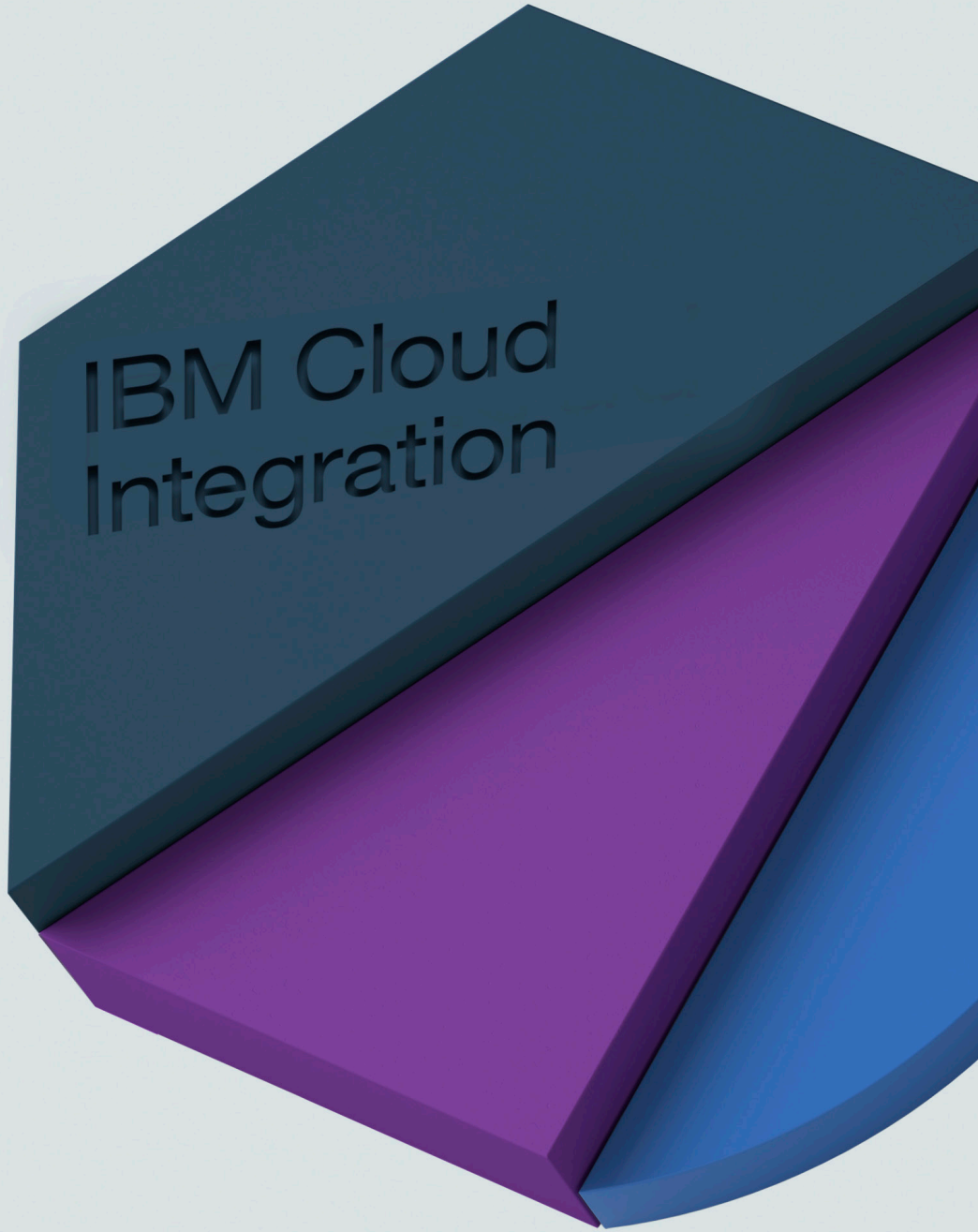
Making the cloud connection

What you need to know about integrating cloud with the enterprise



Many cloud providers would have you believe that the future is born entirely in the cloud. But what about existing data and systems? They can, and should, be part of the picture.

