

How to get the benefits of cloud behind your firewall: IBM Cloud Private



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Introduction

For most, the cloud represents accessing and consuming someone else's compute resources. Images of a team of minions and automation quickly come to mind. While you no longer control the environment, you can now dynamically provision and access compute resources to build, test and scale all manner of applications and services. But what happens when you can't give up control for strategic or regulatory reasons?

Many organisations are grappling with the need to work faster, deliver sooner and scale infinitely but, in many cases, cannot run their applications on the public cloud. Most of the time they are held back by regulatory and legal requirements. Others do not want their strategic assets to leave their organisation. Does this mean that organisations with sensitive or strategic applications will lose out on the benefits of a cloud architecture? No. We believe a Private cloud can bring the benefits of a public cloud behind your firewall.

A private cloud is like a fenced-in backyard with a gate to surrounding properties and public spaces. It can give you many of the benefits of a public cloud with the additional control and security of dedicated resources.

Protecting data is critical in highly regulated industries or when building mission-critical applications. In addition, getting to market faster, iterating faster and attracting new customers faster is top of mind to executives at every company. And even though cloud computing is a major force in business innovation, it also brings challenges. Your cloud is only as private as the technology that protects it. It's only as flexible and scalable as the technology that it's built on. It's only as intuitive as the platform provider's knowledge of your workloads.

What is private cloud?

A private cloud allows companies to customise their environments according to their own unique needs and based on their own security requirements. Private cloud leverages the benefits of public cloud, including rapid deployment, scalability, ease of use and elasticity, but can also offer additional capabilities such as greater control, increased performance, predictable cost, tighter security and

flexible management options.

Developers need to innovate in secure and regulated environments

Today, enterprise developers are being asked to take ideas, turn them into code, test that code, iterate and then scale in a matter of weeks.

As an example, consider the requirements of an enterprise developer, Jane. Jane wants to immediately leverage continuous integration and continuous delivery to rapidly develop, test and deliver her data-sensitive or strategically important applications. Jane may have responsibility for the maintenance and evolution of a heritage application. She wants access to enterprise modernisation tools and guidance to reap additional benefits in elasticity, dynamic resource provisioning and exposure of capabilities via services for her heritage application. Developers like Jane are not looking to build core services like logging, monitoring or security because those things keep developers from getting to market fast. Jane needs common, value-added services like data and application runtime services that provide prescriptive guidance for all types of tasks.

Administrators need to empower developers

Jane is not the only one who cares about agility and the need to deliver applications quickly within an on-premises context. IT administrators and operators need to empower enterprise developers building on a private cloud, including operators like Todd. Todd needs to have confidence in his organisation's private cloud platform because he ensures that policies and regulations are met. Among other things, his role requires him to:

- Be confident that corporate data is secure and in compliance with government regulations and/or industry standards
- Be able to monitor and see all of the applications running on the platform and quickly update workloads and the underlying platform using continuous delivery techniques, all without requiring downtime
- Have transparency into the costs of the platform to recoup through charges and charge-backs
- Use a platform that helps him govern the lifecycle of its assets and provides efficient support for its use
- Have the ability to automatically manage the backup, recovery and disaster failover of his applications and their data into alternate locations.

Developers and administrators need to support each other

Jane and Todd, while occupying different roles, are inextricably linked in their day-to-day activities. Without a secure, up-to-date and reliable platform managed by Todd, Jane can't innovate in a rapidly changing business context. Todd, on the other hand, needs to ensure that he can give Jane the tools, speed and flexibility required to build business-critical applications, even in sensitive or highly regulated environments. A private cloud platform, one which intuitively acknowledges the needs of enterprise workloads, can help facilitate and strengthen Jane and Todd's work so that the enterprise can benefit from agile development practices and rapid iteration.

When we think about what Jane and Todd are trying to accomplish on a private cloud platform, three overarching use cases come to mind:

1. Optimise apps with cloud
2. Open data centers to work with cloud services
3. Create new cloud native applications.

Optimise apps with cloud: Enterprises have application estates that would benefit from modernisation to rapidly meet today’s highly dynamic business environment. These applications are monolithic and not easily extended to develop new applications. They are also difficult to manage and require specialists who know the ‘ins and outs’ of how the applications were architected over time. For these reasons, the company wants to modernise its heritage applications, making them cloud-enabled, componentised and consistently managed.

