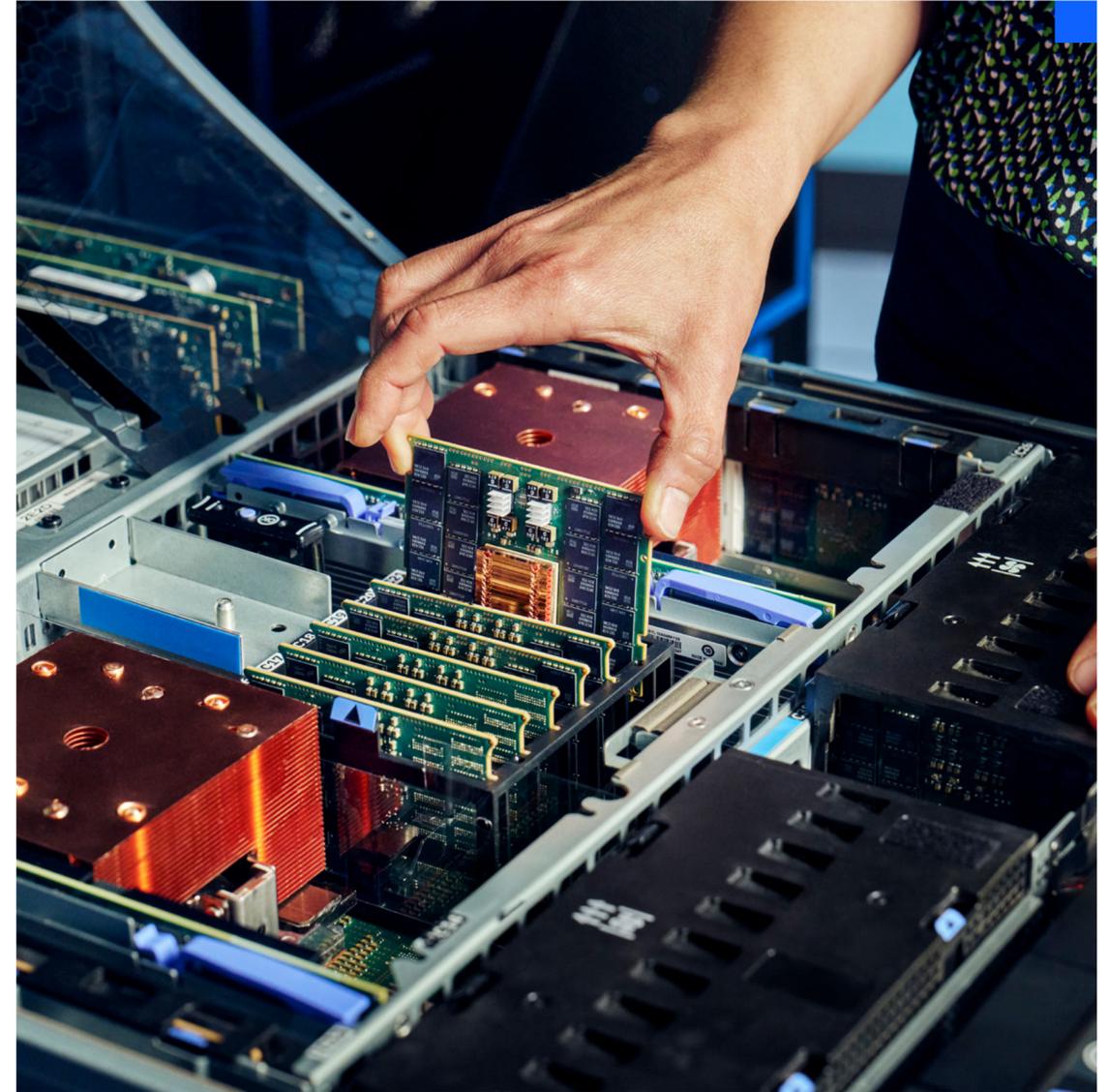


Navigating your
hybrid multicloud
vision with
↔ IBM Power



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Life in a hybrid multicloud world



Cloud computing has undoubtedly changed how enterprise IT is delivered by opening the door to compute and storage resources, seemingly without limits. The additional wealth of cloud services—artificial intelligence and more—is empowering IT administrators to leverage and create the next wave of enterprise innovation. This paper provides a practical guide for [IBM® Power®](#) users to gain an understanding of the portfolio and learn how to map out a journey to a secured and reliable hybrid multicloud infrastructure.

