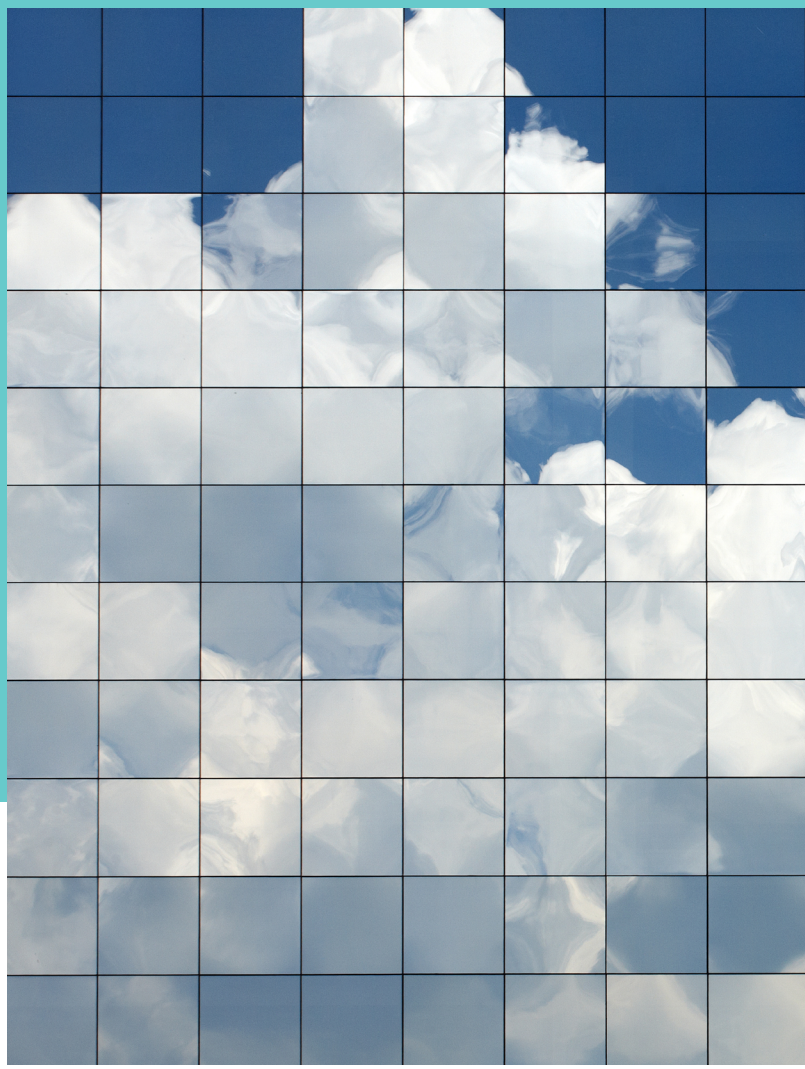
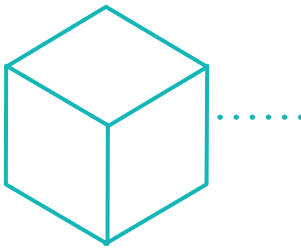
Managing infrastructure at cloud scale

/Keep your options open

Red Hat





Introduction

The efficiency and unlimited scalability of cloud architectures are pushing companies toward cloud environments, whether public, private, or hybrid solutions.

In fact, many organizations plan to move at least half of their workloads to the public cloud in the next 2 years.[1] But cloud environments also introduce new complexities that organizations may not anticipate or be equipped to handle effectively.

Some organizations rein in the complexity of their infrastructure by limiting their scope, for example, by using only 1 cloud platform for all their cloud needs. However, this strategy rarely works over the long term.

Your organization may need to use multiple cloud environments to achieve the highest performance for specific workloads, or to accommodate evolving technology needs. You also need to manage and maintain on-premise and conventional systems. Despite your efforts to limit your cloud environment, the complexity almost inevitably grows.

Complexity never just increases—it multiplies.

