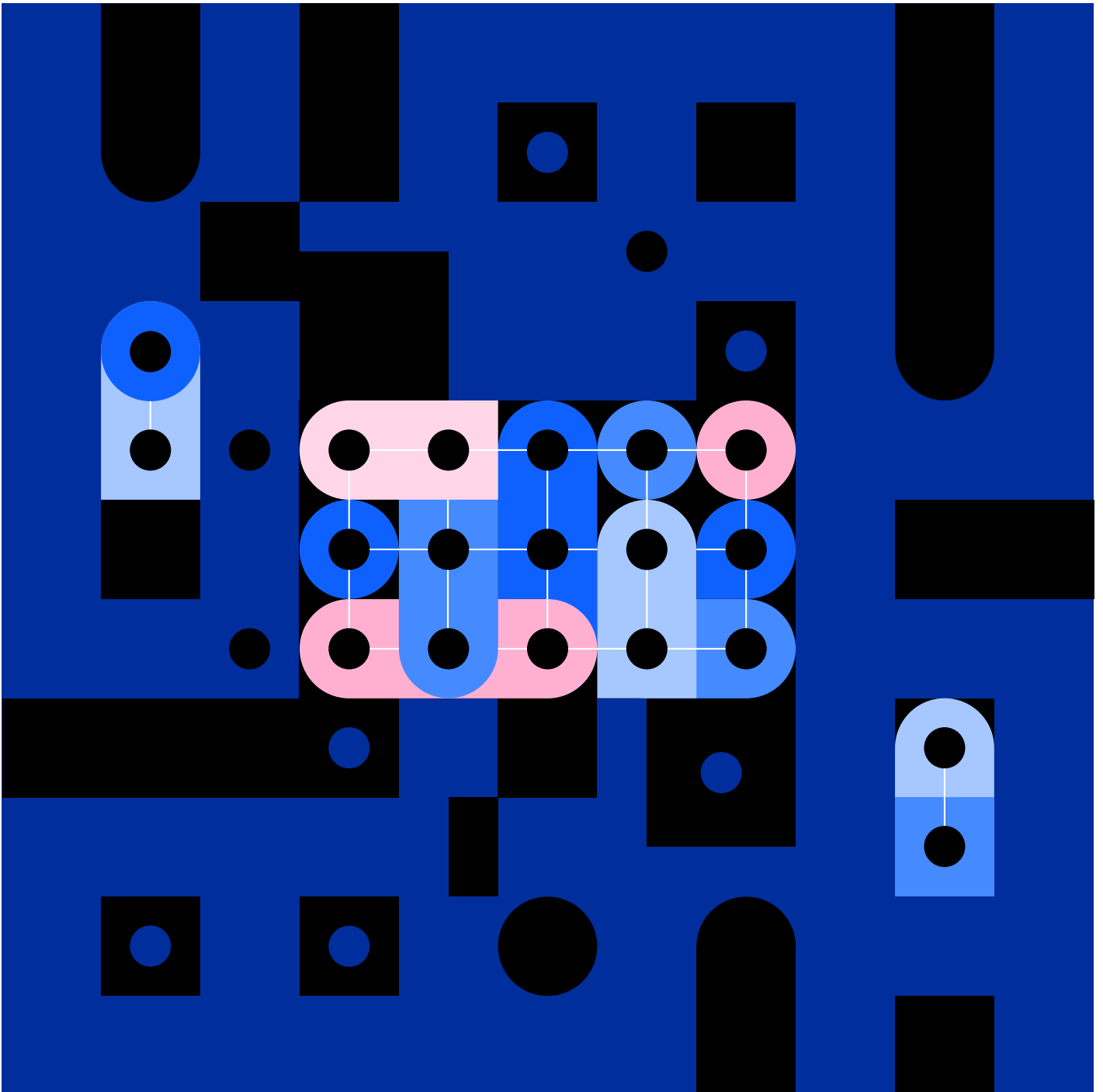IBM

The right hybrid cloud strategy enables agility at scale

Table of Contents

**Section One:
Need for agility and
threat of complexity**

Cloud and the need to adapt

In today's world, there's a common thread connecting almost every organization, of every size, across all industries and regions: uncertainty. Change—often disruptive—is happening faster. Customer demands for a more convenient digital experience rise unabated, security threats are growing, and a complex, ever-changing web of regulations extends from country to country, to name just a few examples. In this climate of unprecedented dynamism and uncertainty, both risks and opportunities abound. For the organizations trying to navigate it, the need for business agility—the ability to adapt rapidly and effectively—has never been more important.

