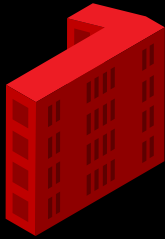


Reinventing
telecommunications
with open innovation

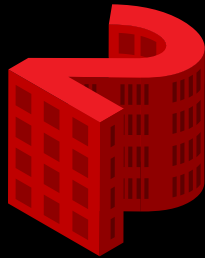


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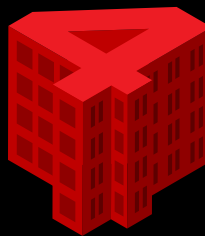
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Unlock a world of opportunity

Modern technologies like virtualization, microservices, and hyperautomation are redefining the capabilities of telecommunications networks from the core to the edge.

These technologies are ushering in a new generation of improvements in operations and business efficiency, speed, agility, and competitiveness.

Infrastructure developments—particularly with advancements in 5G and edge technologies—have empowered telecommunications service providers like you to help other industries reinvent themselves for the 21st century and beyond.



Opportunities with 5G and edge technologies

From agriculture to healthcare, retail to advanced manufacturing, businesses are delivering new services and solutions that improve customer experiences while reducing costs.

These technologies are not just solving existing problems. They are creating new opportunities to differentiate your services, accelerate the return on network investment, and innovate in ways never considered possible before, including:



Smart cities. Local governments are bringing smart city features into use, from parking sensors to advanced waste management systems that reduce the use of limited landfill space.

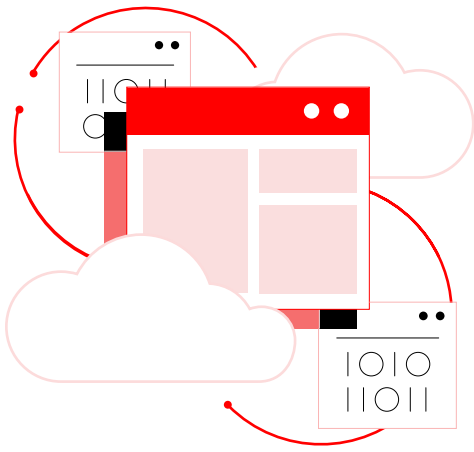


Connected vehicles. Service providers are using open source technologies to enhance 5G and edge computing for autonomous delivery vehicles. These vehicles improve delivery times while eliminating emissions from gas-powered delivery vehicles.



Advanced manufacturing. 5G and multiaccess edge computing (MEC) empower the next generation of manufacturing by nearly eliminating latency between assembly line, material handling, and other robots.¹

¹ Harvard Business Review Analytic Services, sponsored by Red Hat. "[Communications service providers and the rise of open source networking](#)," accessed December 2022.

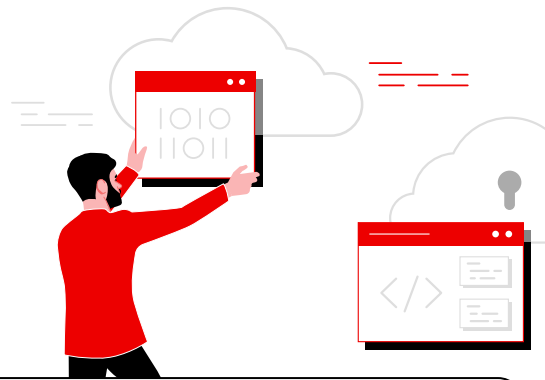


How to succeed in these new environments

From our work with service providers worldwide, we've found that you can succeed in this evolving environment when you:

Adopt a multicloud architecture that provides flexibility and portability with a consistent, secure experience across private and public cloud computing providers.

Prioritize cloud-native development and deployment methodology for new technologies and applications to take full advantage of cloud economics.



Embrace open source development models and culture to increase the speed of innovation and realize the full potential of a large partner ecosystem.



While nearly every industry is making the move to the cloud, not all telecommunications service providers are the same. Your needs require a cloud strategy tailored to your requirements. A great place to start is understanding what's available to you and how an open approach to multicloud can help you meet your customers' expectations today while laying the foundation for continuous innovation.

Deliver a consistent cloud experience

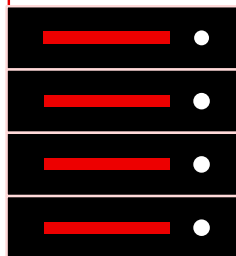
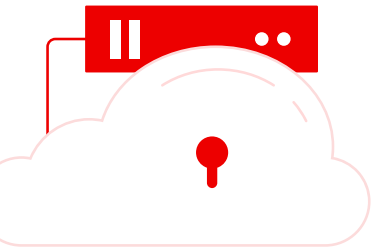
"We're at the intersection of the potential of open source, the potential of open hybrid cloud and software innovation, and that's what gets me excited every day."²

Matt Hicks, Red Hat President & CEO

A multicloud approach helps you run restrictive network functions and critical applications beyond the boundaries of your private cloud.

Embracing open hybrid cloud means providers can take advantage of different public cloud capabilities and economics while ensuring the highest level of observability, control, fault tolerance, and availability required for your demanding operations.

One of the first areas to consider is migrating workloads from on-premise datacenters to the cloud. If you have a standard infrastructure platform, choosing between private, public, and hybrid clouds doesn't have to be a long-term decision. Our customers are using [Red Hat® OpenShift®](#) to deploy and manage their workloads in a consistent way—whether on-premise or in public, private, or hybrid clouds. This means that your team can develop cloud-native solutions for deployment on one cloud provider, and move them to another at a later date.