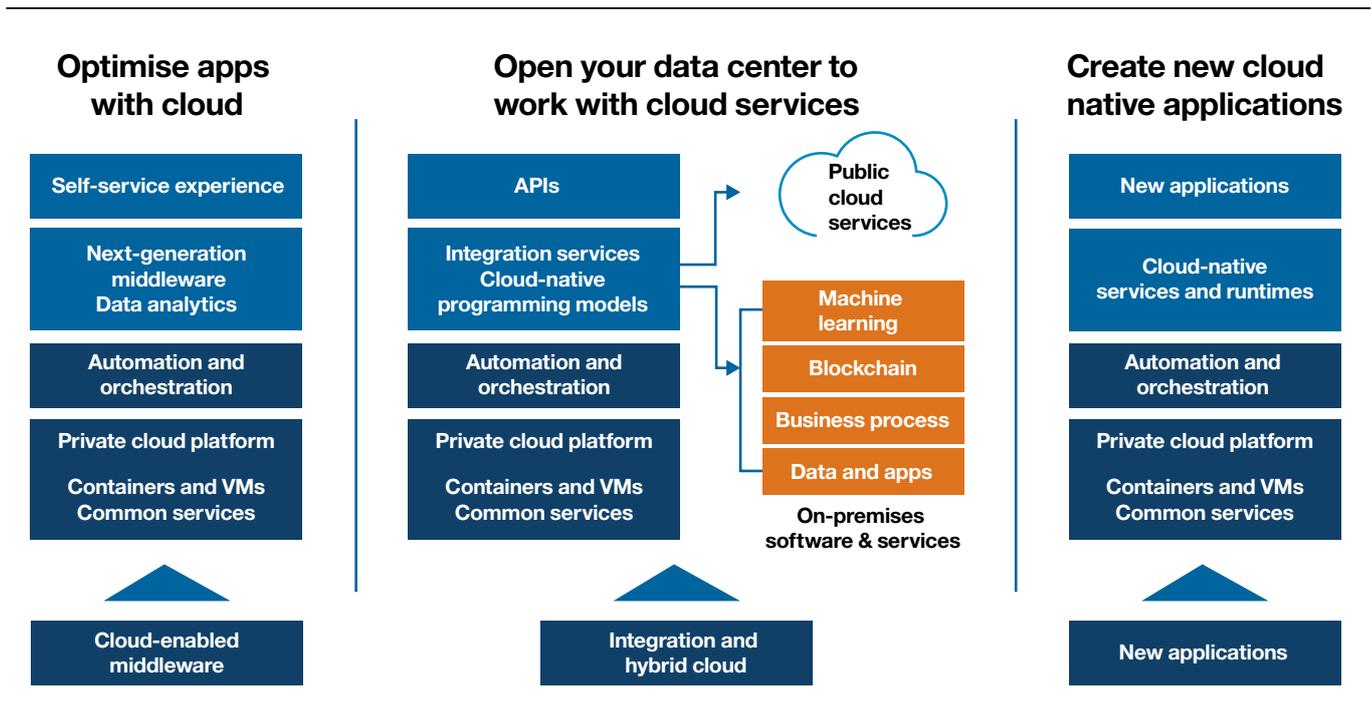


Figure 1: Three overarching use cases for a private cloud platform.

Heritage applications represent a great deal of investment, making it unrealistic to simply throw it all away. A better strategy is to consider an evolutionary approach with reuse of key parts within the best framework. One approach commonly considered is a microservices architecture. Essentially, the approach constructs systems out of a collection of small services, each with its own process that talk via lightweight protocols. Refactoring heritage applications, or parts thereof, into microservices often makes the most sense to keep your existing systems running while you evolve to a more sustainable development model. For a deeper discussion around the microservices architecture, take a look at [this post](#) within the IBM® Cloud Architecture Center.

Open data centers to work with cloud services: Today's enterprise developers are looking to add more functionality to the applications they are building. Jane wants to create cloud-native applications on a private cloud platform that can integrate data and application services from existing applications or new, public cloud services. She also wants access to the immense processing capacity available on her mainframe for large analytics jobs. Imagine pulling mainframe data into an application built on a private cloud that can leverage an external push notification service hosted on a public cloud.

Create new cloud-native applications: Enterprises have a critical need to create cloud-native, 12 factor-based applications while adhering to the security and regulatory needs of their business. Here is where Jane and Todd can blaze a new path of enterprise application innovation on a private cloud. Cloud-native applications are built with a variety of runtimes, but application portability should be a key feature of any cloud platform, public or private. Therefore, Jane should be empowered to build cloud-native applications anywhere and move them anywhere, leveraging the tool chains that Jane loves without compromising the security and compliance that Todd requires.

Why IBM Cloud Private?

The IBM Cloud Private offering is a direct reflection of IBM experience in helping enterprise developers build cloud-native applications and refactoring monolithic applications. Let's look at the principles that guide the IBM Cloud Private platform.

