IBM Z® & IBM® LinuxONE

December 2025

# IBM Cloud Infrastructure Center

## Frequently Asked Questions

Worldwide

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# IBM Cloud Infrastructure Center

## What is IBM Cloud Infrastructure Center?

Cloud Infrastructure Center is a ready-to-use infrastructure management solution for the IBM Z® and IBM® LinuxONE platforms.

Cloud Infrastructure Center provides a consistent industry-standard user experience for the following:

- Manage the full lifecycle of virtual machines based on IBM z/VM® and Red Hat® Enterprise Linux KVM.
- Deployment of Linux® images that can include non-containerized applications from IBM, open source, or other ISV software.
- On-demand user exploitation of services via a self-service portal.
- Integration with enterprise infrastructure and cloud management tools (IBM Cloud Paks®, IBM Instana®, Red Hat Ansible®, Terraform, to provision and orchestrate workloads.
- Simplify deployment of Red Hat OpenShift® Container Platform clusters.

See the chapters ‘Key capabilities’ and ‘Major use cases’ for more details.

## What is hybrid cloud?

At a basic level, a hybrid cloud architecture is a combination of public clouds, private clouds, and on-premises infrastructure. These different elements are connected and work together through communication or orchestration. An open hybrid approach gives the flexibility to choose the best features and functions from any cloud and on-premises IT environment and integrate them into the system.

## What is IBM’s open hybrid cloud approach?

IBM advocates an open, hybrid cloud strategy that unifies an enterprise’s existing infrastructure and cloud environments and creates a bridge to tomorrow’s infrastructure. A hybrid by design approach breaks down significant barriers and overcomes challenges resulting from a complex and often disconnected IT estate. It’s an approach centered on unifying the client experience to manage the infrastructure seamlessly and in a more horizontal way.

The quality that makes this possible, and what sets IBM’s approach apart, is the openness of its architecture, which is rooted in the Red Hat OpenShift Container Platform.

Red Hat OpenShift fully realizes the developer’s aspiration of cloud-native application portability. It provides a consistent platform across all environments, which enables developers to deploy applications without any hardware dependency. And it employs a container orchestration platform to automate the deployment of containerized applications across all

cloud environments, including security, load balancing and scalability. That's the ultimate in flexibility and efficiency.

IBM built an economic model to demonstrate how a hybrid cloud strategy unlocks more value than a public-cloud approach. In fact, IBM's hybrid cloud approach can offer up to 2.5x more value than a public cloud-only approach. Read more at: Unlock the business value of hybrid cloud.

Rounding out the IBM hybrid cloud advantage are deep service capabilities in critical areas like digital transformation, application modernization and industry-specific intelligent workflows. Put simply, it's the ability to team up to realize the potential value of hybrid cloud.

## How does Cloud Infrastructure Center fits into IBM's open hybrid infrastructure and cloud approach?

Organizations worldwide have turned to the agility of hybrid infrastructure and cloud solutions to facilitate their digital transformation for all types of non-containerized and containerized workloads.

IBM Cloud Infrastructure Center is providing an infrastructure management solution for infrastructure-as-a-service (IaaS) computing on IBM Z and IBM® LinuxONE, helping IT organizations to shift their workloads to a hybrid infrastructure and cloud architecture that blends an on-premises infrastructure with cloud models.

Cloud Infrastructure Center is a ready-to-use infrastructure management solution, helping with automation capabilities and an easy integration into a hybrid infrastructure and cloud approach.

## How does IBM Z and IBM® LinuxONE fit into IBM's open hybrid infrastructure and cloud approach?

The IBM Z and IBM® LinuxONE platforms are designed to empower developers with the agility to deploy non-containerized and containerized workloads as-a-service, accelerate cloud-native development, modernize existing workloads, and integrate these workloads with digital services across hybrid infrastructure and cloud models.

IBM Z and IBM® LinuxONE deliver an on-premises infrastructure and cloud platform that provides a security-rich, scalable, and reliable environment for development and deployment.

A few examples of the outstanding capabilities of the new IBM z17™ benefitting the workloads:

- With IBM z17, process up to 5 million inference operations per second with less than 1 ms response time using a Credit Card Fraud Detection Deep Learning model.[1]
- Using a single Integrated Accelerator for AI on an OLTP workload on IBM z17 matches the throughput of running inferencing on a compared remote x86 server with 13 cores.[2]
- On IBM z17, run an OLTP workload with AI infused Credit Card Fraud Detection on the Red Hat OpenShift Container Platform with 10.3x more throughput versus on compared x86 platform.[3]
- On IBM z17 running Red Hat Enterprise Linux with KVM, deploy up to 3,000,000 NGINX containers.[4]
- On IBM z17, reduce the energy consumption of an OLTP workload by 81% running inference operations with multiple AI models on platform versus remotely on a compared x86 server using a GPU.[5]

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[1] Performance result is extrapolated from IBM® internal tests running on IBM Systems Hardware of machine type 9175. The benchmark was executed with 1 thread performing local inference operations using a LSTM based synthetic Credit Card Fraud Detection (CCFD) model (https://github.com/IBM/ai-on-z-fraud-detection) to exploit the IBM Integrated Accelerator for AI. A batch size of 160 was used. IBM Systems Hardware configuration: 1 LPAR running Red Hat® Enterprise Linux® 9.4 with 6 IFLs (SMT), 128 GB memory. 1 LPAR with 2 CPs, 4 zIIPs and 256 GB memory running IBM z/OS® 3.1 with IBM z/OS Container Extensions (zCX) feature. Results may vary.

