Expand innovation and operational efficiency with Linux

7 ways to amplify the value of your
Red Hat Enterprise Linux subscription

Table of contents

Linux is the foundation for the future

Linux® provides an ideal platform for modern, innovative IT, which is why it has widespread adoption across industries and emerging technology use cases.

It has become the de facto standard for developing and running highly available, reliable, and critical workloads in datacenters and cloud computing environments and supports a variety of use cases, target systems, and devices. Every major public cloud provider—including Microsoft Azure, Amazon Web Services (AWS), Google Cloud Platform, IBM Cloud, and Alibaba Cloud—offers multiple Linux distributions in their marketplaces.

Choosing the right Linux distribution for your organization is crucial, whether you are deploying critical business applications or preparing for hybrid cloud operations. Different distributions offer different benefits and value, from features and integrations to support and partnerships. This e-book explores the value of Red Hat® Enterprise Linux for your organization and the experience you can expect to have as a Red Hat customer.

The Business Value of Red Hat Enterprise Linux

| Read the study

Red Hat Enterprise Linux gives you a high-value foundation for modern IT

A flexible, stable, and reliable foundation for modern IT and hybrid cloud environments, Red Hat Enterprise Linux delivers a trusted platform that promotes innovation and increases operational efficiency within your organization—no matter where you choose to run your workloads. Consistency across infrastructure environments—including physical, virtual, private and public clouds, and network edge deployments—allows you to manage applications, workloads, and services using the same tools and staff throughout your infrastructure. And by giving you a platform that satisfies the needs of both development and operations teams, Red Hat Enterprise Linux reduces deployment friction and operating costs while shortening time to value for critical business workloads. In fact, when used as the underpinning for other Red Hat products, the security focus, performance, interoperability, and innovation of Red Hat Enterprise Linux extend throughout your operating environment to deliver more value.

As a result, you can build and operate a hybrid cloud environment that keeps pace with your business needs.

Organizations that use Red Hat Enterprise Linux experience[1]

35%
lower infrastructure costs.

....

16%
fewer unplanned outages.

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17%
more productive development teams.

....

26%
faster application development cycles.

....

38%
more efficient IT infrastructure teams.

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[1] IDC White Paper, sponsored by Red Hat. "The Business Value of Red Hat Solutions Versus Non-Paid Open Source Alternatives," Doc. # US50423523, March 2023.

Operate with confidence from datacenter to edge

Achieve consistency across clouds with Red Hat Enterprise Linux

Cloud computing can bring unprecedented speed and simplicity to your IT estate, but in order to take advantage of cloud benefits, consistency is key. Red Hat Enterprise Linux helps organizations like yours to retain skills, standards, processes, best practices, and management tools—as you move to cloud and edge environments and beyond—reducing the difficulty and cost of cloud migrations, new deployments, and future innovation.

Red Hat Enterprise Linux is certified for use with all major cloud providers, including Microsoft Azure, AWS, Google Cloud Platform, IBM Cloud, and Alibaba Cloud. Featuring capabilities that are jointly engineered and optimized for cloud use, Red Hat Enterprise Linux facilitates efficient workload migration, provides consistent management, visibility, and security capabilities from development to production, for public, private, hybrid, and multicloud infrastructure.

Red Hat works with cloud providers to deliver optimal Red Hat Enterprise Linux user experiences, offering multiple options to match how you purchase and manage software in the cloud. You can bring your own subscription, pay as you go, use cloud provider committed spend, or even work directly with Red Hat to build a custom plan tailored to your specific needs.

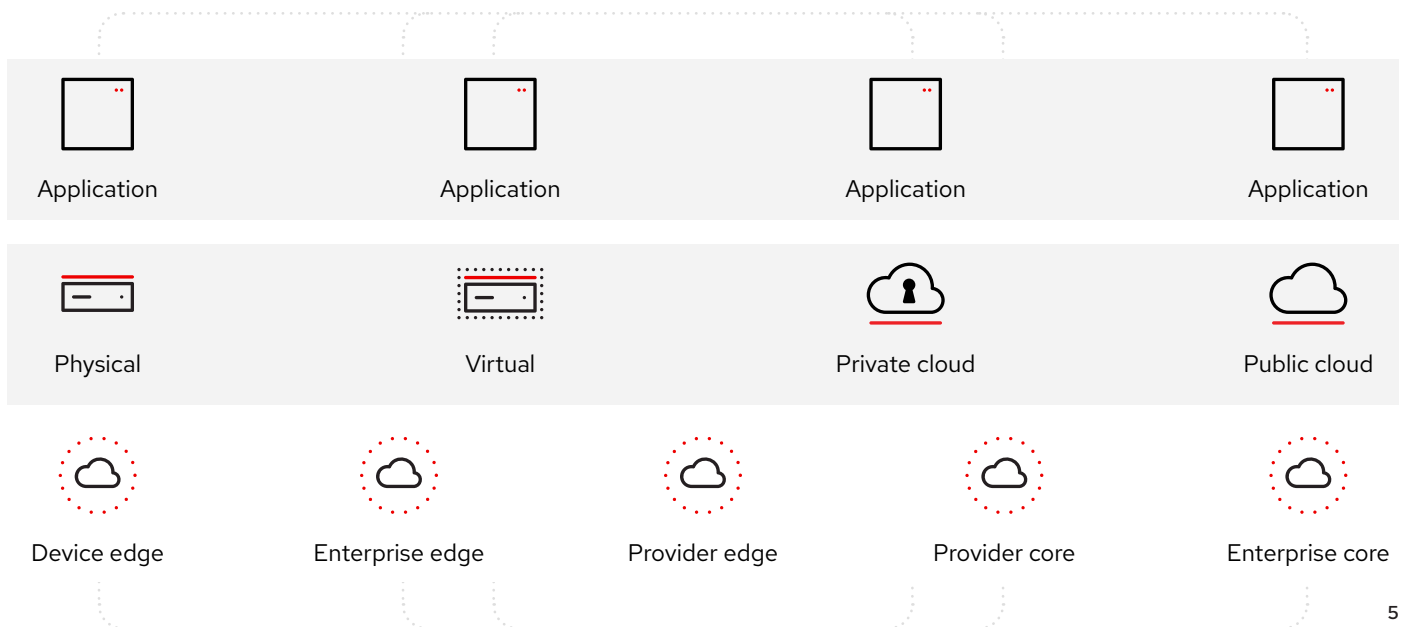## Simplify computing all the way to the edge

Edge deployments encompass workloads that operate outside the core datacenter on a variety of devices. Edge use cases range from running latency-sensitive applications on high-performance systems to scaling workloads across lightweight hardware at remote sites with limited or unreliable connectivity.

Red Hat Enterprise Linux forms an ideal foundation for enterprise edge deployments in small infrastructure environments:

It provides the cross-infrastructure consistency, workload portability, and streamlined operations needed to move traditional and containerized workloads from your datacenter to edge locations.

Custom edge-optimized operating system (OS) images support diverse workloads running at remote sites.

Reliable image and system updates minimize operation interruptions in deployments with limited bandwidth or low connectivity.

Intelligent rollbacks help you avoid downtime when managing thousands of devices and locations.

Edge management capabilities allow you to more securely manage and scale edge deployments from a single interface, providing control and peace of mind at every stage of an edge system's life cycle.

Deploy and manage cloud and edge applications

Red Hat Enterprise Linux provides a consistent platform to deploy and manage applications in the datacenter, cloud, and at the edge.