Navigating a complex IT infrastructure
Whether you're creating an on-premises private cloud, leveraging one or more off-premises public clouds or taking a hybrid cloud approach, cloud infrastructure capabilities can expand your business opportunities.

Given the broad range of cloud technologies, this paper helps IBM Power users running [IBM AIX®](#), [IBM i](#) and [Linux®](#) enterprise applications understand these capabilities and create a technology roadmap in a straightforward and methodical manner.

**A need for a clear vision**

One billion new applications are expected to hit the market by 2028,¹ putting IT on notice to respond to growing demand without compromising business results.

A constantly evolving, fast-paced AI technology space is one of the main forces driving this demand. It's a huge challenge to respond properly without creating silos—or navigating through them. Additionally, there's the risk of downtime—increasing expenses dramatically—or not having the right skills.

What is hybrid multicloud?

A hybrid cloud is a computing environment that combines a private cloud and a public cloud by allowing applications and data to be shared between them. A multicloud refers to a cloud environment made of more than one cloud service from more than one cloud vendor. A hybrid multicloud thus combines a private cloud, a public cloud and more than one cloud service from more than one cloud vendor.

A multicloud strategy can unlock tremendous organizational value because it combines the best of both private cloud and public cloud. It allows organizations to run mission-critical applications and host sensitive data on premises while taking advantage of the flexibility offered by public cloud, and it enables the movement of information between the private and public services.

Hybrid multicloud motivators and use cases

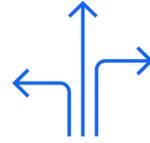


There are several motivators driving enterprises to construct a hybrid multicloud platform. Let's explore some of the more common scenarios for Power customers, several of which are often pursued in parallel.



Deliver streamlined deployment of enterprise resources, including AIX, IBM i and Linux virtual machines (LPARs), and containerized applications

Users have grown to expect easy and on-demand access to IT resources through a cloud experience. Developers, quality assurance (QA) engineers and line-of-business users want simplified access to infrastructure and applications. IT administrators want trusted enterprise-grade security and simplified operations. All these needs can be addressed by adopting Power hybrid multicloud technologies and processes within the data center.

**Increase operational and budgetary flexibility by leveraging IBM Power in a public cloud**

One of the major advantages of a public cloud is that it provides virtually limitless access to compute capacity, billed as an operational expense. With a few clicks of the mouse on cloud.ibm.com, users get immediate access to new virtual machines or containers—where they want, when they want. IBM Power Virtual Server is the perfect place to spin up QA, production or high availability (HA) and disaster recovery (DR) environments for your Power estate.

**Modernize existing applications to adopt cloud-native software development principles**

Containers, Kubernetes and Red Hat® OpenShift® have transformed how software is packaged, installed and operated, paving the way for new software delivery models. Enterprises worldwide are exploring container technology and developing plans on how to integrate them into their technology stacks. At the same time, they must smartly manage the ongoing business need to deploy, manage, operate and integrate with today's virtual machine-based applications.

**Integrate IBM Power with the broader cloud strategy**

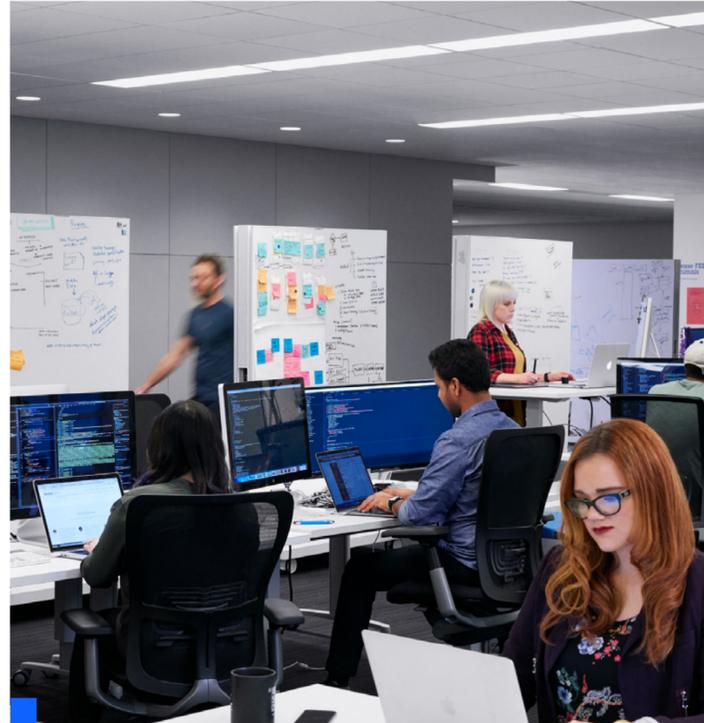
As the industry continues to shift toward hybrid multicloud environments, a comprehensive cloud management strategy has become increasingly important. Long gone are the days of building siloed infrastructures. Enterprises are striving toward a model of interconnectedness so that the collective strength of their platforms and cloud providers can be leveraged to create the next wave of innovation.

