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Real-time AI Acceleration With Cloudera Data in Motion and IBM watsonx for Financial Services

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Abstract: Financial services (FinServ) organizations are quickly moving from periodic batch-based analysis to a focus on continuous intelligence. The accelerating adoption of AI is leading businesses to realize that models are only as effective as the data that powers them and that the most impactful datasets are increasingly streaming, real time, and distributed across hybrid data landscapes. Cloudera and IBM are collaborating to help customers capitalize on this transformation through an integrated platform that combines Cloudera's Data in Motion (DiM) offerings, including Apache NiFi, with IBM's watsonx for AI development, governance, and lifecycle management. By integrating Cloudera's dataflow orchestration expertise along with end-to-end data governance and security capabilities with IBM's industry-leading experience in AI, hybrid cloud, and model governance, the two companies are providing a foundation for delivering real-time AI outcomes at scale that can be trusted.

A New Era of Real-time, AI-driven Enterprise Intelligence

FinServ organizations are entering into a new phase in their use of data and AI at an accelerated pace. While fraud detection and prevention remains one of the most critical and demanding use cases for real-time data, typically requiring response times of a few hundred milliseconds or less, other areas of FinServ are seeing tremendous benefits from the addition of real-time streaming data. Claim processing, for example, can help workers be much more efficient and thus much faster in getting money to claimants, which also improves customer satisfaction. More generally, customer service improves dramatically when real-time data empowers reps to know all of the most recent activities of their customers, significantly cutting down on the need for them to respond, "We weren't aware that happened" to a customer complaint.

Enterprise Strategy Group (now Omdia) research shows that organizations are managing data from increasingly diverse and dynamic sources, with the majority of respondents reporting that their organizations collect data from hundreds of sources each day. At the same time, a significant percentage of enterprise data is now being used for AI modeling and enrichment on a daily or weekly basis.[1] This shift reflects an important truth: Real-time insights are becoming essential to competitive differentiation.

AI strategies that once depended on static, periodically refreshed datasets are being replaced by models that consume streaming information, contextual updates, and situational awareness. Fraud detection, cyber defense, customer experience, operational intelligence, and risk management all depend on data that is accurate in the moment. Hybrid environments, where data flows between on-premises systems, private

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[1] Source: Enterprise Strategy Group (now Omdia) Research Report, *Data Readiness for Impactful Generative AI*, April 2025.

clouds, and public cloud services, also add complexity and increase the need for a unified, governed approach to streaming data.

> 29% of organizations reported that real-time analytics and decision support was the most significant competitive advantage to their analytics capabilities.[2]

These factors are driving enterprises to look beyond point tools and single-purpose streaming services. Organizations require platforms capable of securely moving, transforming, and governing data across the entire lifecycle, from source to pipeline to model. This is where Cloudera and IBM deliver a stronger-together value story.

The Rising Demand for Trusted, Hybrid Data in Motion

The challenge of working with streaming data is not simply acquiring the data stream; it is orchestrating it across hybrid environments while maintaining trust and governance. Many organizations, especially those in the FinServ industry, operate with fragmented pipelines stitched together from open source components, custom scripts, proprietary systems, and cloud-native tools. This fragmentation leads to inconsistent metadata, security gaps, duplicated infrastructure, and brittle integrations, slowing AI readiness.

Data governance becomes especially urgent when data moves rapidly across systems. FinServ organizations need to know who accessed the data, how it was transformed, and whether it meets the standards required for use in regulated AI workflows. In many cases, data sovereignty requirements dictate that certain data must remain on premises or within tightly controlled environments. Hybrid cloud architectures, therefore, need flexibility not only to move data but also to enforce governance and policy consistently.

Cloudera and IBM address these challenges by combining a unified data-in-motion engine with an AI lifecycle platform designed for hybrid environments. Together, they simplify the flow from ingestion to AI, enabling enterprises to take advantage of real-time intelligence with confidence.

Cloudera's Data in Motion Platform: The Core of Real-time AI

Cloudera's Data in Motion offerings are built on proven open source technologies such as Apache NiFi, Kafka, and Flink, integrated and hardened for enterprise-scale deployments. NiFi provides a flexible, visual environment for creating, managing, and optimizing data flows. Its ability to ingest, route, transform, enrich, and deliver data in real time makes it foundational for downstream analytics and AI.

NiFi supports more than 450 connectors, enabling enterprises to integrate virtually any data source or destination across clouds, SaaS applications, devices, and traditional IT systems. Kafka supplies a scalable backbone for high-throughput, low-latency streaming, while Flink enables continuous processing and

> 41% of organizations reported using or exploring RAG in their AI initiatives to improve accuracy and relevancy of AI-generated content.[3]

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advanced stream analytics. Together, these services form a comprehensive data-in-motion platform that can handle log and event data, unstructured content, IoT feeds, and financial transaction streams.

FinServ organizations can embed custom logic, perform data preparation for generative AI and retrieval-augmented generation (RAG) pipelines, and execute lightweight machine learning operations directly within the data flow. With Cloudera's Shared Data Experience (SDX) providing consistent governance and security across hybrid environments, enterprises can trust the quality, security, and lineage of data as it flows into downstream systems.