Application	Application	Application	Application
Physical	Virtual	Private cloud	Public cloud

Device edge	Enterprise edge	Provider edge	Provider core	Enterprise core

Experience Red Hat Enterprise Linux

The following sections provide guidance and tips to help you unlock the full potential of your Red Hat Enterprise Linux subscription in 7 key areas:

1	2	3	4	5	6	7
Security and compliance	Workloads	Containers	Development	Automation and management	Performance	Life cycle
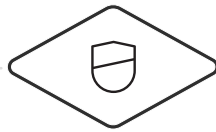
1

Security and compliance

IT security is an ongoing concern for all organizations. In fact, 61% of organizations cite ensuring enterprise-wide cybersecurity as very important in their role as digital leaders.[2] Keeping up with the latest security trends and best practices can be challenging, and modern DevSecOps approaches add to this pressure, as developers and operations staff must build security into their processes.

Security breaches can be costly and damage your reputation and brand. The average cost of a data breach is US$4.24 million, with lost business accounting for 38% of this cost.[3] In contrast, data breaches in hybrid cloud environments cost an average of US$3.61 million, US$1.19 million less than public cloud breaches—a difference of 28.3%.[3]

Industry and government regulations also change frequently. Companies must comply with these regulations quickly or face potentially large fines and penalties. Maintaining compliance with an increasing number of mandates can be challenging, and compliance failures increase the cost of a data breach by US$2.3 million on average.[3]

[2] Harvey Nash Group, "Digital Leadership Report 2021," 2021.
[3] "Cost of a Data Breach Report 2021," IBM, 2021.

Common security and compliance challenges

Several factors can make security and compliance management challenging:

Changing security and compliance landscapes
Security threats change quickly, requiring rapid response to new hazards and evolving regulations.

Distributed, multiplatform environments
Infrastructures are becoming more distributed across on-site, cloud, and edge platforms. Different platforms often use different management tools, preventing you from applying security controls consistently across your environment. Additionally, views and reports from each of these tools must be pieced together to gain a holistic view of the compliance and vulnerability status of your environment.

Large, complex environments and teams
Large, complex infrastructures and teams can complicate coordination across your environment and organization. Consequently, system complexity can increase the average cost of a data breach by US$2.15 million.[3]

Limited security expertise
Effective IT security often requires a thorough understanding of threat trends, best practices, and IT architecture. However, 43% of organizations report a shortage of cybersecurity skills.[2]

The importance of effective security

Effective security is essential for protecting your organization against quickly evolving threats:[3]

61%
Of organizations cite ensuring enterprise-wide cybersecurity as very important in their role as digital leaders.

50%
Organizations that had more than 50% of their workforce working remotely took 58 days longer to identify and contain breaches.

$1.07M
The average cost of a breach was US$1.07 million higher when remote work was a factor in causing the breach.

$750,000
Organizations that did not implement any digital transformation changes as a result of COVID-19 experienced US$750,000 higher costs compared to the global average.

[2] Harvey Nash Group, "Digital Leadership Report 2021," 2021.
[3] "Cost of a Data Breach Report 2021," IBM, 2021.

What you need to successfully manage security and compliance

IT organizations must minimize exposure and attack surfaces at all levels of their IT infrastructure. Ideal administration tools will include capabilities in 3 key areas: vulnerability mitigation, security at scale, and compliance management.

Vulnerability mitigation

Vulnerability mitigation helps you identify and address security risks before an incident occurs. Look for tools that provide:

- Broad vulnerability coverage and analysis capabilities.

- Supply chain protection through static code analysis and trusted build processes.

- Continuous vulnerability scanning and remediation.

- Strong access controls and safe defaults for users and applications.

- Tailored reports regarding risks, remediation actions, and auditing.

Security at scale

Effectively maintaining security at scale requires consistent management and automation across your environment. Look for platforms and tools that provide:

- Built-in security features that work with a layered approach to protection.

- Flexible, repeatable and user-friendly automation that integrates with other management tools.

- Live patching capabilities to minimize reboots and downtime.

- Customizable, system-wide cryptography baselines.

- Hardware root of trust capabilities to resist tampering attempts.

- Streamlined operations that work consistently across hybrid environments.

Compliance management

Compliance management helps you ensure systems are aligned with policies, standards, and regulations over time. Look for tools that provide:

- Unified visibility into your compliance posture.

- Continuous monitoring for compliance risks.

- Built-in security baselines for common standards.

- Certification to government and regulated industry standards.

- Remediation guidance and automated actions.

- User activity logs for security and compliance incident auditing.

Increase security and compliance with Red Hat Enterprise Linux

A more secure IT environment begins with your OS. Security is a key part of the Red Hat Enterprise Linux architecture and life cycle. Red Hat's development approach improves the security of Red Hat Enterprise Linux. During a major release life cycle, Red Hat integrates new features from the upstream Linux community into the latest stable version of Red Hat Enterprise Linux to reduce the risk of security, compliance, and compatibility risks.

Red Hat Enterprise Linux also provides security technologies, controls, certifications, and the ongoing support of the Red Hat Product Security team to help safeguard your IT infrastructure and business.

- Built-in security features help you proactively protect your datacenter environment.

- Mandatory access controls and application isolation in containers created with consistent security protocols help you combat intrusions and meet regulatory compliance.

- Multilayer breach defenses let you automate security controls and mitigate your risk of exposure due to vulnerabilities.

- Certification to stringent security standards—including Federal Information Processing Standard (FIPS) 140-2, Common Criteria (CC), and Secure Technical Implementation Guidelines (STIG)—lets you use Red Hat Enterprise Linux across deployment scenarios without compromising security.

- Security upgrades and live patches—provided as part of your Red Hat Enterprise Linux subscription—help you keep your environment and its security up to date.

- Continuous vulnerability monitoring and rapid security updates help protect your business when critical issues arise.

Red Hat Enterprise Linux integrates with Red Hat management products to provide the capabilities you need to effectively manage security vulnerability risk and compliance.

- Configurable tools and baselines reduce false positives and give you an accurate view of your infrastructure status.

- Automation capabilities improve configuration and patching accuracy, increase repeatability, and reduce human errors.

- Customizable views deliver the right information at the right time.

- Automated and proactive remediation help you fix issues faster, without needing to contact support.

- An extensive library of resources provides detailed, targeted information 24x7.

- Built-in application programming interfaces (APIs) connect with your preferred tools and interfaces.

Red Hat Enterprise Linux helps you protect your business

Red Hat builds security into Red Hat Enterprise Linux from the start so you can better protect your business. Using Red Hat Enterprise Linux, you can:

Reduce your risk of security breaches.

Mitigate security threats more efficiently.

Reduce downtime due to security management operations.

Streamline compliance management and auditing.

Apply security configurations consistently across your entire environment.

Protect your business with innovative, built-in capabilities

Red Hat Enterprise Linux gives you the tools and capabilities you need to increase security and compliance across your IT infrastructure and organization.

Multilayer breach defense
Red Hat Enterprise Linux includes multiple levels of defense, including vulnerability scanning and remediation, SELinux mandatory access controls, rootless containers, and application allow lists.

Verified security certifications
Red Hat Enterprise Linux is an independently validated and certified platform that has passed government and regulated industry standards — including FIPS 140-2, Common Criteria, and STIG — to support your compliance mandates.

Red Hat aims to independently validate every minor release against FIPS standards and certify every Extended Update Support release to Common Criteria requirements.

Modern, scalable encryption
Red Hat Enterprise Linux simplifies how you ensure system-wide, consistent cryptography settings to address compliance requirements. Rather than configuring libraries manually, you can use a single command to change cryptographic settings—including allowed cryptographic key lengths, hashes, parameters, protocols, and algorithms—without modifying your applications.