Many businesses rely on decades-old core systems for a simple reason: they work, reliably and securely. Systems like these, and the data they contain, represent enormous investment and business value that enterprises cannot simply walk away from. Yet, there's great potential in the cloud and it's becoming a key part of business strategy.

For the foreseeable future, enterprises must operate in both environments. The key is to integrate data, systems and services, both in the cloud and across the enterprise, to innovate and succeed in the new sharing economy. The real world is about both cloud and traditional IT, and not all providers are prepared to bring it all together.

This guide provides clarity on the importance of connecting enterprise systems, data and applications with the cloud to unlock their value. More importantly, it compares common approaches available today and the impact they have on business flexibility, speed, innovation and insight.

Marketplace trends are pushing enterprises into the cloud

Compelling customer experiences	**81%** of companies place the personalized customer experience in their top three priorities[1]
Innovative new business models	**80%** of CxOs are experimenting with different business models, or are thinking of doing so[2]
Fast and flexible operational processes	**100+** innovation acceleration programs have been launched in the past three years by leading enterprises[3]
Customer intimacy at scale	**80%** of enterprises will overhaul their "digital front door" to support more customers and touchpoints by 2018[4]
Intelligence from the cloud	**50%** of new apps developed on PaaS will be IoT-centric by 2020[5]
Cognitive is the next edge	**More than half** of developer teams will embed cognitive capabilities in their apps in the next few years[6]
APIs, containers, microservices and 'server-less architecture' are eclipsing DIY IT	**80+%** of organizations that self-manage PaaS frameworks do not achieve the expected experience[7] and **70+%** will deploy a container service by 2018[8, 9]

What's really driving business results?

The world is moving toward the cloud, but it's not there yet. Leading enterprises are thinking about cloud's role in achieving strategic goals, today. They know they need to:

- Develop faster to power new business models and customer experiences
- Tap and monetize the value inherent in back-end systems
- Connect to vast new ecosystems and make sense of data from the Internet of Things

APIs are making this possible, by simplifying the connection between existing IT and the cloud. They define how services and data are shared among applications, systems and business partners.

Faster development creates new customer value. Can your provider really help you achieve it?

Some providers lack experience and expertise in the complex interdependencies between on-premises and off-premises IT, making it difficult to develop, deploy and manage in a mixed environment.

Providers that focus on tactical deployments like cloud-based Dev/Test can make it difficult to fully bridge the gap between enterprise IT and the cloud. That puts a roadblock in the way of innovation, because the value of systems, data and applications is locked behind the firewall.

"Public cloud can be credited with enabling the new world, through infrastructure flexibility and anytime-anywhere connectivity. Yet…for all its benefits, the public cloud does not meet the needs of many workloads. – *The Death of Do-It-Yourself IT: Hybrid Integration Delivers Business Value Through APIs*[10]

Today's leading enterprises want to know…

- How do we innovate faster?
- How do we make better use of data and applications?
- How do we simplify and accelerate development?

They're after…

- APIs and reusable code that are inexpensive and easy to find
- Interaction with the developer community to access innovations
- One source for all things development-related

Where some providers fall short

Some providers may deliver DevOps productivity only in their cloud, using their platform and development tools – which may not fully meet the needs of the enterprise.

Without consistent, automated DevOps and the ability to deploy in the environment best suited for the workload, developers may not be able to meet business goals for speed, security and service delivery.

Ask about…

- Consistent DevOps user experience throughout the application lifecycle
- Tools that simplify development and deployment, like predefined patterns
- Support for your choice of runtime environment
- Development and application portability outside the provider's platform
- Choice of development languages, frameworks and toolkits
- Team-oriented development in the provider's environment

How faster development becomes an engine of business value

"Organizations…are increasingly seeking to leverage technologies developed by a rich ecosystem of partners, vendors, suppliers, and community members." – *The Death of Do-It-Yourself IT: Hybrid Integration Delivers Business Value Through APIs*[11]

Faster, more agile development requires embracing DevOps to automate application build, test, deployment and improvement across a diverse infrastructure. That means placing workloads where they'll run best, whether in dedicated or off-premises clouds. It also demands closer ties with your broader partner ecosystem.

