Solving the data challenges of high-performance analytics

Highlights

- Enables you to build secure data analytics and AI-based applications
- Smooths implementation of full-stack on-premises private clouds
- Provides simplified container utilization with Docker and Kubernetes
- Offers features to boost system efficiency and improve storage economics

IBM Storage Solutions for IBM Cloud Private for Data provide the infrastructure needed to build cutting-edge data analytics applications

Data analytics is already transforming business. Industry analysts confirm that the positive revenue impact of analytics has surpassed USD200 billion annually. Last year, the manufacturing sector alone increased revenue generation by nearly USD40 billion thanks to new implementation of data technology.[1] Three-quarters of company executives state that data analytics have already made a positive impact on their companies.

One data analytics technology that IT industry analysts believe is poised to significantly impact enterprise infrastructure and business processes is artificial intelligence (AI).[2] AI holds great promise with its ability to learn patterns in networks, devices and systems and to decode deviations that could reveal problems before an event occurs or detect in-progress cyber attacks. As the Internet of Things (IoT) progresses, the amount of unstructured machine data created will far exceed our ability to make sense of it with current analytical methods. Organizations will use AI to mine billions of data points for actionable insights, valuable for incremental revenue streams and competitive differentiation.

Though it may be easy to see the potential benefits, implementing the wide range of big-data, real-time, and AI-based analytic solutions is not simple.[3] IT modernization will most likely be required so that applications that utilize various analytics techniques can access distributed data sources that are often siloed and inaccessible in traditional infrastructures. These analytics applications will want to leverage container technology for ease of portability and movement, plus use microservices to simplify and speed development and updates. And analytics applications will often need to draw from both on-premises and cloud resources. This last requirement highlights the additional issues of security in the public cloud versus data kept behind the company firewall.

Implementing effective data analytics may seem challenging; however, help is here. IBM has recently released IBM Cloud Private for Data, a new kind of data and analytics platform that can simplify and unify how enterprises collect, organize and analyze data to speed time to value from data science and analytics. This platform delivers a broad range of core data microservices, with the option to add others from a growing services catalog. And there is no need to move data beyond the company firewall; IBM Cloud Private for Data is based on proven IBM Cloud Private technology that delivers private clouds with multicloud flexibility, yet behind-the-firewall security and control.

Supporting every IBM Cloud Private implementation, powerful IT infrastructure solutions provide the required data management and storage capabilities and storage capabilities at extremely low latency and high cost efficiency. Known as IBM Storage Solutions for IBM Cloud Private, these deeply integrated infrastructure solutions include the storage systems, the software and the validated deployment Blueprints needed to build agile, highly functional private clouds that can help modernize your information architecture and bring the power of data analytics into your organization on your terms.

Challenges of analytics

Supporting data analytics initiatives requires that you obtain all the data you need, govern it to ensure it is trustworthy, analyze and build the machine learning and other algorithms necessary to implement effective analytics and AI, and then put the results of these efforts into production. This is not a trivial process.[3]

Ninety-two percent of business leaders say that to compete in the future, their organization must be able to exploit information much more quickly than it can today.[4] Enterprises need solutions that will allow them to evolve their approach to data and drive real value with strategic decisions. This journey can be depicted in a data maturity curve.

Data maturity curve
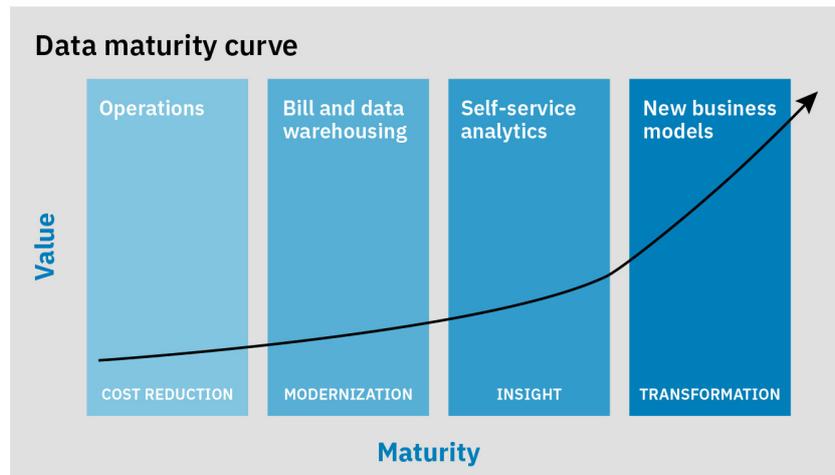
Data maturity curve illustrating the different phases of data storage needs