High-level reference architecture



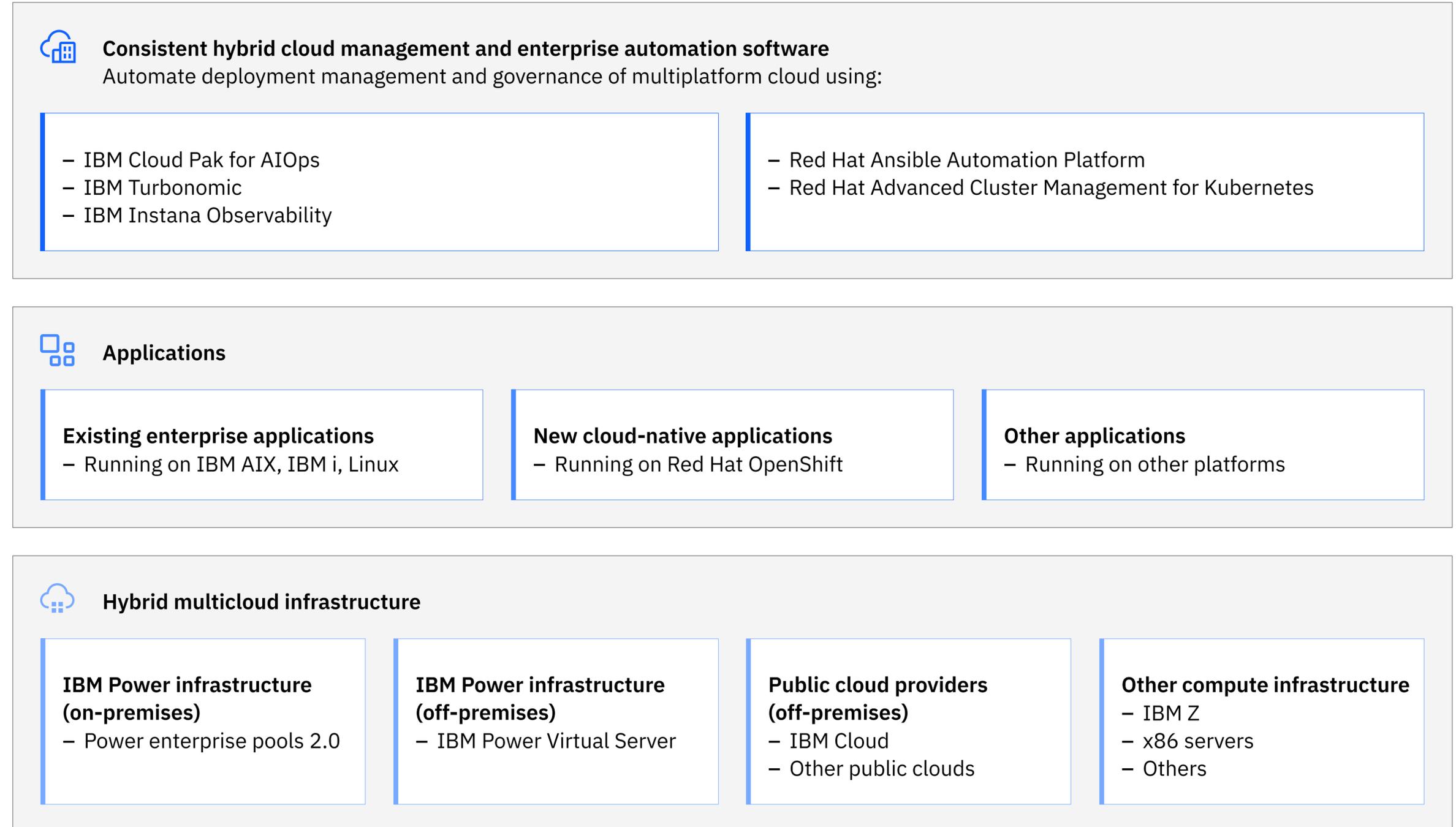
Figure 1 on page 9 shows a hybrid multicloud reference architecture including the major industry hardware platforms—IBM Power, IBM Z® and x86. Power is designed and built to economically scale mission-critical and data-intensive applications—virtual machine-based or containerized—delivering reliability to run them and reducing the cost of operations with built-in virtualization to optimize capacity utilization. It also provides flexibility to deploy applications in the cloud of your choice.

