Building data-driven applications in the cloud

Four characteristics of top-notch big data cloud solutions
Building data-driven applications in the cloud

What makes cloud and big data a good match?

1. Flexibility
2. Simplicity
3. Security
4. Openness
5. Your gateway to cloud innovation
What makes cloud and big data a good match?

The increasing prevalence of cloud, mobile and social technologies is opening the floodgates of data generation and analysis. Leading companies are able to create actionable insight from big data and analytics to deepen client engagement, go after new markets and respond to the needs of the business faster. But to maximize impact, analytical tools and capabilities must be available to all of the people making decisions, wherever they are.

This is where the growing influence of cloud plays an increasingly vital role. The cloud computing model is a perfect match for big data and analytics because it provides anywhere access and virtually unlimited resources that scale on demand.

By accessing analytical resources in the cloud, business users can easily view, understand and interact with data and insights to determine how and when to act. They can also access and update data remotely through mobile devices, improving accuracy and enabling real-time planning and forecasting.

Cloud-delivered big data and analytics present an enormous opportunity for organizations that want to become more agile, more efficient and more competitive. To capitalize on the full potential of this opportunity, businesses need cloud-enabled big data analysis solutions that are flexible, simple, secure and open.

Gartner predicts that analytics will reach 50 percent of company employees by 2014, and by 2020, that figure will be 75 percent.¹ This represents a tremendous opportunity for return on technology investment and organic growth.
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According to an IBM Institute for Business Value report, 60 percent of leaders have predictive analytics capabilities, and 85 percent of leaders have some form of shared analytics resources.²

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Flexibility

Cloud changes the way work gets done across roles: line-of-business (LOB) leaders, IT managers and developers. All three roles want to assemble solutions quickly.

- **LOB leaders** seek best-of-breed services and solutions (in-house and external) that enable them to quickly and easily implement business process changes, leverage new ways to engage with customers and even define entirely new business models.

- **IT managers** prefer to leverage a self-optimizing, dynamic hybrid environment to securely deploy and move applications and data across private and public clouds—without the need for manual intervention and with scalability and elasticity.

- **Developers** need to build applications fast and integrate them on-premises or off-premises using a robust set of tools for service composition through composable services and application programming interfaces (APIs).
Business professionals across the organization are looking for easy access to user-friendly cloud services and applications that are secure and scalable. Until now, they would have searched across the web, looking at vendor sites to piece together solutions. Today, with the IBM Cloud marketplace, users from business, IT and development can consolidate the evaluation, trial, purchase and deployment of both IBM and third-party applications. **The IBM Cloud marketplace serves up content depending on job roles, with service pages designed to intuitively guide customers to areas of interest, such as start-ups, mobile and gaming.**

For example, LOB professionals can explore more than 100 software-as-a-service (SaaS) applications in categories such as marketing, procurement, sales and commerce, supply chain, customer service, finance and legal. Developers can immediately take advantage of an integrated, open, cloud-based development environment where they can create enterprise applications by exploring open source or third-party tools and integrating them as needed with IBM® Bluemix™, the enterprise-grade developer sandbox. IT managers can peruse the Ops category for secure cloud services running on IBM SoftLayer®. Services include big data, disaster recovery, hybrid environments, managed security services and cloud environments.

**IBM SaaS and PaaS solutions are designed to extend the benefits of cloud to analytics.** Case in point is the IBM Cloudant™ fully managed, distributed database-as-a-service (DBaaS), which leverages the CouchDB NoSQL database. Cloudant provides scalable NoSQL database services that allow you to develop new features without redesigning the database or migrating data. Built-in text search, data replication and synchronization features, plus Apache MapReduce support for advanced analytics, enable an exceptional user experience.

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The IBM acquisition of Cloudant is designed to meet emerging market demand for database solutions that accommodate enterprise needs for scalability and store unstructured data. IBM Cloudant database-as-a-service (DBaaS) technology enables developers to easily and quickly create next-generation mobile and web apps. It offers developers of demanding new applications functionalities such as high availability, elastic scalability and innovative mobile device synchronization. Cloudant runs in multiple hosting environments, including the SoftLayer platform.

Cloudant offers a number of unique features:

- It’s delivered as an online as a fully managed service by the experts at Cloudant, so you don’t have to worry about database administration or scaling.
- The service automatically distributes data across data centers and devices, which enables Cloudant to scale widely and stay more highly available than alternatives—even to offline mobile users who are not connected to the network.

