Improve IT efficiency with a standardized OS

9 considerations for building a standardized operating environment

Red Hat

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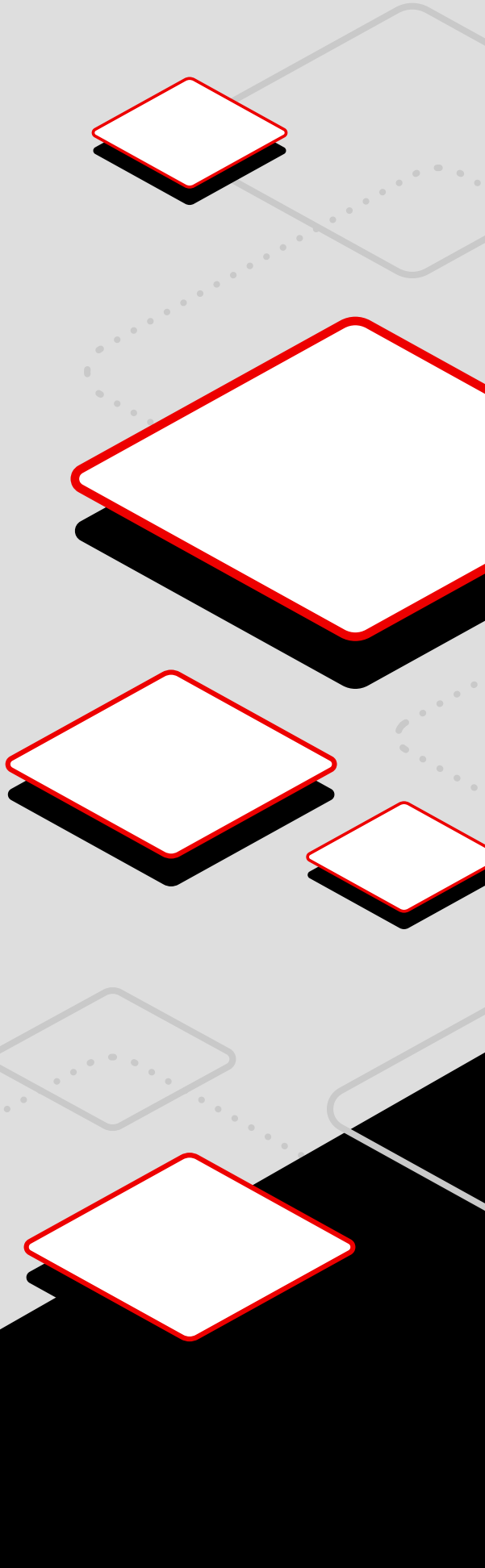


INTRODUCTION

IT efficiency requires standardization

IT teams must deliver more services at a faster pace to support customers' evolving needs with innovation.

However, most organizations have built IT infrastructures that encompass many operating system (OS) vendors and versions, server hardware configurations, and management tools. This creates complex IT environments that commonly consist of new and old technologies that have accumulated over the years, which require large, highly skilled IT teams to manage adequately. The interoperability issues, complicated administration, and convoluted processes associated with these complex environments can hinder IT teams in their mission to deliver innovative solutions more efficiently.

To avoid increased downtime, greater security and compliance risks, and other operational delays, IT teams require streamlined and agile infrastructure.

Standardizing your IT environment can help you increase flexibility and efficiency.

A standard operating environment (SOE) built around a standardized OS can greatly simplify your IT infrastructure and help you overcome many of the challenges of varied, disparate environments.

Streamlined management and operations lead to lower operating expenses (OpEx), increased uptime, faster provisioning and deployment, and improved IT and user productivity. Additionally, increased visibility into your operating environment increases asset control, security, and compliance.

Key benefits of standardized operating environments

An SOE can deliver many benefits for your IT teams, users, and overall business, including the capability to:

- Automate error-prone manual tasks.
- Centralize and streamline system life cycle management.
- Manage software license use and subscription agreement compliance.
- Accelerate software installation, upgrades, and patching.
- Improve security and decrease shadow IT.

Gain more value by standardizing on Red Hat Enterprise Linux.

A popular OS that lends itself especially well to standardization is Linux®, which has achieved widespread adoption across industries and emerging technologies and provides significant business benefits.

Red Hat® Enterprise Linux, a leading Linux distribution, empowers organizations to retain skills, standards, processes, best practices, and management tools, which reduces the difficulty and cost of cloud migrations and provides simplified management from a single console. By standardizing on Red Hat Enterprise Linux, your business can operate more efficiently and effectively while managing workloads consistently, no matter where they run.

Standardizing on Red Hat Enterprise Linux allows your organization to:

- **Increase business agility** by deploying workloads with speed, consistency, and portability across all environments, whether in the cloud, on-premise, in containers, or at the network's edge.
- **Enhance your security posture** with a security-focused platform at the foundation.
- **Address skills gaps** by making use of Red Hat's decades of expertise in Linux, along with tailored training and consulting services and deployment and management solutions that make Linux more user-friendly and accessible.
- **Gain operational efficiency** with consistent management and development tools that help reduce administration time and free up resources to focus on innovation.

Building an SOE based on Red Hat Enterprise Linux can help your business achieve:

Up to 3x

faster database response times.[1]

Up to 60%

less required IT administrator support and maintenance time.[1]

Up to 45%

lower IT maintenance costs.[2]

"Red Hat is one of the most important operating system alternatives for standardization. A Red Hat operating system provides a robust solution with a good understanding of performance, security, and management."[3]

Ali Elmalı
Cloud Services Planning & Infrastructure Operations Group Manager,
Türk Telekom

1 Red Hat case study. "Colombian energy company uses Red Hat for SQL servers," 14 Sept. 2020.
2 Red Hat case study. "Indesso reduces IT maintenance costs by 45% with Red Hat," 1 July 2020.
3 Red Hat case study. "Indesso reduces IT maintenance costs by 45% with Red Hat," 1 July 2020.