To gain flexibility and efficiency in their IT capabilities, enterprises rightly see cloud as the key to moving forward. But more than ever, today's cloud options are neither simple nor clear cut. While the goal to move to public cloud drove the first wave of adoption, the diverse needs of applications can be better satisfied by a mix of different environments including traditional data centers, edge and SaaS. So it isn't surprising that the majority of enterprises expect to run their applications across a constellation of different environments, involving many different cloud providers, each with its unique value proposition. This hybrid, multicloud diversity reflects the reality of their businesses.
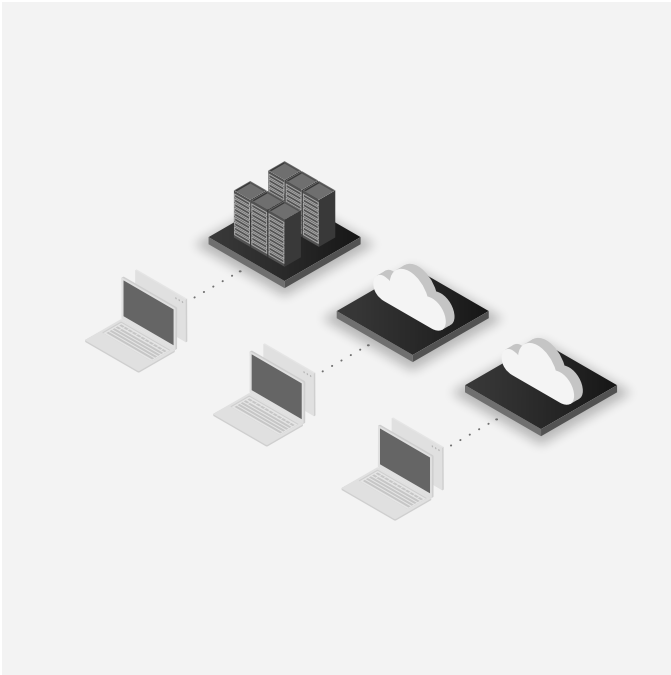
The complexity trap

Many enterprises are experiencing firsthand how decisions that add to the complexity of their IT estates—such as continuing to add to the existing vertical cloud silos—are actually undercutting their flexibility by making processes related to development, operations and security more fragmented. They're finding that cloud fragmentation makes it virtually impossible to achieve the standardization, efficiencies and scale that cloud has the potential to deliver.

That same principle holds true for the ability to support innovation across the enterprise. AI is the most important underpinning of innovation, affecting everything from process automation to customer engagement. The most basic requirement for companies looking to scale AI across their enterprise is data readiness, including the ability to access data from anywhere, without boundaries or silos. It's yet another reason why companies need to look hard at how they move to the cloud. They need a strategy for reducing the complexity of their cloud environment so they can unleash hybrid's full strategic potential.

**Section Two:
Why hybrid's time is now**

Why hybrid?

At a basic level, a hybrid cloud architecture combines some mix of public and private clouds and on-premises infrastructure, with some level of communication or orchestration across these elements. A hybrid cloud is also considered a multicloud when it contains clouds from multiple cloud providers, such as Amazon Web Services (AWS), Google Cloud Platform, IBM Cloud® or Microsoft Azure. Whether it's hybrid, multicloud or both, organizations have assembled their cloud portfolios in ways that conformed to their immediate priorities at the time—from experimentation to expediency to the service provider's expertise—and they don't want to be forced to change them.

