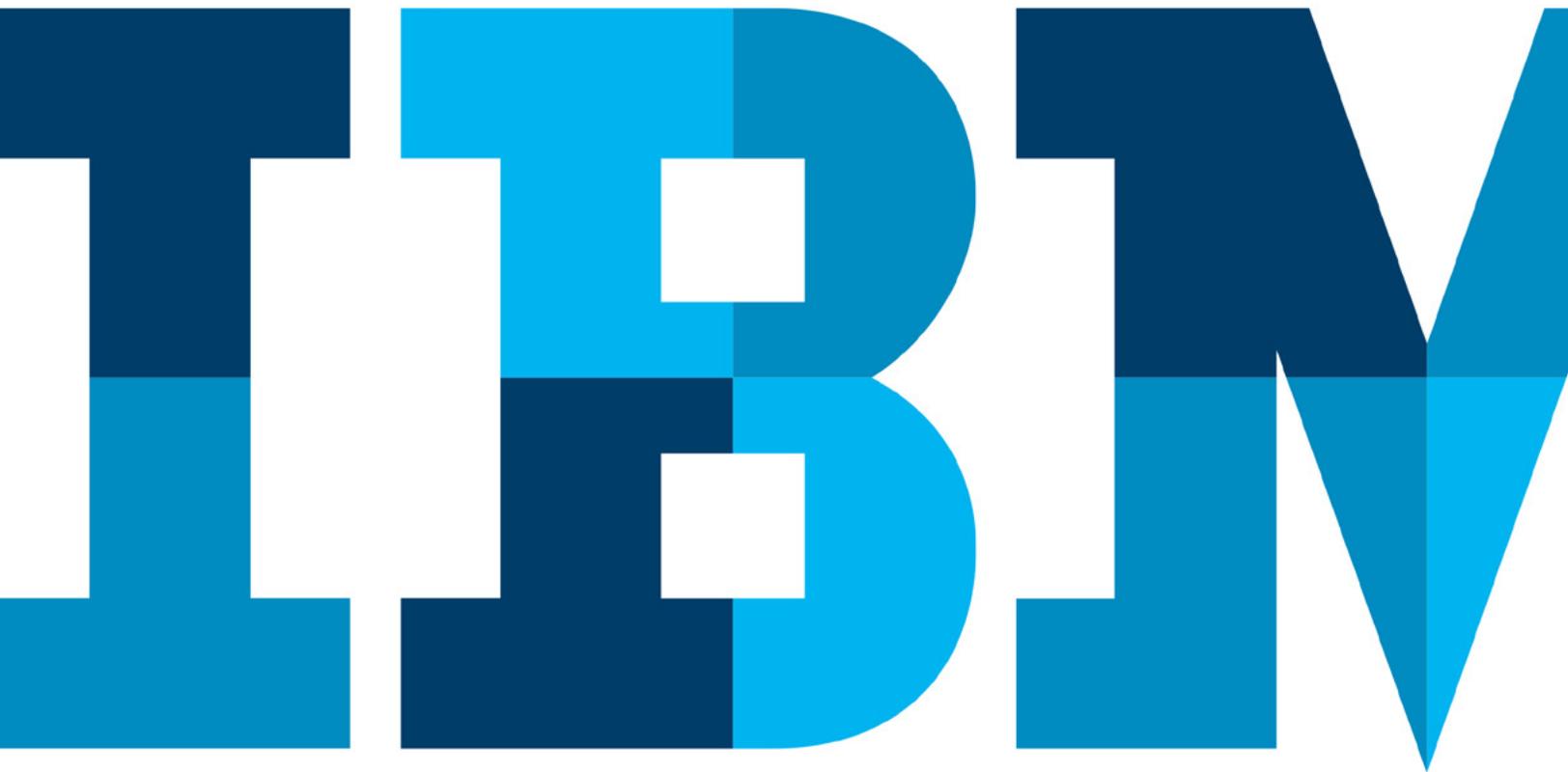


Unleash digital intelligence with data and apps

Multicloud integration architecture provides secure gateway for data governance, analytics



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→ [See the interactive version of this paper on the IBM Cloud website.](#)

Introduction

In a world of rapid market change, technological upheaval and massive restructuring, arguably, your most important business asset isn't your products, technologies, or processes — it's your data.