From a cloud deployment perspective, the on-premises private cloud solution includes IBM Power Virtualization Center (PowerVC) and IBM Power Private Cloud with Shared Utility. PowerVC provides the infrastructure-as-a-service (IaaS) layer and IBM Power Private Cloud with Shared Utility—referenced as Power Enterprise Pools 2.0—delivers a pay-per-use consumption model with permanent activation of installed capacity. These solutions deliver the agility and economics of cloud in an on-premises environment while enabling organizations to rapidly respond to shifts in workload demand.



Power servers are also available on IBM Cloud® and in other public clouds, providing flexibility and choice for deploying HA and DR, DevTest and more. Sitting atop the infrastructure layer is Red Hat OpenShift, which provides the enterprise Kubernetes platform-as-a-service (PaaS) layer. Red Hat OpenShift users can run their software of choice, including IBM's enterprise software delivered through the IBM Cloud Pak® solutions, independent software vendor (ISV) software, open-source software and custom enterprise software.

To manage and operate everything from a centralized location, the IBM Cloud Pak for AIOps, IBM Turbonomic® and IBM Instana® platforms can be used to connect historically separate cloud infrastructures. Lastly, the Red Hat Ansible® Automation Platform can be leveraged across the entire landscape to provide a consistent approach to manage all your operating systems and cloud infrastructures—regardless of the platforms you're running.

Hybrid multicloud
reference architectureFigure 1. Hybrid multicloud
reference architecture

Journey to the hybrid multicloud



While each organization will have its own unique characteristics, Figure 2 on page 11 serves as a general blueprint to guide Power users through the myriad of cloud technologies and remove the mystery from the cloud journey. The path to hybrid multicloud begins with a solid foundation of infrastructure and hardware management capabilities. Users should then establish a cloud experience within their own data center—that is, a private cloud. This move will enable simplified virtualization management and operations, advanced automation, and provide a platform to start building innovative cloud-native applications leveraging Red Hat OpenShift, Kubernetes and containers.

Parallely, it's also recommended that users explore the public cloud to spin up QA, production or HA and DR environments without the need to procure and administer the infrastructure in your data center.

Finally, users need to establish robust connectivity between their on-premises and off-premises infrastructures so that applications and data can flow seamlessly between the two.

