



Highlights

- Offers the benefits of a public cloud on a security-rich, scalable private cloud platform for developing and delivering cloud-native apps
 - Helps make heritage applications cloud-ready
 - Helps protect confidential and proprietary Kubernetes and Docker workloads with IBM Secure Service Containers
 - Enables organizations to build new microservice-based apps for improved agility and innovation
 - Designed to more securely use data and services from external private cloud sources
 - Supports heavy workloads with thousands of parallel users and thousands of Linux servers—in one box
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IBM Cloud Private with Linux on IBM Z

Empower how you build, deploy and manage cloud-native applications

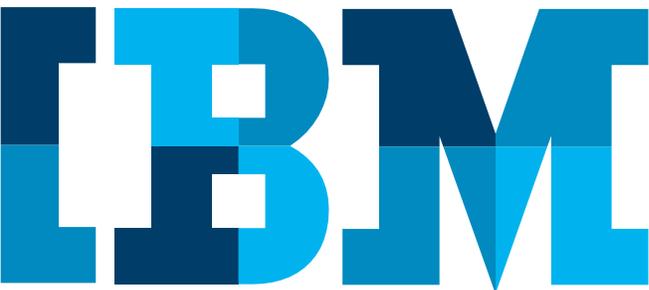
Introduction

Many organizations have unique data sensitivity needs, such as internal policies, government regulations or industry compliance requirements. As a result, these organizations typically require private cloud. Yet in a world of changing business demands, they also need to run demanding applications and use multiple services both on-premise and on multiple clouds for the sake of agility.

IBM Cloud™ Private with Linux® on IBM Z® provides the advantages of a private cloud on a server platform optimized for data and cognitive services, and is designed to deliver the benefits of a public cloud in a security-rich, scalable and reliable environment. It enables enterprises to accelerate innovation using modern agile processes, integrates with existing systems, and provides a strategic platform for multi-cloud integration while maintaining the control and compliance that organizations need.

Connect almost anything on premise and in cloud

IBM Cloud Private gives developers and IT operations a combination of critical capabilities to transform the enterprise. IBM Cloud Private provides an integrated cloud platform for enterprise workloads that need to be run in a customer-controlled and security-rich environment. It is designed for refactoring heritage enterprise applications to the cloud era — componentized, leveraged for multiple enterprise needs, highly optimized, security-rich and highly available. This environment can help you easily connect to existing apps and migrate at your pace.



IBM Cloud Private has at its core the infrastructure, tools, runtimes and services needed to make a private cloud foundation rock-solid. With containers, Kubernetes, and Cloud Foundry at the base, you can excel in your adoption of container technology as a strategic building block for increasing application developer productivity and decoupling teams to help enable speed and agility. Development teams can leverage platform and middleware for availability, elasticity and cost, while accelerating applications and middleware modernization with a catalog of container-based services, minimizing risk and reducing changes to existing applications. They are empowered to integrate within the enterprise (with IBM API Connect™, IBM Application Discovery and Delivery Intelligence and IBM z/OS® Connect Enterprise Edition) and to public cloud services using API connectivity and management tools that run on existing infrastructure and are designed to address security compliance, risk and cost.

IBM Cloud Private also helps enterprises use new technologies and DevOps models for rapid application creation and deployment, and extends the value of existing Systems of Record and Systems of Engagement as your organization enters the new world of applications built for the cloud.

Why IBM Cloud Private on Linux on Z?

Smoothly handling business-critical data requires a robust infrastructure designed specifically for high-volume data transactions. Linux on Z can provide that infrastructure. It offers a single platform for entire business processes designed with robust security and disaster recovery capabilities. Using IBM Z for key workloads can enable easy extension to Linux, with the accelerated deployment and reduced risk proven technology can bring. This open source and agile platform enables organizations to help modernize and optimize cloud applications, open enterprise data centers to work with cloud services, and create new cloud-native applications. Linux on Z runs many kinds of open source software, including Apache Spark, Ansible, Chef, Docker, Go, HyperLedger, Jenkins, Kibana, Kubernetes, MongoDB, NGiNX, Node.js, PostgreSQL, Puppet, Python, Ruby and Salt, among others.

A private cloud with Linux on Z provides a comprehensive environment for developers and operations admins to leverage to help unleash innovation and meet enterprise business needs. Developers can quickly get started on their successful journey to developing cloud-native services either on x86 distributed systems or IBM LinuxONE™, with virtually no change in tooling. This capability helps ease the transition to cloud while leveraging the inherent QoS and Security of the IBM Z platform, for new cloud-native application development and optimization of existing applications.

