

# Adopt cloud-native development

Open technology, processes, and culture help you innovate



*“Red Hat consultants were on site to work with the infrastructure, networking, security, and capacity and performance planning groups. They also quickly trained our developers on container platform technology. We were able to launch the first iteration of the site application in three months. We’ve never brought up a platform that quickly.”*

**Stacie Morgan**  
Senior Application Development Manager,  
UPS

## Adapt to a digital, cloud-native world

Cloud-native application development can help you compete in a digital world. By adapting your technology, processes, and organization, you can rapidly innovate and deliver high-value offerings to your customers. Cloud-native development also aligns cloud technology with business needs and development processes to improve software production and delivery life cycles for both new and existing applications.

Open platforms, tools, and ways of working can help you derive even more value, speed, and agility from your applications and cloud platforms. Open source communities advance technology at a rapid pace and promote interoperability, allowing you to deploy modern tools and platforms that evolve with you over time. Open ways of working encourage inclusivity, collaboration, and transparency, allowing every staff member to contribute and bring new ideas forward.

This open transformation can help you further accelerate innovation and customer engagement. Combining open processes and culture with cloud-native applications development approaches can create lasting improvement in your organization. You can also deliver more value to customers and gain many benefits for your organization. IT-focused outcomes include:

- Faster application updates.
- Rapid application deployment.
- Quicker fault recovery.
- Improved accuracy.

Business-focused outcomes include:

- Faster time to market for new features and services.
- Improved product and service quality.
- Lower operational and capital costs.
- Increased relevance and competitiveness.

Using a unique approach that transforms and aligns your organization, processes, and technology, Red Hat® Consulting helps you adopt cloud-native application development faster and more successfully. This outcome-focused approach addresses the development process itself and emphasizes continuous improvement. It has been proven through successful delivery of cloud-native platforms and applications in many production environments.



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*“Transformation goes beyond the infrastructure to the applications and capabilities you need and the way you work.”*

**Nick Boyle**

Program Director of Enterprise Risk,  
Technology, Investment Banking,  
Deutsche Bank

### Benefits of cloud-native application development

Red Hat IT applied cloud-native application development approaches to its own operations and experienced

**55%**

lower infrastructure footprint per application and

**40%**

faster time to market for feature enhancements, as well as improved security and increased resilience.<sup>1</sup>

## Unite people, process, and technology to modernize

Application development modernization involves three areas of your organization: people, process, and technology. The following sections provide guidance for adapting each area for cloud-native application development.

### People

An open, innovative culture builds upon cloud-native technologies and processes to create real business value and change.

- **Promote open ways of working.** Working in closed environments with limited information results in ineffective action and can impede project and business progress. Advocate for open ways of working to increase the visibility of information and decision-making processes in your organization. Encourage staff to share their knowledge and expertise with others and be open to mentoring and cross-team collaboration.
- **Structure your teams for success.** Team alignment can greatly impact project and business success. Build small, colocated, cross-functional teams that can more easily adopt new technologies and open design practices that allow them to deploy valuable new services and functions faster. Give teams ownership of and visibility across the complete software delivery life cycle.
- **Encourage experimentation and new ways of thinking.** Innovation requires research and change. Encourage staff to experiment and apply new ideas to the challenges they see. Treat failures as learning opportunities and adapt accordingly.
- **Provide skill development opportunities.** By creating a culture where learning and leadership are emphasized, you equip your team to solve problems quickly and innovate efficiently. Ensure your staff has access to the resources, training, and mentoring opportunities they need to adopt open practices, use new technologies, and foster innovation and collaboration.

### Process

Processes define how technology and people work together to achieve business goals. Cloud-native approaches require you to adapt your processes for agility, speed, and continuous improvement.

- **Shift to an agile DevOps development style.** DevOps principles can help you increase the quality and delivery speed of your applications and services. Bring development and operations teams together with a shared purpose and regular feedback. Switch to smaller, faster releases using DevOps practices and container technologies to ease application updates and deployment. Optimize legacy applications using a service-based architecture and continuous integration/continuous deployment (CI/CD) workflows.
- **Adopt results-driven action and change.** Metrics are critical for determining what works and what needs improvement. Apply metrics throughout your development process and align team structures, behaviors, and goals to those metrics. Connect business-level and IT-level goals to ensure all areas of the organization are moving in the same direction. Key metrics for cloud-native application development include lead time for change, deployment frequency, mean time to recovery, and change failure rate.

<sup>1</sup> Red Hat, “Cloud-native meets hybrid cloud: A strategy guide,” September 2019. [redhat.com/en/engage/cloud-native-meets-hybrid-cloud-strategy-guide](https://redhat.com/en/engage/cloud-native-meets-hybrid-cloud-strategy-guide).