[2] Performance results are based on IBM® internal tests running on IBM Systems Hardware of machine type 9175. The OLTP application (https://github.com/IBM/megacard-standalone) and PostgreSQL was deployed on the IBM Systems Hardware. The Credit Card Fraud Detection (CCFD) ensemble AI setup consists of two models (LSTM: https://github.com/IBM/ai-on-z-fraud-detection, TabFormer: https://github.com/IBM/TabFormer). On IBM Systems Hardware, running the OLTP application with IBM Z Deep Learning Compiler (zDLC) compiled jar and IBM Z Accelerated for NVIDIA® Triton™ Inference Server locally and processing the AI inference operations on IFLs and the Integrated Accelerator for AI versus running the OLTP application locally and processing remote AI inference operations on a x86 server running NVIDIA Triton Inference Server with OpenVINO™ runtime backend on CPU (with AMX). Each scenario was driven from Apache JMeter™ 5.6.3 with 64 parallel users. IBM Systems Hardware configuration: 1 LPAR running Ubuntu 24.04 with 7 dedicated IFLs (SMT), 256 GB memory, and IBM FlashSystem® 9500 storage. The Network adapters were dedicated for NETH on Linux. x86 server configuration: 1 x86 server running Ubuntu 24.04 with 28 Emerald Rapids Intel® Xeon® Gold CPUs @ 2.20 GHz with Hyper-Threading turned on, 1 TB memory, local SSDs, UEFI with maximum performance profile enabled, CPU P-State Control and C-States disabled. Results may vary.

[3] Performance result is based on IBM® internal tests running on IBM Systems Hardware of machine type 9175. The MegaCard benchmark (https://github.com/IBM/megacard-standalone) was containerized and deployed on Red Hat® OpenShift® Container Platform (RHOCP) 4.17 on Red Hat Enterprise Linux 9.4 with KVM. 3 RHOCP Compute nodes each with 16 pinned vCPUs and 32 GB memory, 2 RHOCP Infrastructure nodes each with 4 pinned vCPUs and 12 GB memory, 3 RHOCP Management nodes each with 4 pinned vCPUs and 16 GB memory running in virtual machines. The 3 RHOCP Compute nodes ran 3 MegaCard instances in parallel, each driven remotely from Apache JMeter™ 5.2.1. IBM Systems Hardware configuration: 1 LPAR with 28 dedicated IFLs (SMT), 192 GB memory. The Network adapters were dedicated for NETH on Linux. Compared x86 Server Hardware configuration: 28 Sapphire Rapids Intel® Xeon® Gold CPUs @ 2.20 GHz, 1 TB memory. Results may vary.

[4] Performance result is extrapolated from IBM® internal tests running on IBM Systems Hardware of machine type 9175. 1 LPAR with 12 dedicated IFLs (SMT) and 1.2 TB memory running Red Hat® Enterprise Linux® (RHEL) 9.5 with KVM. 24 RHEL 9.5 virtual machines with 1 vCPU and 64 GB memory. On each virtual machine, 7813 NGINX® 1.26.2 containers were deployed. Results may vary.

[5] Performance results are based on IBM® internal tests running on IBM Systems Hardware of machine type 9175. The OLTP application (https://github.com/IBM/megacard-standalone) with IBM Z Deep Learning Compiler (zDLC) compiled jar, IBM Z Accelerated for NVIDIA® Triton™ Inference Server, and PostgreSQL was deployed on the IBM Systems Hardware. The credit card fraud detection (CCFD) with multiple AI models consists of two models (LSTM: https://github.com/IBM/ai-on-z-fraud-detection, TabFormer: https://github.com/IBM/TabFormer). On IBM Systems Hardware, inference operations are processed locally on the Integrated Accelerator for AI versus processing remote inference operations on a x86 server running NVIDIA Triton Inference Server with NVIDIA TensorRT™ using an NVIDIA GPU. Each scenario was driven from Apache JMeter™ 5.6.3 with 64 parallel users to achieve similar throughput and response times. IBM Systems Hardware configuration: 1 LPAR running Ubuntu 24.04 with 7 dedicated IFLs (SMT), 128 GB memory, and IBM FlashSystem® 9500 storage. The Network adapters were dedicated for NETH on Linux. x86 server configuration: 1 x86 server running Ubuntu 24.04 with 28 Emerald Rapids Intel® Xeon® Gold CPUs @ 2.20 GHz with Hyper-Threading turned on, 1 TB memory, local SSDs, NVIDIA L40 GPU, UEFI with maximum performance profile enabled, CPU P-State Control and C-States disabled. Results may vary.

- IBM z17 systems, with GDPS®, IBM DS8000® series storage with HyperSwap®, and running a Red Hat OpenShift Container Platform environment, are designed to deliver 99.999999% availability.[6]

A few examples for IBM® LinuxONE 4:

- With IBM® LinuxONE Emperor 4, execute up to 20 billion HTTPS transactions per day with OLTP microservice applications running on OpenShift Container Platform.[7]
- Quantum-safe encryption technologies used in IBM® LinuxONE 4 are designed to help protect against unintended disclosure of data throughout its end-to-end life cycle.[8]

Operational efficiency, low latency, and high throughput is provided, when workloads are co-located on IBM Z, running on IBM z/OS®, Linux, or Red Hat OpenShift.