Development doesn't happen in a vacuum. Today, business value also comes from outside the enterprise – through the open developer community, partners and streams of data from the cloud and the Internet of Things. Innovating quickly is about an integrated approach, composing and delivering cloud-native, mobile and transactional apps using pre-built cloud services, cognitive insight and links to data sources, all accessed through APIs.

Rapid development is about flexibility and choice – the ability to create, deploy and manage workloads on your terms, in the environment that meets your business needs and using the technology that performs best and most cost-effectively. It's about productivity across your enterprise, using simple, consistent tools, automated processes and analytics that speed innovation and foster business agility.

Where some providers fall short

Cloud providers that emphasize their own portfolio and view of cloud's role in innovation often fall short when it comes to delivering business value in real-world mixed IT environments.

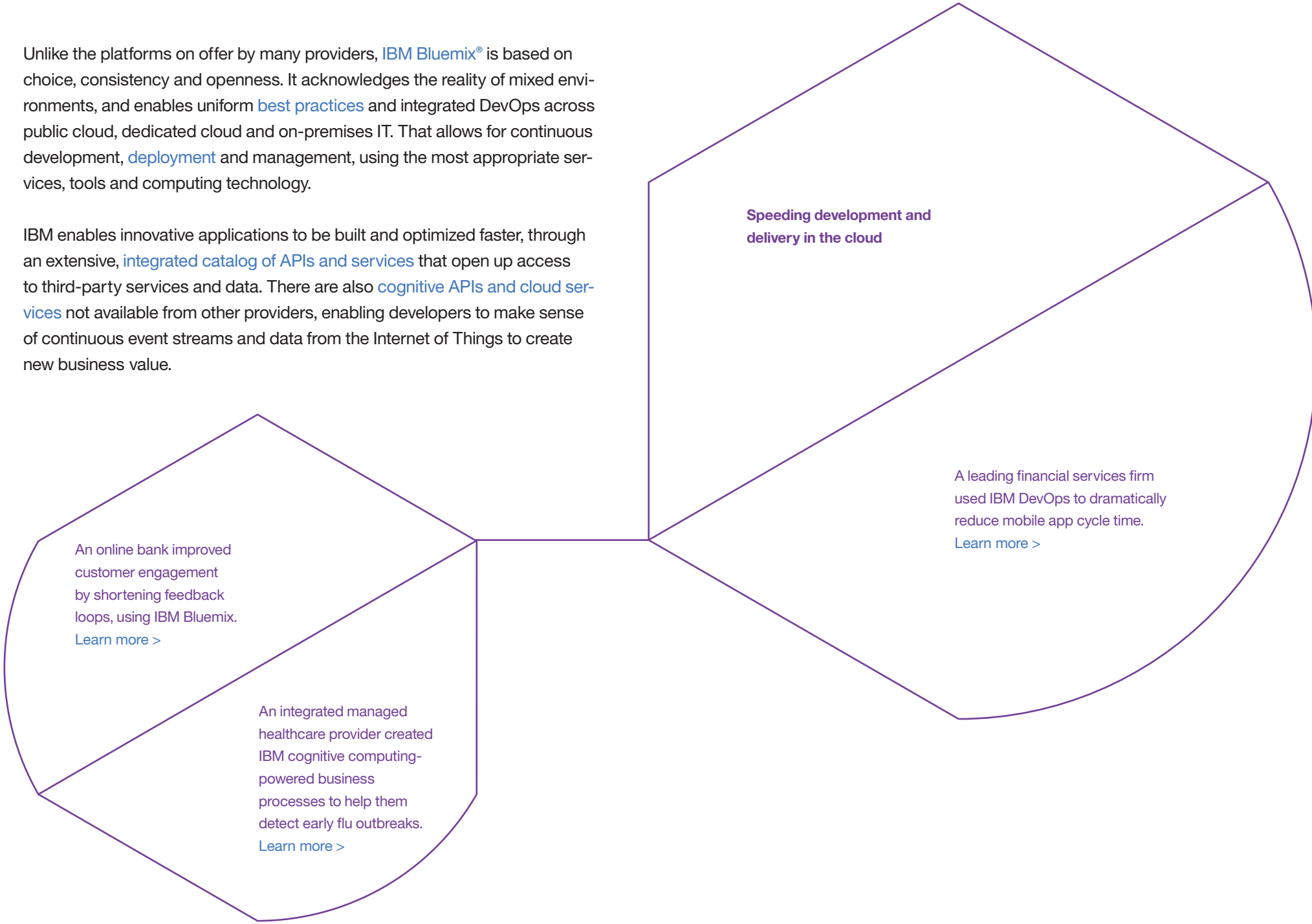
A provider may offer only public cloud infrastructure, rely on its own tools, or fail to recognize the importance of open ecosystems.