For more on Cloudant capabilities, visit: www.cloudant.com
Another example is IBM BLU Acceleration for Cloud, a data warehousing and analytics solution available in the cloud. The solution is powered by next-generation in-memory database technology, IBM DB2® with BLU Acceleration, and combined with IBM Cognos® Business Intelligence software. Users benefit from a powerful, simple, agile cloud solution.

To maintain a competitive edge, businesses need to be able to capture, analyze and act on data from all customer channels. Achieving this level of agility requires a dynamic cloud environment that:

- Constantly adapts to meet new requirements
- Leverages the speed and cost benefits of a public cloud
- Delivers the security and control of a private cloud
- Maximizes return on existing IT investments

Competitive advantage goes to businesses that can consume and deliver cloud-based capabilities through all forms of cloud: public, private and hybrid. Achieving this dynamic flexibility requires a different cloud approach—one that is not vendor-specific or proprietary. It must be based on open standards, and be secure and responsive.

IBM delivers this capability with a secure set of cloud services built on the SoftLayer platform that help businesses deploy cloud-based applications and support high-performance analytics at enterprise scale. SoftLayer gives IT managers the ability to choose a cloud environment and location that best suit their business needs. It provides visibility and transparency into where data resides. SoftLayer also gives customers control of data security and placement, and a choice of public, private or bare-metal server options.
Simplicity

To build applications quickly and efficiently, developers need an environment that is simple and flexible. Instead of spending time on integration or managing infrastructure, developers should be spending time on innovation. They need to minimize the time-consuming drudgery of operations and put their energy into experimenting more and delivering business value faster.

IBM Bluemix, a PaaS designed by and built for developers, enables the rapid development of web and mobile applications. It offers an environment where developers can leverage existing services—provided not only by IBM, but by third parties as well—with pre-configured runtimes to create apps in minutes.

Bluemix enables anyone from individual developers to large enterprise teams to:

- Rapidly bring products and services to market at lower cost
- Continuously deliver new functionality to their applications
- Extend existing investments in IT infrastructure

Try Bluemix today.
Not only do organizations need the agility to scale up and down quickly when invoking cloud resources, they also need to reduce the amount of time it takes to set them up. Many businesses now realize they don’t have the expertise, time or resources required to build every application from scratch. **In fact, the more compelling business metric facing IT service providers going forward is the mean time to delivery based on being able to turn on the service.**

To respond quickly to market changes, organizations need big data solutions that allow everyday business users to visually interact with and apply advanced analytics to big data without needing the specialized skills of a data scientist. This way, LOB professionals in sales, marketing, finance and other areas can obtain and easily interpret predictive insights from data in minutes.

IBM InfoSphere® BigInsights™ featuring Big SQL 3.0 offers unmatched simplicity, performance and security for SQL-on-Hadoop. It provides a single view and access point across all big data, wherever that data lives. Big SQL helps remove the need for specialized, intensive skills to extract value from big data—reducing cost and accelerating time to value.

That’s good news for developers and even better news for business leaders who rely on accurate, instant insights for make-or-break business decisions.
Another example of big data simplicity is IBM InfoSphere Streams, which is engineered to handle the exceptionally high data throughput rates often found with streaming data. With InfoSphere Streams in the cloud, IT administrators can create, maintain and synchronize clusters, automatically scaling from a few nodes to thousands. Plus, they can run multiple InfoSphere Streams applications simultaneously on the same server or cluster.

InfoSphere Streams helps you:

- **Simplify development of streaming applications** with its Eclipse-based integrated development environment (IDE)
- **Analyze data in motion** by providing sub-millisecond response times that let you view information and events as they unfold
- **Extend the value of existing systems** by integrating with your applications, and supporting both structured and unstructured data sources

For LOB leaders, IT managers and developers, these cloud-based offerings combine simplicity, skill and flexibility with lower operational, infrastructure and administrative costs to accelerate big data and analytics success.

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Building the cloud of the future

IBM Cloud marketplace represents a significant step in IBM’s continuing march toward building the most comprehensive cloud portfolio for the enterprise. This single online destination serves as the digital front door to cloud innovation, bringing together IBM capabilities-as-a-service and those of partners and third-party vendors with the security and resiliency enterprises expect.