Ready to start planning your multicloud strategy?

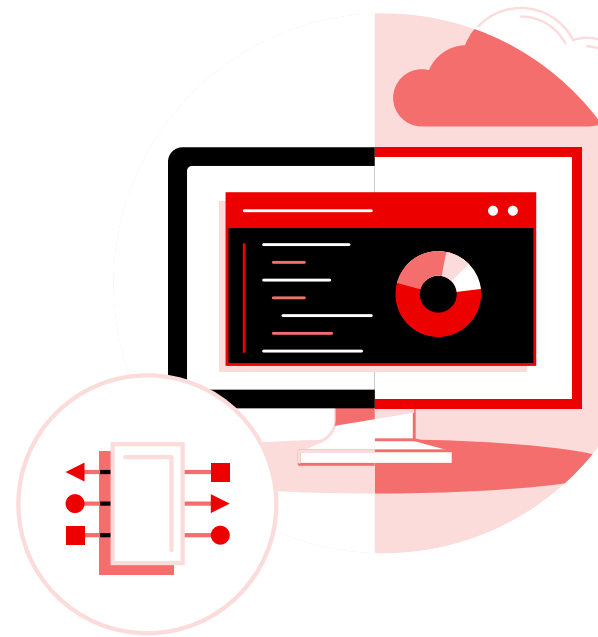
Download the ["6 digital service provider musts: How to get more from your hybrid, multicloud strategy"](#) checklist.

² Condon, Stephanie. ["From software developer to CEO: Red Hat's Matt Hicks on his journey to the top,"](#) ZDNet, 4 Aug. 2022.

Cloud-native for increased agility

Cloud-native application development is an approach to building, running, and improving applications based on well-known techniques and technologies designed for cloud computing. It is a way to speed up how you and your partners build new applications, optimize existing ones, and connect them all. Its goal is to deliver applications and networks users want at the pace the business requires them.

One critical thing to note is that you can often have a massive technical debt in legacy applications—especially within operations, business support systems, and IT systems. Not all applications will, or should be, moved to a cloud environment. Successful cloud-native development strategies enhance and integrate legacy systems, and introduce new applications and services for customers.



[Learn more about cloud-native applications](#)

Beyond simple virtualization

Cloud-native development uses containers instead of traditional virtual machines (VMs). Using tools like the [Red Hat OpenShift Container Platform](#) allows developers to package applications and their runtime environments together in an isolated environment. The container approach makes it easy to move the application between development, test, and production environments while retaining full functionality.

What are the benefits of using cloud-native development?



Lower cost



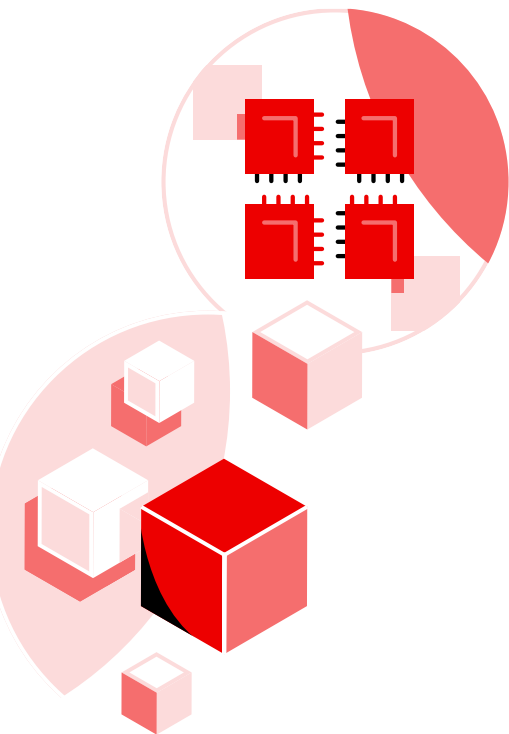
Shorter time to market



Increased cloud agility



Larger available talent pool



Overcoming challenges moving to cloud-native infrastructure

According to [Red Hat's The State of Enterprise Open Source report](#), in-house skill gaps continue to be a major roadblock for digital transformation.³ Having access to a strong ecosystem of partners ensures that you can quickly augment staff and development resources to take advantage of modern cloud-native benefits.

Surveyed IT leaders identified their top obstacles to adopting containers:

43% Don't have the necessary skills.

39% Don't have the right development staff or resources.

33% Don't have any applications to containerize.

29% Lack the time needed.³

Telecommunications service providers use Red Hat's open source approach to cloud-native development to, among other things, modernize their OSS and BSS workloads and build containers for their radio access networks (RANs).

Red Hat offers training paths to prepare service provider teams to work in this more modern environment. Explore your options in the [Red Hat Training and Certification for Telecommunications](#) course catalog.

Embracing an open, agile culture: Evolving from "telco" to "techco"

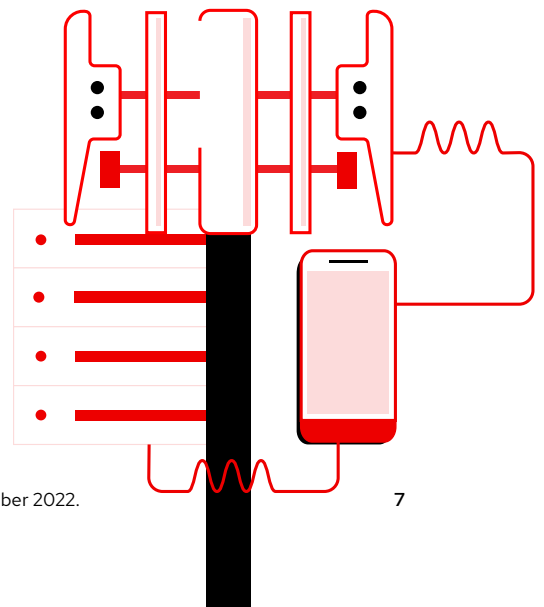
Telecommunications leaders are transforming their businesses by adopting practices used by successful technology companies. But shifting from "telco" to "techco" is more than using new technologies—it takes a shift in mindset. It means adopting agile processes, increasing the use of automation, and evolving a culture suited to faster service delivery.