Ask about…

- On-premises and dedicated deployments
- Computing options like bare metal for high-performance workloads
- Ability to manage complex deployments with multiple dependencies between on-premises and off-premises
- Open source tools, platforms and incorporation of third-party data and APIs
- Reinventing business processes and rethinking operational decisions to take advantage of context and cognition

Unlike the platforms on offer by many providers, IBM Bluemix® is based on choice, consistency and openness. It acknowledges the reality of mixed environments, and enables uniform best practices and integrated DevOps across public cloud, dedicated cloud and on-premises IT. That allows for continuous development, deployment and management, using the most appropriate services, tools and computing technology.

IBM enables innovative applications to be built and optimized faster, through an extensive, integrated catalog of APIs and services that open up access to third-party services and data. There are also cognitive APIs and cloud services not available from other providers, enabling developers to make sense of continuous event streams and data from the Internet of Things to create new business value.



APIs are the next wave of development. Can your provider help you take advantage of them?

Nearly 14,000 public APIs are currently available.[12]
By 2020, more than 300,000 public APIs are forecast.[13]

Some providers tie their development platform tightly to their own "born in the cloud" services, leaving other choices such as third-party APIs as second-class citizens. That makes it harder to collaborate to innovate and drive business value.

The increasing availability of APIs does not automatically open the door to greater business value and competitiveness. They must be created, managed, secured and monetized, and integrated with business strategy. More importantly, the enterprise needs to understand where the opportunities are, to get the most value out of APIs. That takes a provider able to deliver the expertise and access to APIs outside its own platform, to help the enterprise fully leverage this fast-growing resource.

Today's leading enterprises want to know…

- How do we align existing IT and cloud with business strategy?
- How do we build bridges between IT and lines of business?
- How do we leverage data and systems in the cloud?

They're after…

- A way to manage APIs instead of using them ad-hoc
- Publishing and promoting APIs internally and externally, to encourage usage
- Insight into who's using APIs and how, to foster continuous improvement

Where some providers fall short

Most cloud providers lack the expertise to help the enterprise incorporate APIs into business and IT strategy, so that these new connections can drive innovation and business value. Also, by emphasizing their own offerings, they leave a great deal of potential untapped.

Without a way to effectively create, discover, manage and monetize APIs across the entire partner ecosystem, the enterprise is unable to fully leverage them to drive business value. Usage is ad-hoc, often complicated, and opportunities to build on success can easily be lost.

Ask about…

- The depth of the API catalog
- Support for third-party APIs
- Tools for creating, managing and monetizing APIs
- Self-service API management
- API usage analytics
- Consistent developer experience that includes API management
- APIs that allow access behind the firewall
- Connecting new "born in the cloud apps" with existing applications and data
- Support for standard programming tools and languages, like Java

How tapping into the API economy can power innovation

APIs are a natural enhancement the rapid, agile development enabled by DevOps and the cloud. A whole new API economy has arisen, where developers expose everything from knowledge to business processes, and share it with new partners to create market opportunities.