## What is an Infrastructure-as-a-Service?

Infrastructure-as-a-Service, commonly referred to as simply "IaaS", delivers fundamental compute, network, and storage resources to consumers on-demand. IaaS enables to instantiate and decommit, scale and shrink resources on an as-needed basis.

Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS) are common '*cloud computing*' models, used by many IT organizations.

The term '*cloud computing*' also refers to technologies that make cloud computing work, such as virtualization and infrastructure management.

Virtualization optimizes data center resource utilization by abstracting infrastructure into virtualized servers and networks, decoupling them from physical hardware.

Infrastructure management delivers comprehensive control and automation, enabling IaaS capabilities that streamline provisioning, monitoring, and maintenance of IT resources.

Managing the infrastructure as a service enables the seamless convergence of infrastructure services with cloud computing, creating a unified, enterprise-wide infrastructure environment that drives business agility and innovation

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[6] IBM internal data based on measurements and projections was used in calculating the expected value. Necessary components include IBM z17; IBM z/VM V7.3 systems or above collected in a Single System Image, each running RHOCP 4.14 or above; IBM Operations Manager; GDPS 4.6 or above for management of data recovery and virtual machine recovery across metro distance systems and storage, including Metro Multi-site workload and GDPS Global; and IBM DS8000 series storage with IBM HyperSwap. A MongoDB v4.4 workload was used. Necessary resiliency technology must be enabled, including z/VM Single System Image clustering, GDPS xDR Proxy for z/VM, and Red Hat OpenShift Data Foundation (ODF) 4.14 or above for management of local storage devices. Application-induced outages are not included in the above measurements. Other configurations (hardware or software) may provide different availability characteristics.

[7] Performance result is extrapolated from IBM internal tests running in an IBM z16 A01 LPAR with 24 dedicated IFLs, 560 GB memory and DASD storage the Acme Air microservice benchmark (https://github.com/blueperf/acmeair-mainservice-java) on OpenShift Container Platform (OCP) 4.9 using RHEL 8.4 KVM. On 4 OCP Compute nodes 4 Acme Air instances were running in parallel, each driven remotely from JMeter 5.2.1 with 384 parallel users. The KVM guests with OCP Compute nodes were configured with 12 vCPUs and 64 GB memory each. The KVM guests with OCP Management nodes and OCP Infrastructure nodes were configured with 4 vCPUs and 16 GB memory each. Results may vary.

[8] IBM z16 A01 with the Crypto Express 8S card provides hardware enabled quantum-safe APIs. The quantum-safe public key technology used in IBM z16 A01 has been summitted to the PQC standardization process conducted by NIST. https://csrc.nist.gov/Projects/post-quantum- cryptography/round-3-submissions.

## How does the Cloud Infrastructure Center relate to IaaS?

Cloud Infrastructure Center is an industry-proven turn-key IaaS solution on IBM Z and IBM® LinuxONE that provides a consistent, industry-standard user experience to define, instantiate, and manage the full lifecycle of virtual infrastructure.

Beside simplified infrastructure management, it also provides deployment capabilities for Linux images and applications, deployment support for Red Hat OpenShift, and industry-standard based integration with vendor-agnostic infrastructure and cloud management tools.

With Cloud Infrastructure Center the virtual infrastructure can be exploited via services, created by the administrator, which are offered in self-service portal or via enterprise deployment and management tools, such as IBM Cloud Paks, IBM Instana, Red Hat Ansible and other Red Hat products, and Terraform.

## Can Cloud Infrastructure Center integrate with other infrastructure and cloud management tools?

Yes, with its built-in OpenStack compatible APIs, Cloud Infrastructure Center is based on the de facto industry standard for vendor-agnostic IaaS management.

Cloud Infrastructure Center enables for the integration to higher-level infrastructure and cloud management tools, such as IBM Cloud Paks, IBM Instana, Red Hat Ansible, and Terraform.

The integration capability of Cloud Infrastructure Center with infrastructure and cloud management tools can simplify the lifecycle management of virtual machines across the enterprise and can provide a unified hybrid infrastructure / cloud environment with a single pane of glass for the IBM Z and IBM® LinuxONE platforms.

For details read the documentation about Integration with upper layers via OpenStack API.

# Key capabilities

## What are the key capabilities of Cloud Infrastructure Center?

Cloud Infrastructure Center is intended to manage the lifecycle of your infrastructure easier than before. Three areas are in focus:

- Simple lifecycle management,
- Convenient usage,
- Integrated tooling.

Infrastructure management

Cloud Infrastructure Center can help to

- Manage your virtual machines from a single point of action
- Create and deploy images of Linux operating systems, incl. applications
- Instantiate, define, and capture virtual machines with a single mouse click

Cloud Infrastructure Center can deploy Canonical, Red Hat, and SUSE Linux operating system images that can include non-containerized applications, and it can also deploy Red Hat OpenShift clusters with the deployment of Red Hat Enterprise Linux CoreOS as part of Red Hat OpenShift.