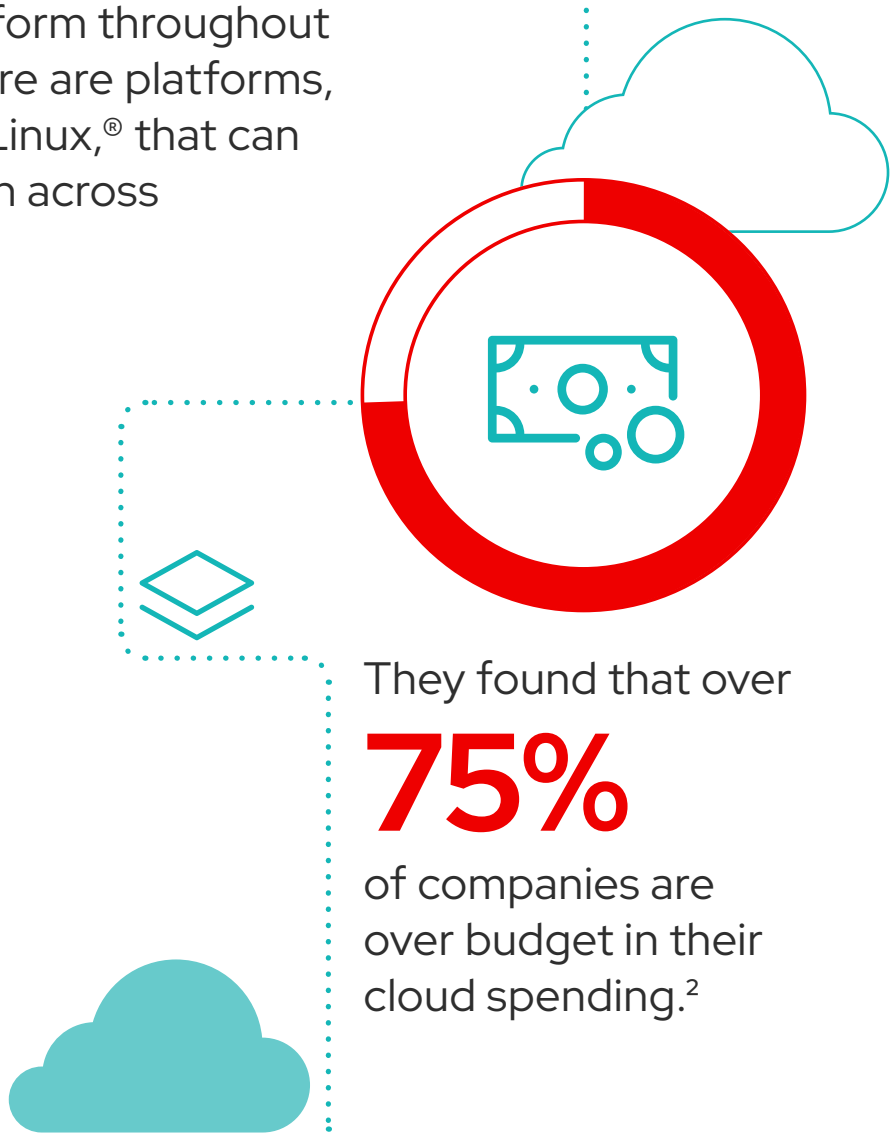
Each component, cloud, platform, and operating system (OS) adds additional overhead for management and maintenance. In time, some teams may become overwhelmed with even basic tasks.

[1] Red Hat annual review. "State of Linux in the public cloud," 9 Aug. 2022.

Your organization may not have considered consolidating on a single platform throughout your environment, even if there are platforms, such as Red Hat® Enterprise Linux,® that can provide a common foundation across your cloud infrastructure.

The result is that your company might not fully realize the benefits that cloud infrastructure can provide. Research by McKinsey & Company indicates that inefficiencies in orchestrating cloud migrations are adding unexpected costs and delays for many companies, incurring a total cost of approximately US$100 billion over the next 3 years on cloud migrations.[2]

As cloud adoption accelerates, the cost of managing the complexity of a cloud-based infrastructure is a significant challenge. To address it, you need to take an approach that lets teams take advantage of cloud-based platforms while helping them manage and maintain infrastructure.



They found that over

75%

of companies are over budget in their cloud spending.[2]

Find out more about how Red Hat Enterprise Linux can support your infrastructure.

Watch a video on the Red Hat Enterprise Linux cloud experience.

[2] Balakrishnan, Tara, et all. "Cloud-migration opportunity: Business value grows, but missteps abound," McKinsey & Company, 12 Oct. 2021.

Chapter 1

Handle complexity with consistency

The best way to handle the complexity of running a multicloud environment is consistency.