Critical security updates and patches
Starting with Red Hat Enterprise Linux 8.5, Red Hat provides kernel live patches for critical and important Common Vulnerabilities and Exposures

(CVEs) at no additional cost for all releases. Kernel live patching allows you to patch a running kernel without rebooting your system, minimizing downtime without compromising security. Experience kernel live patching for yourself.

Centralized identity management
Red Hat Enterprise Linux includes built-in identity management capabilities that allow you to authenticate users and implement role-based access controls (RBACs) using a single, scalable interface. Red Hat identity management also integrates with Microsoft Active Directory, Lightweight Directory Access Protocol (LDAP), and other 3rd-party identity and access management solutions through standard APIs. Learn how to plan your centralized identity management.

Tech tip

Implement the OpenSCAP scanner

Secure Content Automation Protocol (SCAP) is a National Institute of Standards and Technology (NIST) specification for scanning and evaluating the security of enterprise system configurations. Included with Red Hat Enterprise Linux, the OpenSCAP scanner implements the SCAP standard to:

- Verify the presence of patches using content produced by the Red Hat Security Response Team.

- Check system security settings against custom and standards-based profiles.

- Examine systems for deviation from standards and specifications.

For compliance at scale, you can also register your systems with Red Hat Insights to create policies, customize scanning rules, and remediate non-compliance issues.

Try it
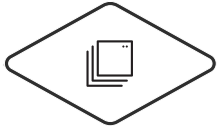
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Workloads

Applications are at the core of digital business operations—62% of organizations consider applications essential to their business, and a further 36% report that applications provide a competitive advantage.[4]

Your organization likely relies on a selection of 3rd-party enterprise applications and internally developed services. All of these workloads must run reliably to support your business needs. Your underlying OS can greatly affect the performance, availability, and scalability of your workloads.

Common workload challenges

Workload operating costs and efficiency are key concerns for IT organizations. Common struggles include:

- **Managing** multiple workloads on different platforms.

- **Ensuring** workloads are optimized for performance and resource use.

- **Maintaining** compliance with security standards and policies.

- **Responding** quickly to issues.

- **Providing** insight and visibility into IT assets and data.

- **Providing** the container and modern development capabilities developers demand.

What you need to build an effective foundation for critical workloads

Efficient, reliable, security-focused infrastructure is needed to support essential applications and services. Standardizing your IT environment on a modern, interoperable, cloud-ready OS can help you increase efficiency, reduce costs, and optimize and manage workloads.

Choosing the right OS to support your workloads is essential. Look for OSes that offer:

- Consistent operation across infrastructures.

- Certification with your applications.

- Proven performance and scalability.

- Integrated security and management.

- Interoperability with existing IT investments.
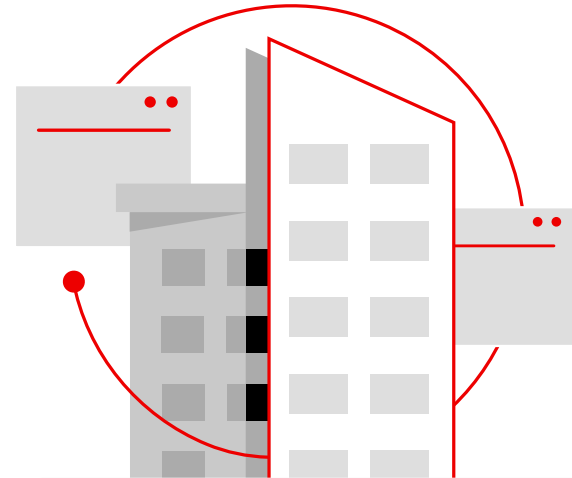
Applications are key business assets

Modern businesses rely on applications and services for both internal and external operations:[4]

62%

of organizations consider their applications to be essential to their business.

··

36%

of organizations believe that their applications provide a competitive advantage.

[4] "2020 State of Application Services Report." F5 Networks, 2020.

Gain workload consistency with Red Hat Enterprise Linux

Red Hat Enterprise Linux provides a consistent, high-performance, and manageable foundation to run the applications your business relies on. It delivers greater application performance and portability, increased workload stability and reliability, and a large selection of certified applications to choose from.

Certified partner ecosystem
Red Hat fosters a large certified partner ecosystem—including leading software, hardware, and cloud providers—so you can choose the products and platforms that best fit your needs, knowing they will work reliably with Red Hat Enterprise Linux.

Optimizations for databases
Red Hat Enterprise Linux incorporates key features and optimizations to increase manageability, performance, and availability for SAP HANA® and Microsoft SQL Server databases. The OS also includes popular open source databases like PostgreSQL and MariaDB via application streams so you can get started quickly.

Interface stability
Red Hat holds Red Hat Enterprise Linux application binary interfaces (ABIs) and APIs stable throughout the entire life cycle of each major release—up to 10 years. A published compatibility guide for each major release provides guidance about interfaces when upgrading your OS.

24/7 High Availability and Disaster Recovery Add-on
The Red Hat Enterprise Linux High Availability Add-On improves and accelerates business continuity by increasing uptime for critical applications and services. It builds on the security and performance features of the Red Hat Enterprise Linux platform— keeping applications running and protecting data in the event of a failure, wherever they are deployed.

Certified software vendor ecosystem
Applications from hundreds of software vendors are certified for use on Red Hat Enterprise Linux.[5]

World record performance
Red Hat Enterprise Linux holds world record performance for SAP Big Data Analytics Total Runtime and Query Executions.[6]

Leading price per performance
Red Hat Enterprise Linux holds the leading TPC-H results for Microsoft SQL Server in terms of price per performance.[7]

Tech tip

Optimize your workload performance with TuneD

TuneD is a system tuning service for Linux. Red Hat Enterprise Linux provides performance profiles to optimize your system for running specific workloads, based on the tuneD technology. It includes tuneD profiles for SAP HANA and Microsoft SQL Server, as well as open source databases, files servers, and high-intensity compute workloads.

Try it

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[5] Learn about certified applications at catalog.redhat.com/software.
[6] Shakshober, Douglas. "Red Hat Enterprise Linux with Intel's newest Xeon processors posts record performance results across a wide range of industry benchmarks." Red Hat Blog, April 16, 2019.
[7] Red Hat blog. "These Microsoft SQL Server on RHEL 8 benchmark results might surprise you," 13 April 2021. Transaction Processing Performance Council Benchmark H (TPC-H) results as of 25 March 2021. TPC, TPC Benchmark, and TPC-H are trademarks of the Transaction Processing Performance Council (TPC). For more information about these results, visit tpc.org.
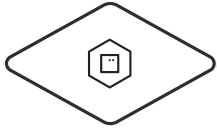
3

Containers

Container environments can help you build, deploy, and operate applications faster and with higher security. Containerized applications and services can be written once, then deployed, moved, and scaled across infrastructure as needed to meet changing demand. On average, Red Hat customers run between 20% and 40% of their workloads in containers today, and expect to double that in the next 12 months.[8]

Common container challenges

Container adoption is often less than straightforward. While many organizations want to experience the benefits of containers, they are not ready to move entirely to a Kubernetes platform and microservices architecture and need a path forward.

What you need to successfully deploy containers

In order for containers to be an effective approach, IT teams need standardized tools and infrastructure that address new challenges in stability, scale, and security.

Simplify container operations with Red Hat Enterprise Linux

Red Hat Enterprise Linux provides both a container host on which you can run industry-standard containers, as well as a path forward to Kubernetes and Red Hat OpenShift®. Containers built from Red Hat Enterprise Linux content and running in Red Hat environments deliver production-grade support, stability, and security features.