Compared to traditional ways of building networks and services, open source communities and their vast

partner ecosystems offer a wide selection of components to create and modify services more quickly.

Using enterprise open source tools and technologies (supplied and supported by a vendor, versus being available for free from a community) is especially critical when developing solutions for hybrid cloud architectures. Public and private clouds need to operate with hardened security measures to protect sensitive data as it moves between systems. Red Hat helps

service providers with this by vetting and testing multiple partner solution configurations and combinations to ensure interoperability.



³ Red Hat report. ["The State of Enterprise Open Source: A Red Hat report,"](#) 22 Feb. 2022. Accessed October 2022.

**From core to edge:
open source and
telecommunications
innovation**

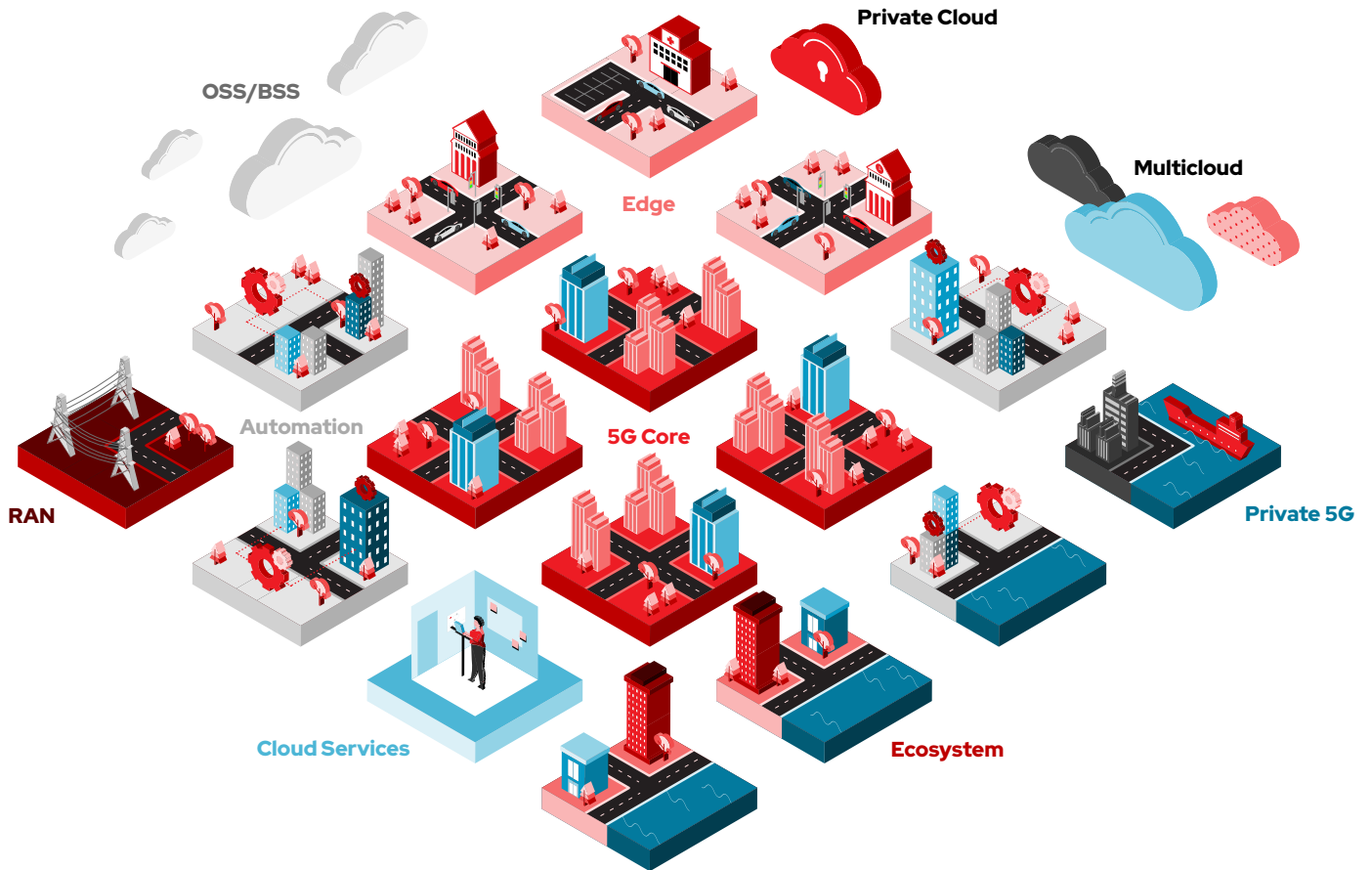
Edge computing, 5G, artificial intelligence and machine learning (AI/ML) are more than just buzzwords. These are technologies in use today, helping to build innovations never thought possible—or even considered.

While 5G often leads the conversation, it is only one part of the solution. Combining the high-speed, low-latency connectivity of 5G with multiaccess edge and cloud-native applications is

changing the way computing is done for everything from autonomous vehicles to healthcare delivery.

