upon request.
- Individual RHEL Security Select Single Add-Ons for CVE fixes beginning with CVE 11 and onward can be ordered at a valued price.
- An ELS/EEUS subscription is necessary to qualify for the RHEL Security Select Add-On.
- Organizations may acquire this offering like ELS, and it can be backdated to align with the start date of their EUS/ELS subscription.
- The RHEL Security Select Add-On provides a Service Level Agreement (SLA) of 90 days.
- Only available with Premium RHEL

RHEL extensions repository

Red Hat delivers high-quality software in a convenient location with minimal maintenance requirements

The RHEL extensions repository will include developer tools, open source libraries, and niche utilities that make RHEL valuable to developers and system administrators



These packages will be:

- Efficient process to access high value packages
- Validated by Red Hat
- Community-supported, having gone through Red Hat's Secure Supply Chain
- Consumable and manageable within the Red Hat ecosystem

Benefits of Extensions Repository to the Customer

Known By Default

- Consumable & Manageable by the Red Hat Ecosystem
  - RHEL
  - Satellite
  - Image Builder

Secure

- Benefits from Red Hat's Secure Supply Chain
- Fast Updates From Community Support
- CVE Communication from Red Hat

Always Up To Date

- Fast Builds for Updated Versions from EPEL
- Not Tied to RHEL Release Cadence
- Abandoned Packages Removed

Red Hat Enterprise Linux for Microsoft Windows Subsystem for Linux (WSL)

WSL is now a validated software platform for Red Hat Enterprise Linux*

Eliminate the need for a VM

Run a Red Hat Enterprise Linux development environment on Windows without having to spin up a traditional virtual machine (VM)

Ease operations

Download Red Hat Enterprise Linux as a WSL image during install, or build a customized image using Insights image builder and install it in WSL to easily run both Windows and RHEL at the same time on a Windows machine

Save time

Use Red Hat Enterprise Linux via WSL to build Linux apps on a Windows machine, and then deploy on a RHEL environment for production to save significant time and resources

* Intended for developer use only

Other Notable Features

System roles expansion

Added system roles to support more technologies

Advanced Intrusion Detection System

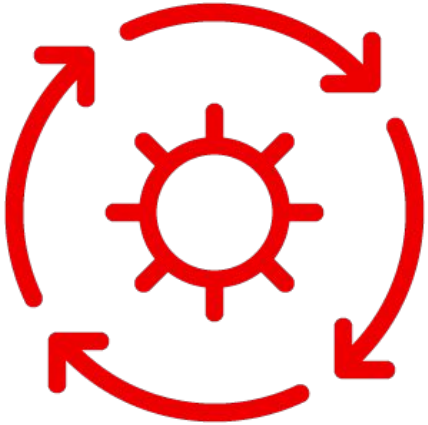
Automate the Installation and Configuration of AIDE

Podman with Quadlet

Deploy podman containers, and quadlet Systemd integrations

Systemd user-level unit support

The systemd system role has been updated to include user defined units



RISC-V Developer Preview

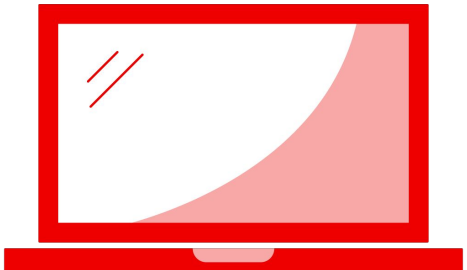
Early access to the combination of RHEL and RISC-V

Red Hat Enterprise Linux 10 with RISC-V technology benefits:

- Provides an open source CPU design solution to enable hardware vendors to build CPU silicon without licenses or royalties
- RHEL and RISC-V as developer preview is now available on the popular high performance SiFive HiFive P550 Platform
- RHEL with RISC-V provides innovation delivered by technology, package in a safe, reliable and usable way for the enterprise

What is “Developer Preview?”

Developer Preview is provided to expose features from upstream communication allowing developer to explore and interact with new capabilities.



Package Changes

Packages removed or deprecated with RHEL 10

XOrg Removal

RHEL 10 will be Wayland-only. With the removal of Xorg, several other technologies leave too, specifically GTK2 and Motif.

VNC Removal

VNC relies on the older X technologies which are no longer included in RHEL10. RDP is the remote graphical desktop alternative. RDP has now replaced VNC for remote graphical installations as well.

SCAP Workbench Removal

Used GTK2, which was removed with Xorg. SCAP Workbench has not been re-written to function with Wayland, and consequently has been removed

Tomcat returns

Tomcat is now included in RHEL (it initially returned in a minor release update of RHEL 9). It had been removed from RHEL8.

