

Build a digital services foundation

Create and deliver high-value banking experiences with Red Hat



73% of financial services and banking institutions are transforming to compete in a digital world.¹

Modern digital infrastructure can help you:

- ▶ Support new business models and enter new markets.
- ▶ Offer new services and improve customer experiences.
- ▶ Streamline operations and optimize costs.

Stay relevant with modern digital banking

Consumer banking has undergone a significant shift during the last 10 years. As technology advances, banking customers demand new, interactive digital services and will move to a competitor's services if their expectations are not met. New, digital-only banks present increased competition for long-standing, traditional banks because these organizations do not have expansive physical infrastructure investments to maintain. As a result, many banks are digitally transforming their infrastructure and services.

The ongoing pandemic has only accelerated these efforts and introduced additional challenges. Remote work and social distancing require a shift to paperless, digital interactions and operations. In fact, 73% of financial services and banking institutions have embarked on their digital transformation journey.¹

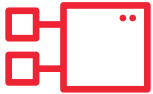
While digital services and operations are a requirement for success, traditional banking infrastructure and development models can prevent you from making the most of these opportunities. Disconnected channels and services result in fragmented customer experiences. Processes that rely on in-person visits and physical paperwork can complicate customer interactions. Rigid architectures and development models can limit your ability to develop new services rapidly, cost-effectively, and in line with changing regulations. Traditional infrastructure approaches rely on complex integrations and far-reaching dependencies, making it difficult to change and adapt services – a small change to one service may require extensive testing and validation throughout your application landscape. Finally, perimeter-based approaches to security do not work with agile development processes and tailored digital service delivery.

Adopt a cloud-native architecture for digital success

Modernizing your digital infrastructure can help you stay relevant in a fast-changing industry. A cloud-native architecture gives you the flexibility, speed, and adaptability to deliver the services your customers want, differentiate your bank, and compete effectively against digital-only organizations. Using a cloud-native approach, you can:

- ▶ Deliver unified, personalized, real-time omnichannel customer experiences.
- ▶ Build and access digital ecosystems and partnerships to create broad, integrated services.
- ▶ Improve compliance, address business continuity, and maintain security.
- ▶ Speed software development and lower support costs.
- ▶ Improve operational efficiency and service reliability.

¹ Red Hat report. "2022 Global Tech Outlook," November 2021.



A cloud-native approach to banking infrastructure allows you to break monolithic product and service offerings into smaller, reusable components.

This modular architecture decouples dependencies, allowing you to build, update, and reconfigure products and services more easily, quickly, and reliably.

Considerations for moving to a cloud-native digital banking architecture

Adopting a cloud-native approach to digital services can help you decouple application and infrastructure dependencies for greater flexibility, speed, and innovation. Building an effective digital foundation is an incremental and ongoing process. There are three main areas to consider when planning and adapting your modernization journey: applications, infrastructure, and practices.

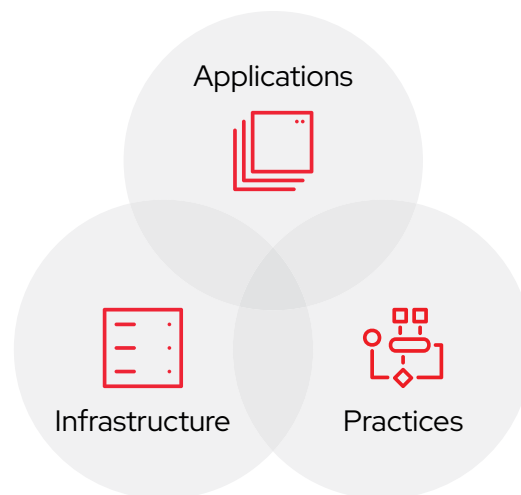


Figure 1. Modernizing your digital foundation and operations requires you to consider your applications, infrastructure, and practices.