Multicloud architecture and open source tools from a strong partner ecosystem can help you deliver solutions faster, at lower cost, and with greater focus on security.

Let's explore how we help service providers use these technologies and open source methodologies to deliver solutions and monetize their networks.



Creating business innovation with 5G and edge innovations

The 5G revolution is just beginning

Each network generation brings with it more speed and capacity. But 5G networks also provide you opportunities to create innovative solutions that delight customers and generate new revenue streams.

These new 5G solutions require a network transformation, one ideally based on open, cloud-native technologies. Radio Access Networks (RANs) and the core network must be built on a distributed architecture with a cloud-native, disaggregated, and open infrastructure to automate the delivery of diverse services.

Building the future together

A strong, robust partner ecosystem is becoming increasingly important for service providers as you seek to accelerate the development of 5G applications. Red Hat helps service providers worldwide with our independent software vendors

(ISVs) partnerships on everything from 5G network functions to multiedge architecture.

Red Hat continuously validates partner solutions and has developed blueprints and reference architectures that help you to deploy pre-integrated 5G components from multiple vendors, simplifying deployment and reducing risk.

5G is creating opportunities for you to:



Help municipalities [create safer cities](#) for their citizens.



Improve [supply chain efficiency and security](#).



Deliver new experiences for [media, entertainment, and sports consumers](#).

5G and edge computing

Deploying compute power and network functions closer to the network edge helps improve application performance, reduce bandwidth consumption and cost, and create new, differentiated, low-latency services. These are services that demand real-time data streaming like virtual and augmented reality, real-time multiplayer gaming, autonomous and connected vehicles, drones, telemedicine, robotic production lines, and Industry 4.0.

By combining 5G and edge computing, you can offer a better user experience, support bandwidth-hungry applications through a more flexible, agile, and resilient network. Pivoting to cloud-native solutions for RANs can help you quickly scale services to meet these evolving demands.

Adding MEC capabilities makes the delivery of innovative, latency-sensitive services and applications possible by processing data close to the end user. MEC can provide real-time experiences for customers in a changing competitive landscape.

Leading service providers and their technology partners discuss their 5G deployment strategies, challenges, and insights.

[Watch the Open5G 2022 telecom virtual event on demand.](#)

The business value of edge

Organizations are looking for edge applications that provide business and customer value.

Edge applications are helping manufacturing, automotive, energy, utilities, finance, healthcare, retail, and government transform their operations, increase efficiency and create new revenue opportunities.

The merger of 5G core services and open (or virtualized) RANs means you can deliver edge computing from the same point in your infrastructure, whether that's to multiple tenants with MEC or a private edge deployment.

Learn how Red Hat's open hybrid cloud solutions position digital service providers for edge success.

[Read about private 5G and edge computing business use cases](#)

[Read more about edge computing and how Red Hat can help](#)

Future-proofing OSS, BSS, and IT

Legacy IT, operating support systems (OSS), and business support systems (BSS) often do not offer the agility needed to take full advantage of new technologies like 5G, edge, and AI. Without this support, service providers can struggle to monetize new business opportunities.

This transformation entails refactoring or adding cloud-native capabilities to legacy OSS and BSS. But 32% of respondents to a Telecoms Intelligence survey said that they didn't have the internal resources necessary to manage the complexity and timeframe to develop and deploy new services.⁴

Accelerating your cloud-native transformation takes the right open source and partner solutions. Your team needs a unified application platform that provides a consistent experience across private and public cloud environments. Deploying workloads on Red Hat OpenShift provides the flexibility to move workloads to another cloud environment or even back on-premise as business requirements change.

Evolving applications systems to cloud-native can help:



Support new services with increased speed.



Provision services for the customer correctly, swiftly, and efficiently.



Provide customers with timely information about the performance of their services.



Optimize the speed and cost of ongoing operations of new services.



Alleviate technical debt by avoiding duplication of development work.⁵

⁴ "Reaping the full potential of 5G," Telecoms Intelligence, sponsored by Red Hat, July 2022.

⁵ Mortensen, Mark H. "The Right Container Platform(s) for Modern OSS and BSS," ACG Research, sponsored by Red Hat, accessed 18 Aug. 2022.



“Previously, when website demand peaked, we had to provision new hardware, which took a lot of time and effort and sometimes introduced issues. With Red Hat OpenShift, we can increase the number of instances in a single step—or even automatically—to sustain peak loads.”

Nicolas Kaczmarek, application services team lead, Proximus

Benefits of going cloud-native

Cloud-native OSS and BSS provides flexibility so resources can be deployed and scaled on demand, where and when needed. For example, because requests for AI capabilities are less predictable, they can be more economical to run in a public cloud, while OSS-related functions requiring more stringent service levels can run in a private or telco cloud.

Service providers are using cloud-native OSS and BSS tools to reinvigorate their businesses. Red Hat has helped service providers achieve:



Increased network efficiency.



Reduced downtime.



Lower operational costs.



Improved customer satisfaction.



New business and market opportunities.⁶

One example of how cloud-native OSS and BSS improves developer productivity and conserves resources: Proximus, Belgium’s largest service provider, uses Red Hat OpenShift and Red Hat OpenStack® Platform to transform monolithic applications into microservices that can be more easily, iteratively updated. Using Red Hat OpenShift in Red Hat OpenStack Platform to deploy and run container-based microservices at scale improves developer productivity and helps Proximus reduce monthly infrastructure setup and maintenance costs.