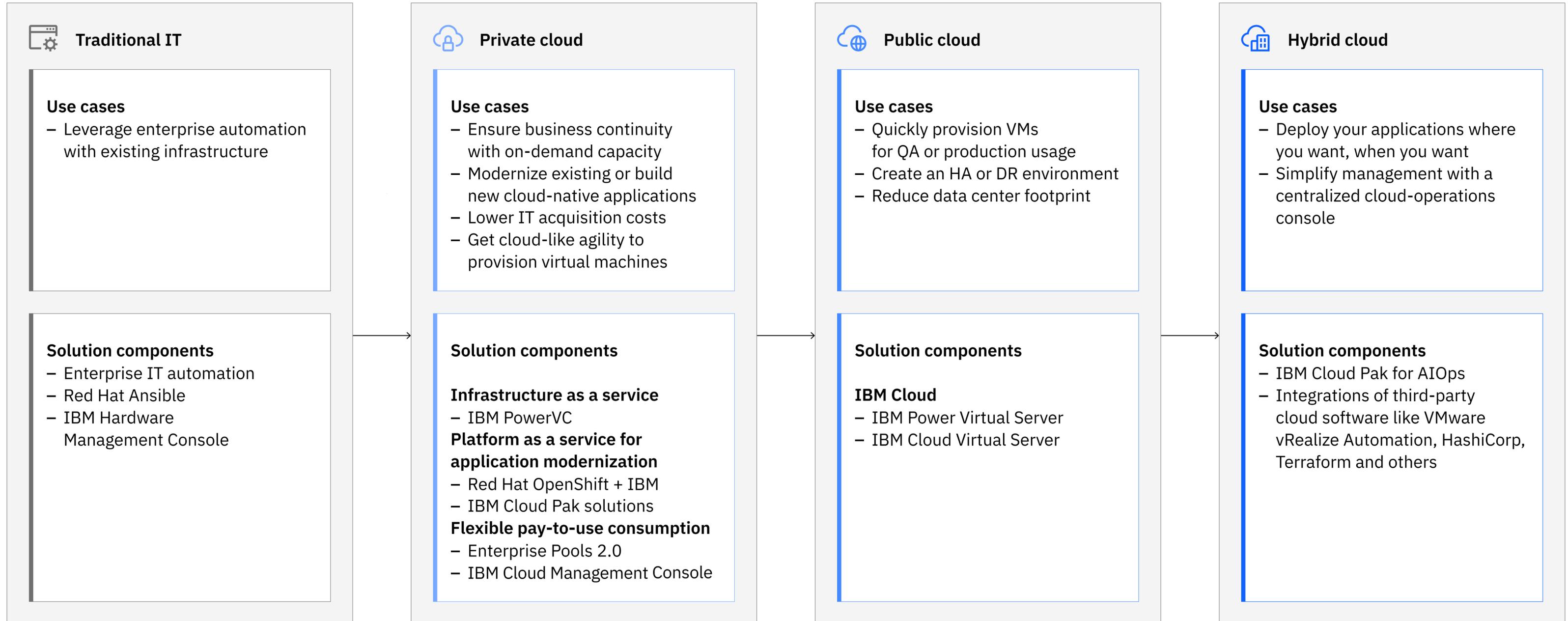


Figure 2. Reference product journey to hybrid multicloud

Deploy hybrid cloud on IBM Power



Boost business continuity and lower IT acquisition costs with on-prem private cloud

Power Enterprise Pools 2.0 delivers enhanced multisystem resource sharing and by-the-minute consumption of on-premises compute resources for clients deploying and managing a private cloud Power infrastructure. It provides comprehensive flexibility for clients to tailor initial Power configurations with the right mix of purchased and pay-per-use capacity across a collection of systems in their enterprise.

With Power Enterprise Pools 2.0, purchased processor activations, memory activations and operating system resources are seamlessly and independently shared across a set of systems. Any remaining unpurchased processor and memory capacity on systems in the set is then activated and made available on a pay-per-use basis, metered by the minute.

The IBM Cloud Management Console for Power helps monitor resources easily. It automatically tracks usage and provides sophisticated drill-down views of real-time and historical resource consumption by virtual machine for all systems within a pool.

The Power processor-based infrastructure can deliver cloud-like economics on prem to enable IT teams to seamlessly automate application deployment and balance workloads across systems. Power Enterprise Pools 2.0 offers a unique and innovative way to reduce overprovisioning of resources required to help ensure business continuity and maintain service levels during unforeseen spikes in demand. And its by-the-minute metering ensures users pay only for the precise amount of capacity consumed.

PowerVC provides on-premises enterprise virtualization management for IBM Power, including AIX, IBM i and Linux guest VMs. Built on OpenStack, it provides a multitenant IaaS layer in your data center, enabling administrators to quickly provision new virtual machines in minutes.

IBM PowerVC provides numerous operational benefits:

- One-click system evacuation for simplified server maintenance
- Dynamic resource optimization to balance server usage during peak times
- Automated VM restart to recover from failures
- Importing and exporting of VM images for cloud mobility

It enables DevOps capabilities such as infrastructure as code by way of Red Hat Ansible or HashiCorp® Terraform®. PowerVC provides the foundational technology on top of which the rest of the on-premises Power cloud stack is built.