Organizations at the beginning of the curve have learned to apply data to operations, usually with an emphasis on cost reduction. As their data maturity progresses, their use of information expands, shifting toward business intelligence. Organizations at this level have modern data operations but may not have incorporated AI and other leading-edge analytics yet. At the top of the curve are enterprises that have achieved full data maturity, have established self-service analytics, are able to use analytics, and have already transformed their business with new revenue and profit streams.

Many enterprises on this journey toward high-performance analytics seek solutions that help them leverage existing on-premises data while conducting advanced analytics in the cloud. This is exactly the multicloud information architecture that IBM Cloud Private is designed to enable.

Highly capable private cloud platform

For organizations with application workloads that operate best on-premises, IBM Cloud Private offers a leading-edge private cloud platform for developing and running workloads locally. It is an integrated environment that enables you to design, develop, deploy and manage on-premises, containerized cloud applications behind your firewall. It accelerates the work of enterprise developers by providing access to valuable data and applications behind the firewall through a flexible, container-based architecture and application programming interface (API)-based catalog of services. It also includes a private image repository, a management console and monitoring frameworks.

IBM Cloud Private provides control for how and where applications consume cloud services. It uses industry-standard open-source technologies such as Kubernetes, Docker, Helm, Terraform, Cloud Foundry, and more than 40 others. Leveraging these services, enterprises can optimize legacy applications with cloud and containers for use with DevOps or analytics, create new AI applications, and open their data centers to work with cloud services.

IBM Cloud Private integrates a variety of microservices (such as IBM Watson APIs) and middleware capabilities to help form a robust and responsive IT infrastructure that can improve the overall integration and continued deployment of applications, while minimizing risks associated with performance bottlenecks and unpredictable scalability. IBM Cloud Private helps drive enterprise transformation by providing developers with a choice of languages, frameworks, runtimes and services to build cloud-native applications and microservices so that you can create your own analytics applications. It accelerates innovation by facilitating utilization of services such as blockchain and machine learning that developers can infuse into existing or new applications.

Enabling greater insight behind the firewall

IBM Cloud Private for Data adds key analytics capabilities and microservices to the basic IBM Cloud Private platform. It offers an integrated, end-to-end solution for high-performance analytics that enables companies to reach their data maturity goals. It allows critical data to remain securely behind the company firewall while being accessed by cloud-based applications to generate new insights.

As an all-in-one solution, IBM Cloud Private for Data empowers organizations to put their data to work quickly and efficiently. It enables data users to collaborate from a single interface, rather than requiring the deployment and connection of multiple applications. This connected platform provides the ability to access and govern data, regardless of where it lives, so it can be used for analysis with a wider range of applications. By leveraging these analytics capabilities, IT teams can generate meaningful insights and drive transformation across the enterprise.

The IBM Cloud Private for Data catalog of microservices brings together key capabilities from the IBM portfolio of analytics solutions. These capabilities include tools for leveraging on-premises data with cloud-based analytics tools that can help build powerful foundations for data maturity and generate meaningful insights to drive business value.

These microservices and tools enable you to:

- **Protect your data.** IBM Cloud Private for Data helps enterprises retain control of their data by porting only the insights—not the underlying data—to public cloud applications. This allows organizations to tap into the benefits of public cloud while maintaining all the data behind the firewall of their private cloud.