Today, business value is generated by connecting applications, data and services. Applications are becoming intelligent through cognition, and data is flowing in from everywhere. Accelerating innovation is about taking data from often unexpected sources – from the Internet of Things to ecosystem partners, customers and the enterprise itself – combining and making sense of it, and using it in entirely new ways.

The right API tools put a vast array of services, data and processes in the hands of developers so they can be used to compose new apps instead of coding from scratch. They protect customer privacy and the security of the services you expose via APIs, and promote and analyze API usage to monetize your services and drive continuous improvement.

Why do APIs matter so much?

APIs are about much more than creating simple connections between applications, services and data. It's the entirely new capabilities they enable that provide real value. Through IBM Watson™ APIs, for example, the enterprise can see what's going on outside its own environment, uncover the meaning, and use that knowledge to create new opportunity in ways never before possible.

Where some providers fall short

Many providers are limited in the way they enable API usage. They lack robust solutions to quickly identify service opportunities and create APIs to take advantage of them to drive innovation and generate revenue.

When the enterprise can improve the creation, use and management of APIs, it becomes far easier and faster to compose new applications and services.

Ask about…

- Integrated tools that help you compose, run, manage, secure and monetize APIs and microservices
- Extent of the API and service catalog
- Ability to tailor the API catalog to enterprise needs
- Integration of API management with the provider's PaaS
- API tools that allow business users to innovate directly, with little or no coding knowledge
- Cognitive APIs that can leverage unstructured data from the Internet of Things

IBM recognizes the importance of APIs as a cornerstone of innovation and digital transformation, and has been investing in an extensive portfolio of middleware to create, manage, connect and help you secure APIs across your digital ecosystem. That opens the door to new revenue streams, far faster development, innovation and new opportunities for collaboration within the enterprise and with third parties.

Using APIs to multiply customer value

An energy company deployed a scalable, API-driven IoT solution to help customers save on energy costs. Learn more >

A home insurer used APIs to improve and personalize service based on weather data, linking critical business processes to data in the cloud. Learn more >

Linking existing enterprise IT to the cloud multiplies the value of both, accelerating business results. Can your provider help you make the connection?

"Applications and workloads that once stood alone – or awkwardly exchanged packets of data – are now being integrated in ways that yield greater value." – *The Death of Do-It-Yourself IT: Hybrid Integration Delivers Business Value Through APIs*[14]

Some providers emphasize native app development, Big Data/IoT, and mobile, all built using their proprietary tools. But what happens if you want to use a different environment, or integrate with existing systems?

To deliver business value, solutions for hybrid integration need to address all parts of the IT environment, from traditional enterprise IT – legacy platforms, operating systems and enterprise applications – to the cloud and the broader technology ecosystem. APIs may be the links that drive innovation, but hybrid integration is connective tissue that enables the enterprise to differentiate itself in an economy driven by the monetization of data.

For many providers, it's a challenge to make those connections between existing systems, applications and data, and cloud. Lacking experience, they may not fully comprehend the challenges and opportunities – or the realities of supporting an environment that combines stable, mission-critical systems that seldom change with the dynamic, fast-moving world of cloud and mobile apps.

Today's leading enterprises want to know…	They're after…
_ How do we keep up with digital transformation and stay ahead of competitors?	_ APIs that allow the enterprise to get to market more quickly, reach new customers and can be a source of direct revenue
_ How do we leverage the cloud to go to market better and faster?	_ Ways to constantly deliver innovative value
_ How do we standardize innovation processes?	_ Making APIs a key aspect of business strategy