Consistency can mean multiple things in a cloud environment, from the components you are running to the control and management of your applications and data. When your platform is consistent across all environments, your entire cloud infrastructure, including all your clouds and on-premise systems, becomes more manageable, and works more efficiently.

Consistency is not about limiting your environment to just 1 cloud or just 1 set of components. It is about taking a strategic approach to ensure that your features and services, compliance and security, governance and visibility, and data control are all working together, and managed from the same place.

Consistent features and services

When your system works across multiple environments, the features and services you use should be available in all of them—and work between them.

If your environment includes private or public clouds, traditional applications, an on-premise environment, or any combination of these, you probably experience mismatches between these environments, such as:

- A service that 1 public cloud provides is not available in the same version, or available at all, in another cloud environment.
- A service you are using is deprecated by a cloud provider.
- A service in 1 cloud, such as a messaging application, for example—does not work with other environments.

When features and services that your system depends on are not available or not under your control, the complexity of implementing and continuing your system's functionality increases.

Consistent compliance and security

Security is always a primary need for any system. From your OS to your applications to your implementation, your entire environment must be as secure as possible right out of the box. And you need to be proactive about your compliance and security management to ensure that it meets—and continues to meet—your needs.

With components spread across your different environments, it can be difficult to keep them all synchronized. As compliance requirements evolve, you might have to update configurations across all aspects of your infrastructure separately. Each provider's components can have minor differences that you need to know about, understand, and manage on an ongoing basis. In a complex infrastructure with multiple environments, managing your security and compliance can become overwhelming in no time.

A centralized approach for controlling your components' configuration, ensuring that all of your environments consistently meet the same security and compliance requirements, is the only way to reduce the overhead to a manageable level.

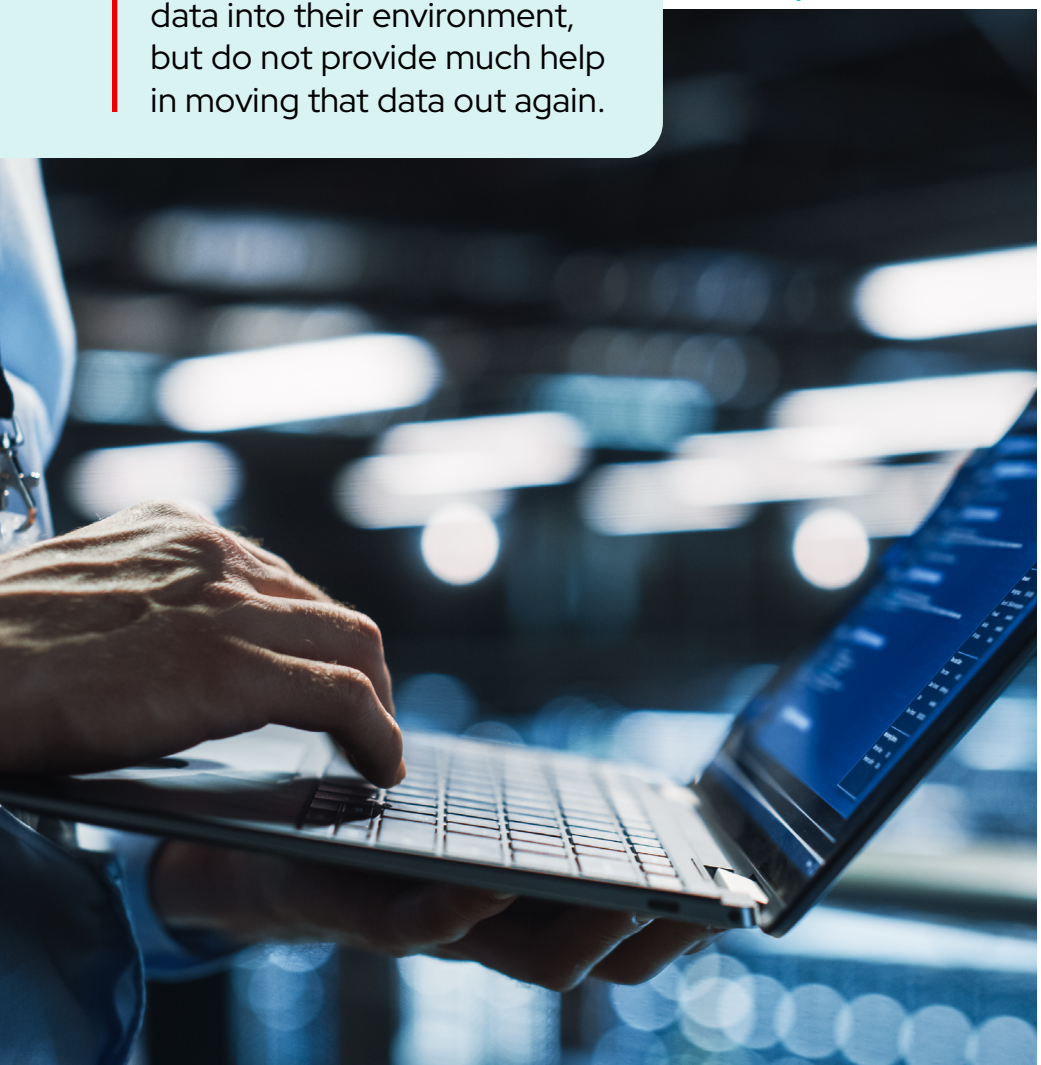
As workloads shift to an open hybrid cloud, it's increasingly important to prioritize a security-driven foundation for your applications and processes.