Applications

Applications designed for traditional multitier architectures require changes to run on modern cloud-native and container-based infrastructure. Even so, the cost of these changes is offset by simplified development, deployment, and portability across infrastructure and reduced operational costs and risks. You can modernize and containerize applications in several ways:

- ▶ **Lift and shift.** Lifting and shifting packages your application with an optimized operating system and dependencies into a container that can be deployed anywhere your container platform runs. This does not modernize your application architecture – it helps you get started with an agile foundation and gives you more time to rewrite your application.
- ▶ **Decouple with new layers.** Decoupling with new layers adds a new [application programming interface \(API\)](#) layer to existing applications, making them more easily accessible to other applications. As with lifting and shifting, the architecture of the existing application is unchanged.
- ▶ **Rewrite and replace.** Rewriting and replacing involves creating new applications that take full advantage of cloud-native architecture and technologies. As part of an overall modernization strategy, rewriting and replacing can follow lifting and shifting and decoupling with new layers, and it is the only way to update the application architecture for a fully modern stack.

Infrastructure

Flexible, easy-to-consume infrastructure can provide the capabilities and tools needed to support application innovation and transformation. Modern cloud-native and container-based infrastructure allows you to connect and integrate all of your banking systems and channels into a single, unified operating environment. This environment provides a consistent foundation for building and deploying applications across on-site and off-site cloud infrastructure.

[Hybrid cloud infrastructure](#) provides flexible, programmable IT resources with easier access to new tools and capabilities. Connected data streams permit deeper, more sophisticated insights and analytics. Fast, cost-effective replication and failover increases operational resiliency. And dynamic cloud resource pricing and scaling convert capital expenses to more predictable operational costs.

[Kubernetes-based containers](#) help you maximize the value and flexibility of this environment by allowing you to write code once and deploy it anywhere – bare metal, virtualized, or cloud infrastructure. Effective container platforms provide self-service capabilities that let users provision preapproved resources on demand, eliminating wait times and speeding development and operations. They also offer a broad, consistent set of tools, libraries, and runtimes so developers can use their preferred components.

Finally, using an API-focused approach to infrastructure design can ease integration with cloud-based, container-based, and traditional systems, as well as third-party applications. This approach involves joining and accessing internal and external systems, applications, and services via flexible, programmable APIs rather than static connections.

Practices

[Cloud-native practices](#) that focus on iterative workflows, collaboration, automation, and integration can help you adapt to the demands of a digital world. Key practices include:

- ▶ **Service-centric operating models.** Realigning teams around products and services, rather than technology functions, makes it easier to respond rapidly to market changes.
- ▶ **Agile software delivery.** Test-driven development and [continuous integration and continuous deployment \(CI/CD\) pipelines](#) help you create lean, collaborative, and fully automated software delivery life cycles.
- ▶ **Cloud-native architecture design.** Cloud-native architectures break down boundaries between technologies, functions, and teams, allowing you to realign your infrastructure with products, services, and customer needs.
- ▶ **Security-focused service patterns.** Incorporating security and risk management practices throughout your development and deployment life cycles allows you to create a trusted software supply chain and mitigate vulnerabilities in your services more quickly and easily.

Combining these approaches, architectures, and methodologies can help you promote innovation and change within your organization.



Our modular solutions let you deploy the components you need now, integrate with existing systems, and expand as needs change.

Create a digital services foundation with Red Hat

Red Hat can help you modernize your digital infrastructure more efficiently and effectively, so you can deliver integrated services and customer experiences, faster. We provide cloud-native platforms and tools that allow you to run traditional and cloud-native applications in the same environment. Our modular solutions let you deploy the components you need now, integrate with existing systems, and expand as needs change. You can also customize your deployment with access to a large [certified partner ecosystem](#) and open source interoperability.