Enterprise-focused platform: As mentioned earlier, the microservices architecture is an approach that has gained momentum within enterprise developer communities over the past few years. Many of the advantages of microservices come from resource isolation, scale up and scale down and lightweight, portable movement of applications workloads. However, as the number of microservices constituting an application grows, management and overhead become more and more complex. Developers need to discover existing services to avoid duplication while administrators need to ensure that they can monitor and secure the environment. Therefore, IBM has delivered a platform that both Todd and Jane can use to build, deploy and manage enterprise workloads built as microservices. IBM Cloud Private is designed to adhere to the best practices of building with microservices from engagements with developers in the [IBM Cloud Garage](#).

Application services: Application services are runtimes, middleware, data and other value-added services that can be added to cloud-native applications or connected to existing applications. IBM Cloud Private makes it easier to stand up an elastic runtime that is based on a variety of workloads. The platform embraces open-source. IBM packages both open-source and IBM middleware and databases that enterprises need to build applications more quickly and securely. Along with capabilities to build and run enterprise workloads, we're also delivering enhanced support to run CPU-intensive capabilities such as machine learning or data analytics faster by taking advantage of GPU clusters. These application services have been built or re-imagined for cloud-native workloads and are informed by IBM's long

history and experience with enterprise workloads. Jane can use the application services she wants and knows, while Todd can help ensure that the catalog of services is up to date and made available to the appropriate development teams.

Learn more about microservices architecture:

- Microservices with Kubernetes
- Microservices with OpenWhisk and Cloud Foundry

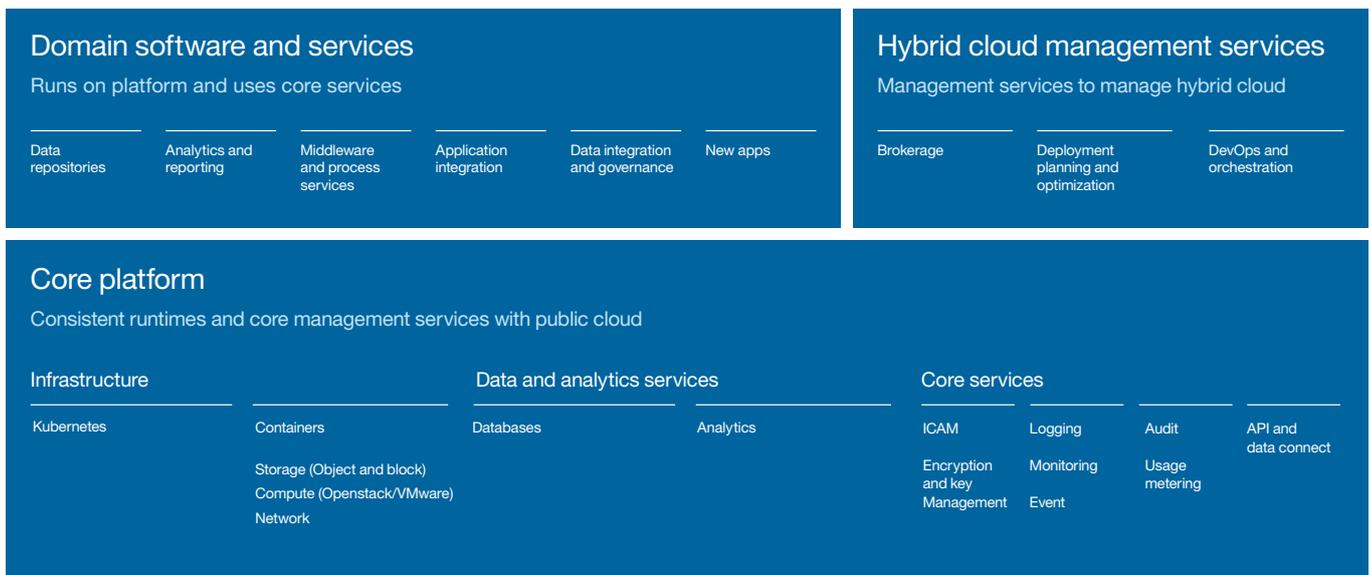


Figure 2: A closer look at IBM capabilities in a private cloud platform.