Built to meet today's high expectations of security and compliance, Red Hat Enterprise Linux provides that foundation.

Consistent data control

When your company discovers an unauthorized release of data, or that your data resides in a noncompliant cloud, or just wants to move an application from 1 cloud to another, getting that data out of the cloud can be difficult and expensive.

> Cloud providers often make tools available for moving data into their environment, but do not provide much help in moving that data out again.



The need for greater control over data across the IT industry has led to jurisdictions implementing laws that require all organizations to meet strict standards for controlling personal, financial, and other data.

The California Consumer Privacy Act (CCPA) and Europe's General Data Protection Regulation (GDPR) have resulted in billions of dollars in fines for major organizations, including market-leading software companies, online platforms, and retailers.

Even without the threat of prosecution, you need to effectively control your data. A consistent environment for managing your data greatly simplifies this effort.

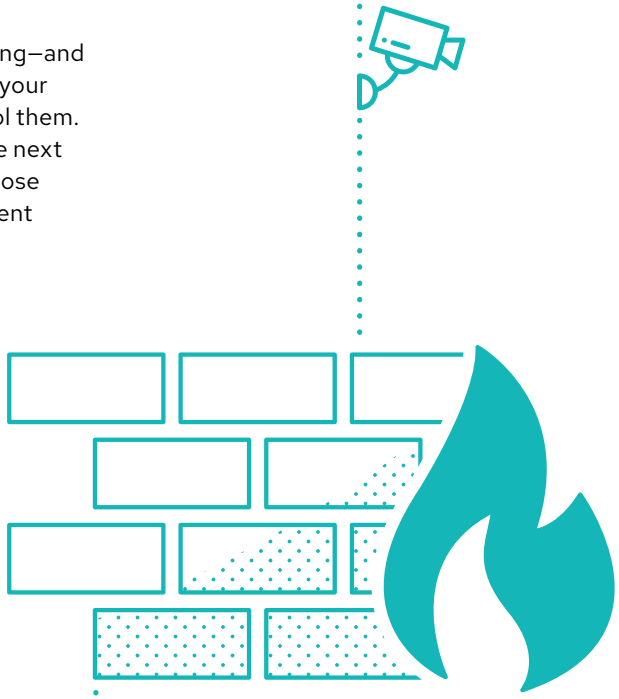
Consistent governance and visibility

Adding an application or a new user to your existing environment is usually fairly simple. However, in a complex hybrid cloud environment, this often leads to cloud sprawl, and abandoned, unneeded, or forgotten workloads rapidly multiply.

The result is increased costs for compute, storage, and bandwidth; it is also a major security risk. It is not unusual for cloud environments to have hundreds of user accounts for personnel who have left the company.

For example, development servers often remain active in an environment, although they are dormant. They may be compromised from a security standpoint without anyone in the organization realizing it. Even if they are dormant, segregated, or devoid of active data, these servers can carry significant risks.

Having visibility into what is running—and consuming resources—in each of your environments helps you to control them. With visibility into what exists, the next step is to apply rules to govern those environments, giving you consistent control over your systems.