- CTO benefit examples:
  - Infrastructure can be simply managed as a service
  - Rapid deployment of virtual infrastructure
  - Standard tooling doesn't require specific skills
- Administrator benefit examples:
  - Start, Stop, Delete and Restart of virtual machines
  - Quickly deploy by launching a stored image or utilizing a template
  - Capture / snapshot and maintain a library of images

Convenient user experience

- Contract, create and allocate infrastructure from a self-service portal
  - Don't worry about infrastructure details or technical skill requirements
- Fast service delivery to multiple tenants (users, developers, admins, etc.)
- Built on the devOps-model to support consistency and agility across all platforms

As organizations continue to seek simplicity and efficiency in managing their infrastructure, Cloud Infrastructure Center provides a user-friendly and effective management experience. The basis idea: create once and deploy quickly and easily.

- CTO benefit example:
  - Operate as a service bureau for infrastructure and cloud services to a multiplicity of tenants
- Administrator benefit example:
  - Provide a self-service portal for users, allowing them to manage their own infrastructure by selecting from a catalog of pre-defined services. This enables users to easily access and manage the resources they need, without requiring manual intervention
  - Dynamically provide a project or tenant context for sub-ordinate administrators to operate a project/tenant sub-cloud autonomously
- User benefit examples:
  - Contract services via the self-service portal and its built-in service catalog
  - Consume services in an easy and automated manner with an industry-standard user experience
  - Don't worry about infrastructure details or technical skill requirements

Integration of IBM Z / IBM® LinuxONE into hybrid enterprise infrastructure and cloud management

Cloud Infrastructure Center can work as an OpenStack 'adapter' to infrastructure and cloud management tools to make the connection to the infrastructure and cloud resources running on the IBM Z / IBM® LinuxONE platform.

- Integrate the virtualized infrastructure on IBM Z / IBM® LinuxONE with the 'service platforms of choice'
- Seamless integration with infrastructure and cloud tooling, such as IBM Cloud Paks, IBM Instana, Red Hat products.
- Automated deployment of infrastructure via Red Hat Ansible® and Terraform

With that, a single glass of pane can be created to manage x86, ARM, IBM Power®, and IBM Z / IBM® LinuxONE based infrastructure.

- CTO benefit examples:
  - Infrastructure and cloud operations model with an automated management of compute, storage, and network resources
  - Shorter provisioning lead times compared to traditional IT deployment times
  - Usage of industry standard tooling - OpenStack

- Admin benefit examples:
  - Easy integration of infrastructure and cloud resources and related life-cycle management to higher level infrastructure and cloud management tools
  - Support of Red Hat OpenShift cluster deployment in a user provisioned infrastructure model (UPI) via Red Hat Ansible or Terraform
  - Same skills to manage an infrastructure and cloud environment on IBM Z / IBM® LinuxONE as those needed to operate it on x86

### What workflow-driven policies can be defined?

The infrastructure provisioning can be confined by workflow-driven policies.

Administrators and project managers can set several project-specific policies such as users require approval to perform certain tasks. Following policies are supported: deploys before approval is required, days before virtual machine expiration, days before expired virtual machine deletion, expiration extensions before approval is required, and days before automatic approval of pending expiration extension requests.

Such policies can configure Cloud Infrastructure Center to send email notifications when events occur, for example in the case of a new provision request. Also, administrators can configure which emails to send by default, including the subject and content for those emails.

### Does Cloud Infrastructure Center provide an environment checker?

Yes, the Cloud Infrastructure Center provides an environment checker. It helps to verify resources, versions, and the service status for both management nodes and compute nodes.

Read more at Verifying your environment

### Does Cloud Infrastructure Center provide a diagnose tool?

Yes, Cloud Infrastructure Center provides a diagnose tool. It helps to collect diagnostic data, for example information about the product, operating system, configurations, databases, message queue, service status, error logs, and more.

### Does Cloud Infrastructure Center provide an upgrade validation tool?

Yes, Cloud Infrastructure Center provides an upgrade validation tool. It provides pre-upgrade and post-upgrade validation, helping the administrator to validate whether there are potential issues before and after the upgrade.

Read more at: Upgrade Validator Overview

### Where are all capabilities of Cloud Infrastructure Center documented?

In the Cloud Infrastructure Center documentation, you can find the information about all capabilities and the related details: ibm.com/docs/en/cic.

# Major use cases

Cloud Infrastructure Center's adoption patterns include four common use cases, although that does not exclude others.

- Simplified virtualization experience
- Infrastructure management for service providers
- Deployment of on-premises database-as-a-service
- Deployment support of Red Hat OpenShift clusters

Simplified virtualization experience

Having a great experience with the IBM Z and IBM® LinuxONE platforms is of interest of all, particularly for users who are just starting on these platforms.

The capabilities of Cloud Infrastructure Center in '*infrastructure management*', '*automated deployment*', and the '*integration of IBM Z and IBM® LinuxONE into enterprise computing*' are all designed to significantly simplify the management of IT infrastructure. They are all based on the industry standard and vendor-agnostic OpenStack technology and deliver a major step towards simplifying the management of virtualized infrastructure.

Providing a consistent, industry-standard user experience to manage the full lifecycle of virtual infrastructure on IBM Z and IBM® LinuxONE platforms, helps users to do their first deployments.