For organizations using IBM watsonx, NiFi serves as the engine that delivers clean, relevant, and timely data to AI workloads. NiFi acts as more than a pipeline engine: It orchestrates data movement across the enterprise. Whether providing real-time context for RAG pipelines, delivering current operational signals for streaming inference, or preparing data for watsonx.data, NiFi helps ensure accuracy, consistency, and freshness.

Migrating From Open Source to Cloudera

Cloudera's NiFi migration tooling is also a significant advantage for organizations transitioning from Apache NiFi. Open source NiFi introduces significant architectural challenges, does not provide support for as many processors (140 fewer than Cloudera NiFi), and shifts security mechanisms—changes that create risk for organizations with hundreds of existing flows. Cloudera provides automated tooling that maps and rebuilds flows, maintains support for critical production components (such as Ranger, Atlas, Spark, Kafka, and cloud connectors), and offers an extended support window that reduces operational disruption. This is especially valuable for IBM customers who depend on long-term, stable data platforms to feed AI and analytics systems.

With Cloudera NiFi positioned at the heart of data movement, organizations gain a durable, scalable, and secure foundation for all downstream AI operations.

Cloudera + IBM: A Unified Architecture for Real-time AI and Governance

As shown in Figure 1, Cloudera and IBM offer a cohesive platform that unites real-time data movement with a governed, hybrid AI lifecycle ideal for FinServ. Cloudera manages the complete flow of data, from acquisition at the edge, through transformation and enrichment, into lakehouse environments, while IBM's watsonx AI portfolio layers governance, model management, and hybrid deployment options on top of that trusted data foundation.

Figure 1. Cloudera and IBM Data in Motion for FinServ Organizations
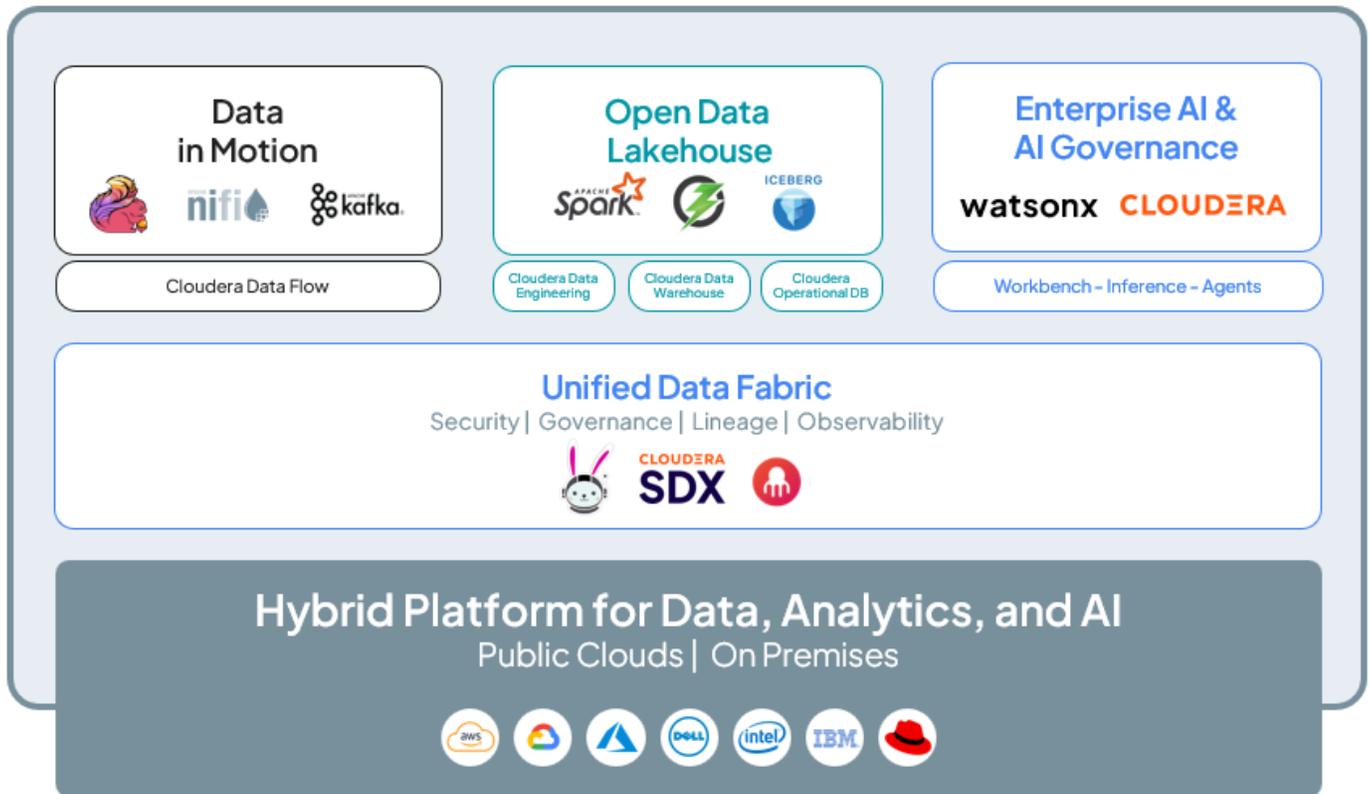
IBM watsonx provides access to foundation models, development tools, and training capabilities. watsonx.governance adds policy controls, model risk management, and compliance features that enable enterprises to deploy AI responsibly and transparently. Together, Cloudera and IBM create an environment in which high-quality, real-time data is directly actionable for AI development and production.