Open container technology, including Docker and Kubernetes orchestration, prevents vendor lock-in. You may find improved efficiency and lower cost by co-locating cloud apps with transactional systems and data with unprecedented workload availability on the platform. In the three generations since IBM introduced redundant array of independent memory (RAIM) technology, IBM Z has experienced no server failures due to a memory crash.

Robust, security-rich virtualization helps protect your data from external and internal breaches with a high security rating or classification increased memory for greater processing, including analytics of in-memory data, and a higher capacity ceiling, can help improve your performance. For example, IBM studies show running an unsharded MongoDB instance of 8 TB runs 2x faster than a comparable database sharded across multiple x86 servers. And the unsharded instance can scale up to 350,000 transactions per second or 30 billion transactions per day.¹ Controlled testing demonstrates better insights in less time with up to 3x more analytics performed with Apache Spark (Spark) on the same system.² With a Service Catalog with a large library of services such as Liberty, Microservices Builder, IBM Db2® Developer-C (non-production), Open Source databases and many other open source app dev tools, your environment can be open and connected to help drive more value for your enterprise.

Why IBM Cloud Private?

Built to help you solve problems and advance opportunities in a world rich with data, IBM Cloud Private can deliver:

Business innovation

- New microservices-based applications to build, deploy and manage more easily — offering dynamic scalability and variable demand management
- New integrated IBM and open source DevOps tools and services for code repositories, deployment, test automation and promotion to production
- Virtually seamless integration to IBM Public Cloud — designed to offer secure access and integration to innovative technologies including cognitive/AI, blockchain, IoT and more

Integration

- Ease of access to the platform and other services to help developers easily integrate within and across cloud environments
- Catalog of services and integration tools to assist developers on- and off-premises

Compliance and management

- Capabilities designed to monitor, secure and operate microservices at scale
- Security-rich corporate data and compliance management with government regulations and/or industry standards
- Management, back-up and recovery of data and applications

Investment protection

- Ability to preserve or delay risky application changes by using the next generation of cloud-enabled software
- Ability to modernize existing heritage applications while integrating with new applications
- Catalog of software and services to enable developers and operations teams to more confidently migrate applications to new versions and the cloud

How to move forward

IBM has extensive experience with high transaction volume data and infrastructure security. Take advantage of this IBM expertise by:

- Arranging an IBM Linux on Z workshop, including presentations and demonstrations of deploying solutions on the new technology
- Arranging a Discovery Session to determine how running open source software on your Linux on IBM Z hardware can benefit your workloads
- Performing IT assessments, developing implementation plans or providing IBM Linux on Z solution deployment services. IBM IT services professionals can help you prioritize your IT projects, plan installations with little or no disruption to your business operations, and perform as much or as little of the implementation as you need

Ready to try it out?

- IBM Cloud Private guided demo: ibm.biz/BdjSYK
- IBM Cloud Private proof of technology demos: ibm.biz/BdjSYn
- Free Community Edition: ibm.biz/BdjKEa

For more information

To learn more, please contact your IBM representative or IBM Business Partner, or see the following websites: Linux OS on IBM Z: ibm.com/systems/z/os/linux



¹These claims are based on results from internal IBM lab measurements in a controlled environment with dedicated processors. Unless specifically documented, performance is based on External Throughput Rate (ETR) measurements and projections using standard IBM benchmarks in a controlled environment. The actual performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance stated here.

²These claims are based on results from internal IBM lab measurements in a controlled environment with dedicated processors. Performance is based on elapsed time measurements. The actual performance will vary depending on Spark-Perf benchmark version, Spark versions, IBM JDK versions and other factors. Also, the actual performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the stack configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve performance improvements equivalent to the performance stated here. Spark-Perf performance suite core primitives component, called 'Spark', was used for this measurement (Dated June 29th 2015 with Commit ID 1cb45d3). The above z13 measurements were performed on a standalone dedicated System z13 running Linux in a native LPAR. The z13 machine was at GA hardware level. Only externally documented options were used. The z13 was configured with 6 physical cores and each core in SMT2. IBM 64-bit SDK for Java Technology Edition, Version 8 with SR1-FP10 service release applied was used for Spark on z13. The above alternative platform (x86) measurements were performed on standalone dedicated Intel(R) Xeon(R) CPU E5-2699 v3 @ 2.30GHz, running Ubuntu 15.04 with no other workloads running. The x86 was configured with 36 physical Cores using hyper-threading but only 6 physical Cores were used for Spark. IBM 64-bit SDK for Java Technology Edition, Version 8 (with SR1 service release applied) was used in the x86 configuration. Spark 1.4.0 used on both platforms had Spark local, log and working directories on Ram Disk; 540672Mb was the total executor memory on both platforms.

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