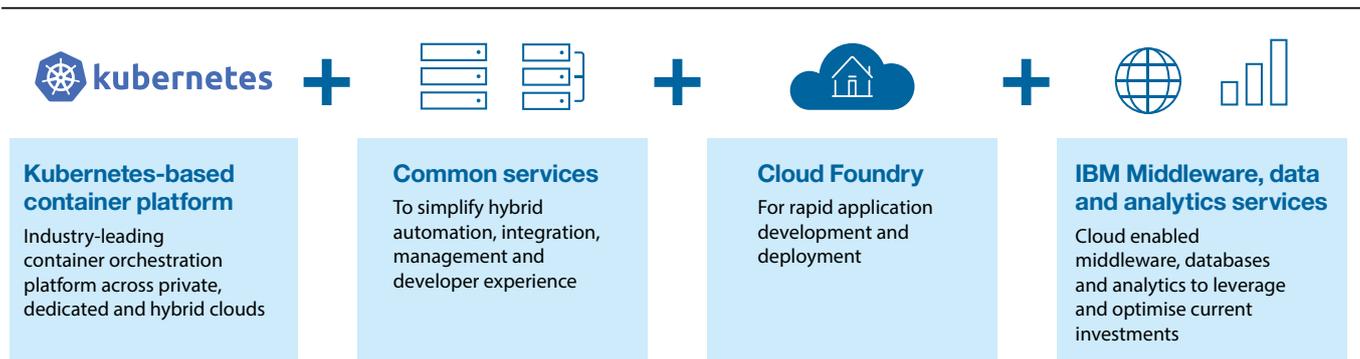
More about IBM Cloud Private

IBM Private Cloud is built with flexibility to integrate easily into your data center and is designed for compatibility with leading systems manufacturers that include Cisco, Dell EMC, Intel, Lenovo and NetApp. It is optimised for IBM Z, the security-rich transaction platform, IBM Power Systems designed for Artificial Intelligence (AI) and cognitive workloads, IBM Hyperconverged Systems powered by Nutanix software and IBM Spectrum Access data management and infrastructure solution from IBM Storage. In addition, IBM Cloud Private offers the ability to deploy via VMware, Canonical and other OpenStack distributions or bare

metal servers.

Taking a closer look at how IBM is delivering this set of capabilities in a private cloud platform, we deliver a choice of open-source application runtimes, consistent with IBM public cloud offering, Kubernetes and containers or Cloud Foundry technology.

Customers can choose the prescriptive development approach of Cloud Foundry, or the more customisable and portable approach of Kubernetes and Docker Containers. Consistency with the IBM public cloud gives clients a choice of deployment models across the lifecycle of their workload and a more consistent management experience as the workload evolves and matures.



Kubernetes-based container platform

Industry-leading container orchestration platform across private, dedicated and hybrid clouds

Common services

To simplify hybrid automation, integration, management and developer experience

Cloud Foundry

For rapid application development and deployment

IBM Middleware, data and analytics services

Cloud enabled middleware, databases and analytics to leverage and optimise current investments

Figure 3: IBM offers a number of development approaches along with a core set of management services.

Along with the application runtime frameworks, IBM delivers a core set of management services for these frameworks and the applications being developed on top. Some examples of the management services include logging, monitoring, access control and event management. Clients can use these management tools integrated with the platform out-of-the-box. These are tools frequently used by enterprise clients today and leverage existing skills. If needed, these tools can be integrated with enterprise instantiations, so that the management needs are operationalised from one location.

Perhaps one of the most beneficial aspects of the IBM Cloud Private platform are the application services that move innovation from idea to reality. IBM Cloud Private is designed to provide an end-to-end solution for your applications, including popular open source frameworks and languages, built in DevOps, integrated monitoring and industry-leading enterprise solutions from the IBM middleware, data and analytics portfolio. These services are crucial for enterprise application creation and with IBM Cloud Private, they can be deployed rapidly and ready to accelerate your ideas.

Getting started

Ready to put the power of IBM Cloud Private in your hands?

- **Try IBM Cloud Private - Community Edition**

IBM Cloud Private - Community code provides a platform to develop and manage on-premises, containerised applications. It is an integrated environment for managing containers that can include Kubernetes orchestration, a private image repository, a management console and monitoring frameworks. IBM Cloud Private -

Community is available as a no-charge trial for non-production environments.

- **Develop and deploy cloud native applications with IBM Cloud Private - Cloud Native**

IBM Cloud Private - Cloud Native is a direct reflection of IBM's experience in helping enterprise developers build cloud-native applications. It drives enterprise transformation by providing developers with choices for languages, frameworks, runtimes and services to build cloud-native applications and microservices. It also drives innovation based on existing and new services such as Blockchain, machine learning, data and cognitive capabilities that developers can infuse into their applications.

- **Modernise your existing applications with IBM Cloud Private - Enterprise**

For years, enterprises have invested heavily in IBM middleware (such as IBM Websphere Application Server, IBM Db2, IBM UrbanCode Deploy and IBM MQ), which is the foundation on which many of their critical applications are built. With new containerised versions of IBM middleware available through IBM Cloud Private - Enterprise, organisations can optimise existing investments and modernise the applications to help accelerate future business innovation. IBM Cloud Private - Enterprise delivers a focused platform and is designed to adhere to the best development practices.

- [Talk to developers on Slack](#)
- [Learn more about IBM Cloud Private](#)



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