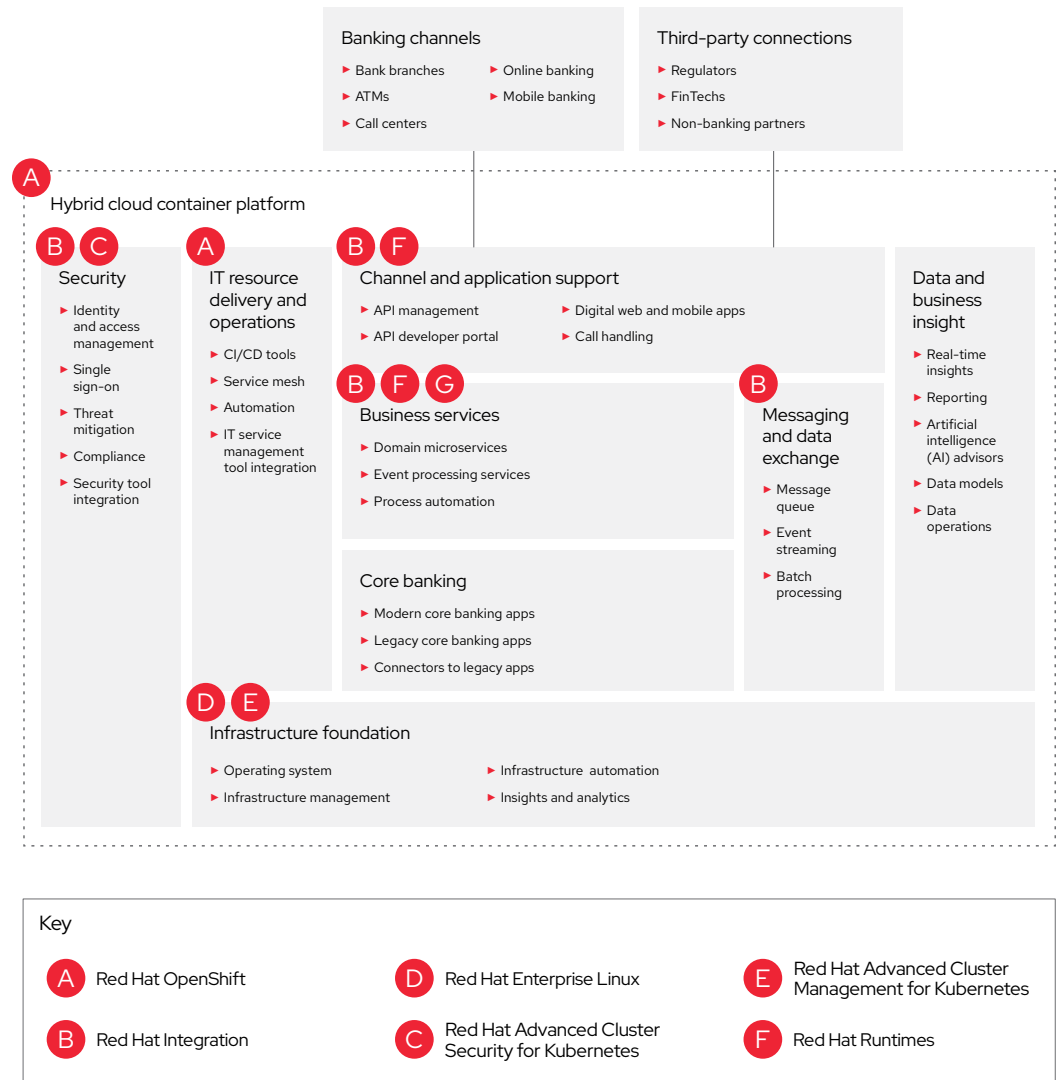


Figure 2. High-level architecture and capabilities of the Red Hat foundation for digital banking services



Red Hat OpenShift Platform Plus is a combined offering for security-focused application delivery and innovation. It includes:

- ▶ Red Hat OpenShift.
- ▶ Red Hat Advanced Cluster Management for Kubernetes.
- ▶ Red Hat Advanced Cluster Security for Kubernetes.
- ▶ Red Hat Quay.
- ▶ Red Hat OpenShift Data Foundation.