See the IBM Whitepaper as well: Empower how you deploy, manage, and integrate infrastructure as a service (PDF 1.2 MB).

Infrastructure management for service providers

Service providers demand exceptional efficiency in managing the infrastructure, and for them, Cloud Infrastructure Center can serve as a centralized management system to achieve this efficiency.

With the built-in OpenStack-compatible APIs, service providers can benefit and use Cloud Infrastructure Center to streamline a wide range of infrastructure management tasks, automate infrastructure services, and deliver predictable and repeatable outcomes in a secure, multitenant environment - thereby reduce cost and complexity.

Accurate charging of the allocated and consumed resources is crucial for service providers serving multiple tenants. Cloud Infrastructure Center, integrated with the IBM Cloud Pak for AIOps, enables metering of the resources consumed by the virtual machines that are managed by Cloud Infrastructure Center. As well, Cloud Infrastructure Center can work together with IBM Instana.

### Deployment of on-premises database-as-a-service

As described above, Cloud Infrastructure Center can help to deploy Linux based images with non-containerized workloads. Using this capability, administrators can create customized images that combine a Linux distribution and a database. By offering this image as a service in the self-service portal, user can rapidly deploy a database with a seamless and on-demand experience.

Administrators can create a range of database-as-a-services, using different Linux distributions, different data bases (e.g., MongoDB), and tailor each service to specific user needs. The services can be saved and offered as distinct services to the users.

While database-as-a-service is a widely adopted use case, such as MongoDB-as-a-service being utilized as a caching database for read-only queries of the backend database, the 'as-a-service' approach can be seamlessly applied to other workloads to achieve similar benefits.

### Deployment support of Red Hat OpenShift clusters

Cloud Infrastructure Center supports the simplification and automation of the deployment of the Red Hat OpenShift and the management of the virtual machines used for the deployment.

A Red Hat Enterprise Linux CoreOS image as part of Red Hat OpenShift can be deployed like any other image into a virtual machine that is based on z/VM or Red Hat KVM.

Cloud Infrastructure Center can ease an automated Red Hat OpenShift cluster deployment in a user provisioned infrastructure model (UPI) via Red Hat Ansible or Terraform.

## Hybrid Cloud Resource Management and Automation with IBM Cloud Infrastructure Center and Terraform

IBM Cloud Infrastructure Center integrated with Terraform for IBM Z and LinuxONE delivers a unified, automated approach to managing hybrid cloud environments. This solution streamlines infrastructure provisioning and lifecycle management, reduces manual errors, and ensures consistent security and compliance across platforms. By leveraging HashiCorp Configuration Language (HCL) and OpenStack APIs, it enables seamless integration with hybrid and multi-cloud ecosystems, providing scalability and governance for mission-critical workloads.

# Client experiences

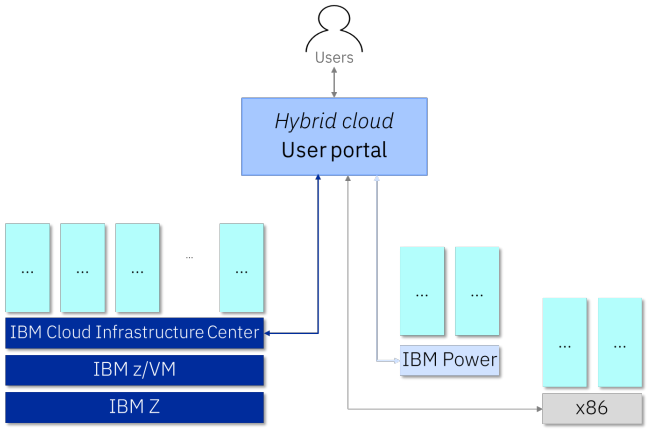
## Client example: Service provider using Cloud Infrastructure Center for infrastructure management

The CIO Office is helping its users to realize the potential of IBM Z, demonstrating its power as part of an open hybrid cloud IT strategy. As part of the consolidation of their IT environment, the transition from the traditional IT operations model to a cloud operations model was implemented.

Cloud Infrastructure Center provides an infrastructure-as-a-service (IaaS) layer for IBM Z, enabling virtual machines to be provisioned and managed and with its built-in OpenStack-compatible APIs. That provides the integration capabilities to infrastructure / cloud management tools to provision and orchestrate infrastructure and workloads.

The entire setup of Cloud Infrastructure Center was done very quickly, in a few steps, and supports the CIO Office to reduce the costs and complexity in managing a hybrid infrastructure / cloud environment. Its integration capability increased flexibility and improved efficiency at the CIO Office with a common skillset, simplifying the IBM z/VM based virtual machine lifecycle management on IBM Z and providing unified cloud provisioning.

"IBM Cloud Infrastructure Center allows us to substantially improve our infrastructure management and reduce cost and complexity to manage from simple to complex environments," said Eric Everson Mendes Marins from the IBM CIO Office.




The main values of integrating IBM Z into the hybrid cloud approach are increased business acceleration, higher developer productivity, increased infrastructure efficiency, improved risk and compliance management and long-term strategic flexibility.

Read the full story: IBM CIO Office integrates IBM Z into the hybrid cloud

## Client example: On-premises database-as-a-service deployment with Cloud Infrastructure Center

A client in the financial industry had the challenges to comply with the industry regulations and the business objectives for sustainability.