CONSIDERATION 1

Simplify your IT infrastructure

Simplicity is at the core of all standard operating environments.

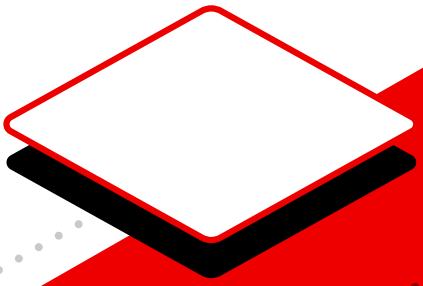
Complex IT infrastructure can be difficult to manage and maintain, resulting in increased downtime, reduced efficiency, and higher costs while making it increasingly difficult to automate existing processes and deployments in heterogeneous environments.

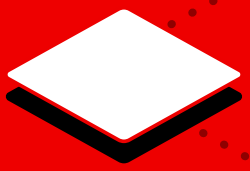
Standardizing your operating environment helps you reduce complexity and its associated risks. Your SOE should use a defined set of components, interfaces, and processes across your entire infrastructure, including physical, virtualized, and cloud-based resources. This creates a consistent, known foundation for all systems and streamlines your infrastructure and operations.

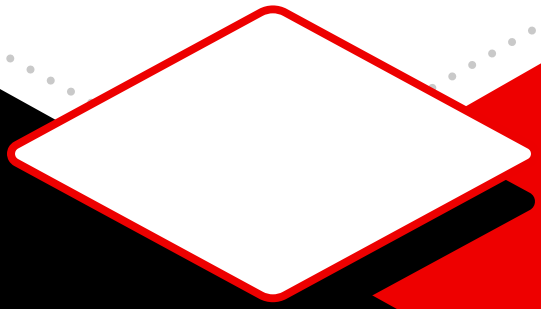
Fewer variations make it easier to provision systems, scale resources, troubleshoot errors, and remediate other issues across your environment. An SOE also allows you to create a single, standard set of operating procedures and processes, accelerating operations and allowing your team to manage larger infrastructure.

Building an SOE with Red Hat Enterprise Linux as your standardized OS empowers your team to increase their operational efficiency with a simplified, repeatable management experience and consistent tools and resources across all IT environments and workloads.

The simplicity of Red Hat Enterprise Linux allows system administrators—even those new to Linux—to more efficiently and effectively manage multiple versions of their standardized OS running on physical, virtual, private cloud, and public cloud environments.







"We decided early to standardize on Red Hat Enterprise Linux because it was stable and offered commercial support. Security updates were built in, and it also has a long life cycle, like many of our automotive applications, so we could easily keep any legacy version up to date."[4]

Gunther Mayer
Integration Specialist, CAE-Integration, R&D, Volkswagen

4 Red Hat case study. "Volkswagen supports computer-aided engineering with a modern operating system," 30 June 2023.

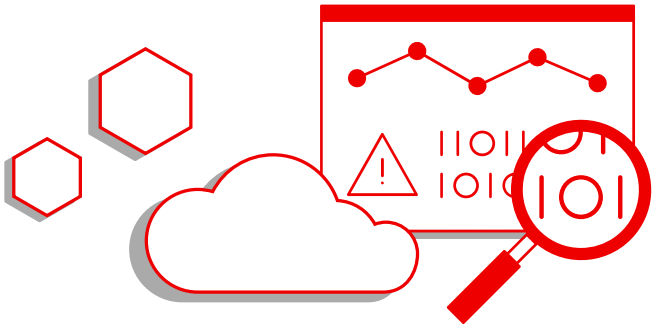
CONSIDERATION 2

Document your IT assets continuously

Documentation records how your IT infrastructure works.

A good understanding of your infrastructure and operations is needed to support business requirements for stability, reliability, and uptime. A lack of knowledge about components, resources, and processes can result in more outages, delayed repairs, and lower efficiency.

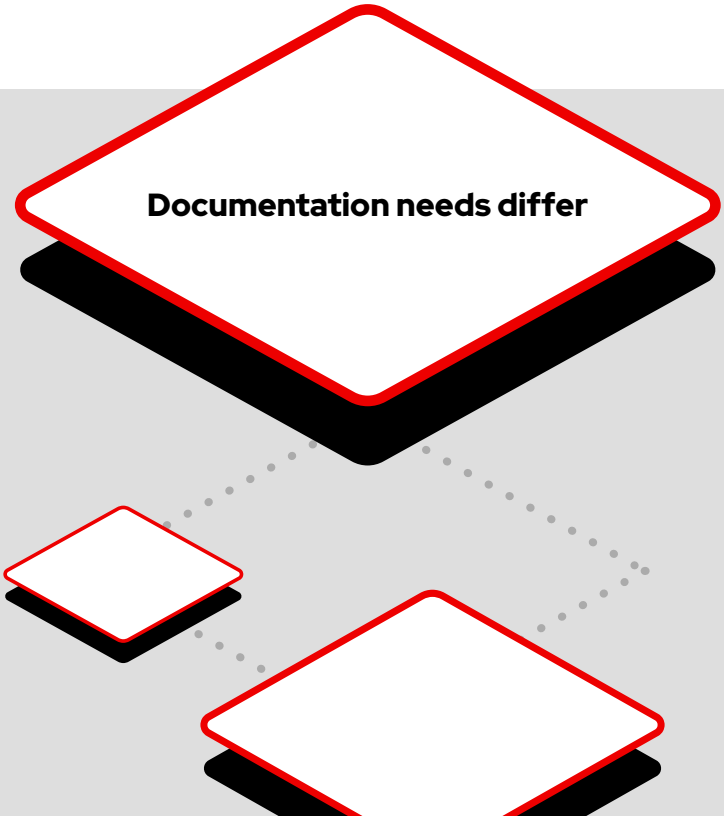
To avoid these pitfalls, it is imperative that your business practices good documentation creation and maintenance, which is an integral part of infrastructure management and operation.