In 2014 alone, IBM announced several investments designed to augment the Cloud marketplace offerings:

- USD1.2 billion investment to expand the IBM global cloud footprint with SoftLayer
- USD1 billion in cloud development with the launch of Bluemix, enabling much of IBM middleware to move to the cloud
- USD1 billion in the launch of a new business unit, the IBM Watson™ Group, for cloud-delivered cognitive innovation
- Acquisition of Aspera and Cloudant, bringing the total investment in 17 cloud acquisitions to USD7 billion since 2010
Security

One of the challenges of managing big data is that it opens up a much-greater variety of data streams and sources. Many of these sources originate outside the organization, and vouching for the quality and sensitivity of this data is difficult. But that doesn’t eliminate the need for data governance and careful stewardship. It just demands a new approach, because the data is flowing in from beyond the walled boundaries of the enterprise.

For a robust, security-rich cloud, look for a big data solution provider with a comprehensive portfolio of solutions that span the entire cloud lifecycle and all security domains. Establishing a clear data protection road map with the right mix of capabilities to secure foundational technologies lays the groundwork for cloud success.

IBM offers built-in data security services that help take the complexity out of protecting enterprise data in the cloud. These services leverage technologies from IBM InfoSphere Guardium® and IBM InfoSphere Optim™ to provide data masking, discovery and audit capabilities. Applied to enterprise data sources, they help businesses protect big data and drive innovation with less risk.

A new Bluemix feature includes built-in monitoring for cloud databases, including automatic provisioning of data security and privacy. This feature tracks people who use the data and shows how the data is used, enabling you to create comprehensive audits and reports to demonstrate compliance in just a few clicks. Bluemix also identifies sensitive data within databases and lets companies intelligently mask that data on demand to protect against misuse.

Learn more about IBM InfoSphere data security and privacy solutions.
Openness

Organizations should not be forced to solve all their data challenges with a single, one-size-fits-all technology. Standards are a way to give workers freedom of choice in the vendors, products and solutions they select and deploy. If an enterprise is using a solution based on open standards, it can switch to another solution that’s based on the same open standards without having to perform a lot of complex integration. This level of interoperability paves the way for innovation.

In considering all the components of a big data platform, remember that the end goal is to easily integrate all of your enterprise data so you can conduct deep analytics on the combined data sets. Organizations need
to use more specialized and fit-for-purpose applications to accelerate deployment of functionality and data availability to meet rapidly changing requirements and voluminous data growth. They also need to ensure the compatibility of these applications across heterogeneous data warehouse platforms and clusters of distributed computing systems, while guaranteeing the ability to share data between all applications and systems.

IBM has developed a unique, enterprise-class big data and analytics platform—IBM Watson Foundations—that allows organizations to address the full spectrum of big data business challenges as part of an open architecture framework. The platform blends traditional technologies that are well-suited to structured, repeatable tasks with complementary new technologies that address speed and flexibility and are ideal for ad hoc data exploration, discovery and unstructured analysis.

Core capabilities of Watson Foundations include:

- **Hadoop-based analytics:** Enables distributed processing of large data sets across commodity server clusters
- **Stream computing:** Continuously analyzes massive volumes of streaming data with sub-millisecond response times
- **Data management:** Delivers deep operational insight with advanced in-database analytics
- **Information integration and governance:** Allows you to understand, cleanse, transform, govern and deliver trusted information for critical business initiatives

Get an overview of IBM Watson Foundations.
Your gateway to cloud innovation

Analytics can improve almost any business decision-making process and outcome, from which products to build and risks to take, to which customers are the best targets and how to best gain their loyalty. By offering big data and analytics solutions in the cloud, IBM is helping organizations drive stronger employee and customer engagement and gain real-time insight into how their business is performing—while enjoying much-needed flexibility, simplicity, security and openness.

IBM Cloud marketplace is available to all IBM and non-IBM customers. The goal: give you the development capabilities you need to deploy better applications faster and at a lower cost. In addition to saving time, you also save costs with deeper integration to back-end IBM services without requiring those systems to be in place.

Finally, the adaptable IBM “as-a-service” approach doesn’t require you to abandon your existing applications or infrastructure in a rush to the cloud. Instead, you can use these solutions to enhance and extend your existing environment with new capabilities—and use your data resources to drive your business forward.

Get started with IBM Cloud marketplace today, and visit these resources to learn more about IBM cloud solutions:

- ibm.com/cloud
- IBM Bluemix
- ibm.com/Hadoop
- The IBM approach to big data and information management