Traditional approach
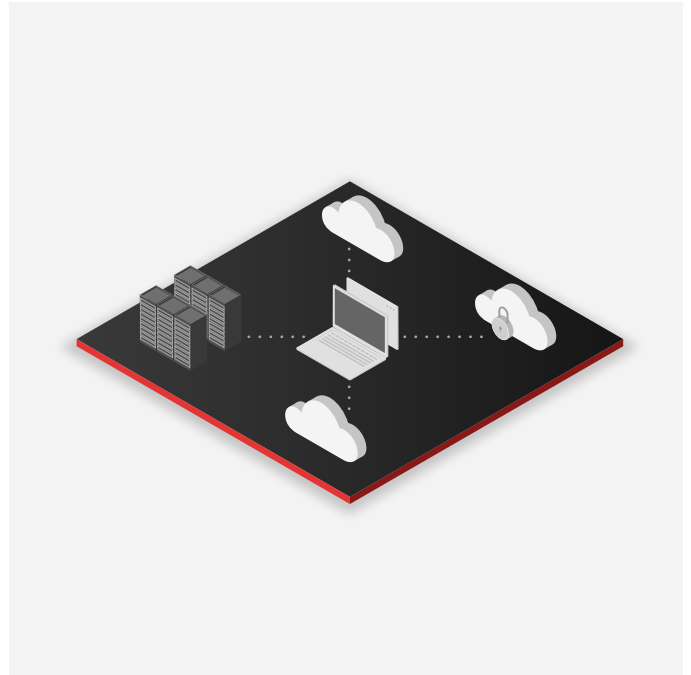
Hybrid approach

So, how can an enterprise push ahead with a hybrid strategy—and keep their option to choose—without adding to the complexity and inflexibility of their IT infrastructure? IBM advocates an open, hybrid cloud strategy that unifies an enterprise's existing cloud environments and creates a bridge to tomorrow's infrastructure. It's an approach centered on unifying the experience for enterprise customers so they can manage their estates seamlessly and in a more horizontal way.

The quality that makes this possible, and what sets IBM's approach apart, is the openness of its architecture, which is rooted in the hybrid cloud [Red Hat® OpenShift® platform](#). If you're a company looking to build once, deploy anywhere and integrate everything—across all cloud types and cloud providers—openness matters. It's a quality that competitive offerings, built around proprietary architectures, can't deliver. That's not all. IBM's hybrid cloud approach also stands out for the way AI capabilities—the key to prediction and automation—are deeply woven into its fabric, as is security. Rounding out the IBM hybrid cloud advantage are deep service capabilities in critical areas like digital transformation, application modernization and industry-specific intelligent workflows. Put simply, it's the ability to team up to realize the potential value of hybrid cloud.

**Section Three:
How IBM's open hybrid
cloud strategy stands apart**

The path to "build once, deploy anywhere"

Red Hat OpenShift fully realizes the developer's aspiration of cloud-native application portability. It provides a single operating system across all environments, which enables developers to deploy apps without any hardware dependency. And it employs a container orchestration platform to automate the deployment of containerized applications across all these cloud environments, including security, load balancing and scalability. That's the ultimate in flexibility and efficiency.
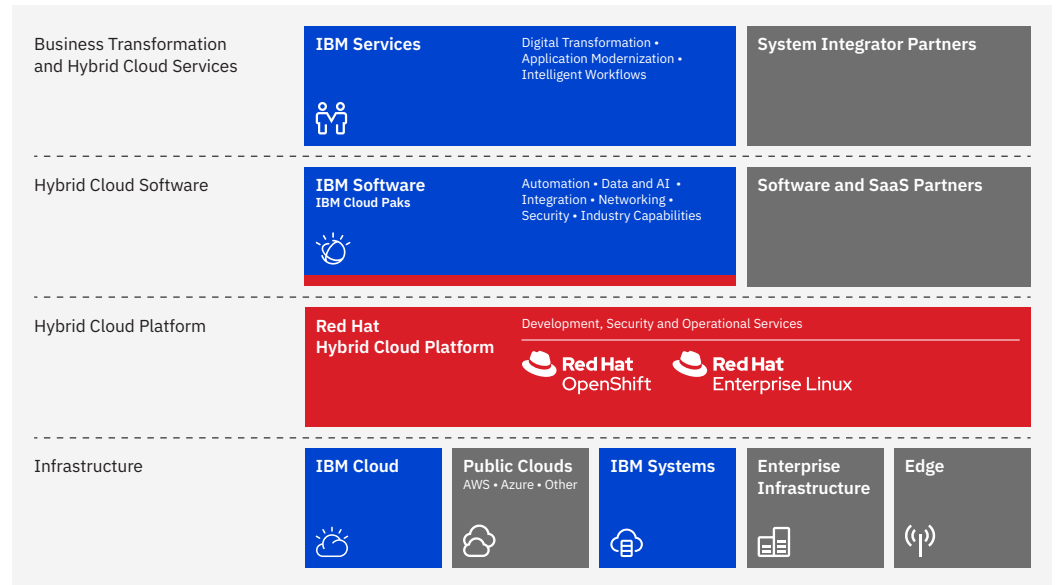
Red Hat OpenShift, powered by Kubernetes, allows you to run containerized applications and workloads anywhere.
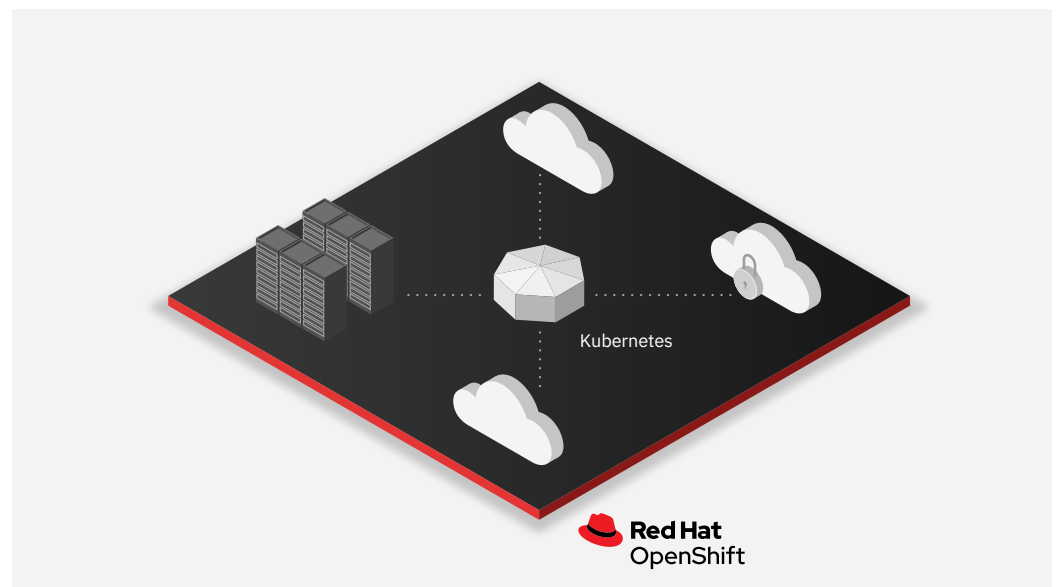
While Red Hat OpenShift is a foundationally important part of IBM's open hybrid cloud approach, it represents one of the multiple layers that make up IBM hybrid cloud and AI solutions. See Figure 1. The base of this approach is a flexible infrastructure layer where infrastructure can come from any environment, public or private.