The ability to transform your data into digital intelligence is central to competitive advantage. Only then can it fuel and automate processes, accelerate decisions, bring unique client experiences to life, and ultimately, disrupt entire industries.

The problem is that data often remains trapped in siloed data stores or applications — both on premises, and increasingly, in the cloud. Different vendor APIs, architectures and data formats can make it hard to access and apply the advanced analytics needed to elevate data's value — and make it available to the right people.

What's needed is a more proactive approach that integrates data and applications in all its forms, on and off premises,

and provides greater visibility and control. The right solution must also secure and govern all types of data, from any source, across a hybrid cloud infrastructure.

Is your data AI ready?

The key to AI starts with a strong data foundation. True innovation in this space cannot be achieved until an organization has a strong grasp on all of its incoming data and makes every decision with data as its backbone.

Your data needs to become a corporate asset. As such, it has the power to transform your organization, add monetary value, and enable your workforce to accomplish extraordinary things. If that data is not collected, organized, managed, controlled, enriched, governed, measured and analyzed, it's not just useless — it can become a liability.

In today's multicloud world, data often remains trapped in siloed data stores or applications — both on premises and in the cloud. The first step is to discover where your data lives. Next, users must be able to access all data with confidence. This involves satisfying all matters of finding, integrating and cataloging data to create a fluid "single version of the truth," with built-in data lifecycle management, compliance and protection controls. It also includes understanding possible compliance issues posed by US and international regulations. Finally, data must enable the radical scaling of insights on demand using advanced analytics and data science to make better decisions and power smarter business processes.

→ [Read the IBM and BizTechInsights survey findings that reveals the challenges organizations face in integrating data and their priorities for improving data integration.](#)

In its August 10, 2017 “Magic Quadrant for Metadata Management Solutions” report, Gartner noted: “By 2020, 50% of information governance initiatives will be enacted with policies based on metadata alone.”

→ [Read the full report: “Magic Quadrant for Metadata Management Solutions.”](#)

Data Governance 2.0

According to the IBM white paper, *Achieving a unified governance strategy*, “Data Governance 1.0” was initially defined as a project-driven IT function that encapsulated an approach on how to manage enterprise data. Adopters used an established framework that created a structure for data that featured accountability, while ensuring the security and privacy of the data. Although Data Governance 1.0 could effectively manage and control data assets, it brought little to the table in the form of insight, opportunity identification and transforming data into the currency of business operations.¹

Now, organizations are moving to a more unified approach of managing and extracting value from data that melds “Governance for compliance” with “Governance for insight” as the new framework and business opportunity. “Data Governance 2.0” brings more value to a wider range of stakeholders, empowering them to garner knowledge,

trends and insights from data, and apply those discoveries to business practices. Multicloud integration architecture further enables data governance strategy with a secure gateway that supports APIs and analytics tools both within and beyond the firewall.

Good data governance in a hybrid cloud environment implies:

1. **Broad agreement on what data means**, including metadata on common policies and plain language rules for the information the business needs.
2. **Clear agreement on how owned data assets will be maintained and monitored**, including operational data quality rules and master data management.
3. **Enterprise and departmental standard practices for securing and protecting strategic data**, such as defining role-based access to data, creating rules governing how it’s shared and protecting sensitive data from third parties.
4. **Enterprise data integration strategy that includes lifecycle management** and directs how data will flow and be assembled into strategic information.

Data lakes: Data governance in a hybrid environment

Data lakes enable secure multicloud integration by providing a means for an enterprise to achieve unified data governance in a hybrid environment. By using a data lake, components of compliance, risk management and business performance can be addressed within a singular framework. These storage repositories accept data flows from any source (on premises and in the cloud) and bring

them into a common platform for use. Data is stored in its raw, unrefined state and located, processed, refined and extracted as required. In essence, you don't have to know what you need to use the data for before it's stored.

As an example, mobile apps that provide services and support transactions to customers by mobile devices challenge traditional data infrastructure, which is designed for batch processing. With a data lake, contextual information (such as device ID and location) can be combined with structured data (account number, password) to drive mobile app-based services in a way that is secure, resilient, reliable and replicable.