[Learn more](#) about Red Hat OpenShift Platform Plus.

Each component provides key capabilities within the solution.

[Red Hat OpenShift®](#) is an enterprise-grade cloud platform with full-stack automated operations to manage hybrid cloud and multicloud deployments. It is optimized to improve developer productivity and promote innovation. It includes [Red Hat OpenShift Service Mesh](#) and [Red Hat OpenShift Pipelines](#) for building effective microservices architectures and CI/CD workflows.

[Red Hat Runtimes](#) is a set of products, tools, and components for developing and maintaining cloud-native applications. It offers lightweight runtimes and frameworks for highly distributed cloud architectures like microservices. Key technologies within Red Hat Runtimes:

- ▶ The [Red Hat build of Quarkus](#) – a Kubernetes-native Java™ framework for building lightweight microservices and serverless applications – is integrated with Red Hat OpenShift and features low memory use, fast startup times, support for popular Java standards, and an enhanced developer experience.
- ▶ [Red Hat Data Grid](#) is an in-memory, distributed, NoSQL datastore solution that lets your applications rapidly access, process, and analyze data.
- ▶ [Red Hat Single Sign-On](#) is an identity provider solution that implements federated authentication for web applications, mobile applications, and RESTful web services. It is compatible with open banking standards like Financial-grade API (FAPI) and Client-Initiated Backchannel Authentication (CIBA).

[Red Hat Integration](#) is a comprehensive set of integration and messaging technologies that connect applications and data across hybrid infrastructures. Key components within Red Hat Integration:

- ▶ [Red Hat Fuse](#) is a distributed, cloud-native integration platform that uses an API-centric, container-based architecture to decouple services, allowing them to be created, extended, and deployed independently.
- ▶ [Red Hat 3scale API Management](#) allows you to share, secure, distribute, control, and monetize your APIs on an infrastructure platform built for performance, customer control, and future growth.
- ▶ [Red Hat AMQ](#) is a flexible messaging platform that delivers information reliably, permitting real-time integration and connecting the Internet of Things (IoT).

[Red Hat Advanced Cluster Management for Kubernetes](#) offers end-to-end visibility and control to manage your Red Hat OpenShift clusters and application life cycles, along with improved security and compliance of your entire Kubernetes domain.

[Red Hat Advanced Cluster Security for Kubernetes](#) is an enterprise-ready, Kubernetes-native container security solution that helps you build, deploy, and run cloud-native applications more securely.

[Red Hat Enterprise Linux®](#) is an open source operating system that creates a consistent foundation for deploying applications across bare-metal, virtualized, containerized, and all types of cloud environments.

Customize your deployment with certified partner products

Red Hat's open business model focuses on collaboration and partnership to bring vendors, customers, and communities together. The Red Hat ecosystem connects industry-leading hardware, software, and cloud partners, as well as trusted open source communities, to create diverse innovative, validated, integrated solutions for the banking industry. Our certified partner ecosystem can provide:

- ▶ Complete, interoperable solutions based on certified components.
- ▶ Increased choice of technologies and services.
- ▶ Greater banking operations and infrastructure scalability and flexibility.
- ▶ Innovation and best practices that have been proven across industries.

Find certified ecosystem partners and products on the [Red Hat Marketplace](#).

Take your digital transformation journey further with Red Hat Consulting

Red Hat experts can help you, your team, and your organization develop the practices, tools, and culture needed to more efficiently modernize your existing banking infrastructure, architecture, and applications and to build new ones using technologies like containers, Kubernetes, databases, and data analytics. Engage [Red Hat Consulting](#) to help you deploy a cloud-native foundation for digital services, or schedule a [Red Hat Open Innovation Labs](#) residency. This immersive residency pairs engineers with open source experts to learn how to successfully adopt Red Hat technology and open source practices.