The client decided to use Cloud Infrastructure Center as the infrastructure management layer to provide automation and simplification for the provisioning and operation of the virtual machines running 1000+ MongoDB instances.

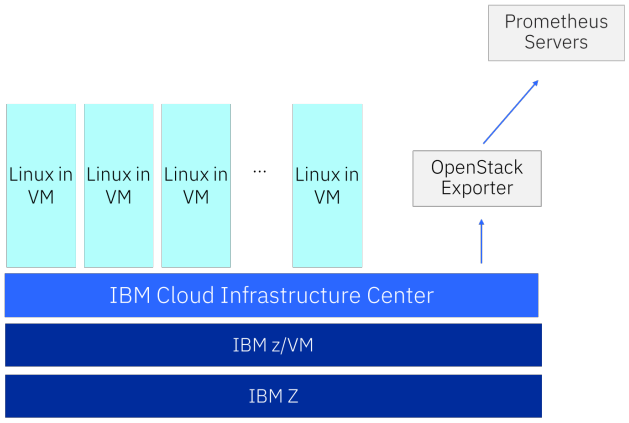
The client benefits from the automated deployment of the MongoDB instances at scale and the improved efficiency in terms of data center space, power, and cooling on the IBM® LinuxONE platform.

Solution elements

| Function | on IBM Z |
|---|---|
| Deployment Catalog | Integrated with existing tools |
| Automation | Provision via Ansible / IBM Cloud Infrastructure Center |
| Mongo Instance | Mongo Enterprise on IBM Z |
| OS Hypervisor | Red Hat Enterprise Linux 8 IBM z/VM |
| Encrypt Data @ Rest | H/W accelerated on IBM Z + FS9200 |
| Compression | H/W accelerated on IBM Z + FS9200 |
| FFIEC Appendix J | IBM Safeguarded Copy |
| Logging | Mongo Ops Manager |

## Client example: Simplified management of z/VM virtual machines and tooling integration with Cloud Infrastructure Center

A client in the retail industry has a large Linux environment running in z/VM based virtual machines (VM). Cloud Infrastructure Center is used to simplify daily operations via the Web user interface to instantiate, define, capture, and manage the VMs-lifecycle.




As well and important for the client, he can

- Use Live Guest Relocation (LGR) for the z/VM VMs,
- Manage monitoring data via monitoring / telemetry APIs,
- Easily expose and integrate IBM Z resources with other tools via the OpenStack-compatible APIs.

# New with IBM Cloud Infrastructure Center 1.2.5

IBM Cloud Infrastructure Center 1.2.5 introduces enhanced environment checks for better diagnostics and UI responsiveness, resume capability for install/upgrade failures, full z/ VM onboarding, and advanced platform management features for LPARs and resources.

- Enhancements to Environment checker
  Environment checker has been enhanced to deliver a smoother and more responsive user experience:
  - Environment checker now dynamically displays intermediate results as they become available, significantly improving UI responsiveness.
  - The environment checks are refined to be more specific to the underlying hypervisor, reducing the chances of false alarms and ensuring more accurate diagnostics.

- Seamless recovery with resume support for install/upgrade failures
  IBM Cloud Infrastructure Center now supports a resume capability for installation and upgrade operations. If an install or upgrade fails, users can now resume the process after correcting the issue, without needing to perform a full cleanup or rollback. This enhancement streamlines recovery, preserves system state, and minimizes downtime.

- Onboard full Z/VM Hypervisor
  IBM Cloud Infrastructure Center now enables onboarding of externally created Virtual Machines (VMs), providing full lifecycle management and supporting all standard functionalities equivalent to IBM Cloud Infrastructure Center-deployed VMs. This enhancement ensures a consistent management experience for both onboarded and IBM Cloud Infrastructure Center-deployed VMs and improves operational efficiency through seamless integration of externally created VMs.

- Cross user authentication
  IBM Cloud Infrastructure Center now restricts zvmsdk from having direct SSH access to the Nova user environment, enhancing security and compliance. This change enforces the principle of least privilege, ensures clear separation of duties between system components, and reduces the risk of unauthorized access or privilege escalation. Operational continuity is maintained through Nova's read-only integration for essential VM lifecycle activities such as deployment, capture, and redeployment.

- Storage pool rename
  IBM Cloud Infrastructure Center now supports seamless synchronization of renamed storage pools with the backend, ensuring uninterrupted operation of storage templates and volumes. This enhancement improves reliability, eliminates manual fixes, and maintains smooth storage lifecycle management across the env

- Onboard and attach volumes to a deployed VM
  IBM Cloud Infrastructure Center now supports onboarding and attaching backend-created volumes to deployed virtual machines without requiring redeployment. This enhancement restores consistency between backend volume states and the IBM Cloud Infrastructure Center UI, ensuring all attached volumes are accurately reflected and fully manageable through the interface and APIs. It improves operational efficiency by automatically detecting missing volume mappings and synchronizing them with the corresponding VM.

- Serviceability enhancements
  IBM Cloud Infrastructure Center introduces a comprehensive set of serviceability improvements to enhance system reliability, ease of recovery, and proactive diagnostics. These enhancements include resume capability for install and upgrade failures, refined environment checks for accurate diagnostics, and automated SMAPI health monitoring for early issue detection. Additional improvements include better logging, responsive UI, and compliance safeguards for RPM validation and file ownership checks, ensuring secure and efficient operations.