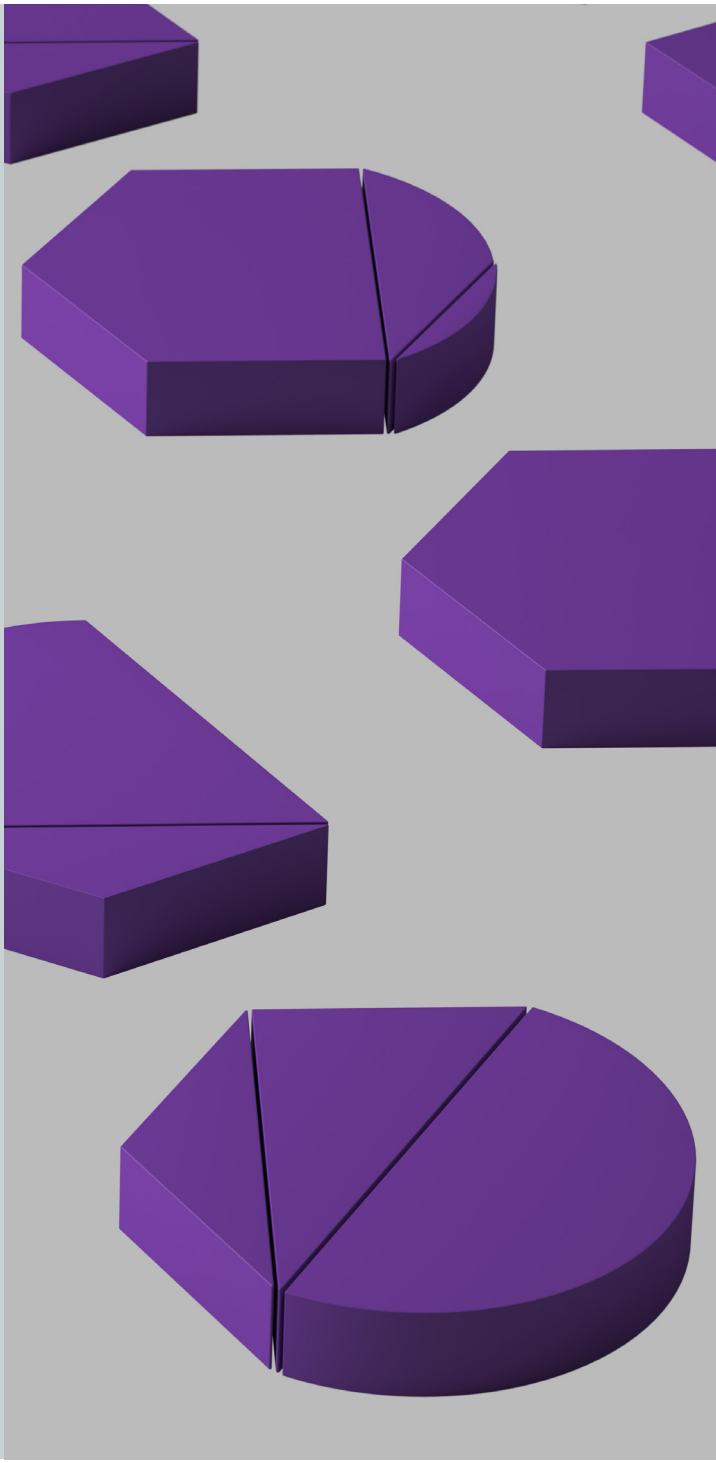
Where some providers fall short

Few cloud providers have a deep background in enterprise computing. This lack of experience can cause potential problems when integrating data, applications and services in a hybrid environment. Providers that prioritize their own portfolio and platform may not be able to fully address enterprise requirements for support of on-premises legacy platforms, operating systems, applications and integration, and must turn to third parties for support.

Without a robust way to securely and simply connect existing enterprise systems, data and applications to new data sources and mobile apps, enterprises may find it difficult to maximize the value of existing investments.