[Read the complete case study.](#)

[Proximus Group virtualizes network and cuts costs with Red Hat.](#)

⁶ Red Hat e-book, “[Imagine a world where your OSS/BSS supports business expansion](#),” 14 Jan. 2021 accessed December 2022.

Modernizing applications is not limited to OSS and BSS systems

Modernization extends to all applications you require to run your business for your customers. Moving to a container-based microservices architecture is foundational to cloud-native development. This architecture can provide increased scalability, higher reliability, and better integration capabilities than VMs can deliver in a distributed network.

Container-based microservices also offer greater efficiency for services and operations, including a consolidated view of network and customer data, and higher network and business process automation levels. They promote support innovation and the ability to adapt to customer demand and requirements in less time.

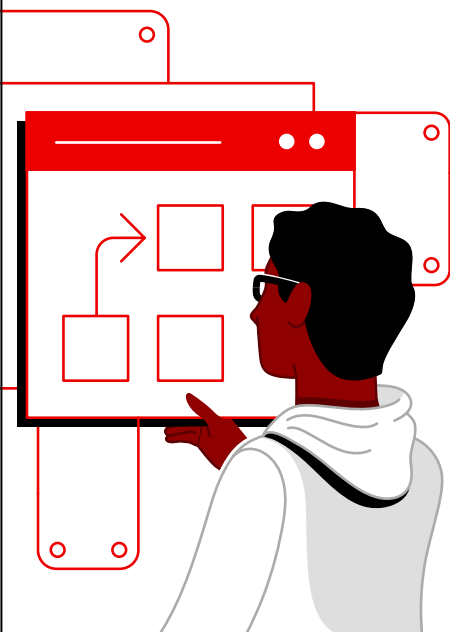
Learn how Türk Telekom cut feature delivery time from days to seconds using Red Hat OpenShift.

Automation and AI

Spending time on manual tasks can lead to missed opportunities. Automation is essential for managing telecommunications network complexity at scale while lowering the risk of business disruptions.

Automation helps you scale network and compute resources more quickly, reliably, and economically. Service providers are using [Red Hat Ansible® Automation Platform](#) to provide a common set of automation tools across their organizations and reduce the complexity of automating business functions at scale.

Today's networks are ecosystems built on solutions from multiple vendors. You need to look at automation from the network to the core, across your partner ecosystem, and across private and public cloud environments. To do this, a hardened automation platform that integrates with the tools and technologies you use today is essential.



Zero-touch provisioning: Automate to scale securely

Infrastructure and network complexity require automation to ensure processes move forward and execute consistently. [Zero-touch provisioning](#) allows for edge devices to be provisioned in a network automatically, freeing system administrators to perform specialized tasks and reducing human errors by eliminating manual configuration efforts, downtime, and travel time to physical sites. Zero-touch provisioning can be performed at scale and much more rapidly, which are all key to building a strong edge security posture at scale.

Tested and certified content AND robust management are two key automation platform requirements for improving efficiency, controlling costs and reducing risk.

[Read the "Holistic automation for telco service providers" whitepaper to learn more.](#)



Extend automation to the network edge

Automating edge workloads, services, and applications can help you discover problems before they become issues for customers. Automation helps improve security, response times, and gives customers control over an expanding array of data being collected and processed at the edge.

[Learn more about how automation works at the edge.](#)

Maximizing the value of data with AI

Service providers are using AI to advance automation and decision making processes while improving user experience. By combining AI/ML, you can automate your operations in:



Network assurance functions.



Event correlation and analysis.



Anomaly detection.

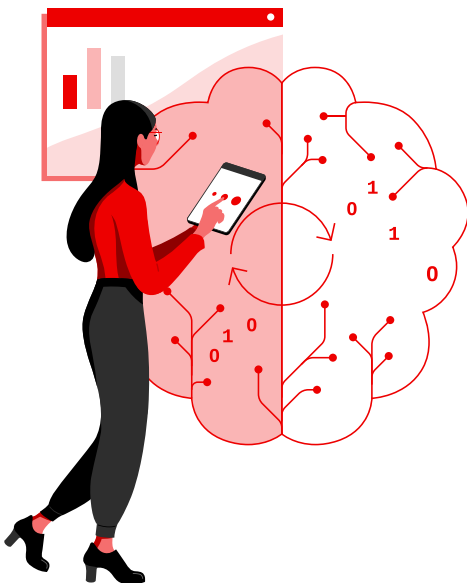


Root cause analysis.



Alert prioritization.

AI can boost revenue by identifying user patterns, both consumer and business, based on buying affinities, behaviors, and actions. At the edge of the network, AI and analytics services can help process massive amounts of data from sensors, monitoring devices, and usage patterns, and locally manage the decision to communicate alerts to central resources.



Powering AI with open source

Advancements in AI/ML are driven by the open source community. Red Hat and our ecosystem of partners make it easier for organizations to implement these powerful technologies by providing a tested, modular, and flexible open source architecture.

This architecture provides the components and foundation needed for an end-to-end AI/ML solution with the benefits of open source

[Learn how Turkcell supports AI-powered innovation using Red Hat OpenShift.](#)

innovation and interoperability. Its modular nature allows development teams to swap out system components over time to keep pace with advances in technology while protecting previous investments.