Reduce your data center footprint and get cloud agility with public cloud

[IBM Power Virtual Server](#) integrates AIX, IBM i and Linux workloads into the IBM Cloud experience and supports deployment on Power11-based server infrastructure. Users benefit from rapid self-service provisioning, flexible infrastructure and OS image management and access to enterprise-grade cloud services. Billing is usage-based—prorated by hour—for compute, memory, storage and OS licensing, so customers pay only for what they deploy.

Users can easily export virtual machine images in the standard open virtual appliance (OVA) format from PowerVC and upload them onto IBM Cloud for easy back-and-forth image mobility. With this public cloud solution, Power users can grow at their own pace and run enterprise workloads when and where they choose, with a variety of flexible operating systems, compute, storage and networking configurations.



Simplify hybrid cloud management

Hybrid cloud environments offer flexibility but are complex to manage. Organizations need the right tools that can simplify management of heterogeneous environments of public and private cloud systems and data centers.

Managing your hybrid cloud presence with Power provides cost-effective and compelling offerings. With Power solutions, you can support and manage hybrid cloud landscapes, automate end-to-end IT operations and modernize cloud-native applications.



Virtual infrastructure management

IBM Cloud Pak for AIOps integrates a virtual landscape into a consistent user experience, greatly simplifying management of your hybrid cloud resources. IBM Cloud Pak for AIOps not only enables teams to understand the health and performance of applications and infrastructure, it also delivers insights and recommendations to leverage automation, delivering efficiencies and results for your business.

[Learn more →](#)



Enterprise observability

IBM Instana provides enterprises a comprehensive observability platform that covers not only what's in their data centers but also across public cloud providers and across all platforms, including IBM Power, IBM Z and x86. From the standpoint of capabilities, Instana provides enterprise observability, automatic application performance monitoring and hybrid and multicloud monitoring.

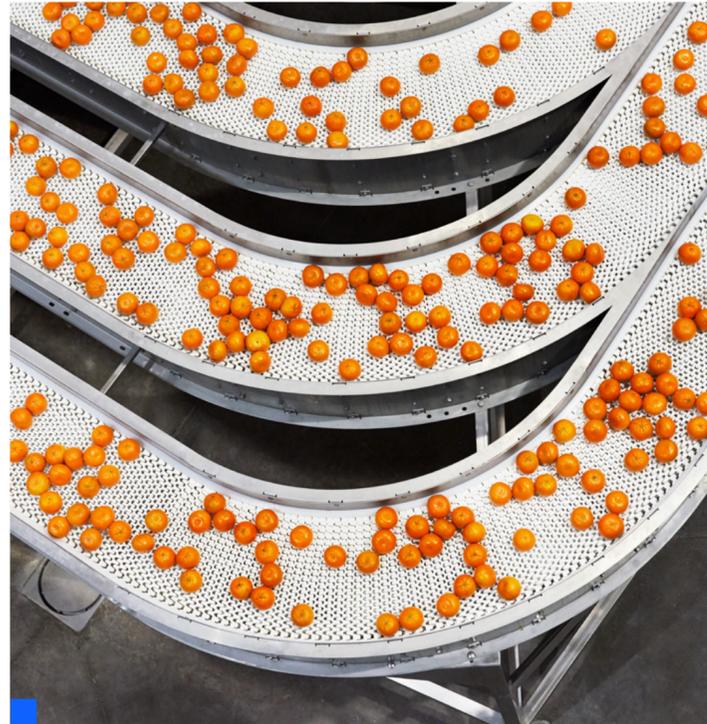
[Explore more →](#)



Resource optimization

IBM Turbonomic enables ongoing resource optimization across any cloud infrastructure. The platform continuously makes resourcing decisions that ensure applications get the compute, storage and network resources they need, while automatically accounting for business constraints. Turbonomic also provides continuous performance assurance with AI-powered software, increased IT productivity and true full-stack visibility for application and infrastructure teams.

[Discover more →](#)

**Enterprise application modernization**

Red Hat Advanced Cluster Management for Kubernetes aggregates the management of multiple Kubernetes or Red Hat OpenShift Container Platform clusters into a single management framework.

With such a framework, you can see all your clusters and applications from a single place more easily. You can even deploy new applications and define policies to help ensure every cluster is adhering to organizational standards and best practices.

Cloud-native applications

Red Hat OpenShift is a single platform for application innovation. It enables organizations to operate consistently across any infrastructure with full-stack automated operations and streamlined developer workflows, empowering teams to innovate continuously and outpace rising customer expectations.