To achieve this, consider following these key steps:

1. Thoroughly document everything in your infrastructure, from components and configurations to governance policies, operational processes, and automated tasks.
2. Once you have a detailed set of documentation, record every change to your environment and version-control each document.
3. Keep your IT team and end users informed of any and all changes to the environment.

By standardizing on Red Hat Enterprise Linux, you gain the visibility you need to succinctly and accurately document your IT infrastructure and more easily track any changes. Additionally, with a thoroughly documented supply chain supporting Red Hat Enterprise Linux, you can more easily track the software versions within your SOE.



A single resource typically requires multiple versions of documentation for different roles within your IT organization. This means you will likely need to document parts of your infrastructure in various ways to allow your teams to work effectively. For example:

- Developers require information about the purpose of application code, usually listed as comments in the source code itself.
- IT operators need administration guides that specify installation, configuration, management, and troubleshooting processes.
- End users require manuals that describe how to use applications and resources to accomplish a task.

CONSIDERATION 3

Maintain the right level of flexibility

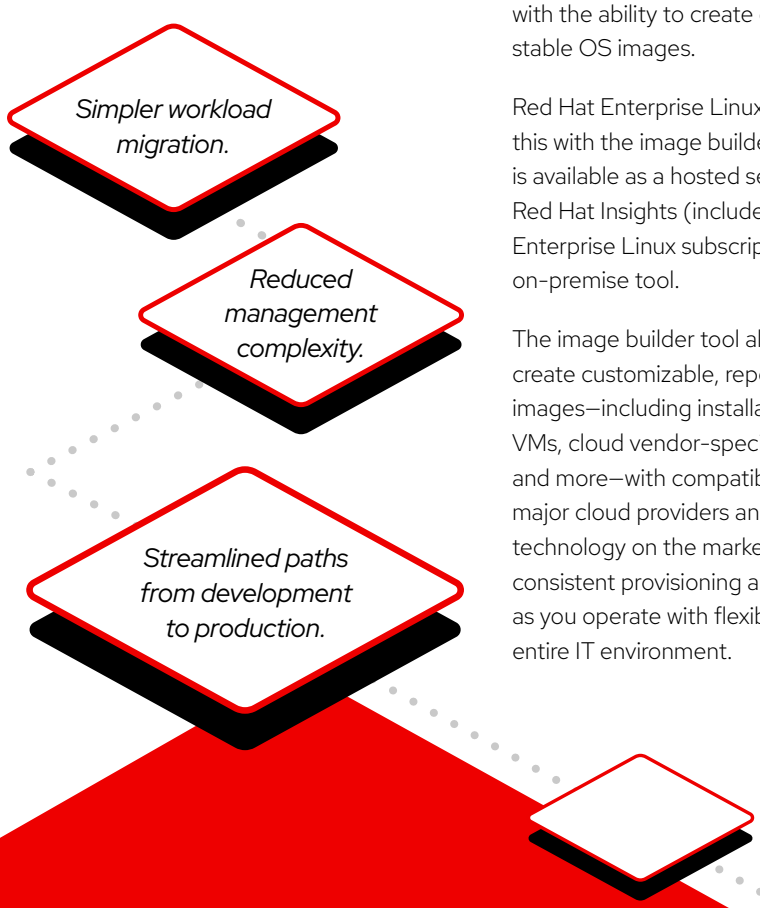
IT flexibility is essential to keep up with changing demands.

While standardizing your IT infrastructure provides many benefits, it is possible to standardize too much. To be most effective, you need to balance your level of standardization with your organization's need for flexibility and agility.

SOEs are based on core builds, which are designated sets of components, interfaces, and processes that form known foundations for applications, virtual machines (VMs), and tools. Large enterprises that run hundreds or thousands of servers may need several core builds to ensure their employees have the right tools to do their jobs effectively, while smaller companies may need only a few.

Careful analysis can help you develop a reasonable number of core configurations for your organization. But to further balance that level of standardization with flexibility and succeed in today's dynamic and fast-moving market, your organization needs a standardized OS that delivers significantly increased levels of IT flexibility.

Red Hat Enterprise Linux does this by providing a flexible platform for innovation and growth, in addition to support for legacy workloads, with:



It is important to note that operating with flexibility across various IT environments—as Red Hat Enterprise Linux allows you to—should be reinforced with the ability to create consistent and stable OS images.

Red Hat Enterprise Linux users can do this with the image builder tool, which is available as a hosted service through Red Hat Insights (included in a Red Hat Enterprise Linux subscription), or as an on-premise tool.

The image builder tool allows users to create customizable, repeatable OS images—including installation disks, VMs, cloud vendor-specific images, and more—with compatibility to all major cloud providers and virtualization technology on the market. This ensures consistent provisioning and deployment as you operate with flexibility across your entire IT environment.

"Red Hat's open source technology has shown us the direction Daegu should be heading in the future. Now we're able to provide better and improved services through a standardized and flexible system built on the cloud."[5]