Red Hat Enterprise Linux delivers advanced, innovative container infrastructure and tools to simplify container development and deployment. It supplies a lightweight, open standards-based container toolkit with everything you need to get started. Red Hat Enterprise Linux also provides several Open Containers Initiative (OCI) compliant tools to simplify and improve container development, management, and security.
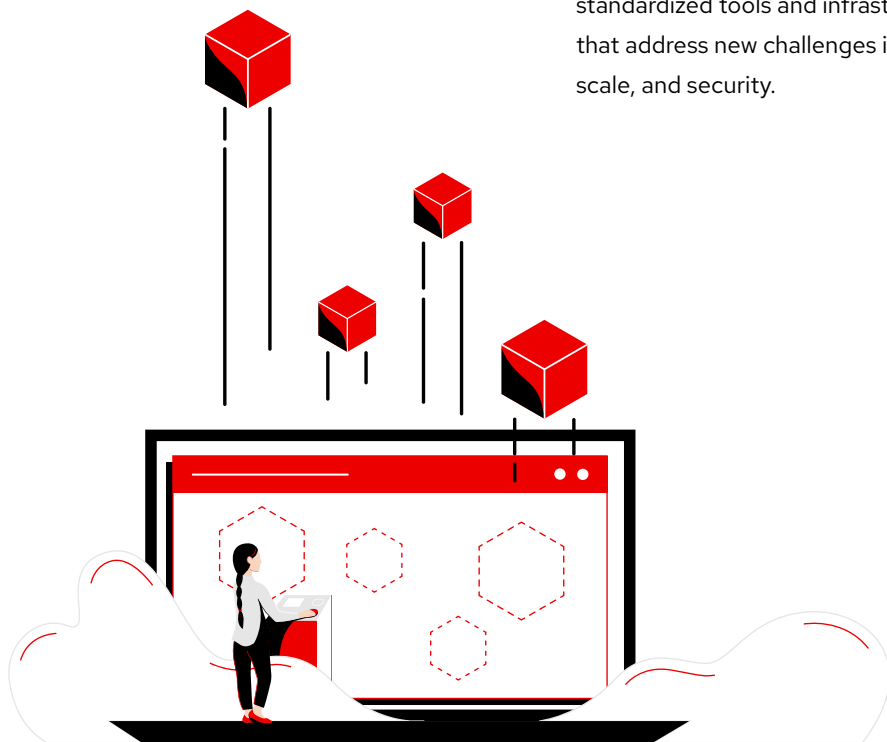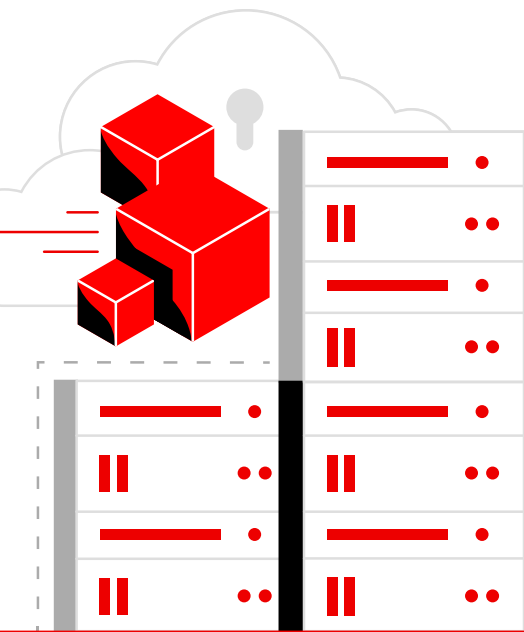
[8] Red Hat report. "2021 Red Hat Global Customer Tech Outlook," Oct. 2021.

Ease container deployment with Red Hat Enterprise Linux

Red Hat Enterprise Linux includes lightweight, open standards-based container tools to simplify and improve container development, management, and security.

Buildah
Buildah allows you to build and modify containers without any daemon or docker. It preserves your existing dockerfile workflow while allowing detailed control over image layers, content, and commits. Try Buildah at lab.redhat.com/buildah.

Podman
Podman is a complete, daemon-less container engine for running, managing, and debugging OCI-compliant containers and pods. It lets you manage containers without the daemon dependency and is docker command line interface (CLI) compatible. Try Podman at lab.redhat.com/podman-deploy.

Skopeo
Skopeo is a new, comprehensive tool and library for inspecting, signing, and transferring container images. This advanced container sharing allows you to inspect, verify, and sign image manifests and move container images between registries.

Udica
Udica allows admins and container developers to create security policies that only allow the exact capabilities needed by analyzing a container and generating extra controls that work with the default policy. Try creating customized policies with Udica at lab.redhat.com/selinux-containers.

Checkpoint/restore in userspace
Checkpoint/restore in userspace (CRIU) works with Podman to implement checkpoint/restore functionality for Linux containers. CRIU can freeze a running container and save its memory contents and state to disk so that containerized workloads can be restarted in less time. Try CRUI with Microsoft SQL Server at lab.redhat.com/sql-server-ubi.
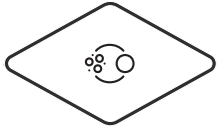
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Development

In a digital world, organizations must deliver differentiated applications to remain competitive. Developers play a critical role in creating and maintaining these applications. In fact, 62% of organizations state that IT operations and IT infrastructure knowledge are must-have for DevOps team members.[9]

Common development challenges

Development languages and frameworks continually evolve to support new features and capabilities. Developers need access to different versions of these tools to create efficient, innovative applications. Even so, it can be difficult for IT organizations to provide and support the breadth of tools, languages, platforms, and runtimes their developers need to be most successful.

What you need to support modern application development

To be most efficient and productive, developers need access to their preferred tools and platforms. An OS that includes or integrates with popular and emerging development tools, languages, and runtimes can help you streamline how you support application development and deployment efforts.

Simplify development with Red Hat Enterprise Linux

Red Hat Enterprise Linux provides an intelligent, consistent, and security-focused IT foundation for application development and deployment. Streamlined access to high-quality open source development tools and support for a wide range of popular languages, frameworks, and databases gives you the resources you need to quickly deliver the valuable applications your business requires. Consistency across infrastructures allows you to write an application once and run it on any footprint. And advanced, unified management capabilities make it easier for operations teams to deploy, scale, and manage your applications in production.

Red Hat Enterprise Linux adds more developer-focused tools and features—including support for multiple languages and runtimes, faster package update cycles, and an advanced container toolkit—so you can work how you work best.

• Developer-focused design and tools.

• Streamlined developer tool delivery.

• Wider base image distribution.

Take advantage of a developer-focused design

Red Hat Enterprise Linux is designed to combine production stability with developer agility, offering:

The latest stable developer tools.

Support for a broad selection of programming languages and runtimes.

Faster, simpler OS and tool installation.

Tool, language, runtime, and framework updates to speed application development and deployment in the hybrid cloud.

Get started

[9] DevOps Institute, 2021 UpSkilling: Enterprise DevOps Skills Report, 2021

Streamline development with Red Hat Enterprise Linux

Red Hat Enterprise Linux includes key capabilities to give you a simpler, more efficient path from development to production.

Universal Base Images (UBIs)
Red Hat UBIs let you take advantage of the reliability, security, and performance capabilities of official Red Hat container images. Portable application images let you develop once and deploy on Red Hat Enterprise Linux and other Linux distributions, simplifying container development. You can build a containerized application on a UBI, push it to your choice of registry, and share it with others. Developers can distribute smaller container images anywhere, while operators can deploy supportable base images with enterprise life cycles.

Application streams
Application streams are a method for delivering multiple versions of userspace packages. They provide updates at a cadence that makes sense for each package, rather than combining them into a monolithic distribution. Application streams also offer multiple versions of select packages, giving you more choice. Finally, they combine all distribution channels into a single location. As a result, you can readily access the latest stable versions of the programming languages, tools, and databases you need to be productive.