IBM's public cloud provides an optimized infrastructure for OpenShift and provides diverse computing resources—from ready-to-use software-as-a-service applications to complete infrastructure and development platforms—all available to users securely over the network while providing guardrails for clients to securely deploy their workloads on the cloud. IBM Cloud provides as-a-service delivery of the entire hybrid cloud architecture, from the infrastructure through AI, security and automation. IBM Cloud Satellite™ extends the IBM public cloud by bringing a secured, unifying layer of cloud services for clients across any environment, enabling hybrid cloud to be consumed as a service, and ensuring the same security and controls are used no matter where data is being collected, processed or shared.

Figure 1:
IBM Hybrid Cloud and AI Solutions

Business Transformation and Hybrid Cloud Services	**IBM Services** — Digital Transformation • Application Modernization • Intelligent Workflows	**System Integrator Partners**	
Hybrid Cloud Software	**IBM Software** IBM Cloud Paks — Automation • Data and AI • Integration • Networking • Security • Industry Capabilities	**Software and SaaS Partners**	
Hybrid Cloud Platform	**Red Hat Hybrid Cloud Platform** — Development, Security and Operational Services — Red Hat OpenShift — Red Hat Enterprise Linux		
Infrastructure	**IBM Cloud** / **Public Clouds** AWS • Azure • Other / **IBM Systems**	**Enterprise Infrastructure**	**Edge**

The role of IBM Systems is fundamental for the simple reason that solutions such as IBM Z®, IBM Power® Systems and IBM Storage perform many of the critical functions underpinning an open hybrid cloud. These functions include accessing vast troves of untapped on-premises data across a hybrid cloud environment, scaling the impact of data-driven insights with AI and automation, and being agile enough to process critical enterprise apps and data in near real time. Then there's security. Storing data across multiple clouds and moving it between partners and third parties can leave companies more vulnerable to security issues such as data breaches. IBM infrastructure solutions support the ability to protect data even when it leaves IBM platforms.

IBM Cloud Paks, the main element of the software layer, are pre-integrated, containerized software solutions. Certified to run on Red Hat OpenShift, IBM Cloud Paks are designed to speed up and simplify development to get faster time to value. Here's why they're needed: some 75% of existing enterprise workloads have yet to move to the cloud due to the huge challenge of moving, connecting and managing applications across disparate clouds. To cut through this, IBM created IBM Cloud Paks to give developers, data managers and administrators an open environment to quickly build new cloud-native applications, modernize existing applications and extend the AI capabilities of IBM Watson into their business in a consistent manner across multiple clouds. The fact that they seamlessly use Kubernetes as the management framework supporting production-level qualities of service and end-to-end lifecycle management gives you

an open, faster, more secure way to move your core business applications to any cloud. Individual IBM Cloud Paks deliver different capabilities:

- IBM Cloud Pak® for Integration simplifies the integration of legacy workloads onto Red Hat OpenShift as containers.
- IBM Cloud Pak for Data enables enterprises to run analytics where their data lives, shortening the path to AI adoption.
- IBM Cloud Pak for Security gives enterprises a unified view of threats that spans hybrid, multicloud environments.
- IBM Cloud Pak for Business Automation offers design, build, run, and automation services to rapidly scale programs and fully execute and operationalize an automation strategy.
- IBM Cloud Pak for Network Automation enables communications service providers to automate their network operations so they can transform their networks, evolve to zero-touch operations, reduce operating expenses and deliver services faster.
- IBM Cloud Pak for Watson AIOps enables the deployment of advanced, explainable AI across the ITOps toolchain to confidently assess, diagnose and resolve incidents across mission-critical workloads.