Chan Yun
Deputy Director of Informatization Office, Daegu Metropolitan City

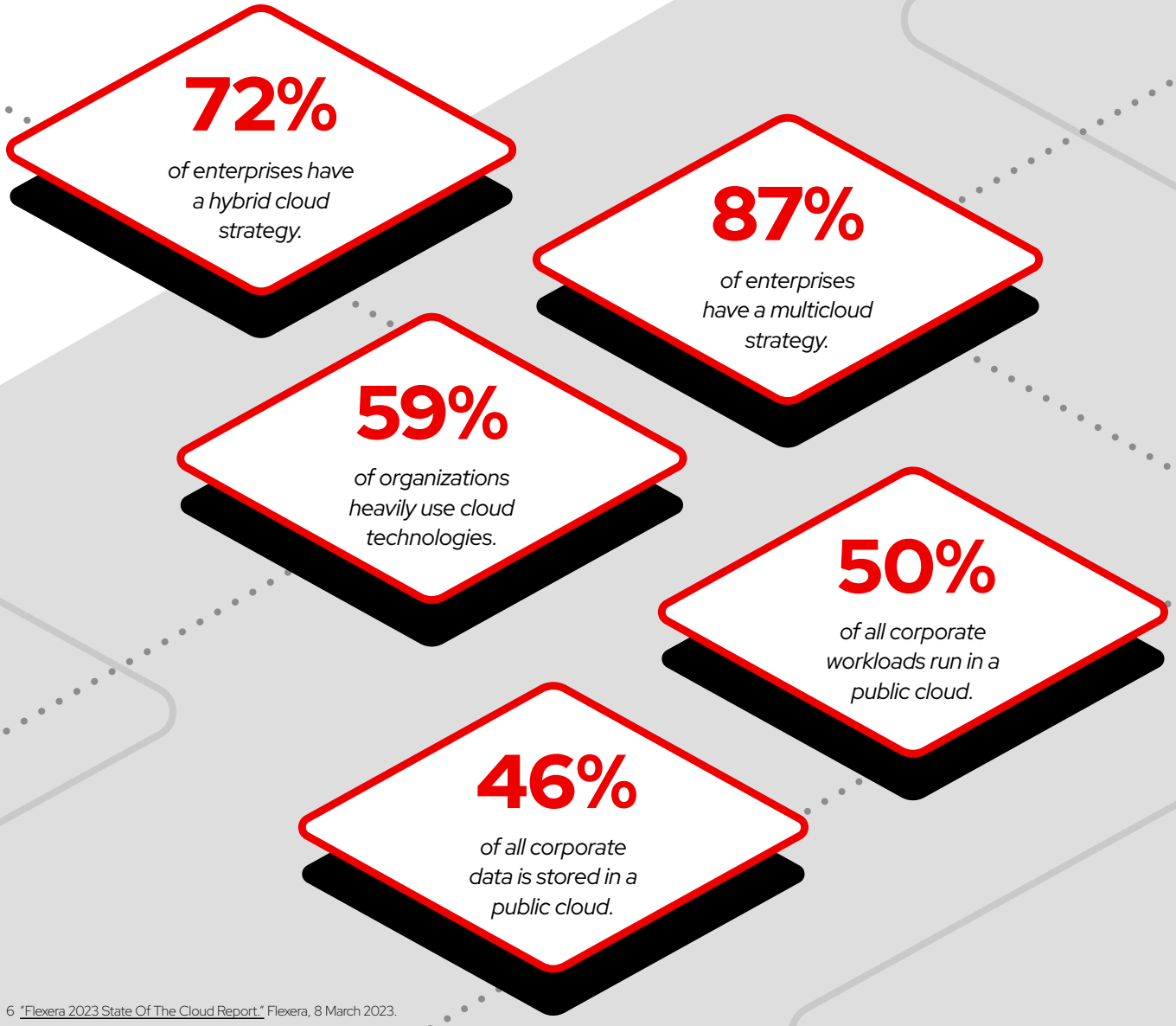
5 Red Hat press release. "Daegu Metropolitan City and Korea Land & Housing Corporation Announced as Winners of the Red Hat APAC Innovation Awards 2021 for Korea," 13 Oct. 2021.

CONSIDERATION 4

Ensure consistency across cloud environments

Cloud adoption is growing and organizations need to ensure consistency across their hybrid and multicloud environments.

Organizations deploy cloud infrastructure to reduce costs, improve flexibility, and access the latest technologies. In fact, the current business landscape shows an increasing popularity of cloud computing, as:[6]



6 "Flexera 2023 State Of The Cloud Report." Flexera, 8 March 2023.