Ask about…

- Experience in enterprise computing and support for your legacy platforms and operating systems
- Portfolio offerings that span public and dedicated clouds, and on-premises IT
- Approach to enterprise integration in a hybrid environment
- Reliance on third parties to fill gaps in expertise or offerings
- Robust security when linking legacy applications to mobile, IoT and cloud.
- Shifting virtualized enterprise workloads to the cloud and back
- Enabling business users to connect applications and processes
- Ability to manage and deliver app and data portability in a mixed environment
- Automated DevOps tools and processes across the enterprise



Using the cloud and APIs to unlock the value of what you already own

"The best way to manage an API-enabled environment is to implement a comprehensive API management platform." *– The Death of Do-It-Yourself IT: Hybrid Integration Delivers Business Value Through APIs*[15]

Integrating existing systems and information with new sources of data and services in the cloud unlocks a whole new level of innovation. It allows the inherent value of enterprise data, applications and processes to become a critical differentiator for the enterprise.

Hybrid integration makes it possible for the enterprise to penetrate the wall between its systems and the outside world, creating new competitive advantage. What if, for example, a legacy inventory management system could sense and respond to weather data, and push additional stock out to retail outlets in advance of a storm? What if legacy CRM and ERP systems could detect and interpret customer feedback and market trends, and respond intelligently to capture emerging opportunities?

Where some providers fall short

Providers that emphasize born-in-the-cloud innovation often lack an understanding of, and appreciation for, the value inherent in existing systems and data. Their solutions may provide access to enterprise IT from the cloud and mobile applications, but stop short of truly integrating across the hybrid environment to generate new value.

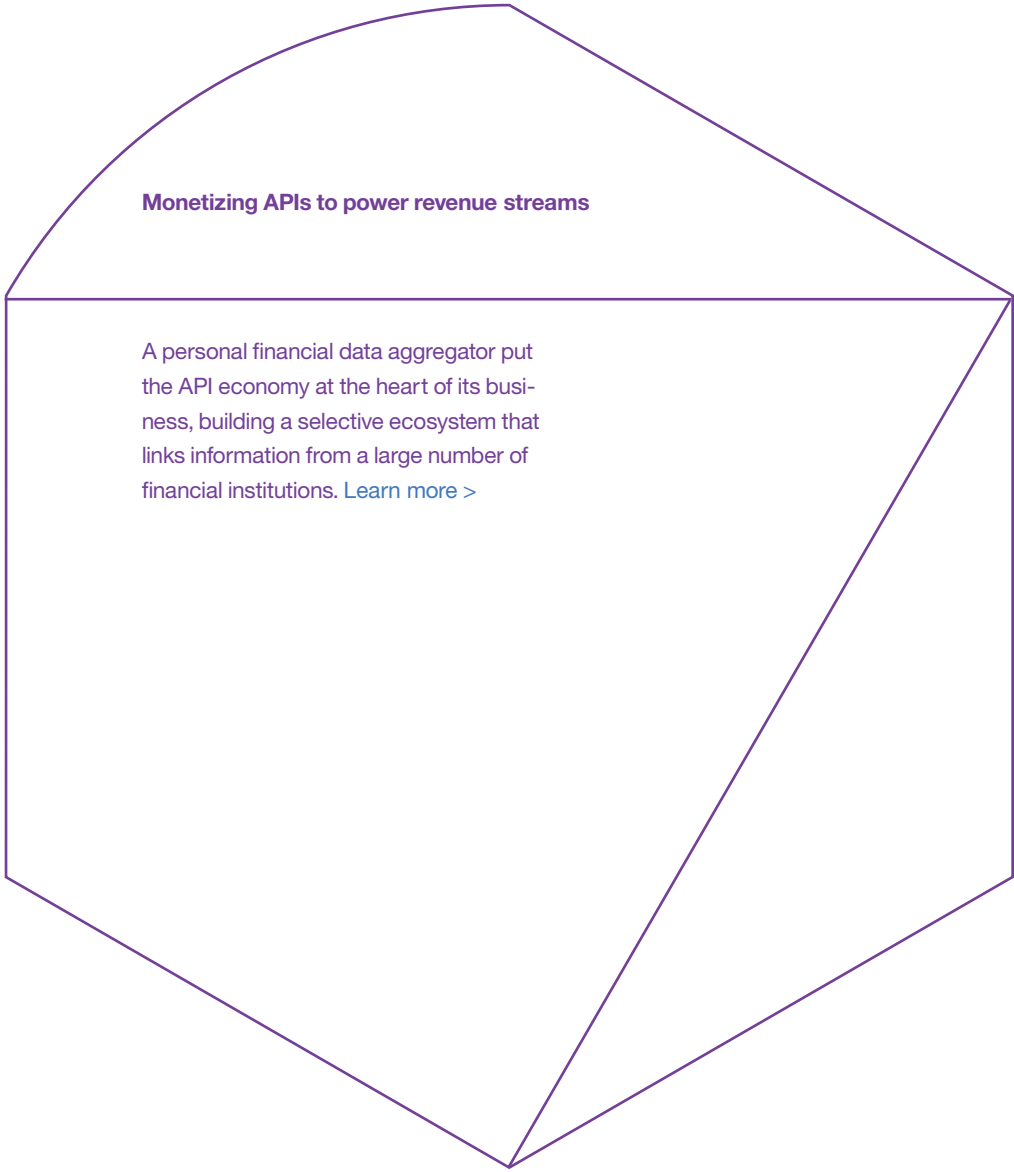
When the enterprise can deploy APIs to fully integrate a hybrid environment, it becomes possible to capitalize on new technologies and leverage institutional knowledge, creating a new context for the data it already possesses.