The capstone of IBM's open hybrid cloud portfolio is the broad range of IBM Services® and the process expertise IBM brings in areas like digital transformation, application modernization and intelligent workflows. These teams help enterprises like yours to design, build and accelerate the adoption of an open, hybrid cloud architecture and to apply best practices from previous engagements to reimagine your workplace as a digital enterprise. For customers that want the fastest path to business value, IBM Garage™ methodology provides a tested, end-to-end model for accelerating digital transformation—whether it's a limited pilot or a full-scale transformation. According to a recent study, IBM clients using the IBM Garage approach generated 10 times more innovative ideas, experienced 67% faster speed to outcomes and moved six times as many projects into production.[1]

Ecosystems matter

There's one more important aspect of IBM's hybrid cloud approach that's designed to help its customers succeed, and it's built on the recognition that AI for business and hybrid clouds are only as good as the ecosystem that supports them. To that end, IBM supports its IBM Cloud Pak hybrid cloud software with an ecosystem of thousands of IBM Business Partners, open-source communities, strategic vendor alliances, developers, business consultants and integrators that can all help clients customize and extend their software to meet the unique needs of every client.

**Section Four:
Unlocking value through
hybrid cloud**

Unlocking value

The business case for adopting IBM's open hybrid approach is about progressively unlocking value trapped by the inherent inefficiencies of the vertical cloud model. The main sources of value are in five key categories: increased business acceleration, higher developer productivity, increased infrastructure efficiency, improved risk and compliance management, and long-term strategic flexibility. And why progressive? IBM's view of the hybrid cloud value proposition is predicated on the idea that the value from transformation can be unlocked in incremental steps. Choosing a hybrid path allows enterprises to build on their existing investments and get the benefits of cloud incrementally—often starting on-premises—rather than waiting for a complete rebuild on public cloud.

A recent study commissioned by IBM and performed by an external consulting company vividly illustrated this dynamic at work. The goal of the study, which involved more than 30 global enterprises, was to examine how different degrees of hybrid multicloud adoption correlated to the overall ROI of the transformation. One key finding was that the greater the share of workloads that are consistently deployed on a hybrid cloud platform, rather than siloed in a public cloud, the more value that was unlocked. See Figure 2.

Figure 2:
IBM built an economic model to demonstrate how a hybrid cloud strategy unlocks more value than a public-only approach.

Based on an IBM-commissioned study measured across five key value areas: business acceleration, developer productivity, infrastructure costs, regulatory and compliance, and strategic optionality.
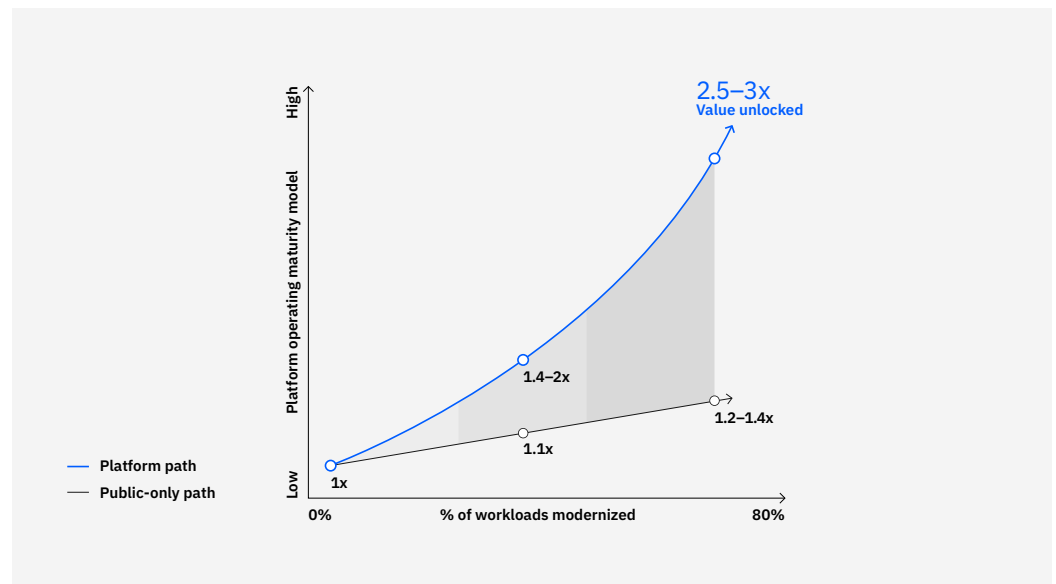
The study also showed that pairing the tech-based transformation with an operating model transformation—people and processes—unlocks even more value. As the figure shows, enterprises that transform both their technology and operating models stand to unlock up to 2.5 times the total business value of a public-only cloud strategy.[2] It implies that for every USD 1 million an enterprise captures on public cloud, a fully realized hybrid model has the potential to capture roughly USD 2.5 million in business value.