- **Organize your data.** IBM Cloud Private for Data helps users find existing data, request access to data and easily collaborate with colleagues across the organization. With these capabilities combined, you can spend less time finding and managing data and more time using it effectively to create insights to drive business decisions. An enterprise data catalog helps create a cohesive information architecture by ensuring that your data is mapped to a standard set of business terms and follows information governance policies and rules.

- **Prepare for the future.** IBM Cloud Private for Data minimizes the time and expense needed to create meaningful insights while expanding analytics capabilities. In order to successfully adopt new analytics technologies such as machine learning and AI, organizations need to be able to rely on meaningful and trustworthy information. Disparate data must be in a consistent format and organized into a single access point to provide the most value. With IBM Cloud Private for Data, you can move from raw data to trusted data. At that point, your organization can be ready to analyze that data to gain insights that can enable you to drive better business outcomes.

Infrastructure for high-performance analytics

Building the information architecture and achieving the organizational data maturity needed to leverage the power of high-performance analytics requires underlying IT infrastructure elements designed to facilitate modernization, work closely and simply together, enable multicloud architectures, and provide a wide range of data management and efficiency features. IBM Storage Solutions for IBM Cloud Private were engineered to address these 21st-century IT infrastructure requirements. A number of these solutions have already been integrated and validated with specific deployment and configuration Blueprints. And more are on the way, including solutions designed specifically to maximize the performance and efficiency of IBM Cloud Private for Data implementations.

IBM Storage Solutions for IBM Cloud Private incorporate the latest enterprise software-defined data center technology, including network and storage virtualization and container integration. In fact, the solutions help to scale and simplify containerized environments, scaling to more containers with automated, faster provisioning of supporting volumes compared to native container scripting.

As expected from a cloud deployment, IBM Storage Solutions for IBM Cloud Private are designed to expand and shrink depending on the application necessity—scaling up or down is a simple and easy procedure that can be done without impact. The solutions enable the movement from technology silos to a cloud model that transforms data center infrastructure into pools of resources that can be easily allocated and repurposed. Applications can run more efficiently within, between and beyond data center boundaries—and IT departments can evolve into IT-as-a-service centers to accelerate service delivery and leverage the power of data analytics.

IBM Storage Solutions for IBM Cloud Private hides the complexity of individual devices, hypervisors and virtual machines in a simplified model that makes them easy to manipulate and incorporate into automated processes. Users simply request the resources they need through an easy-to-use, secure, self-service portal, and the system provisions the underlying infrastructure resources. Cloud infrastructure layers are synchronized and optimized, helping ensure that IT resources are available on demand. Because this intelligent system knows how objects fit together and can apply service profiles in a consistent manner, you can have the confidence that the right equipment is quickly and easily provisioned for the workload that you need it to support.
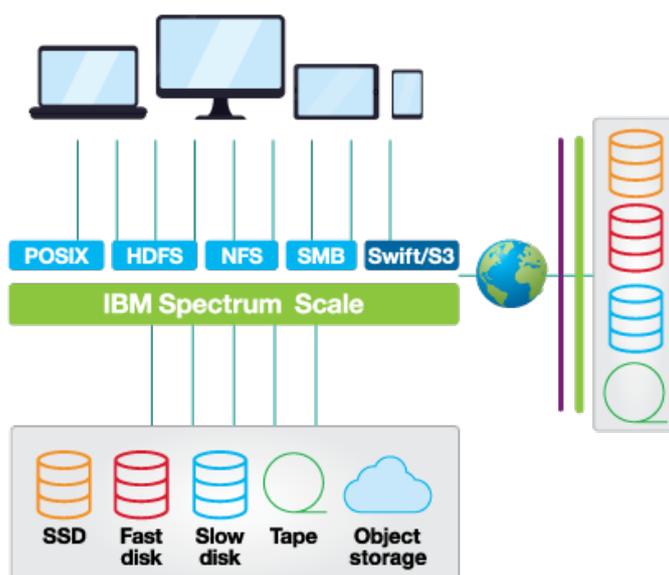
IBM Spectrum Scale can provide seamless, unified storage infrastructure

Today, upwards of 80 percent of data is unstructured,[5] existing as emails, business documents, images, telemetry from the IoT, and much more. IBM Storage Solutions for IBM Cloud Private can easily leverage the capabilities of IBM Spectrum Scale to manage file systems, object storage, and, in fact, data of all types. It is one of the most widely deployed members of the IBM Spectrum Storage family, used extensively across multiple industries worldwide. IBM Spectrum Scale is designed to provide high-performance, highly functional data management for all the types of data that business activities may generate, including structured data, data files and even the newer data objects.