Red Hat Developer program
The Red Hat Developer program gives you access to software, knowledge, and user-friendly Red Hat technologies for building all types of applications. As a program member, you gain access to many benefits, including:

- No-cost Red Hat Developer subscriptions for Red Hat products.

- Developer-specific blogs and tutorials.

- Red Hat Customer Portal resources.

- Bonus e-books, cheat sheets, webinars, and sample code.

Sign up to learn more

Tech tip

Gain development flexibility with integrated tools and frameworks

Red Hat Enterprise Linux includes developer-friendly technologies—like the latest versions of the node.js, Ruby, and Python application frameworks—delivered through application streams, as well as UBIs that provide a simplified baseline for containerizing applications.

Try it

5

Automation and management

To support digital business, IT teams must operate efficiently and rapidly implement new technologies. In fact, improving operational efficiency is the top business issue for organization boards.[10] IT optimization and modernization initiatives require effective management and automation to be successful. Automation is also critical for at-scale operations, as manually tracking and implementing security patches, updates, and configuration changes across large numbers of systems is simply too onerous and time consuming. Consequently, 83% of organizations cite too many manual processes as a challenge in managing IT spending.[11]

Adding to this, more organizations are deploying workloads across hybrid environments that encompass bare-metal, virtualized, cloud, and edge footprints. This complexity often impedes visibility into your overall environment and compounds management challenges.

Common automation and management challenges

Several circumstances can make it difficult to manage systems effectively:

Environment sprawl and complexity
Larger environments contain a greater number of systems, complicating deployment and administration across your organization.

Limited staff and expertise
IT teams are not growing at the same pace as the infrastructure they manage, and it can be difficult to find new IT staff with Linux expertise.

Business requirements
Ever-increasing requirements for system availability, application performance, and no-downtime maintenance complicate IT administration.

What you need to implement effective management and automation

A comprehensive IT management strategy that incorporates standardization, automation, and simplicity can help you increase IT efficiency, security, and reliability while reducing operational costs.

Standardization
A standardized operating environment (SOE), based on consistent OSes and tools, is at the core of the most effective management strategies. SOEs can simplify your IT infrastructure to streamline management operations like system provisioning and deployment.

Automation
Infrastructure automation uses software to create repeatable instructions and processes to replace or reduce human interaction with IT systems. Automation can help your organization speed operations, boost productivity, and increase reliability, while reducing time spent on tedious tasks.

Simplicity
Unified, streamlined administration interfaces provide a single launchpoint for management operations. A centralized management interface can help you improve IT efficiency, speed, and consistency across both local and remote infrastructure.
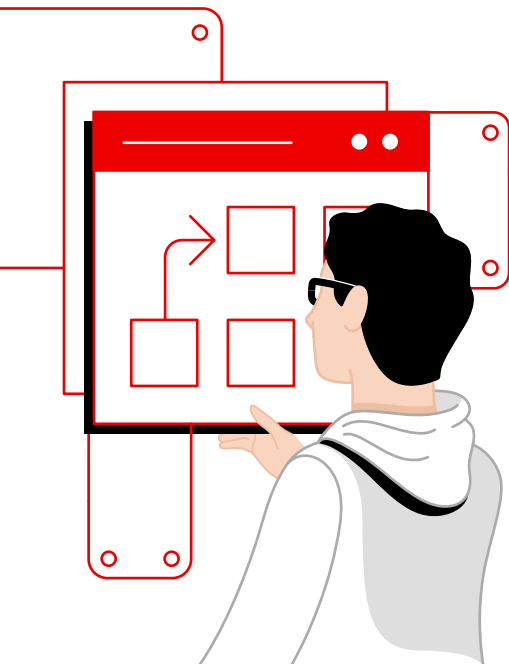
[10] Harvey Nash Group, "Digital Leadership Report 2021," 2021.
[11] "2021 Flexera State of Tech Spend Report," Flexera, 2021.

Streamline management with Red Hat Enterprise Linux

Red Hat Enterprise Linux provides a consistent and repeatable management experience by automating manual tasks, standardizing deployment, and simplifying day-to-day administration. It gives you:

- Streamlined OS management with automated, repeatable workflows.

- Intuitive, robust, web-based administration that you can extend to meet your needs.

- Consistent OS administration across infrastructure types.

Through built-in capabilities and integrated tools, Red Hat Enterprise Linux provides simpler management across your environment.

Common interfaces
Red Hat Enterprise Linux uses common interfaces to allow you to manage all systems in a consistent manner.

Intelligent insight
Red Hat Enterprise Linux includes unified tools like Red Hat Insights for proactively identifying and remediating threats to security, performance, availability, and stability to avoid issues, outages, and unplanned downtime. These tools also help you ensure your Red Hat environment is operating optimally.

Flexible automation
Red Hat Enterprise Linux integrates with Red Hat Ansible® Automation Platform to provide flexible, powerful IT automation.

Simplified patching
Red Hat Enterprise Linux works with Red Hat Satellite for simplified deployment, management, and scaling of Red Hat infrastructure to increase efficiency and reduce operational costs.

The benefits of Red Hat Enterprise Linux management capabilities

Take advantage of flexible automation, predictive analytics, and integrated management tools to spend:[12]

96%
less time detecting availability, performance, stability, and configuration issues.

91%
less time identifying security vulnerabilities.

90%
less time detecting drift.

89%
less time monitoring for patches.

70%
less time creating custom policies.

Read the study

[12] Principled Technologies, sponsored by Red Hat. "Save administrator time and effort by activating Red Hat Insights to automate monitoring," September 2020.

Take advantage of built-in management and automation capabilities

System roles

System roles are a collection of supported workflows that provide a consistent configuration interface with dependable task execution across multiple versions of Red Hat Enterprise Linux. Using system roles, you can rapidly configure different Red Hat Enterprise Linux versions using the same automation playbooks.

Try system roles

Subscription watch service

The subscription watch service provides an account-level view of your subscription use over time to help you get more from your investment. It shows you which subscriptions are in use and how many subscriptions of each type you have purchased.
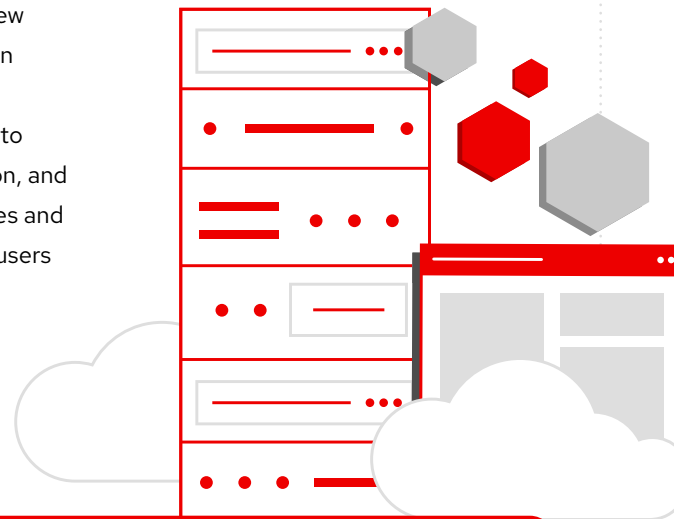
Web console

The Red Hat Enterprise Linux web console is an intuitive graphical interface that simplifies IT administration. IT administrators of all skill levels can perform management tasks, gather information about system health, and generate reports for various audiences.

Try the web console

Image builder

Image builder helps you create customizable image files for use with major cloud providers and virtualization technologies—including Amazon Web Services, Microsoft Azure, Google Cloud Platform, OpenStack®, and VMware—to efficiently deploy workloads across hybrid and multicloud environments according to your requirements.