Why an operating model matters

Within the overall 2.5 times, the subset of application development and maintenance costs represents the biggest hybrid versus public advantage (at a 2.9 times benefit multiple), exemplifying why operating model transformation matters.[2] The prevalence of siloed vertical operating models is a virtually unavoidable outgrowth of the traditional vertical cloud infrastructure model. When processes are specific to each cloud silo—and often ad hoc—you can't standardize and automate across them. Each process requires its own teams and skill sets, and communications between them are less than effective. Scaling up means more cost and inefficiency.

Figure 3:
Separate environments with a traditional operating model
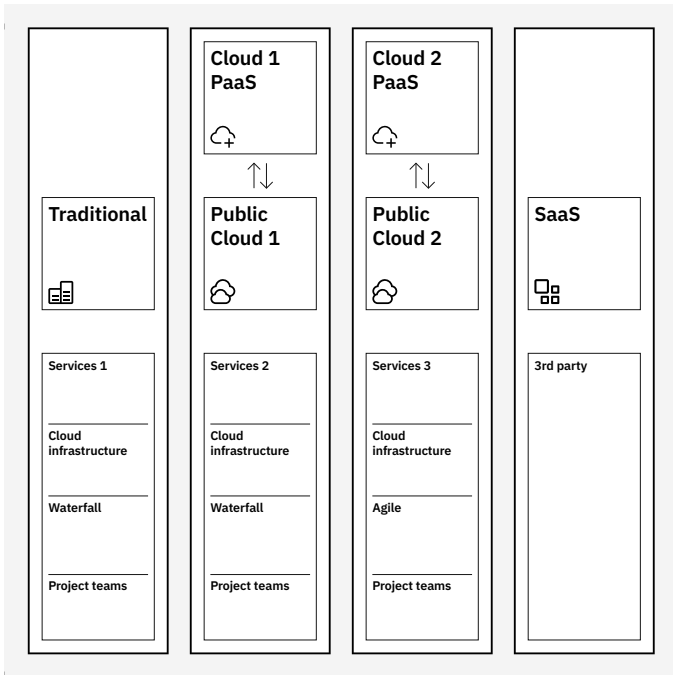
Single hybrid platform and operating model
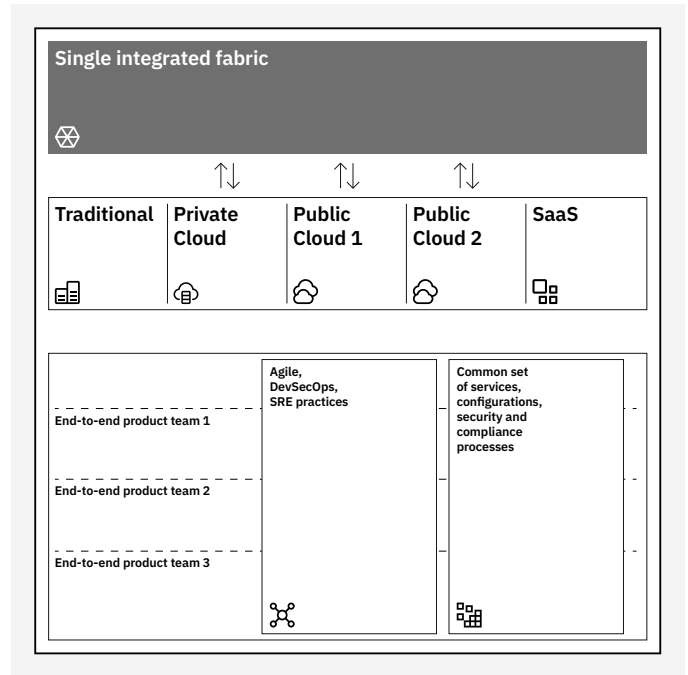
Enterprises that move to an open hybrid cloud model put each cloud environment on a common technical plane, essentially clearing the deck for a new set of consistent processes, practices and governance frameworks horizontally, across all cloud environments. Take application development. With a unified hybrid cloud platform, enterprises can more easily adopt agile and DevSecOps methodologies, eliminating bottlenecks and reducing application releases from months to weeks. They can put in place consistent internal development standards across clouds and simplify their application portfolios. And most prominently, they can reap the huge productivity benefits of being able to develop those applications once and deploy them anywhere, using continuous integration or continuous delivery tools and infrastructure orchestration.