A consistent management approach across the many environments in your infrastructure is the key to managing cloud sprawl.

Chapter 2

Linux: The OS for the hybrid cloud

The starting point for controlling complexity and sprawl in your environments is your OS.

You need to make sure your entire infrastructure is manageable, while ensuring your workloads are consistently reliable, available, and secure. The answer for many organizations is to use enterprise Linux, which has become a widely-adopted standard for developing and running critical workloads in the datacenter, a cloud, or at the network edge.

Linux played a major part in the creation of cloud computing and its proliferation, and its role as the operating system of choice for cloud computing and cloud services continues to grow. Organizations using enterprise Linux on the cloud get the same benefits as using it on-premise, and Linux can more efficiently integrate cloud and on-premise systems.

Enterprise Linux can provide organizations with:

- Open source innovation.
- Consistency across infrastructure.
- Container portability.
- Massive scalability.
- Continuous security.

By standardizing on Linux, enterprise organizations migrating workloads to the cloud can take advantage of the fact that existing processes, business practices, knowledge, and skills can be used between on-premise and cloud footprints.

To fully realize the benefits of cloud computing in your IT environment, it is also important to consider which Linux distribution you choose. Cloud providers might make different Linux distributions available through their marketplaces.

Each distribution is different, offering a variety of subscription models, operational costs, support models, and integrations with existing infrastructure or third party technologies. This is especially important when you have a multicloud environment, where you're using more than 1 public or private cloud solution.

Enterprise Linux offers flexibility and consistency.

While Linux has many advantages as an OS, using a single version, such as Red Hat Enterprise Linux, supports a strategy of consistency across your hybrid cloud environment.

Find out more about how organizations are using Linux in public cloud environments in the 2021 State of Linux in the public cloud.

Chapter 3

Red Hat Enterprise Linux: A consistent, reliable solution

The consistency you need to manage a complex, multicloud infrastructure starts with your OS.

Red Hat Enterprise Linux helps you address the problems that hybrid cloud environments can introduce, while supporting unified workload migrations, improved management and security, and a visible, streamlined path from development to production, in public, private, hybrid and multicloud infrastructures.

Discover the benefits of hybrid cloud with Red Hat Enterprise Linux, or learn more about Red Hat Enterprise Linux.

Simplified access in cloud marketplaces

Red Hat Enterprise Linux is available via cloud provider marketplaces.

Not only does this make it simple to implement Red Hat Enterprise Linux, it simplifies the purchasing process, allowing you to buy Red Hat Enterprise Linux using your cloud provider committed spend programs—you can maximize your budget without needing separate requisitions and approvals. Examples of these programs include Enterprise Discount Program (EDP) in the Amazon Web Services (AWS) marketplace and Microsoft Azure Consumption Commitment (MACC) on Microsoft Azure.

Find out more about Red Hat Enterprise Linux in cloud provider marketplaces:

- Red Hat on Amazon Web Service →
- Red Hat on Azure →
- Red Hat on Google Cloud →

Alternatively, your organization can use an existing Red Hat Enterprise Linux subscription via Red Hat Cloud Access or choose from cloud provider pay-as-you-go options, or Red Hat can work with you to develop a custom plan tailored to your needs.

Choosing Red Hat Enterprise Linux can help your organization overcome complexity and management challenges with applications that you are moving to the cloud.

No matter where you are in your cloud journey, Red Hat Enterprise Linux can help you move forward more efficiently and effectively.

Find out how other organizations use Red Hat Enterprise Linux to achieve their goals, scale their organizations, and expand into the future.

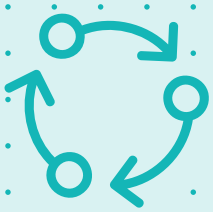
Ease of management

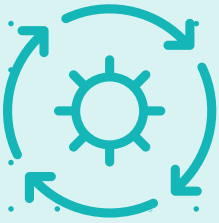
Standardizing on an OS across your infrastructure with Red Hat Enterprise Linux gives you consistency as well as integration access across thousands of third-party hardware, software, and cloud providers.

Advanced tools from Red Hat automate and streamline the management of applications for everything from provisioning, scaling, and policy enforcement to decommissioning.

One of the major difficulties with a complex infrastructure is managing all of the components you have implemented across the different environments that you're using.