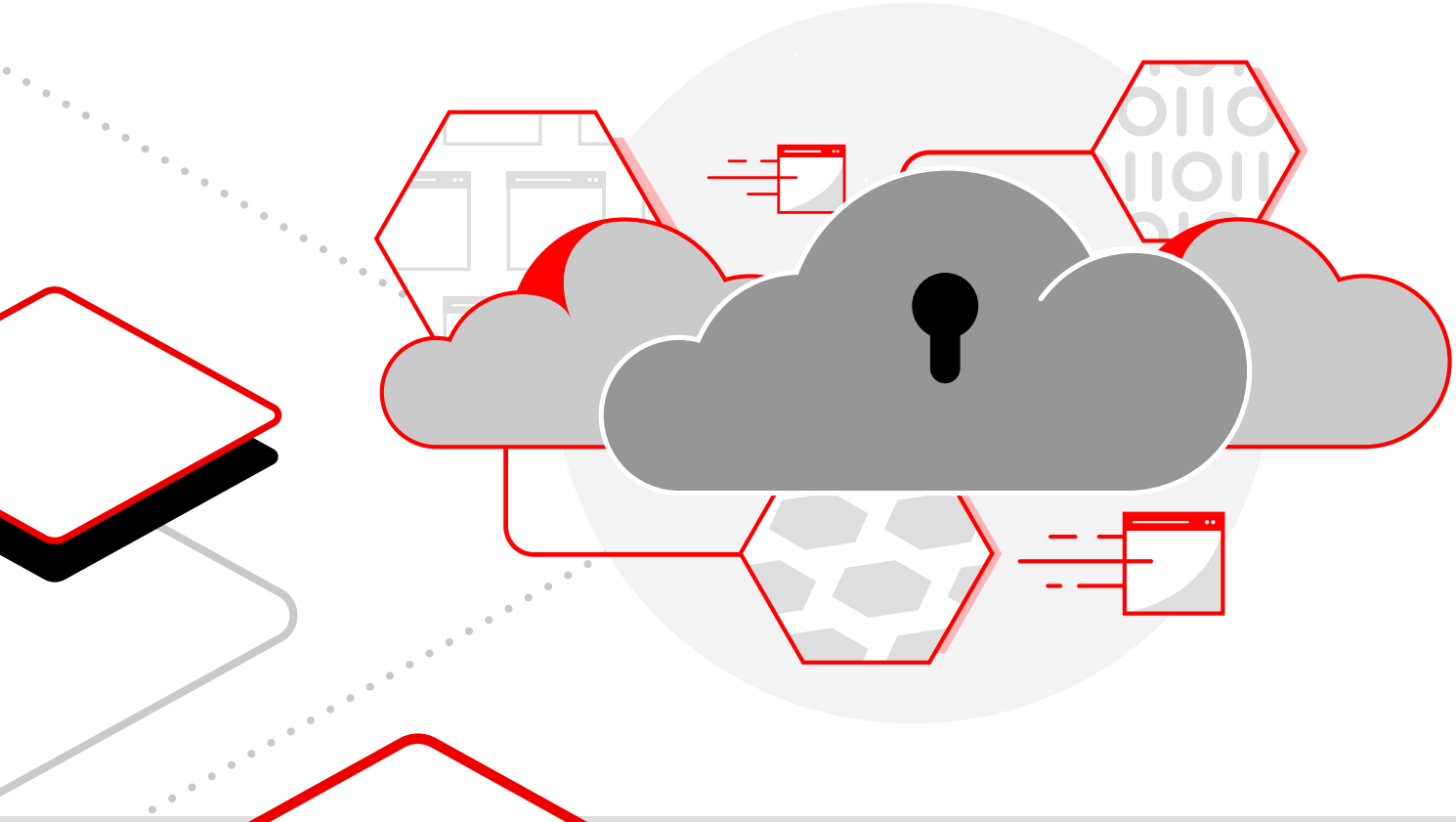
CONSIDERATION 4

Cloud infrastructure is designed to scale dynamically and elastically. Servers are treated as single-workload devices that are deployed quickly, configured automatically, and easily replaced. This approach deconstructs systems into layers and components that can be combined easily, released independently, and maintained as collections.

Hybrid and multicloud architectures combine on-site infrastructure and private or public cloud infrastructure into a single environment. Because of this structure, consistency is critical for effective hybrid or multicloud operation, and the right standardized OS will offer an ideal deployment strategy for hybrid and multicloud environments.

Because Red Hat Enterprise Linux provides consistency across physical, virtual, container, and cloud environments, it always works the same, with consistent management tools, no matter where it is deployed. As a foundation for standardization, this gives you the agility needed to transform your infrastructure as your business evolves without sacrificing consistency.

This also allows you to place and move applications and workloads as needs change with consistency, flexibility, and portability while still retaining skills, standards, processes, best practices, and management tools across a hybrid or multicloud environment.



Centralize SOE management for more efficiency

Organizing your SOE core builds under a centralized management platform lets you deliver fully provisioned systems in minutes, regardless of the underlying infrastructure.

The Red Hat Enterprise Linux image builder tool simplifies this process by allowing you to deploy hosts in the cloud from SOE images it creates, making it possible to launch hosts from an identical SOE image with a few clicks.
Read this blog to learn how.

CONSIDERATION 5

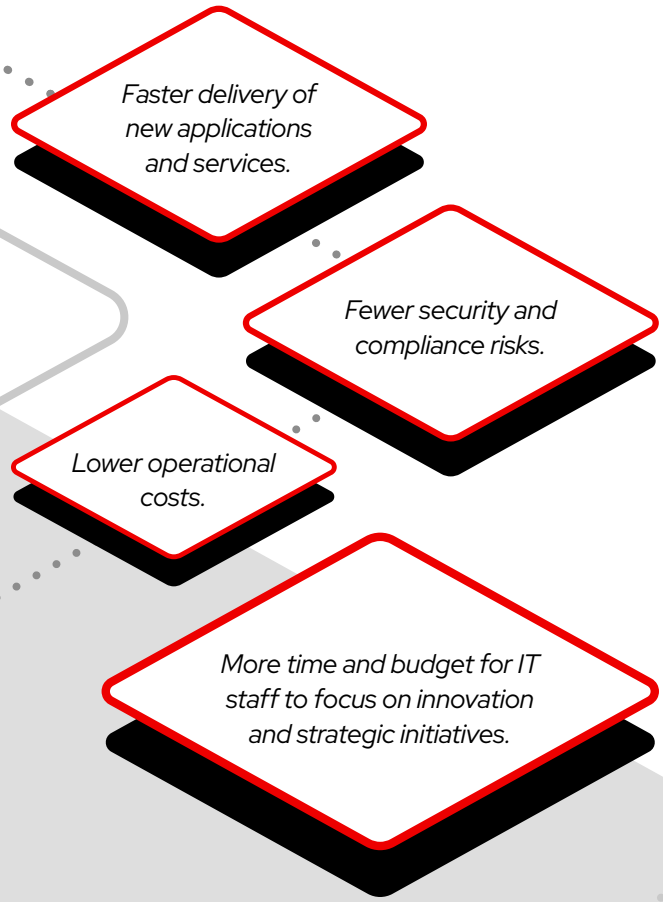
Automate your infrastructure

Automation can free up your IT teams to focus on high-value projects.

Manual operations lack the speed, efficiency, and accuracy needed to succeed in a fast-paced digital world. In fact, 86% of organizations cite having too many manual processes as a challenge in managing IT spend.[7]

Automation can accelerate tedious, time-consuming, manual tasks, allowing your IT teams to refocus their time and effort on projects that deliver more business value. Using automation, you can rapidly provision new resources and services, enforce consistency across IT environments, and complete day-to-day infrastructure maintenance tasks with fewer IT staff members.

These improvements provide many business benefits for your organization, including:



However, automation is not an all-or-nothing proposition. You need a sustainable strategy to guide your automation adoption journey. Document and review all automation assets regularly to ensure they are understood and working as planned. A human-readable, self-documenting automation framework can greatly simplify these efforts while allowing all staff members to contribute.