Try image builder

Red Hat Insights

Red Hat Insights, included with your subscription, provides a unified view of your system population. You can analyze Red Hat Enterprise Linux systems across your environment to simplify identification, prioritization, and resolution of security vulnerabilities and operational risks before business users are impacted.

Tech tip

Simplify deployment of firewalls with Red Hat Enterprise Linux system roles

Configuring and managing firewall rules is a complex and critical task that ensures that your Red Hat Enterprise Linux host minimizes its attack surface from network intrusion. The Red Hat Enterprise Linux Firewall System Role simplifies and automates the configuration and management of firewalls in a repeatable and scalable manner.

Read more about the Firewall System Role.

Try it

6
Performance

The demand for improved performance continues to stimulate technological advances. New IT hardware—including processors, memory, and storage—supports faster application performance through hardware acceleration and optimization. Advanced data processing allows you to gain better insights, faster, from your data. Cloud technologies provide increased scalability to meet dynamic demands and support higher application performance.

As a result, user expectations for OS and application performance have increased dramatically. High, reliable workload performance can provide a competitive advantage to your organization, especially in fast-paced industries.

Common performance challenges

While performance is key, many organizations struggle to establish and maintain the system performance benchmarks they need to be successful. Complex infrastructure and numerous performance tools make it difficult for administrators of all experience levels to find and resolve performance issues and inefficiencies. As a result, IT teams are frequently forced into a reactive approach to performance management.

What you need to proactively manage IT performance

Your underlying OS can greatly impact the performance of your applications. You need a high-performance platform that includes capabilities to help you identify issues, analyze metrics, and tune systems to optimize and manage application performance across your IT environment. Look for OSes that offer:

- Broad performance monitoring and baseline comparisons.

- Performance analysis at scale and across environments.

- Prescriptive remediation for performance issues.

- Best practices and recommendations for tuning performance.

- Support for the latest hardware and technologies.

Boost performance across hybrid environments with Red Hat Enterprise Linux

Red Hat Enterprise Linux provides a modern, open, high-performance foundation for your applications.

Identify issues
Quickly detect and locate issues that cause poor application performance.

Analyze metrics
Collect and analyze performance metrics across hybrid environments performance.

Tune systems
Access best practices to configure systems for higher performance.

Optimize performance with Red Hat Enterprise Linux

Red Hat Enterprise Linux includes capabilities that make it simpler to identify issues, analyze metrics, and tune systems to optimize the performance of your applications and hardware, across your entire hybrid cloud infrastructure.

Performance co-pilot
Included with Red Hat Enterprise Linux, performance co-pilot is a suite of tools, services, and libraries for monitoring, visualizing, storing, and analyzing system-level performance measurements.

TuneD profiles
TuneD is a Linux service that uses profiles to optimize your systems for different workloads and use cases. Red Hat Enterprise Linux provides built-in tuneD performance profiles for running specific workloads.

Kernel backports
Red Hat uses kernel backports to add select upstream performance improvements to stable, proven Red Hat Enterprise Linux code without compromising application compatibility or reliability.

Web console
Red Hat Enterprise Linux includes a browser-based graphical interface for viewing system processors, memory, storage, and network performance metrics and deploying configured tuneD profiles.

> **Red Hat Enterprise Linux powers the top 3 supercomputers on the TOP500 list.[13]**

Tech tip
Analyze your performance with bcc-tools

Based on extended Berkeley Packet Filter (eBPF) technology included with Red Hat Enterprise Linux, BPF Compiler Collection (BCC) tools help you gather kernel information and analyze the performance of your Linux OS. The bcc-tools package includes a variety of small Python-based programs to collect specific, programmable performance metrics that let you analyze performance without adding system overhead or security risk.

Try it
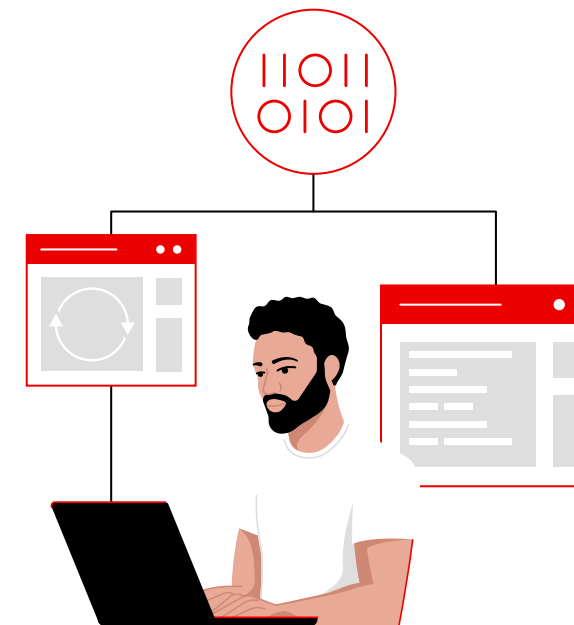
13 "TOP500 List November 2021" Top500, Nov. 2021.
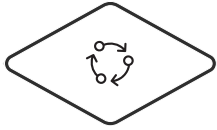
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Life cycle

According to recent research by Altimeter, 48% of organizations are modernizing IT infrastructure to increase agility, flexibility, manageability, and security as part of their overall digital transformation efforts.[14] IT life cycle planning is a key aspect of this transformation, as well as ongoing maintenance, optimization initiatives, and new technology adoption.

OS life cycle planning is especially important, as it is a foundational layer of your IT infrastructure. End of maintenance dates, upgrade options, and application and hardware compatibility are critical considerations that can drastically impact your IT operations and business.

Common OS life cycle challenges

IT life cycle planning can be complicated. Lack of visibility into vendor roadmaps makes it difficult to understand when new releases and features will be available. Limited product life cycles require more frequent updates, which in turn require more frequent testing and recertification. And upgrading to a new OS version to continue receiving support can be a major IT project, especially at scale.

What you need to simplify OS life cycle management

In order to ease IT life cycle planning, IT teams need visibility into vendor roadmaps and life cycle and support options that align with their needs. Look for an OS vendor that helps you:

Prepare for success
Identify potential complications and access guidance to proactively remediate issues.

Automate operations
Streamline operations and reduce the risks associated with migration via automation.

Migrate more efficiently
Simplify and speed updates and upgrades with automated tools and expert guidance.

Simplify upgrades with Red Hat

Red Hat provides detailed guidance and simple-to-use tools to help you upgrade your OS and migrate applications.

You can also take advantage of Red Hat's partner ecosystem or Red Hat Consulting services to speed your migration projects. Red Hat experts work with your organization to develop the practices, tools, and culture needed to accelerate the Red Hat Enterprise Linux upgrade process.

These services help you:

Identify key applications, workloads, and tools.

Create automated workflows.

Reduce risk for critical applications and workloads.