### Deutsche Bank streamlines development platform and democratizes IT with Red Hat

As a leading bank serving private, corporate, and fiduciary clients, Deutsche Bank wanted to improve their user experience, including employees and external providers and developers who use their back-end platform to build and run applications. Using Red Hat solutions, Deutsche Bank built an open source Platform-as-a-Service (PaaS) to simplify DevOps collaboration, optimize capacity, and increase efficiency.

- Cut end-to-end application development time from 6–9 months to 2–3 weeks
- Simplified DevOps collaboration with flexible integration and agile approach
- Optimized use and costs of datacenter and cloud capacity with microservices, containers, and cloudbursting

Read the complete case study at [redhat.com/en/success-stories/deutsche-bank](https://redhat.com/en/success-stories/deutsche-bank).

### Technology

Your cloud-native technology must be aligned to your organizational goals. Key components include:

- **Service-based architecture.** A modular, service-based architecture like microservices provides more application development flexibility and speed without increasing complexity.
- **Application programming interfaces (APIs).** APIs connect services via lightweight, standard links that reduce the complexity and overhead of deployment, scaling, and maintenance. Combining APIs with a [contract-first approach](#) can increase collaboration, independence, and consistency.
- **Containers.** Containers provide a common operational model for all processes—regardless of underlying technologies—to reduce the management overhead of multitiered and multicloud environments. Container-based deployments also deliver application portability across infrastructure to support IT agility.

When shared widely, the changes to your organization, processes, and technology made while adopting cloud-native application development can extend outward to support larger transformation initiatives. Successes within your cloud-native initiatives can serve as proof points for the value of this approach, encouraging other teams throughout the organization to embrace the same practices. This innovation and improvement at the organizational level can increase speed, revenue, and cost savings. Finally, executive-level strategy can realign with the improved organizational delivery capabilities, leading to large-scale transformation.

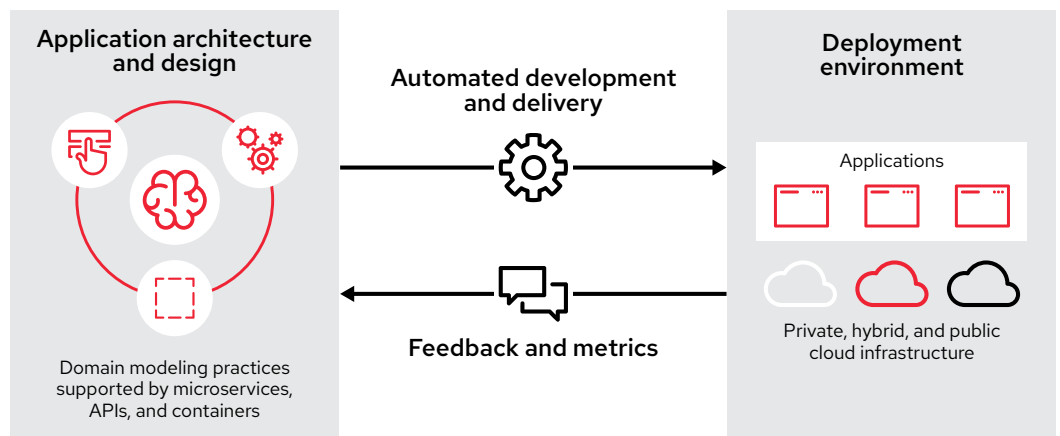


Figure 1. Cloud-native application development architecture

*“The shift from virtual machines to containers, and traditional applications to microservices, is a big one. We needed a partner that could help us build our deployment capabilities and train our global developer base so we could get maximum value from our investment.”*

**Tom Gilbert**  
Managing Director, Global Head of Cloud,  
Application, and Integration Platforms,  
Deutsche Bank

## **Build an environment for cloud-native application development**

Effective cloud-native application development requires a comprehensive process that brings teams together and aligns your software development and delivery strategy with the agility provided by cloud environments. This combination of modern design technologies and techniques serves as the core for fast, reliable business innovation.

### **Application architecture and design**

Application architecture and design are important considerations when building flexible, cloud-native software. A microservices architecture lets you decompose applications into modular, loosely coupled parts to support greater reliability, agility, and speed of development, deployment, and change. APIs connect services and allow dynamic reconfiguration of services into new and improved applications. Container orchestration and service mesh capabilities support the dynamic, elastic nature of microservices-based applications. [Domain modeling practices](#) connect business domain definitions with microservices and security implementations.

### **Automated development and delivery**

An automated pipeline moves applications and infrastructure from concept to production and eliminates the need for manual tasks with limited scalability. Automation and CI/CD practices are at the core of rapid application delivery and allow faster response to business requests. They also help to improve application security and quality. Effective development and delivery workflows support efficient coding, user interface and services integration testing, security scanning, and Infrastructure-as-Code (IaC) approaches.