Open source is reshaping telecommunications

Collaborative innovation

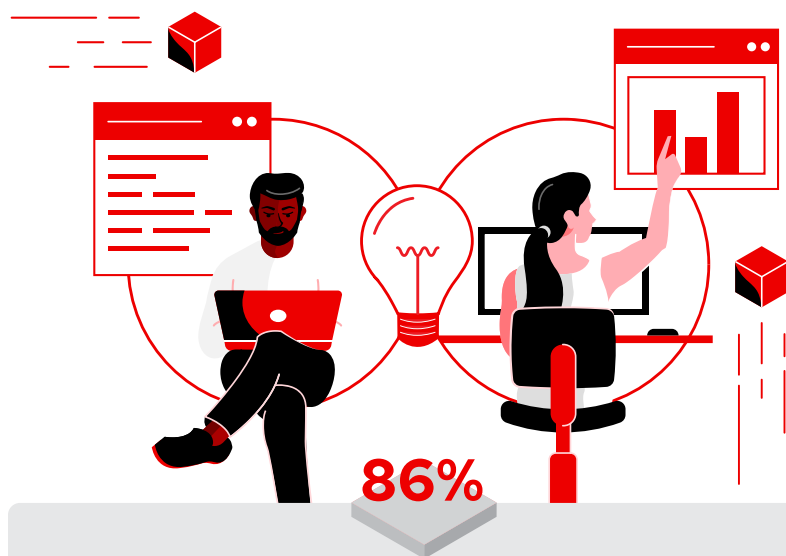
The value of open source software is derived from an ecosystem of partners that is built on a commitment to collaboration. The more we share, the faster we can speed up the innovation process across industries.

Innovation is key to differentiating from competitors. Open source software and methodologies offer developers a trusted way to create innovative applications and services faster and at lower cost.

Bringing innovative solutions to market requires agility, not only in

development, but also in delivery and operation. A cloud-native application platform built using open source software allows service providers to take full advantage of hybrid and multicloud architectures. An open platform provides the flexibility you need to move data and workloads between cloud services and cloud providers, while maintaining a consistent experience.

With this adaptable foundation, open source technologies and methodologies represent a powerful combination for today's challenges and tomorrow's opportunities.



of telecommunications industry IT leaders reported having a more positive perception of enterprise open source than they did a year ago.⁷

Three trends in telecommunications open source software adoption:



Open source is increasing agility and innovation for service providers.



Service providers are using open source software to move away from proprietary networking solutions that stifle innovation.



"Hardened" tools are proving that security doesn't have to be compromised when adopting open source tools.

⁷ Red Hat report. ["The State of Enterprise Open Source: Telecommunications,"](#) 25 Feb. 2022.

Security-first thinking

Security is not a product, it's a process. It's about establishing a set of IT security systems, solutions, and strategies that work together to help protect critical business and customer data.

No service provider wants to make the news with a security breach losing millions of customer data

87%

of telecommunications IT leaders believe enterprise open source is as secure or more secure than proprietary software.⁸

89%

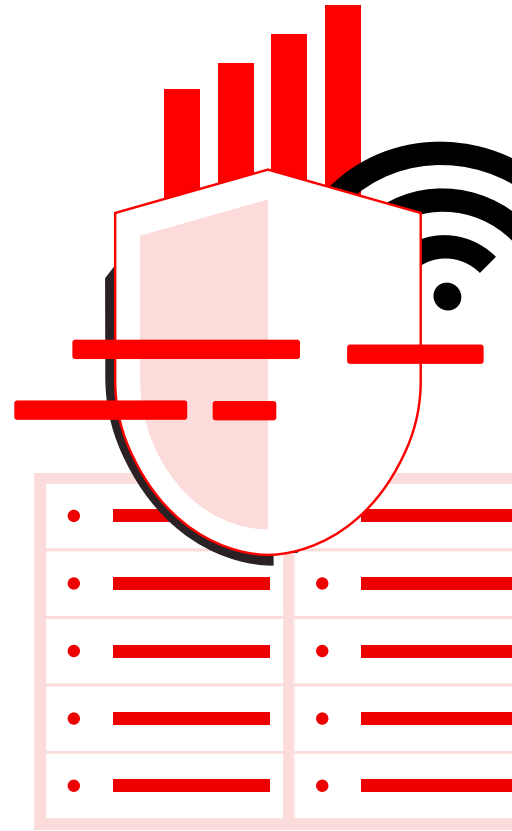
of IT leaders see enterprise open source as more secure or as secure as proprietary software.⁹

sets or their networks being down. IT security, commonly referred to as cybersecurity, includes network security, internet security, endpoint security, API security, cloud security, application security, container security, and more.

Whatever the use of open source—edge, Internet of Things (IoT) hardware, or multicloud—consistent configuration, deployment, and monitoring are critical to helping protect against cybersecurity threats.

Developing software in an open source community that includes security researchers and auditors results in many trained eyes and a variety of perspectives for seeking and addressing vulnerabilities. Enterprise and commercial open source products and platforms need to be further tested, monitored, and certified to balance the benefits of open source innovation with the trustworthy security you need for your networks and applications.

Containers and hybrid cloud technologies have made the security landscape much more complex. Your in-house security teams are increasingly finding it challenging to keep up with the changing risks, compliance requirements, tools, and architectural changes introduced by these technologies. Traditional perimeter-based network security



is no longer effective on its own and security teams must rethink their approach.

Red Hat's layered Security as Code (SaC) approach helps customers take a security-focused approach across their infrastructure and application stack and life cycle. Red Hat delivers hardened open source solutions that focus on security through rigorous testing, support, and certifications for use in a demanding commercial environment like telecommunications.

⁸ Red Hat infographic. "[The State of Enterprise Open Source: Telecommunications](#)," 25 Feb. 2022.