Standardizing on Red Hat Enterprise Enterprise Linux provides a consistent and repeatable management experience that simplifies the implementation of enterprise-wide automation, along with the capabilities to:

- **Automate security controls** to mitigate the risk of being exposed to vulnerabilities.
- **Perform provisioning, configuration, and auditing** with the automation and intelligence capabilities of Red Hat Insights to better predict risk, recommend actions, and analyze costs.
- **Simplify how you implement and scale the capabilities of Red Hat Enterprise Linux** with prepackaged and supported automation to accelerate configuration and scale across multiple systems.
- **Create consistent configuration and workflows** at scale with Red Hat Enterprise Linux system roles and the extensive library of common services and configuration tasks they automate. These system roles are built out of Ansible® Content Collections that help automate the management and configuration of Red Hat Enterprise Linux systems.
- **Automatically create and launch standard OS templates** for quick and consistent deployment across your hybrid or multicloud environment with Red Hat Enterprise Linux image builder. This image builder tool automatically handles the details of how to deploy to a cloud, VM, or image, which saves you significant time.

7 "Flexera 2022 Tech Spend Pulse." Flexera, 8 June 2022.

CONSIDERATION 6

Build in dynamic scalability

Change is inevitable, especially in IT, and dynamic scalability is needed to navigate this.

Over time, the demand or load placed on a given service will fluctuate. Static infrastructure cannot keep up with these changes. Traditional methods of overprovisioning capacity to meet peak demands consume too much budget while leaving systems idle for long periods of time.

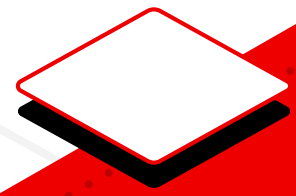
Your infrastructure needs to scale dynamically and elastically to keep up. Using a common foundation for your systems lets you scale up and down more quickly while maintaining a more efficient infrastructure.

Adopting a standardized OS can help you build dynamic scalability into your infrastructure. With a common, shared foundation across your environment, each system can deliver a variety of services instead of being dedicated to a single application. You can allocate the same resource to multiple services simultaneously to adapt to changing demand without overprovisioning.

This approach also prepares you to take advantage of cloud technologies. You can operate a small, on-site IT infrastructure to meet average daily needs and deploy cloud resources to meet additional demand during peak times.

Standardizing on Red Hat Enterprise Linux supports this need for dynamic scalability with:

- **A consistent and repeatable management experience** with standardized deployment at scale.
- **A security-focused foundation** that allows you to scale existing applications and roll out emerging technologies consistently across all environments.
- **The portability you need** to be able deploy and manage your applications in a consistent manner—no matter where they are—and to simplify your workload migration.
- **Consistent tools and training** for simpler application scaling in hybrid and multicloud environments.
- **System roles that simplify** how you implement and scale Red Hat Enterprise Linux capabilities.



"The success of this project was essential for the 800 people who work on this environment on a daily basis. The Red Hat solution will enable us to scale up projects faster and grow our organization more quickly."[8]

Nikolaus Schillinger
Team Leader Network & Server Team, TTTech

8 Red Hat case study. "TTTech automates virtualized environment with Red Hat," 31 Jan. 2020.

CONSIDERATION 7

Build a foundation for a layered security strategy

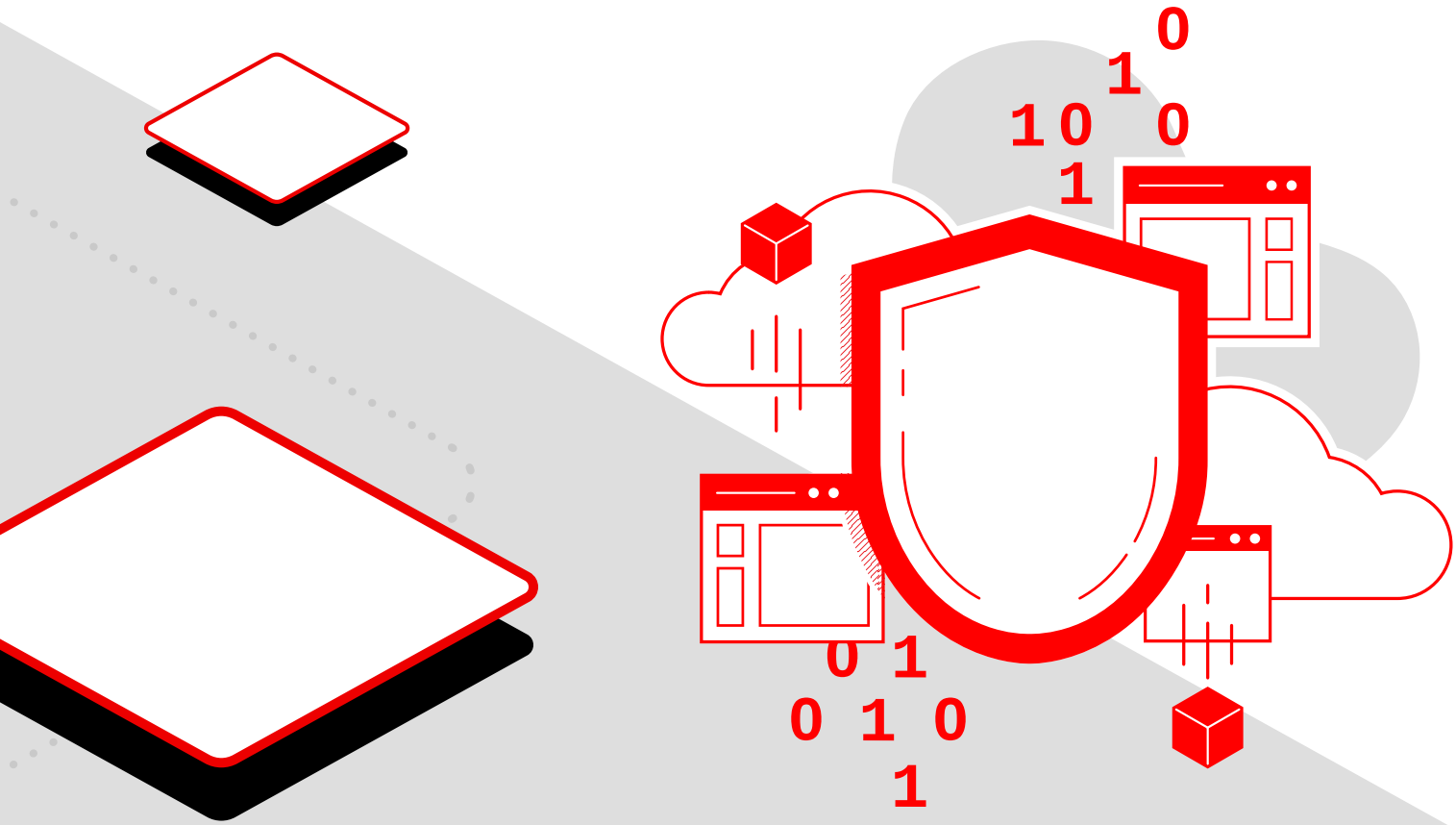
Security is still a top concern for organizations,[9] but the right OS can help.