In the ideal scenario, the data lake would replace the data warehouse, serving as a large and vastly scalable collection of unstructured data in its native format, ready for all types of analysis and experimentation.

One of the primary challenges with using a data lake is the difficulty involved with storing data in such a way that it's retrievable again by query. "That capability must be built into the data lake through unique and rich metadata tags. Without these tags, the data lake quickly devolves into what industry insiders have dubbed the 'data swamp.'"²

"Cloud-first mandates make on premises application adoption an exception rather than the rule," notes IDC's July 7, 2017, white paper.

→ [Read the full details in "The urgent need for hybrid integration."](#)

Multicloud integration

When it comes to digital business success, what's needed is a more proactive approach that integrates data in all its forms, on and off premises, and provides greater visibility and control. The right architecture must also secure and govern all types of data, from any source, across a hybrid cloud infrastructure. It must be open and agile so it can connect new data sources quickly and deliver data securely and rapidly to the apps and people who transform the latest ideas into reality.

IT leaders must drive constant digital reinvention to bring cloud and cognitive together to make initiatives possible that focus on:

Accelerating the move to multicloud. A multicloud environment offers many of the benefits of cloud but it does raise some additional barriers such as what to move to cloud, where to move it and when.

Driving new revenue streams through APIs. Creating digital capabilities for end users and API experiences that set themselves apart in the minds of developers and the organizations they support.

Integrating blockchain into business. Distributed trust systems such as blockchain are redefining industries and go-to-market models.

Integrating AI into customer experiences. This challenge has manifested itself in AI-driven product recommendations, next-best action simulations and automated AI chatbots. IT leaders must look at ways to bridge the data divide and integrate not only all of their current data but also new data sources.

Organizations need to integrate applications across all the different cloud domains, connecting traditional on-premises enterprise applications with private cloud environments and new lightweight public cloud services. Since new services and connections are rarely exclusively governed by central IT, the result is a confusing network of point integrations. What's needed is a way to standardize integrations and data movement quickly and securely across multiple organizations and actors to help maintain control without slowing down innovation.

An agile, multicloud integration architecture is born when you break up your integration runtimes into smaller, more manageable and dedicated components so that new applications can perform the integration they need at the pace and scale of modern innovation.

When integration is broken down into separate pieces, you can opt to distribute those pieces differently from an ownership and administration point of view. There are many potential advantages to this decentralized integration approach:

- A common challenge for separate SOA teams is that they don't fully understand the applications they're exposing. Application teams know the data structures of their own applications better than anyone.
- Fewer teams need to be involved in the end-to-end implementation of a solution, significantly reducing the cross-team chatter, latency and inevitable waterfall development that typically occurs in these cases.

Ultimately, such an architecture should enable users to:

- Manage access to services in and out of your company with APIs
- Connect apps on premises or in the cloud to drive business transformation
- Protect APIs, the data they move, and the systems behind them
- Conduct reliable messaging communications across application boundaries
- Move huge amounts of data rapidly, securely and predictably
- And cleanse and prepare data for a consistent view of your business

→ [Learn how to integrate across different cloud domains to bring apps and data together to power your latest initiatives.](#)

Next steps

Together with a secure data foundation, an agile, multicloud integration architecture allows enterprise applications to become living, dynamic tools powered by machine learning models (and analytics) deployed for scalability.

As you think about next steps, consider these key questions:

- Is our data extremely complex?
- Is our data storage too costly?
- Is our data analytics straining our production?
- How will we apply data governance across a multicloud environment?
- How will we assure data quality and security in a multicloud environment?

Check out these resources for more details on IBM Cloud capabilities.

→ [Learn how to integrate across different cloud domains to bring apps and data together to power your latest initiatives.](#)

→ [Read the IBM and BizTechInsights survey findings that reveal the challenges organizations face in integrating data and their priorities for improving data integration.](#)



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¹ [Achieving a unified governance strategy](#), Madison Logic, IBM®, ibm.com, July 2017

² [The pros and cons of data lakes](#), Steve Linwood, data-insider.com, August 20, 2016



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