Red Hat OpenShift helps organizations accelerate their cloud-native journey. They can use a trusted platform to build new cloud-native, containerized applications, while benefiting from the reliability, adaptability and performance provided by IBM Power. Designed to offer flexibility and choice for a variety of cloud-consumption models, Red Hat OpenShift on IBM Power helps establish a hybrid cloud environment, enabling organizations to be ready for today and build for the future.



Solutions to build
cloud-native applications

[IBM Cloud Pak solutions](#) are enterprise-ready containerized software solutions that provide an open, fast and secured way to move core business applications to any cloud. They are lightweight, easy to run and certified by IBM and Red Hat. Each IBM Cloud Pak sits atop Red Hat OpenShift and can run anywhere—On prem, in the cloud or at the edge.

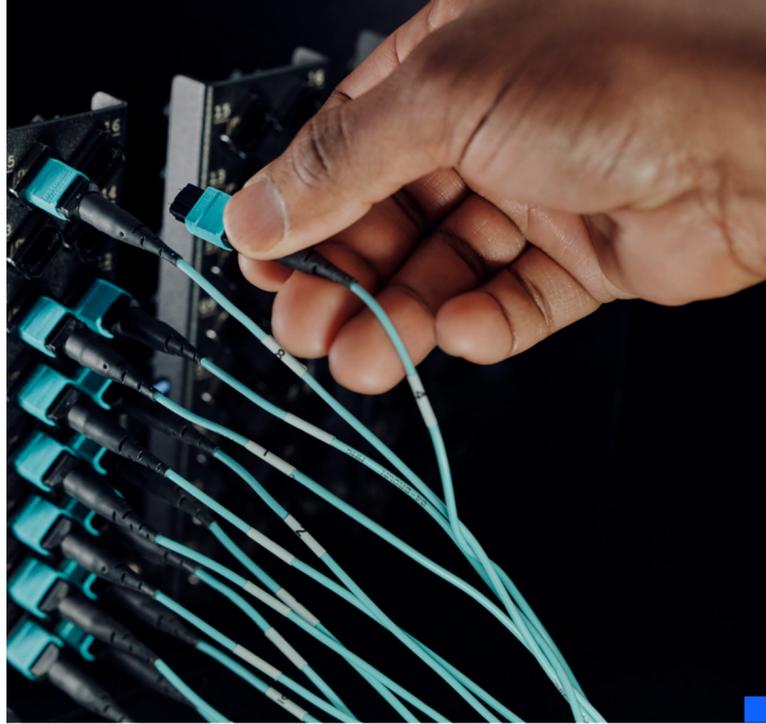
IBM Cloud Pak solutions are comprised of a set of containerized IBM middleware and common software services. IBM offers six IBM Cloud Paks: IBM Cloud Pak for Data, IBM Cloud Pak for Business Automation, IBM Cloud Pak for AIOps, IBM Cloud Pak for Integration, IBM Cloud Pak for Network Automation and IBM Cloud Pak for Applications. Each offering provides a broad set of capabilities for a specific domain.

Gain insights across
hybrid multicloud

IBM Concert® is a modern AI-powered observability and automation platform. It's designed to help IT operations teams gain deep insights across hybrid multicloud environments, accelerate issue resolution and proactively prevent disruption using AI and automation.

IBM Concert can monitor and optimize workloads running on Power processor-based servers running AIX, IBM i and Linux. On Power, Concert offers comprehensive performance monitoring, AI-powered issue detection, predictive resource optimization and integration with automation solutions such as Red Hat Ansible playbooks.

Seamlessly integrate with IBM Power



With the right advice and solutions, IT leaders can seamlessly integrate [IBM Power](#) into their overall hybrid multicloud strategy.

IBM Power has a solution to help you:

- Streamline virtual-machine deployments
- Streamline operations with a private cloud
- Leverage the flexibility of public cloud
- Modernize applications with microservices, containers and Kubernetes
- Innovate with AI
- Build a hybrid multicloud

Let's help you identify the next steps in your journey to the hybrid multicloud world. Reach out to an [sales representative](#) or IBM Business Partner to start the conversation today.



1. 1 Billion New Logical Applications: More Background, IDC Market Note, IDC, April 2024.

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