If you have containers running in multiple public or private clouds, plus data sources and other workloads running in your business location, just knowing what you have running can be a challenge—and maintaining and updating everything that is running in every environment can take up too much of your IT resources' time.





The key management features available in Red Hat Enterprise Linux include:

Integrated analytics and remediation.

All Red Hat Enterprise Linux subscriptions include Red Hat Insights, a Software-as-a-Service (SaaS) offering that collects analytics about each environment to proactively identify and fix issues.

Long-term life cycle support and flexibility.

A Red Hat Enterprise Linux subscription provides flexible and stable performance and security, fulfilling business requirements with long-term lifecycle support. Choose from multiple supported versions, upgrade on your schedule, and adopt new features as needed.

Streamlined management and automation.

Red Hat Enterprise Linux includes built-in workflow automation tools and integrates with Red Hat Satellite and Red Hat Ansible® Automation Platform to help organizations administer their environments more readily and effectively.

Partnership and certification with hardware, software, and cloud providers.

Red Hat partners with industry-leading hardware, software, and cloud vendors to offer more choice, innovation, and stability. Red Hat fosters a large certified partner ecosystem and is certified for use with all major cloud providers.

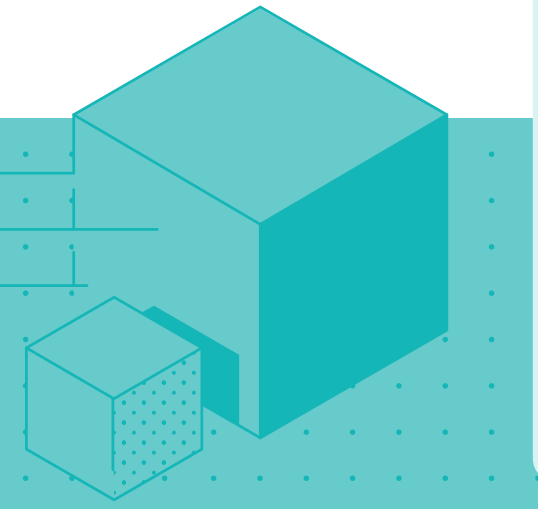
Flexibility and consistency

Red Hat Enterprise Linux is designed to have consistent performance and security across different environments, whether in the cloud, on-premise, or at the edge.

By using an OS that is the same wherever you deploy it, you get a unified experience as you move workloads to the cloud.

In a modern hybrid cloud environment, workloads are deployed in whatever location meets the need for performance, scale, and compliance. Red Hat Enterprise Linux is engineered to perform optimally not only on 1 specific cloud, but as part of a much larger partner ecosystem that provides freedom from vendor lock-in.

That means even when your organization's needs change and evolve, if you've standardized on Red Hat Enterprise Linux, you're able to retain skills, standards, processes, best practices, and management tools—reducing the friction and cost of constant change.



Full support and access to developer tools

A Red Hat Enterprise Linux subscription provides access to the Red Hat Knowledgebase, how-to videos, demonstrations, "get started" guides, documentation, and more.

Red Hat offers a vast ecosystem to help you build and deploy applications in a cloud and Red Hat Universal Base Image (UBI) provides a solid and stable Red Hat Enterprise Linux userspace to streamline efforts as you expand into container development projects.

With application streams in Red Hat Enterprise Linux, you can access the latest versions of popular languages and tools—very useful when it comes to trying out newer releases of software.

Developers also benefit from using Red Hat Enterprise Linux as a container host, as it lets them use many additional tools, including Podman, Skopeo, and Buildah, to get their containers up and running.

Learn more

A more effective approach

Using only one cloud provider for all of your infrastructure needs introduces unnecessary challenges since specific cloud offerings only reach as far as the edge of that cloud.

This can severely limit your options to integrate conventional and on-premise systems, as well as introduce new risks, as you are subject to the one provider's cost changes and technology approaches.

No matter what combination of environments your infrastructure includes, the key to success is a foundational OS that remains consistent and reliable regardless of where your workloads reside.

The more effective approach is to maintain a flexible and scalable cloud strategy that aims to achieve the highest performance for your organization.

Ready to make your environment more consistent, efficient, and effective?

Talk to a Red Hatter today about building your cloud infrastructure on Red Hat Enterprise Linux.

Get in touch →

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