Effective security strategies go well beyond simple authorization checks using a centralized identity management system. A layered security strategy is needed to efficiently manage risk, protect data, provide user authentication and access policies, encrypt data, ensure correct system configuration, and help enforce compliance mandates across managed deployments.

While no single solution can do this on its own, the right OS can establish the foundation for an increased focus on system security and integration with other solutions to implement a layered security strategy across your infrastructure.

Additionally, with a standardized OS, you can more consistently integrate security measures over multiple layers of your infrastructure stack and reduce the management complexity of those security protocols across your entire IT environment.

While security and stability are baseline requirements for any operating environment, finding a security-focused open source platform for building, running, and scaling workloads and applications can be challenging.



9 "Flexera 2022 Tech Spend Pulse." Flexera, 8 June 2022.

CONSIDERATION 7

Red Hat Enterprise Linux provides the foundation you need to build a layered security strategy on, with:

- **Built-in security features**—including automated security controls—and security profiles.
- **Proactive analytics**, vulnerability alerts, targeted guidance, and remediation playbooks.
- **Critical security upgrades and live patches**, often within 24 hours of a critical vulnerability being made public.
- **Security standards certification** for most governmental and industry mandates.
- **A security-focused software** supply chain that validates all components delivered by Red Hat.

Ineffective security can be costly

Security threats continue to grow and breaches are always expensive, resulting in: [10]

US$4.45 million

average cost of a data breach in 2023.

204 days

on average to identify and contain a data breach in 2023.

US$1.02 million

savings in costs if a breach can be identified and contained in 200 days or fewer.

"Our customers have asked for a more secure and robust operating system, which Red Hat Enterprise Linux has provided."[11]

Emilio Barcelos
Product Manager, Wayside Intelligence and Analytics, Alstom

10 "Cost of a Data Breach Report 2023," IBM, 24 July 2023.
11 Red Hat press release. "Railway Communication with Edge Computing and Open Hybrid Cloud," 26 April 2021.

CONSIDERATION 8

Unify platform management tools

Effective management can help you get more from your IT environment.

Advanced management tools and approaches are critical for large-scale IT environments. A comprehensive management strategy—based on a standardized OS and consistent, connected tools—can help you get the most from your IT environment while protecting your assets and business.

When defining your SOE, consider the management tools available for your chosen platforms. This set of tools will form the core of your IT operations and should work together to provide the features and capabilities your teams need to be productive. Ideal tools will help you effectively manage system life cycles, security vulnerabilities, and compliance.

Key platform management tool capabilities

System life cycle management.

- **Build and scale** systems.
- **Monitor and track** systems, assets, and subscriptions.
- **Maintain, patch, and update** systems consistently.
- **Retire** systems and resources when they are no longer needed.

Security vulnerability and compliance management.

- **Identify** noncompliant, vulnerable, and unpatched systems.
- **Organize** remediation actions by effort, impact, and issue severity.
- **Efficiently patch systems.**
- **Validate changes and report results.**

CONSIDERATION 8

IT management best practices

Choosing the right set of management tools is only the beginning, as you must define operational processes using those tools to maximize the value of your IT environment.

- Retire abandoned and unused resources to save costs.
- Deploy automation to streamline common tasks and reduce errors.
- Connect your management, automation, and security tools to improve productivity.
- Scan systems regularly to identify compliance issues and security vulnerabilities faster.
- Patch systems often and test your patches to keep systems up to date.

Read the ***Manage your Linux environment for success*** e-book to learn more about IT management best practices.

"Red Hat Insights helps us identify opportunities to enhance security and manage risks more quickly, leading to time savings for our teams and more security for our systems."[12]

Timothy Runion
Security Architect, DIRECTV

12 Red Hat customer feedback. "Red Hat customer success slide deck (slide 600)," 2022.

CONSIDERATION 9

Identify and bridge skills gaps

As hybrid and multicloud use continues to grow in popularity, and businesses continue to diversify the IT environments their workloads reside in, many are finding skills gaps within their organization that can restrict their ability to effectively and efficiently manage a hybrid or multicloud environment.

Standardizing on the right OS can be crucial to addressing these skills gaps. This will allow you to streamline your processes with consistent tools and training, and subsequently, the required staffing and resources to manage those processes, under a single unified operating environment.

This consistency allows your business to retain skills, standards, processes, best practices, and management tools as you move applications across hybrid or multicloud environments, thereby reducing the staffing and resources required to manage it.

By adopting Red Hat Enterprise Linux as your standard operating environment, your IT teams can employ consistent tools and training for simpler application development, deployment, and scaling in hybrid or multicloud environments.