The partnership strengthens areas that are traditionally difficult for enterprises to manage independently, including securing hybrid pipelines, maintaining audit trails across data and model operations, and establishing governance at both the data and AI levels.

High-value FinServ Use Cases Enabled by the Joint Solution

The combination of Cloudera and IBM supports a wide range of industry use cases without requiring deep application-specific customization. In FinServ, real-time transaction data can be streamed, enriched, and analyzed immediately to flag anomalies such as fraud activities. AI-centric use cases are especially compelling. RAG pipelines depend on fresh, relevant context; NiFi ensures that documents, signals, and metadata are cleansed, enriched, and delivered to vector databases or AI models without delay. Operational AI systems benefit from continuously updated features and model inputs that reflect current conditions, improving accuracy and responsiveness.

Real-time Fraud Prevention and Security

Financial institutions are leveraging Cloudera and IBM technologies like NiFi, Kafka, Spark, and Flink to combat fraud in real time. These solutions enable machine learning models to analyze transactions and detect fraudulent activities, processing over 100 million events daily. They also support secure real-time payment processing and fraud prevention for Pix transactions, ensuring robust security across financial systems.

Customer Experience and Loyalty

To enhance customer engagement, FinServ organizations use Cloudera DataFlow and IBM watsonx to capture and process transactions for loyalty programs, generating points and reimbursements. Near-real-time cashback gifts and dashboards displaying daily card and Pix transaction data further improve customer satisfaction and shopkeeper trust.

Data Ingestion, Transformation, and Flow Management

Cloudera Flow Management and NiFi with IBM watsonx are helping FinServ organizations reduce data transfer times from days to hours and simplify the integration of new data sources. Reliable pipelines can ingest large volumes of data. There are many instances of FinServ companies moving over 50TB of mainframe data monthly, with the transaction data being cleaned and distributed for targeted marketing campaigns.

Platform Modernization and Reporting

FinServ organizations are modernizing their platforms with Cloudera Data Streaming with IBM watsonx to enable real-time analytics and personalized services. Offloading customer reporting from transactional databases provides internal teams with low-latency access to critical data, ensuring faster and more informed decision-making. Overall, the use cases share a common pattern: real-time data ingestion and preparation through Cloudera, combined with AI development, governance, and lifecycle management through IBM watsonx. This creates a repeatable pathway for enterprises to operationalize AI quickly while maintaining trust.

Governance, Security, and Migration: Reducing Enterprise Risk

As FinServ organizations adopt AI at scale, governance and security become foundational requirements rather than optional safeguards. Cloudera and IBM provide complementary capabilities that empower organizations to enforce consistent policies for data and models throughout the AI lifecycle.

Cloudera's SDX provides unified security, lineage, metadata management, and access control across hybrid deployments. IBM's watsonx.governance adds model-level accountability, policy enforcement, bias monitoring, and risk evaluation. Together, the

58% of organizations cited data security and privacy as one of their top data and analytics-related challenges.[4]

companies create a holistic governance framework that spans raw data, curated datasets, feature pipelines, models, and AI applications.

Business Benefits and Outcomes

FinServ organizations that adopt the combined Cloudera and IBM architecture gain tangible improvements in speed, efficiency, and risk management. Real-time AI development becomes faster and simpler because data pipelines are unified and governed end to end. Trust and transparency are strengthened through consistent lineage and policy enforcement across both data and AI workflows.

Key benefits include:

- **Accelerated AI readiness** through clean, real-time data flows.
- **Lower total cost of ownership** by consolidating tool sprawl.
- **Improved governance and policy enforcement** for regulated industries.
- **Hybrid flexibility** that aligns with data sovereignty and security needs.
- **Future-proof architecture** supported by enterprise-grade migration and security tools.

These outcomes help FinServ organizations modernize their data infrastructure while advancing AI initiatives with confidence.

Conclusion

Real-time AI requires data in motion that is timely, trustworthy, and governed across complex hybrid environments. Cloudera and IBM offer a unified solution that brings together enterprise-grade streaming, advanced AI capabilities, and comprehensive governance for FinServ organizations globally.

The future of AI is not built on static data sources; it combines structured and unstructured data with real-time data flows to build powerful, unique customer experiences and enable data-driven real-time business decision-making. Cloudera and IBM have the tools, experience, and capabilities to help FinServ organizations create the AI solutions they need today and for the future.