Learn more

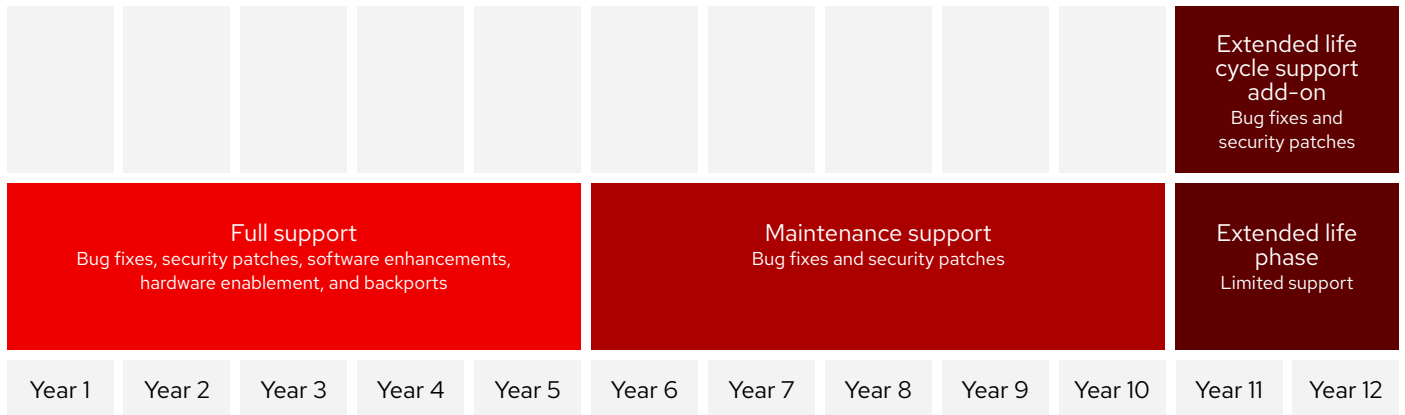14 "Altimeter's 2022 Trends in " Digital Transformation" Altimeter, 2022.

Gain life cycle flexibility with Red Hat Enterprise Linux

A Red Hat Enterprise Linux subscription offers flexible and stable life cycle options to support your business and security requirements. You can choose from multiple supported versions, upgrade on your schedule, and adopt new features as you need them. With up to 10 years of updates and support for major releases, up to 2 years of updates and support for select minor releases, and binary compatibility between releases, Red Hat offers life cycle flexibility that lets you plan for long–term success. Finally, ongoing access to advanced security features, patches, and guidance helps you implement continuous security strategies to protect your business.
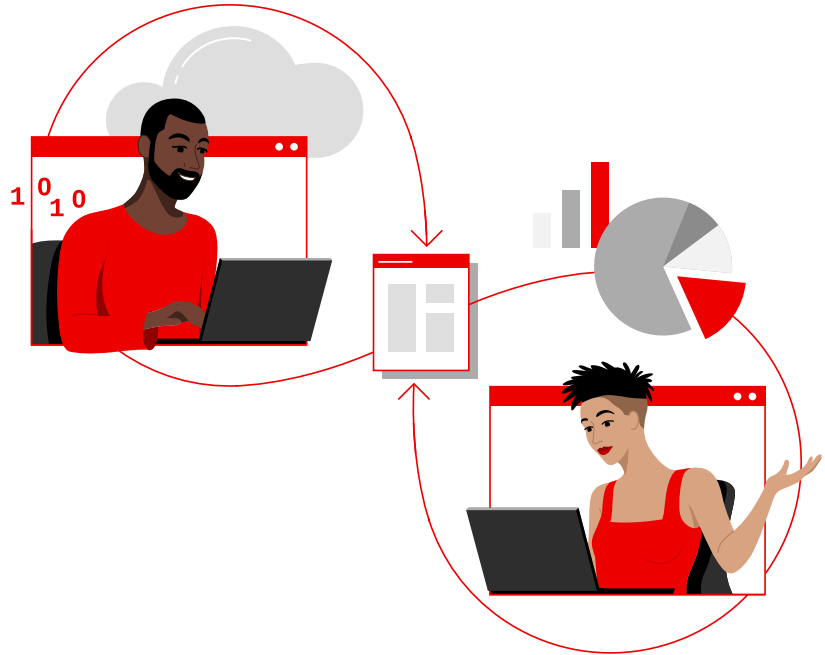
Read more about the Red Hat Enterprise Linux life cycle

Figure: Red Hat Enterprise Linux 8 & 9 major release life cycle

										Extended life cycle support add–on Bug fixes and security patches
Full support Bug fixes, security patches, software enhancements, hardware enablement, and backports					Maintenance support Bug fixes and security patches					Extended life phase Limited support
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12

23

Take advantage of enterprise-focused life cycle options

Red Hat Enterprise Linux offers enterprise-focused life cycle options to help you create an informed infrastructure strategy and plan for change on your own schedule.

Long-term life cycle support
Red Hat Enterprise Linux offers up to ten years of updates and support for major releases, up to 2 years of updates and support for select minor releases, and a published life cycle to give you more stability for long-term planning. If you need a little more time for transitions, you can extend these life cycles even further through the optional Extended Life Cycle Support Add-On and Extended Update Support Add-On.

Red Hat Enterprise Linux Extended Update Support Add-On
The Red Hat Enterprise Linux Extended Update Support Add-On is a supplemental subscription that extends support—including bug fixes and security patches—for select minor releases of Red Hat Enterprise Linux. With this add-on, you can standardize on a given minor release for up to 24 months after its initial release date.

Leapp in-place upgrade tool
Leapp is a utility that gives you the control, confidence, and freedom you need to streamline your Red Hat Enterprise Linux 7 or 8 upgrade. A pre-upgrade analysis provides application compatibility and remediation guidance. Moreover, it can perform the upgrade in minutes when you are ready while maintaining your customizations, configurations, and preferences.

Plus, if you are using an earlier version of Red Hat Enterprise Linux, we also provide guidance and tools to help you upgrade to Red Hat Enterprise Linux 7, so you can then take advantage of the Leapp utility for further upgrades.

Convert2RHEL tool
Convert2RHEL allows you to quickly migrate systems from CentOS Linux or Oracle Linux to a fully supported Red Hat Enterprise Linux deployment. This streamlined tool maintains your existing customizations, configurations, and preferences during the migration process, helping you to avoid costly redeployment projects.
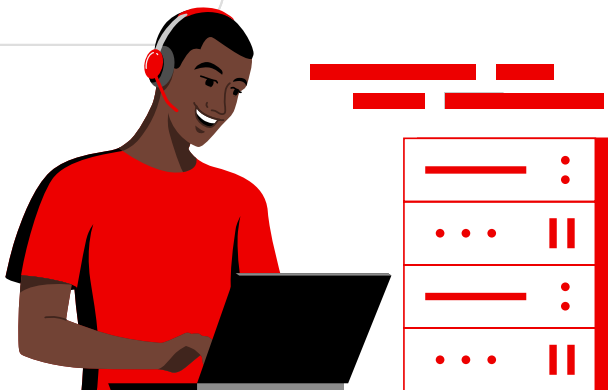
Tech tip
Simplify how you plan your IT life cycles

Red Hat simplifies IT planning with published long-term release cycles and life cycle options.

Red Hat publishes the entire Red Hat Enterprise Linux release life cycle so you can make informed planning decisions about whether to upgrade for dot releases.

A long major release life cycle, with stable kernel and userspace interfaces, allows you to standardize for up to 10 years without worrying about breaking your applications.

The Red Hat Enterprise Linux Extended Update Support Add-On lets you choose to upgrade between minor releases less frequently.

Experience the value of a Red Hat Enterprise Linux subscription

Your Linux distribution is a strategic choice that must take into account both the technology itself and the vendor that provides it.

Through a comprehensive subscription, Red Hat and Red Hat Enterprise Linux give you the security, flexibility, resilience, and performance needed to support your critical workloads wherever they're deployed in the hybrid cloud.

Your Red Hat Enterprise Linux subscription provides more than just product availability—it defines your overall technology experience and relationship with Red Hat. Your subscription delivers specific support levels, life cycle updates and maintenance, visibility into the Red Hat Enterprise Linux roadmap, and tools for upgrading, patching, automating, and analyzing your environment. Finally, our subscription model fosters an ongoing relationship with your organization, giving you opportunities to influence the direction of the technologies your business relies upon.