Features and capabilities of a Red Hat Enterprise Linux subscription that help bridge the skills gaps by streamlining staff and resources include:

- **Access to a shared library** of proprietary resources and tools, and decades of Linux expertise, to help your team optimize IT environments, address operational issues faster, and reduce the barrier to entry for new Linux users.
- **Proactive analytics and remediation tools** from Red Hat Insights to help increase efficiency and inform staff where they need to develop the skills to manage their workloads effectively.
- **A guaranteed service level agreement** (SLA), with 24x7 support coverage for severity 1 issues available for premium Red Hat Enterprise Linux subscriptions.
- **The added support of Red Hat product engineers**, who work closely with both support teams and hardware and software vendors to solve your challenges.

Other valuable services that help bridge the skills gap that can be purchased as add-ons to your subscription include:

- **Red Hat Training and Certification** to help close skills gaps within teams and increase retention of top talent.
- **Tailored training** to ensure your team has any required skills to manage their workloads within a hybrid or multicloud environment.
- **Customized consulting services** to bridge the gap where any required hybrid or multicloud expertise is lacking within your organization or to provide tailored solutions to overcome unique challenges.
- **A dedicated and security-focused** Red Hat Technical Account Manager (TAM) to lighten the load on your team with the confidence that your infrastructure is in the hands of experts.

The growing cloud skills gap

As more businesses move into the cloud, the skills gaps within their organizations are becoming more pronounced. Research shows that:[13]

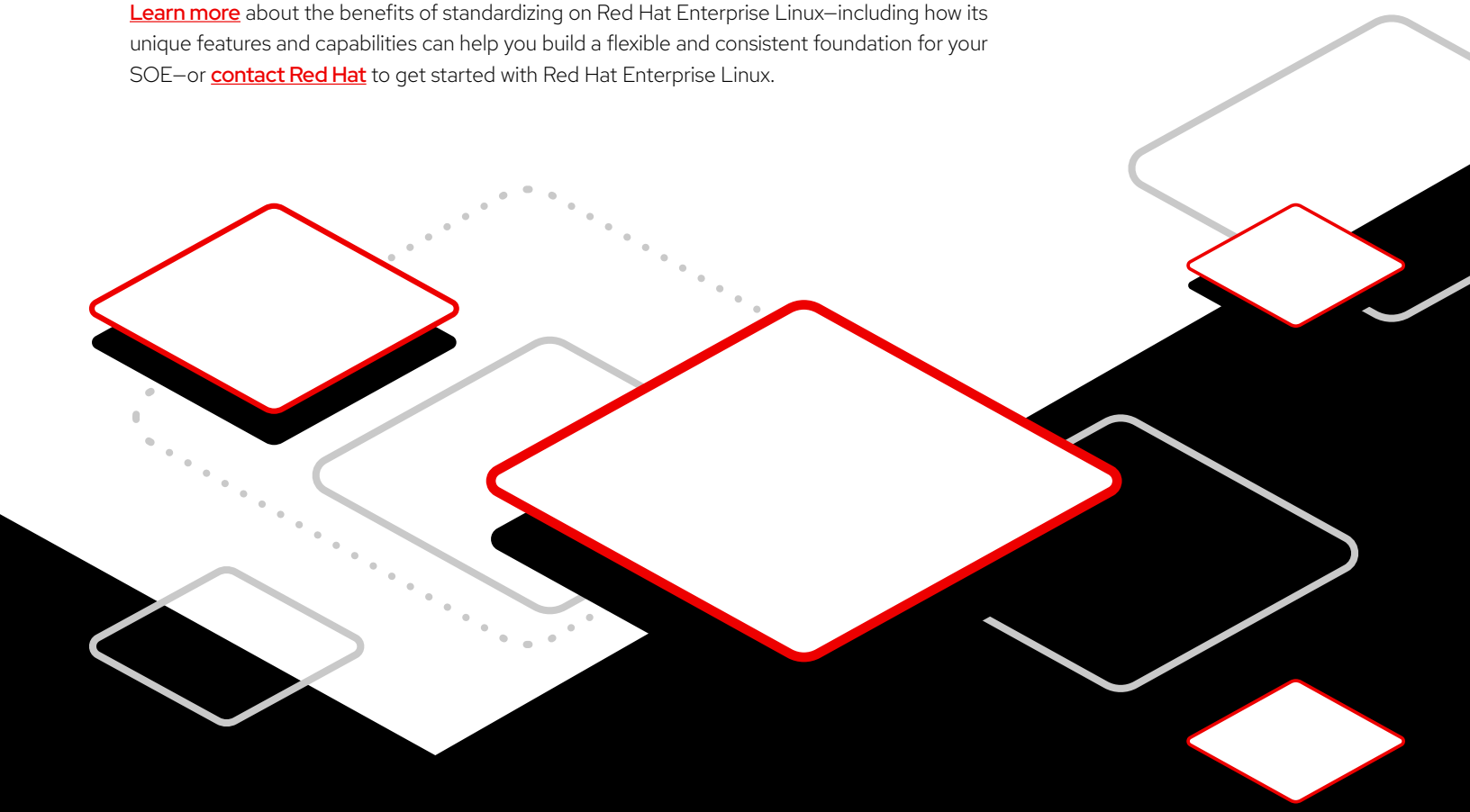
Only **8%** of companies have no skills challenges when it comes to deploying and managing cloud environments.

13 IDC Infobrief, sponsored by Red Hat. "Why Enterprise Linux is Becoming More Relevant for Hybrid Cloud." Document #US50679023, June 2023.

CONCLUSION

Are you ready to standardize on Red Hat Enterprise Linux?

Learn more about the benefits of standardizing on Red Hat Enterprise Linux—including how its unique features and capabilities can help you build a flexible and consistent foundation for your SOE—or contact Red Hat to get started with Red Hat Enterprise Linux.



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Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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North America
1 888 REDHAT1
www.redhat.com

Europe, Middle East, and Africa
00800 7334 2835
europe@redhat.com

Asia Pacific
+65 6490 4200
apac@redhat.com

Latin America
+54 11 4329 7300
info-latam@redhat.com

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