IBM Storage Solutions for IBM Cloud Private can utilize non-volatile memory express (NVMe)-optimized IBM FlashSystem 9100 all-flash storage arrays and IBM Storwize systems to create virtualized storage solutions that provide efficient storage infrastructure for private cloud environments. These systems include technologies that enhance cloud advantages, with built-in capabilities such as data virtualization and comprehensive data reduction. Embedded within IBM FlashSystem 9100 and Storwize arrays is IBM Spectrum Virtualize, the industry-leading storage virtualization software that can extend data services such as copy management, encryption and high availability to heterogeneous external third-party storage systems. By leveraging the power of IBM Spectrum Virtualize, you can centrally manage storage volumes from a single point, migrate data from existing arrays without disruption to applications, and avoid downtime for backup, maintenance and upgrade operations.

IBM Storage Solutions for IBM Cloud Private also include IBM Z and IBM DS8800 deployment Blueprints to build mainframe-based private clouds that leverage the security, performance and resiliency levels available in mainframe processing environments.

Among the many advantages and benefits offered by IBM Storage Solutions for IBM Cloud Private, enterprises can:

- **Solve analytics problems in real time.** The solutions offer self-service tools that increase efficiency and agility for data scientists and business analysts. Training models for AI/deep learning can be built faster with more iterations in less time.

- **Modernize and optimize existing applications.** New containerized versions of IBM middleware available through IBM Cloud Private allow you to refactor existing applications and modernize infrastructure to accelerate business innovation.

- **Enable data centers to work with cloud services.** There are security and regulatory constraints preventing organizations from leveraging innovative capabilities normally delivered through public cloud. With API consistency across both its public and private cloud solutions, IBM enables you to securely integrate capabilities from the public cloud with applications developed on-premises, opening up potential new revenue and profit streams.

- **Modernize/refactor applications.** IBM private cloud solutions accelerate modernization via architecture guidance available from tools such as the IBM Cloud Garage Method, IBM Cloud Transformation Advisor tool that provides assessment and planning guidance, and IBM Cloud Automation Manager that enables multicloud provisioning and management.

- **Address large capacity requirements.** IBM Storage Solutions for IBM Cloud Private provide highly scalable storage systems designed to start small and grow as business needs grow. The powerful data reduction, nondisruptive upgradeability and high-capacity IBM Flashcore technology provided by these solutions are ideal for cloud-native workloads.

- **Increase container security.** Secure Service Container for IBM Cloud Private allows deployment of highly secure containers with automatic encryption and no code-at-rest, in-flight, host or operating system interaction.

- **Simplify multicloud deployments.** The solutions facilitate Docker and Kubernetes environments that transform on-premises storage with cloud efficiency and flexibility. You can automate storage provisioning and data protection and reuse data copies for DevOps, analytics and reporting.

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Why IBM?

The future belongs to high-performance data analytics. For enterprises that want to gain competitive advantage by implementing the full range of analytics, including AI-enhanced applications, sooner rather than later, modern information architecture and IT infrastructure is required. IBM Cloud Private for Data provides a powerful, comprehensive platform for developing and deploying a full range of analytics applications. And IBM Storage Solutions for IBM Cloud Private provide the flexible, efficient, multicloud storage infrastructure needed for enterprises to most effectively leverage the great power of data analytics and to thrive.

For more information

To learn more about IBM Cloud Private for Data, please contact your IBM representative or IBM Business Partner, or visit: ibm.com/analytics/cloud-private-for-data

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: ibm.com/financing

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