Production-grade life cycle support and options

Your Red Hat Enterprise Linux subscription offers flexible, stable, and security-focused life cycle options to support your business requirements. Deploy and run any supported version of Red Hat Enterprise Linux, upgrade on your schedule, and adopt new features as you need them. Up to 10 years of active maintenance for major releases—and up to 2 years for minor releases—lets you test and upgrade your environment on your schedule. Binary compatibility within major releases allows you to update and upgrade with confidence—if a workload runs on the first version of a major release, it will continue to run reliably on each update and minor release.[15]

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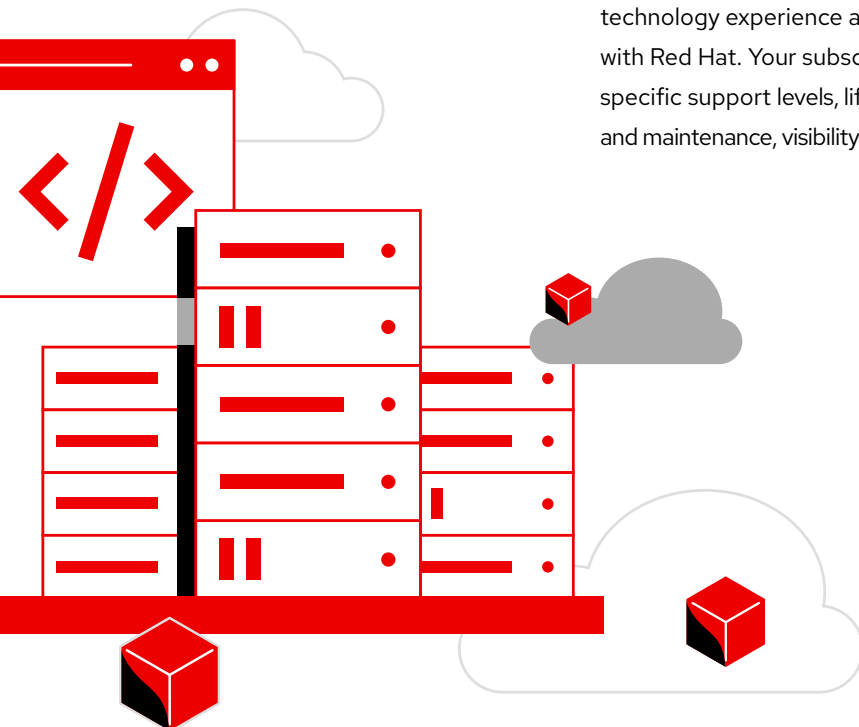
[15] During the life cycle of a major Red Hat Enterprise Linux release, Red Hat makes commercially reasonable efforts to maintain binary compatibility for the core runtime environment across all minor releases and errata advisories. Learn more about the Red Hat Enterprise Linux life cycle.

Flexibility and control across IT footprints, versions, and costs

Your Red Hat Enterprise Linux subscription provides the flexibility needed to tailor your environment, support, and costs to your requirements.

Portability across IT footprints: Your subscription is not tied to a specific installation location, cloud provider, or hardware. Apply your subscriptions to a broad selection of physical, virtual, cloud, or edge systems and move them as needed.

Support for multiple versions: Your subscription provides access to and support for every actively maintained version of Red Hat Enterprise Linux. Manage upgrades on your schedule and standardize on major releases for up to 10 years.

Flexible cost control: Subscriptions shift IT costs from capital expenditures (CapEx) to operating expenses (OpEx), giving you more immediate control over your spending. Choose from several levels of included support to meet your budget. For example, you can use a higher support level for your production systems and a lower level for your development systems.

The value of a Red Hat Enterprise Linux subscription: Gain access to resources, tools, and technologies you need to succeed

Integrated analytics with remediation, management, and automation
Included with all active Red Hat Enterprise Linux subscriptions, Red Hat Insights is a Software-as-a-Service offering that collects analytics about your environment to proactively identify security threats, bottlenecks, and misconfigurations that could affect availability, performance, and stability. Red Hat Enterprise Linux also integrates with other Red Hat management and automation tools like Red Hat Smart Management and Red Hat Ansible Automation Platform.

Support and expertise
In addition to phone and online incident support, your Red Hat Enterprise Linux subscription gives you access to our knowledge-centered support portal, which includes access to reference architectures, documentation, videos and collaborative discussions with Red Hat experts. Above and beyond support and sharing best practices, our customer portal delivers information about ongoing security vulnerabilities and the critical steps it takes to mitigate their impact.

"Hybrid cloud **is about a capability**. It's not about an end state. It's not about having this percentage in public cloud, and this percentage in a private cloud, and this percentage on bare metal. It's about the ability and the capability to be able to move and adapt and adjust as you see fit, and based upon your needs."[16]

Stefanie Chiras
Senior Vice President, Partner Ecosystem Success, Red Hat

Learn more

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[16] "Red Hat's approach to hybrid cloud." Red Hat, 10 Sept. 2020.

Security resources and tools

Red Hat Enterprise Linux provides multilevel protection from threats and simpler ways to maintain compliance. A dedicated security team, scanning and remediation tools, and ongoing access to new resources help you ensure continuous compliance. Automated security tools, regular updates and patch releases, and accessible security intelligence and expertise improve threat protection. Certification to stringent security standards lets you use Red Hat Enterprise Linux across industries and situations without compromising security.

Visibility into the Red Hat Enterprise Linux roadmap

Red Hat builds long-term relationships with customers to ensure that you are well-supported over time. Advance visibility into the product roadmap and new features lets you benefit from cross-industry, customer-inspired improvements to Red Hat products.

Partnerships with hardware, software, and cloud providers

Red Hat partners with leading hardware, software, and cloud vendors to give you more choice, innovation, and stability. Through testing, certification, and collaborative engineering, Red Hat works with partners to deliver multi-vendor technologies and solutions that meet your requirements for innovation, availability, performance, and security. Red Hat fosters a large certified partner ecosystem so you can choose the products and platforms that best fit your needs, knowing they will work reliably with Red Hat Enterprise Linux.

Operate with confidence using Red Hat Insights

Red Hat Insights is a single, consistent tool for analyzing Red Hat Enterprise Linux running across hybrid cloud and on-site infrastructures, making it easier to identify, prioritize, and resolve risks.

Key Red Hat Insights services include:

Advisor
Detect availability, performance, stability, and configuration issues.

Vulnerability
Identify and remediate CVEs that impact your environment.

Compliance
Assess your level of compliance to OpenSCAP policies.

Policies
Create and manage custom policies to govern system configurations.

Patch
Assess your current patching status against applicable Red Hat Product Advisories.

Drift
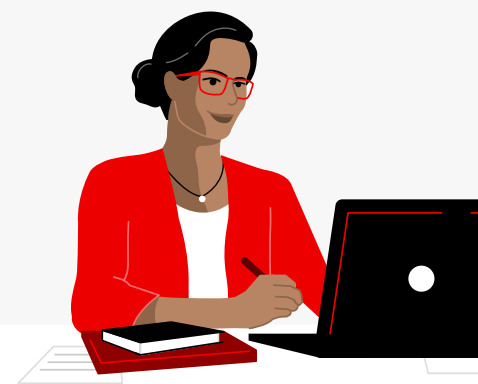Compare systems to baselines, system histories, and each other to troubleshoot and identify differences.

Subscription watch
Track the use of your Red Hat subscriptions.

Learn more

Get started with
Red Hat Enterprise Linux

Your business relies on your IT infrastructure.

The right OS can help you boost performance, improve security, speed development, and prepare for the future. Red Hat Enterprise Linux delivers a flexible, stable and reliable operating foundation for modern IT and enterprise hybrid cloud deployments.

Experience the value of Red Hat Enterprise Linux.

Get started