The study's findings also reinforced the importance of application modernization—in addition to openness—in unlocking the value of hybrid clouds. As Figure 4 shows, enterprises have a spectrum of options for bringing their apps to the cloud, ranging from pure "lift and shift" or rehosting an existing app "as is" to the refactoring of code to make the app cloud native. The study found that over a six-year period, the highest ROI, at 310%, comes from containerizing applications to make them infrastructure agnostic and running them on either the public or private cloud.[2]

Figure 4:
Workload modernization with containers delivers the highest return on investment.

Assumes a six-year ROI for a traditional app modernization with USD 100,000 IT spend on a per-app basis, rounded to the nearest thousand. Based on an IBM-commissioned study measured across five key value areas: business acceleration, developer productivity, infrastructure costs, regulatory and compliance, and strategic optionality.

Workload platform	"Lift and Shift"	Containerized	Re-platformed	Proprietary, cloud-native refactoring
Cost	USD 15,000	USD 25,000	USD 50,000	USD 105,000
Benefit	USD 53,000	USD 103,000	USD 130,000	USD 155,000
ROI	250%	310%	160%	50%

When it comes to modernization, every enterprise faces
a different set of factors in deciding which application
workloads to move to the cloud and how. IBM's approach
enables clients to optimize their portfolio modernization
efforts by selecting the path most suitable to their particular
workloads, and it also provides support across all of their
environments, including bare metal, virtualization, and private
and public clouds.

The takeaway? Enterprises have the choice, and the results
are there to see.

**Section Five:
Why hybrid cloud
matters to you**

Where are you?

Let's take stock. You're an enterprise looking to move more of your business to the cloud, or multiple clouds, and you're already somewhere down that path. Maybe you've already recognized the looming challenges—in terms of orchestration, inflexibility and security—and you've taken the first steps toward either doing it yourself (DIY) or going with a provider. Perhaps the most compelling reason to resist the DIY path is the sheer amount of resources an enterprise needs to commit to building and sustaining a homegrown hybrid cloud platform. Talent—in the form of engineers experienced in open-source development—is the main gating factor.

So, why embrace IBM's vision of horizontality? IBM doesn't claim to have the only solution in the market. Indeed, the fact that hybrid multicloud solutions are coming to market from major cloud players attests to it being the "right" solution for today's cloud adoption challenges. What IBM does have is one of the most complete, comprehensive and extensible solutions. These qualities derive from the fact that it's built on the Red Hat OpenShift platform, which has been tested, tried and true since 2015—a strength that sets IBM apart from its competitors.

While all industries have their own unique priorities, issues and challenges, it's no stretch to say the growing need for agility, efficiency and security cuts across all. For that reason, there's a strong business case for open hybrid multicloud technology across a broad spectrum of enterprises, by size, industry and business model. Still, whether you're on the IT or line-of-business side of technology planning, the epiphany comes from seeing how your company—and its goals, issues and challenges—fits into the big picture.

From a broad swath of IBM customers adopting open hybrid multicloud technology, clear patterns have emerged in terms of the core-business use cases driving it. In no particular order, enterprises are trying to:

- Streamline and speed their product and service development cycles to respond to changing market demands.
- Create a better and more personalized end-to-end experience for customers—digital and physical—that harmonizes with all the underlying processes.
- Bring new services into emerging, fast-growing global markets where the rules around data and cloud vary considerably.
- Drive operational efficiency by sharing data and AI-based insights across processes and ecosystems.
- Battle for customers by keeping service performance levels high even as their networks get larger and more complex, and customer traffic volumes grow less predictable, by the day.
- Stay ahead of changing regulatory compliance and security risks across diverse global locations and environments.

While this list is neither complete nor mutually exclusive, it provides a contextual framework for drilling down into a small cross section of use cases related to IBM's open hybrid multicloud solutions.