### **Deployment environment**

Applications must be deployed to deliver value. Open hybrid cloud platforms are designed to provide a consistent application environment across your on-premise and cloud-hosted environments. This architecture provides scalability, consistency, portability, and availability, using a common container-orchestrated architecture.

### **Feedback and metrics**

Feedback and metrics are critical to realize improvement. They complete the flow of information and code back into your architecture and design to influence future fixes and enhancements. Collect metrics about customer experience, runtime behavior, and operational experience to start and add other measures according to your organization’s needs.

## **Red Hat helps you adopt open, cloud-native practices successfully**

Innovation is more than just technology. Red Hat provides the expertise – as well as the technology – needed to better align teams, streamline processes, and promote interoperability across platforms and organizations. Red Hat consultants have extensive engineering experience with the open source technologies – including Kubernetes and cloud-native runtimes – that are essential for cloud-native application development. Red Hat also fosters an [open culture](#) and [development model](#) in its own organization.

## UPS streamlines package tracking and delivery with Red Hat

### United Parcel Service

(UPS), a global leader in logistics, created a flexible, agile, container-based cloud computing environment – and adopted a collaborative DevOps approach – with help from Red Hat. UPS developers can now more efficiently create new features for operations logistics and staffing, providing a better tracking and delivery experience for end customers.

- Cut development cycle time from over a year to months or weeks with automated, agile container and cloud technology
- Gained high scalability and availability to support peak holiday demand
- Improved collaboration between internal teams and external partners with DevOps approach and Red Hat services

Read the complete case study at [redhat.com/en/success-stories/ups](https://redhat.com/en/success-stories/ups).

With this expertise and knowledge to draw upon, [Red Hat Consulting](#) can help you adopt cloud-native application development practices to become a nimble, responsive market leader. Using an open, people-centric approach, you can deploy platforms, tools, and practices that empower your development and operations teams to deliver more business value.

Red Hat Consulting works with you and your staff to:

- Unite people, processes, and technology to create more business value.
- Bridge disparate teams, operations, and infrastructure to improve efficiency, transparency, and collaboration.
- Build an open culture and communities of practice within your own organization to foster collaboration and innovation.

Red Hat experts use a proven, prescriptive design methodology to understand your organization's needs, goals, and challenges and implement a custom solution – based on Red Hat and certified partner products, targeted training, and extensive experience – that helps you succeed today and prepare for future opportunities. Predefined toolsets, frameworks, and blueprints allow you to get up and running faster and extend your solution throughout your organization.

## Connect with the expertise, guidance, and technologies you need

Red Hat provides access to essential resources, information and technologies for adopting cloud-native application development.

### Practices and processes

Red Hat contributes to and curates the [Open Practice Library](#), a community-driven repository of collaborative practices and tools for teams seeking new ideas and solutions. Practices span four main categories:

- **Foundation.** Create a team culture and environment for collaboration and technical engineering practices.
- **Discovery.** Define goals and outcomes.
- **Options.** Identify possibilities and solutions.
- **Delivery.** Implement and test solutions and processes.

### Culture

Red Hat believes that open culture is at the core of innovation and transformation. Red Hat Consulting uses an open source approach to adjust organizational structure and create high-functioning teams and communities of practice that deliver more value. In fact, many of the techniques included in the Open Practice Library were pioneered and proven by Red Hat experts and shared with the community.

### Education

Red Hat Consulting provides mentor-based engagements and role-specific, hands-on training to help your teams adopt new technology and approaches faster and more effectively. Topics include using and managing open source technology and developing applications and culture within the scope of your solution. Through these engagements, you can create repeatable processes that

*“Historically, we would say ‘business drives technology’. We’ve flipped that equation, with IT demonstrating the transformative power of technology to line-of-business partners. We built an innovation center that’s an open environment for our IT and line-of-business groups to work together to design and develop solutions.”*

**Nick Costides**

President of Information Technology,  
UPS

extend from your core team outwards through your organization to support wider open transformation efforts. Red Hat also offers a full suite of online and self-paced [training courses](#) that let you learn on your schedule.

### Technology

Finally, Red Hat provides supported, enterprise-grade, open source platforms and tools for cloud-native application development, transformation, and collaboration. These technologies allow you to more easily share information and scale cloud-native approaches across your organization and environment. Key platforms for cloud-native application development include Red Hat OpenShift® and Red Hat Runtimes.

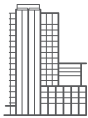
### Learn more

Cloud-native application development is a key part of open transformation. By focusing on your technology, processes, and people, you can deploy innovative, open approaches that support business agility, transformation, and success. Red Hat Consulting provides the approaches, training, and services to help you get there faster.

Learn how Red Hat can support your transformation initiatives at [redhat.com/en/services/consulting/cloud-native-development](https://redhat.com/en/services/consulting/cloud-native-development).

### 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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