⁹ Red Hat report. "[The State of Enterprise Open Source](#)," 22 Feb. 2022.

Open source for hybrid and multicloud success

In our “The State of Enterprise Open Source” survey, 80% of communications service provider IT leaders said that open source has been instrumental in their organization’s ability to take advantage of hybrid cloud architectures.¹⁰

As part of their digital transformation efforts, businesses of all types have been using large public cloud providers to meet their needs, whether strategically, through shadow IT, or both. Public cloud providers make infrastructure resources available on-demand and with consumption-based pricing.

Before adopting public clouds into transformation strategies, leaders need to understand if:



Public cloud infrastructures deliver the requirements of applications and services.



Business can actually reap the perceived cost and agility advantages from public cloud services after adding storage, networking, or other services.



They should move strategic assets like network infrastructure into a public cloud environment.



They can manage and minimize competitive risks for disintermediation.



They can optimize the use of hyperscaler services to facilitate more agile operations and culture with DevOps methodologies and deliver more value to customers.

Technologies change and business requirements change. To successfully compete, boost revenue and profitability, and meet rising customer expectations, you need a sustainable strategy for using public cloud services as part of an open hybrid or multicloud architecture.

The importance of the ecosystem

Building new agile and flexible network systems requires a solid foundation built on open source technologies. You can use open source to quickly access a wide set of capabilities from multiple partners and vendors to build feature-rich applications and services.

The advantage comes from the ability to find the components

or services from a vetted partner ecosystem. Working with partners can also reduce research and development costs by licensing instead of building needed components.

The Red Hat telecommunications ecosystem program brings together partners and trusted open source communities to deliver innovative, validated, and integrated solutions to

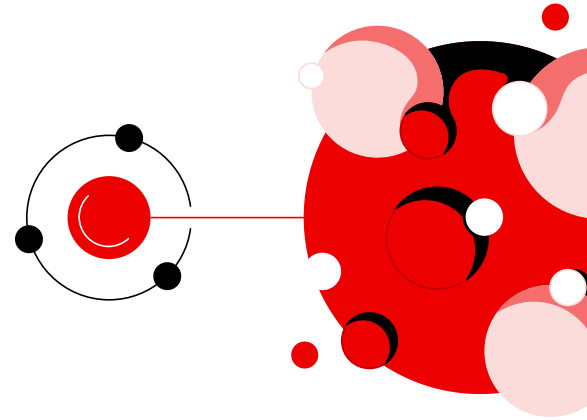
the telecommunications industry. Partnership and multivendor solutions are critical for rapid, flexible digital service development and delivery. Through collaboration with industry leaders and innovators, Red Hat provides the reliable, standards-based software foundation and certified partner ecosystem you need to transform your business.

¹⁰ Red Hat report. [“The State of Enterprise Open Source,”](#) 22 Feb. 2022.

Discover how Red Hat helps

Red Hat's role in open source

Digital service providers from around the world partner with Red Hat on their open transformation initiatives because, for more than 25 years, Red Hat has played a leadership role in open source software development.¹¹



We have helped by:



Navigating open source communities and advocating on behalf of service provider so requirements are addressed and the solutions developed provide maximum business value.



Aggregating open source code to make sure it is developer-friendly to use the solutions coming out of open source communities.



Handling the integration, testing, and compliance.



Collaborating with hardware and software partners to take advantage of the newest innovations—allowing disruptors to embrace new opportunities with confidence.



Advising and mentoring on the behaviors, collaboration, and open practices needed to help customers adopt agile DevOps methodologies.

With Red Hat, ecosystem partners are able to develop solutions once that customers can deploy anywhere to deliver a consistent experience. We work together to offer solutions on a platform that ensures portability, choice, focus on security, and support.

Innovate for digital success with an open and certified ecosystem.

[Get the ebook.](#)

¹¹ ["Creating better technology with open source,"](#) Red Hat, accessed October 2022.

Red Hat products and solutions

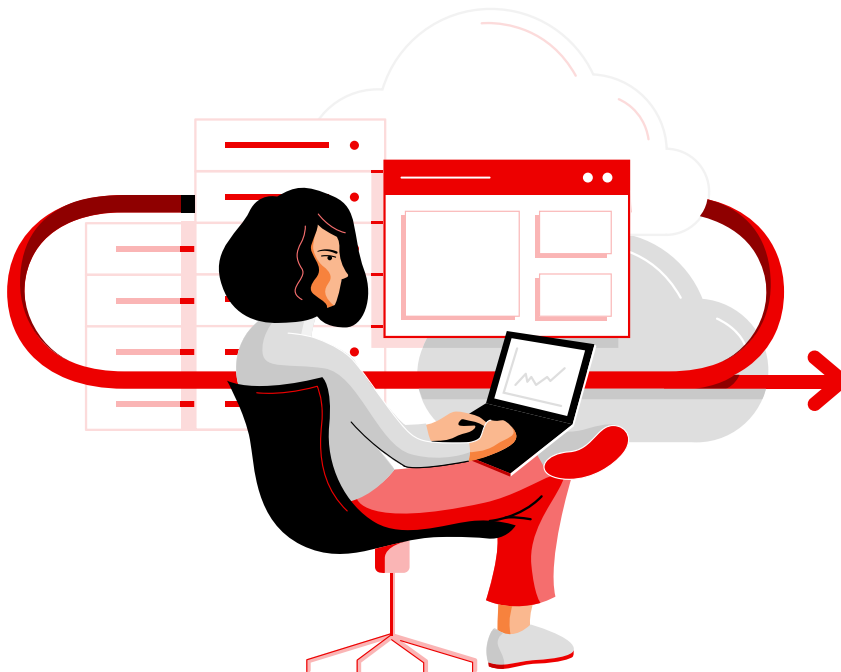
Modernizing networks requires moving workloads and services out of the core network (in datacenters) toward the network's edge around points of presence and central offices. From here, services can be delivered to subscribers more efficiently with lower latency and higher bandwidth.