Customer success highlight: ANZ

Australia and New Zealand Banking Group Limited (ANZ), a multinational banking and financial services company with a purpose of helping to shape a world in which people and communities thrive, needed to modernize an aging core banking application that supported its internet banking platform. To prepare its internet banking platform for ongoing reliability and effectiveness, ANZ decided to adopt a containerized platform to remain architecturally aligned with the core banking platform upgrade path. With the help of Red Hat Consulting, ANZ deployed Red Hat OpenShift, Red Hat Enterprise Linux, and Red Hat Runtimes as the foundation of its internet banking platform. With Red Hat OpenShift, ANZ will be able to reuse the internet banking services that are upgraded and transitioned for the bank's other channels like its mobile banking application.



"Collaborating with Red Hat to use its open source solutions means we can meet the scalability, reliability, supportability, and security requirements to host our internet banking platform. Together we were able to build deployment pipelines that enable us to reuse code, rapidly test and retest deployment, as well as meet the stringent performance and volume testing criteria."

Raghavendra Bhat
Lead Digital, Tech Area,
Australia and New Zealand
Banking Group Limited



Launched the new application version in production while running and migrating services from the original



Processed AU\$2.9 billion worth of scheduled payments within the first hour of production use



Reduced unplanned outage time for the internet banking platform by around 80%

Read the [press release](#) to learn more about ANZ's experience.



"Our private cloud is a first for the Middle East's banking sector. As a critical pillar of our four-year transformation, it helps us deliver significant, innovative benefits to our customers."

Miguel Rio Tinto
Group CIO, Emirates NBD

Customer success highlight: Emirates NBD

Emirates NBD, a leading banking group in the United Arab Emirates (UAE), embarked on an ambitious multimillion-dollar digital transformation initiative to enhance its end-to-end technology platform, increase software delivery speed, and reduce long-term operational costs. The bank built a centralized private cloud platform using Red Hat cloud and integration technologies. With this new platform, Emirates NBD simplified collaboration with third-party partners, cut software development cycles by months, and launched innovative digital engagement capabilities to compete with cloud-native companies. Now, it can take advantage of emerging technology to offer the services modern consumers in key markets demand.



Simplified collaboration between internal teams and with partners using APIs



Reduced application launch and update cycles from 6-18 months to hours



Built a flexible yet stable foundation for private cloud now and hybrid cloud later

Read the [customer success story](#) to learn more about Emirates NBD's experience.



"Participating in Red Hat Open Innovation Labs and adopting technology like Red Hat OpenShift has demonstrated our commitment to exploring new ideas. We aim to attract passionate professionals, and we can't do that if we're working with proprietary, closed-source technology using traditional methods."

Joaquín Moraga Gallego
Head of Architecture,
Santander Tecnología

Customer success highlight: Santander Tecnología

Santander Tecnología, the in-house technology division of Santander Group, supports the group's digital transformation efforts to improve the customer experience. As part of this work, Santander Tecnología adopted Red Hat OpenShift and Red Hat Data Grid with help from Red Hat Consulting. At a residency with Red Hat Open Innovation Labs, Santander Tecnología's teams learned new agile, DevOps, and CI/CD approaches, as well as Red Hat OpenShift best practices. The group has now used efficient, responsive capabilities to reduce time to market from weeks to minutes.



Reduced provisioning time from weeks to 10-12 minutes



Established CI/CD and DevOps processes for faster time to market



Improved ability to attract and retain skilled talent

Read the [customer success story](#) to learn more about Santander Tecnología's experience.

Learn more




Digital banking is a requirement for future success. Deploying a cloud-native foundation and modernizing your banking applications can help you deliver enhanced customer experiences, support new business models, and streamline operations and costs. Red Hat hybrid cloud solutions give you the flexibility, integration, and innovation you need to digitally transform now and continue to adapt to future change.

[Discover more about Red Hat solutions for digital banking.](#)



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 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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