Ask about...

- Connecting your enterprise backbone to the cloud
- Linking applications in a hybrid environment
- Strategies for integrating data from the Internet of Things and customer interactions with enterprise systems
- Extending enterprise applications into the cloud and onto mobile devices
- Security when legacy applications are linked to mobile, IoT and cloud
- Best practices for identifying opportunities to monetize enterprise data

These kinds of solutions require the ability to connect data and applications inside the firewall with input and services from outside at scale, and generate new value from existing processes and information. The way it happens is by harnessing the power of APIs to integrate across any environment and technology.

IBM has a fully developed strategy for capitalizing on hybrid integration to generate business value, backed by a robust portfolio of integration tools that enable the enterprise to leverage APIs and combine native cloud applications with current infrastructure and critical enterprise data. That becomes a driver of digital transformation and competitive advantage, using existing assets. The hybrid environment becomes an important stepping-stone on the journey to cloud.



Connecting to the future

Hybrid integration as we know it now is a critical intermediate step on the way to a future in the cloud. But it's not just about legacy enterprise IT– there's something much larger at stake.

Every day, vast amounts of data are created. Most of it is "dark" data – unstructured and of little use if it cannot be captured, interpreted, and acted upon. That's why integration, cognition and APIs are so important – they are what allows that data to be understood and used to drive innovation. IBM is taking action to address the radical changes to come as that data becomes essential.

In a future "born in the cloud" integration may look different, but it will still exist. There will be the need to bring disparate systems, applications, data, processes and users together and combine them to create new value through better customer experiences, better decisions and a deeper understanding of the world and what's happening in it. And that need will only grow as more data and more connections are made.

That's why the IBM approach to hybrid integration matters. Taking steps to integrate systems and data today lays the groundwork for a future in which connections and data will be what separates successful enterprises from the rest.

Can your cloud provider do what IBM can?

Help link critical enterprise data and processes to cloud-native apps to unlock the value of existing investments by:

- Connecting applications across multiple environments including on-premises, cloud and hybrid IT
- Enabling business users to quickly connect their applications without any coding facilitating speed, innovation and business agility
- Using pre-built integrations to quickly and seamlessly connect endpoints across and beyond the enterprise

Enable you to create, deploy, manage and monetize APIs and micro-services to deliver new revenue streams that:

- Put your apps, data and processes in the hands of developers
- Protect customer privacy and the security of your services
- Promote and analyze API usage to monetize your services

Help you accelerate, secure and scale your enterprise for the data generated by the Internet of Things by enabling:

- Integration of enterprise messaging across any environment or device
- Delivery of enterprise-grade messaging security for mobile, IoT and cloud
- Scaling to edge-computing while maintaining response time

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