Our open hybrid cloud solution is open source and standards-based—creating a stable, interoperable foundation to build upon.

This solution is the result of Red Hat's leading contributions to the Kubernetes, OpenShift Origin Community Distribution (OKD), OpenStack, Kernel-based Virtual Machine (KVM) and Data Plane Development Kit (DPDK) projects.

Red Hat is among the top contributors to many of these core projects,¹² giving us insight into where the industry is going and allowing us to inform telecommunications companies about future trends.

Red Hat works with the open source communities to make sure specific telecommunications customer needs are addressed. For example: DPDK, single root input/output virtualization (SR-IOV), virtual data path acceleration (vDPA), and support for hardware acceleration.



¹² Stackalytics and The Linux Foundation, "Commits by company." See also [Red Hat's Open Source Program Office](#) for a list of Red Hat's software contributions.

Explore Red Hat products

Red Hat Enterprise Linux

[Red Hat Enterprise Linux](#)® is a foundation for [Red Hat OpenShift](#) and Red Hat OpenStack® Platform, so the security features, reliability, performance, ecosystem, and other benefits of Red Hat Enterprise Linux apply to the entire stack. As a result, workloads behave the same, regardless of form (VNF, CNF) or infrastructure (datacenter, private cloud, public cloud).

Red Hat Ansible Automation Platform

[Red Hat Ansible Automation Platform](#) is a foundation for building and operating automation across an organization. The platform includes all the tools needed to implement enterprise-wide automation.

Red Hat OpenStack Platform

[OpenStack](#) is widely used to manage NFV infrastructure, and [Red Hat OpenStack Platform](#) is a leading commercial OpenStack distribution.

Red Hat OpenShift Container Platform

[Kubernetes](#) is the dominant infrastructure technology for managing container environments, and [Red Hat OpenShift Container Platform](#) is a leading commercial Kubernetes platform.

Red Hat Gluster Storage

[Red Hat Gluster® Storage](#) is a software-defined storage (SDS) platform designed to handle general purpose workloads like backup and archival and can be deployed on bare metal, virtual, container, and cloud environments.

Red Hat Integration

[Red Hat Integration](#) provides messaging, API security and management, and runtimes solutions that help telecommunications companies develop their own cloud-native applications and implement an automated, more security-focused continuous integration (CI) and continuous development pipeline to get them into production.

Red Hat Device Edge

[Red Hat Device Edge](#) extends Kubernetes capability to edge locations—focusing on use cases with small, resource constrained devices like IoT gateways, drones, and more. Red Hat Device Edge is built using edge capabilities of Red Hat Enterprise Linux with enterprise support for MicroShift, a low footprint Kubernetes distribution derived from Red Hat OpenShift.

Start small. Think big.

We understand organization-wide modernization is not a switch you can flip. Red Hat provides services and training to help you take necessary incremental steps with the big picture in mind so modernization becomes a mantra, not an item on your to-do list.

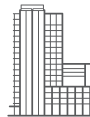
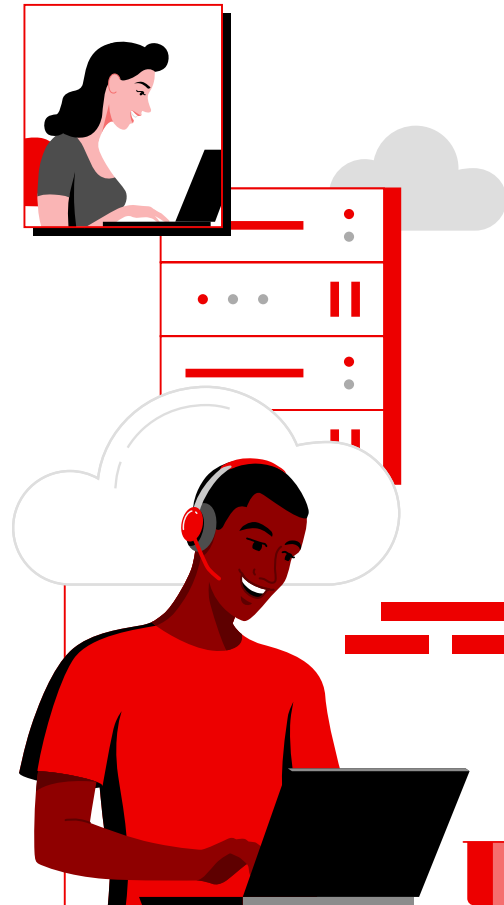
[Red Hat Services and Red Hat Support](#) help you get the most out of Red Hat investment. Not just in our software, but also in making open source a part of your competitive advantage.

We can provide you with the resources you need to begin, accelerate, and expand your open source journey. [Take the Red Hat Consulting Services Ready To Accelerate assessment.](#)

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Ready to get started?

Contact a [Red Hatter](#) and let us help accelerate your modernization strategy.



About Red Hat

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 integrate new and existing IT applications, develop cloud-native applications, standardize on our industry-leading operating system, and automate, secure, and manage complex environments. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500. As a strategic partner to cloud providers, system integrators, application vendors, customers, and open source communities, Red Hat can help organizations prepare for the digital future.

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