**Section Six:
Open hybrid cloud
solutions in action**

Large telecom operator in South Asia

Driver

Operating in an extremely mature and competitive market, this fast-growing telecom operator recognized that delivering a consistently high-quality customer experience—fewer dropped calls, better-quality video and low data latency— is the key to its growth and competitiveness. The broad challenge was in optimizing the operations of a highly complex and diverse network spread across multiple environments. With traditional manual processes for fault detection and a new cloud capacity provision constraining flexibility, the operator saw AI-enhanced automation as the answer. But without the ability to orchestrate across silos of multiple clouds and systems, automation wasn't feasible. Vertically separated clouds are what the operator had; horizontally connected hybrid is what it needed.

Solution

The operator embarked on a broad architectural transformation, the first step of which was to implement an open hybrid cloud network running on the Red Hat OpenStack Platform and Red Hat OpenShift. On top of this, the operator— working with teams from IBM Services—developed an automated, one-click cloud provisioning process that handles every stage from plan to build to run. With this new tool, a network planner or engineering team's request for a new site has become a virtually touchless, completely catalog-driven user experience. This tool has enabled the operator to reduce cloud implementation time by 75%—from four weeks to one week—while all but eliminating the implementation errors that can degrade the customer experience, weaken satisfaction and ultimately reduce revenue.

Large oilfield services company in Europe

Driver

A key part of this company's services portfolio is a set of application modules that focus on specific operational areas, such as exploration, drilling planning and drilling operations. To improve accessibility and usability for customers, it wanted to convert these modules into services, move them to the public cloud and bring them to market around the world. For reasons of data sovereignty, security and other factors, energy companies in places like Russia, the Middle East and China face constraints on where they can store their data and run their upstream applications. To make the offering accessible in any part of the world, the company needed the ability to run in whatever kind of environment a customer wanted— on-premises, private cloud or public cloud—without changing its way of doing business.

Solution

To expand access to customers around the world, the company moved its service offering to the Red Hat OpenShift container management platform. In addition to expanding the company's worldwide addressable market, the move to containerization with Red Hat OpenShift means the company can respond to customer requests for new application capabilities—in the form of microservices—seven times faster than before. The fact that containerized applications were shown to reduce its customers' infrastructure costs by up to 75%, along with lifetime total cost of ownership, is one of the reasons Red Hat OpenShift is helping the company drive innovation and efficiency in the global energy industry. Moreover, the solution uses the IBM Cloud Pak for Data platform to unify data for the subsurface and wells, resulting in more streamlined access to and use of data across the industry, enabling wider collaboration and greater efficiency.

Global digital advertising agency in the US

Driver

A global digital agency, specializing in using data-driven human insights to help clients create personalized campaigns, wanted to use AI to make its market segmentation models more accurate. It recognized that to deploy AI across the organization at scale, it needed to prepare its data to make it "AI ready" and that its data silos stood in the way. The agency realized that without a unified data and AI platform, it would face slower time to market, higher costs and greater risk.

Solution

The agency worked with the IBM Data Science and AI Elite team to build a platform with open information architecture to efficiently consolidate and analyze its diverse data assets, containing more than 10 TB of data amassed over more than 30 years from hundreds of primary sources. With this open platform in place, the agency was able to rapidly experiment to create better-performing models using IBM Watson services. Within the project, IBM Cloud Pak for Data played a critical role by supporting a scalable machine learning approach to drive predictions at a higher volume. The models that were developed—over the span of just eight weeks—performed even better than expected, showing a significant uplift over previous models.

Following the success of the models and application in-market, the company knew it couldn't afford not to build these better-performing AI models for its clients around the world. But that goal presented a challenge: how could it build these better-performing models for clients who would need to deploy them on any cloud, across geographies where different infrastructure providers were in place?

Using Red Hat OpenShift, the agency worked with IBM to implement a hybrid cloud architecture to deploy these AI models. Combined with IBM Cloud Pak for Data and Red Hat OpenShift, a set of tools was provided that allowed developers and the operations team to work together, enabling visibility into the making and deployment of the model. By taking a hybrid cloud approach, the agency saved time and money by using the same products and tools to build the better-performing AI models across basically any cloud. The agency can run them everywhere the exact same way, while helping to ensure security, compliance and governance of the data.

This process enables the agency to instantly enter new markets, be mindful of local regulations, serve virtually any client and outperform competitors in delivering faster time to value.

To learn more about IBM hybrid cloud and AI solutions, visit
ibm.com/cloud/hybrid.

Interested in calculating the potential business value of adopting an open
hybrid cloud approach for your organization?

Endnotes

1. "The Total Economic Impact of IBM Garage," a study commissioned by
   IBM and conducted by Forrester Consulting, October 2020
2. Based on an IBM-commissioned study measured across five key value
   areas: business acceleration, developer productivity, infrastructure costs,
   regulatory and compliance, and strategic optionality.