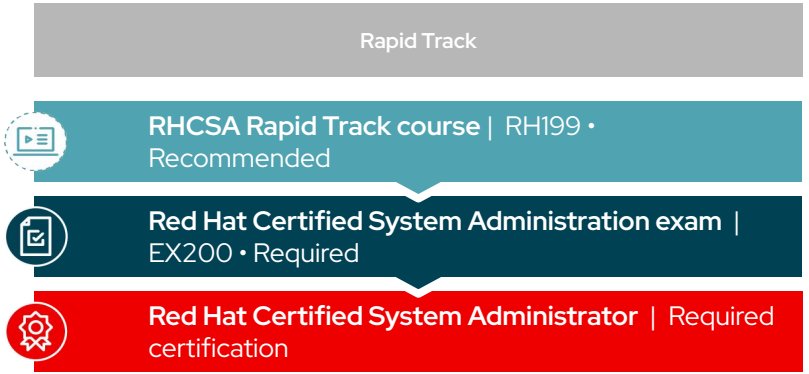
CPU Changes

x86-64-v3 : Instruction Set Architecture version 3 (ISAv3)
Haswell or greater Intel CPUs, Excavator or greater AMD CPUs
Not all CPU platforms are v3 compliant (Some Atom)

i686 removed :
No software compiled for i686 support will be included. This affects 32-bit multi-lib support

Red Hat Developer Blog on x86-64-v3

Red Hat Certified System Administrator skills path



New course available!!
Duration: 2 day classroom, 3 day VT
Included in RHLS

Upcoming events to mark in your agenda

Red Hat Summit: Connect 2025 Copenhagen

Date: October 9, 2025
Time: 08:00 - 18:00
Location: Radisson Blu Scandinavia Hotel, Amager Boul. 70, 2300 Copenhagen, Denmark

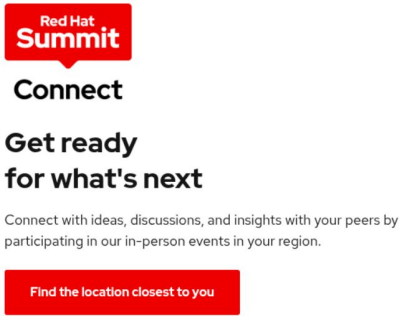
Red Hat Technical Journeys

On demand, virtual

redhat.com/en/events

Red Hat Summit: Connect 2025

September 2025 through to January 2026
Find a location near you:



Lab Time!

Command Line Assistant

Try the AI assistant - https://red.ht/lab-rhel-cla

Image Mode Basics

Build and deploy an Image Mode system - https://red.ht/lab-image-mode

Image Mode Day 2 Operations

Manage a virtual machine running in Image Mode - https://red.ht/lab-image-mode-day2

RHEL 10 (beta) Open Lab

Ready to explore an installed RHEL 10 system? - https://red.ht/lab-rhel10-beta

Red Hat Satellite Basics

Basics of what is new in Satellite 6.17 - https://red.ht/lab-satellite-basics

Satellite Advanced Topics 6.17

Advanced lab on what is new in Satellite 6.17 - https://red.ht/lab-satellite-advanced

Rootless Podman Lab

Learn how to configure a docker image to run as a rootless podman service - https://red.ht/lab-podman-rootles

Building Pods and using Quadlets

Build podman pods and define them as services using Quadlets - https://red.ht/lab-podman-pods

https://labs.redhat.com

Try it yourself!

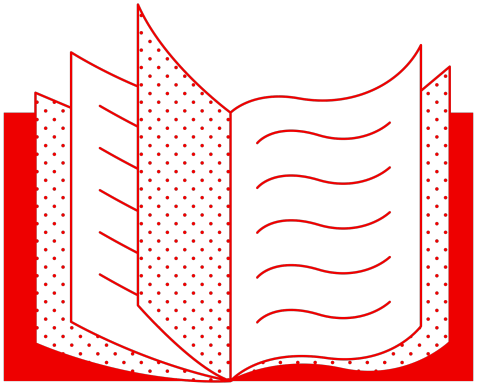
The whole demo shown in this session and other use cases are available in the following Github repository:

https://red.ht/rhel-image-mode-demo

Everybody is welcome to use it, fork and suggest improvements.

Useful resources

- RHEL Image mode on Red Hat Developers
  - https://developers.redhat.com/products/rhel-image-mode/overview
- RHEL Image mode documentation
  - https://docs.redhat.com/en/documentation/red_hat_enterprise_linux/9/html/using_image_mode_for_rhel_to_build_deploy_and_manage_operating_systems/index
- RHEL Image mode quickstart on Red Hat Blog
  - https://www.redhat.com/en/blog/image-mode-red-hat-enterprise-linux-quick-start-guide
- RHEL Image mode overview - YouTube
  - https://www.youtube.com/watch?v=QZDaTHyl1Sk
- RHEL Image mode Lab fast forward instructions
  - https://github.com/AutomationWitch/instruqt-mods/tree/main/image-mode



Red Hat
Enterprise Linux

Give image mode for Red Hat Enterprise Linux a try!

Visit red.ht/imagemode
to learn more

labs.redhat.com

Get hands on with image
mode at red.ht/im-rhel

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Thank you

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