- Platform management through IBM Cloud Infrastructure Center
  - Enable customers to place LPARs with resources through simplified methods - IBM® Cloud Infrastructure Center with platform management capability allows customers to manage logical partitions through Web services REST APIs
  - Enable LPAR resource management aka IOGen for OSA - IBM Cloud Infrastructure Center with platform management capability allows customers to manage logical partitions and allows customers to provision OSA resources to logical partitions on an IBM Z system in classic mode IBM Cloud Infrastructure Center
  - Enable LPAR resource management also known as IOGen for FICON® - IBM Cloud Infrastructure Center with platform management capability allows customers to manage logical partitions and allows customers to provision FICON resources to logical partitions on an IBM Z system in classic mode
  - Transform HCD configurations into Terraform for IBM Z Management - Onboard the logical partitions defined in HMC and HCD along with OSA and FICON resources associated with the logical partitions

    Manage multiple CECs from a single IBM Cloud Infrastructure Center Management Pane - Support managing one or more PR/SM hypervisors through IBM Cloud Infrastructure Center

For more information go to “What is new” in the documentation of Cloud Infrastructure Center 1.2.5 at ibm.com/docs/en/cic/1.2.5.
Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# Software and hardware requirements

## What are the software requirements for Cloud Infrastructure Center 1.2.5?

Cloud Infrastructure Center 1.2.5 requires the following software:

- As a managed hypervisor:
  - z/VM 7.3, z/VM 7.2, or 7.4
  - KVM as part of Red Hat Enterprise Linux (RHEL) 8.8 , 8.10, or 9.4
- As a host environment on z/VM or KVM:
  - RHEL 8.8, 8.10, or 9.4
- As guest operating system instance on z/VM any of the following:
  - Canonical Ubuntu 20.04, 22.04, or 24.04
  - RHEL 8.8, 9.2, 9.4, 9.6, or 10.0
  - Red Hat Enterprise Linux CoreOS 4.12, 4.14, 4.15, 4.16, 4.17, or 4.18 as part of Red Hat OpenShift
  - SUSE Linux Enterprise Server 15 SP3-SP5
- As guest operating system instance on Red Hat KVM any of the following:
  - RHEL 8.8, 9.2, 9.4, 9.6 or 10.0
  - Red Hat Enterprise Linux CoreOS 4. 12, 4.14, 4.15, 4.16, 4.17, or 4.18 as part of Red Hat OpenShift

*Note: for the supported Linux distributions and Red Hat OpenShift versions you must check the individual IBM hardware announcements.*

## What are the hardware requirements for Cloud Infrastructure Center 1.2.4?

Cloud Infrastructure Center 1.2.4 requires one of the following IBM servers:

- IBM z17™
- IBM z16® (all models)
- IBM z15® (all models)
- IBM z14® (all models)
- IBM® LinuxONE 4 (all models)
- IBM® LinuxONE III (all models)
- IBM® LinuxONE II (all models)

# New with IBM Cloud Infrastructure Center 1.2.4

Cloud Infrastructure Center 1.2.4 enhances its solution capabilities, offering enhancements to support Red Hat Enterprise Linux 9.4, storage migration utility, improved upgrade experience, and multiple disk pool.
Cloud Infrastructure Center will be updated in version 1.2.4 to provide:

- Enable support for Red Hat Enterprise Linux 9.4 for management and compute nodes
  - *Supports IBM® Cloud Infrastructure Center deployment for z/VM and KVM hypervisors on management and compute nodes running Red Hat Enterprise Linux 9.4, with management node installation in standalone mode and compute node installation available in both standalone ( RHEL 9.4 + RHEL 8.X ) and HA modes (RHEL 8.X )*

- Storage migration utility
  - *Facilitates smooth migration between PBHA (Policy-Based High Availability) supported Storage Providers.*

- Improve upgrade experience
  - *Optimizes the upgrade process through a two-phase approach and policy inclusion.*

- Multiple Disk Pool Support
  - *Utilization of disk space by enabling multiple disk pool support on the z/VM Hypervisor. IBM Cloud Infrastructure Center allows user to select disk pool while deploying virtual machine. Supported disk pool types are ECKD and FBA.*

For more information go to “What is new” in the documentation of Cloud Infrastructure Center 1.2.4 at ibm.com/docs/en/cic/1.2.4.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.2.3

Cloud Infrastructure Center 1.2.3 enhances its solution capabilities, offering enhancements in the storage management, e.g., an advanced scheduler for volume creation and boot-from-volume. Other enhancement examples are the two new roles for managing security and network, the attachment/detachment of virtual NICs to/from virtual machines, and several items to improve the user experience.
Cloud Infrastructure Center will be updated in version 1.2.3 to provide:

- Redefine Control Pane: Optimize compute node assignment
  - *Ability to split the compute node of an existing cluster to compute nodes of multiple clusters for better admin experience*
- Utilize the capability of z/VM directory management regarding CPU and memory sharing
  - *Optimize CPU and memory resource handling for z/VM-based VMs*
- Live resize and Live Guest Relocation (LGR) for onboard VM's
  - *Resize and LGR of VM's that have been created outside and onboarded to Cloud Infrastructure Center*
- Rebuild z/VM Boot from Volume (BFV) VMs
  - *Rebuild existing z/VM VMs with new image via CLI without manual effort*
- GPFS support enhancement
  - *Enhanced error log*
- Diagnostic Tool enhancement
  - *Reduce ssh connections to compute node*
- Cinder Hight Availability enhancement
  - *Notify user if failover node not configured*
- Additional Guest OS support for: Canonical Ubuntu 24.04, SUSE Linux Enterprise Server 15 SP5, Red Hat Enterprise Linux CoreOS 4.16, 4.17, and 4.18

For more information go to "What is new" in the documentation of Cloud Infrastructure Center 1.2.3 at ibm.com/docs/en/cic/1.2.3.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.2.2

Cloud Infrastructure Center 1.2.2 enhances its solution capabilities, offering enhancements in the storage management, e.g., an advanced scheduler for volume creation and boot-from-volume. Other enhancement examples are the two new roles for managing security and network, the attachment/detachment of virtual NICs to/from virtual machines, and several items to improve the user experience.
Cloud Infrastructure Center will be updated in version 1.2.2 to provide:

- Storage related:
  - Advanced scheduler for volume creation with IBM Storage FlashSystem FC host awareness
  - Advanced scheduler for boot-from-volume with FC physical connectivity and IBM Storage FlashSystem FC host awareness
  - Support the setting of blocked storage providers or allowed storage providers per compute node
  - Volume protection related enhancements for IBM Storage FlashSystem, including add volume protect health check
  - Boot From Volume enhancement: only provide FCP device(s) number to rd.zfcp in IPL parameter for Red Hat Enterprise Linux (RHEL) 8 and 9 virtual machine
- Support to attach a NIC to given virtual machine on the fly or detach a NIC from the virtual machine.
- New for z/VM:
  - Support to indicate the max memory during deployment for a z/VM virtual machine.
  - Support to use a VDISK as swap disk for deployment of a z/VM virtual machine, optionally.
- New for KVM:
  - Support to attach a volume with the multi-attach capability to multiple KVM virtual machines.
  - RoCE card support as KVM virtual machine's uplink port through macvtap and workload spread across multiple RoCE cards.
- Added 2 new roles: the security administrator and the network administrator for managing the security and network, respectively.
- SMTP TLS client certificate enablement: support the input of the SMTP TLS client certificate during the SMTP setup

- User experience improvements
  - Control the VM startup process to avoid a startup storm that leads to instability of the hypervisor
  - Display all virtual machines from all projects and operate those virtual machines
  - Export virtual machine information from UI page
  - Operational enhancement including RAS/IVP/service applied processes
  - Various updates in backup/restore and upgrade processes

For more information go to “What is new” in the documentation of 1.2.2 at ibm.com/docs/en/cic/1.2.2.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.2.1

Cloud Infrastructure Center 1.2.1 further enhances its solution capabilities, offering enhancements in the areas of FCP device management, availability, performance, and day-to-day operations to meet the demands of hybrid cloud by providing a ready-to-use solution for industry-standard infrastructure management that helps simplify the lifecycle management and improve administrator productivity.

Cloud Infrastructure Center, the infrastructure management solution on IBM Z and IBM® LinuxONE servers, will be updated in version 1.2.1 to provide:

- FCP device limit management
  - *Monitor and select best fit PCHID to schedule the workload and avoid overload the FCP card, instead of planning ahead and rescue after over-allocation of the FCP devices on the same PCHID.*
- z/VM Multipath IPL (alternative path)
  - *Improved business continuity by ensuring for VMs (that boot from FCP devices) to automatically setup the multipath settings, avoiding a single point of failure that can be caused by FCP path issue at the boot phase of VMs.*
- Remote console access (KVM)
  - *The ability to access VMs through UI console (noVNC), provides an easier way to do daily operations on the VMs (admin/end user can access VMs via UI), and to rescue a VM through the UI, even the network of the VM is down (e.g., start network manager) even if there is no network.*
- HiperSockets™ enablement for KVM
  - *Gain better performance by connecting Linux VMs and other OS such as IBM z/OS via IBM HiperSockets on same IBM Z / IBM® LinuxONE server.*
- Export host into csv
  - *Ability to expose the compute node (hypervisor) information into csv file.*
- Storage agent High available support
  - *Automatic failover of storage agent to other nodes for business continuity (storage agent manages the storage resources such as volume, snapshot, create, read, update, delete operations).*
- Chargeback support through IBM Cloud Pak for AIOps
  - *Consumption based chargeback of used resources for internal / external tracking and audits.*

- Deploy z/VM instance with specified USERID
  - *Enable to set alternative USER ID when deploying z/VM VM, instead of the default USER ID generated from the Cloud Infrastructure Center template.*
- Allow_lun_scan enablement by default
  - *Easy configuration of management and compute nodes, avoiding manual setup.*
- User experience enhancements
  - *Compute node metrics include processor and memory utilization.*
  - *Lock and unlock of a VM, avoiding mis usage of critical VM.*
  - *Insights about what's configured and what's free, by showing z/VM DASD POOL in the UI.*

- For more information go to "What is new" in the documentation of 1.2.1 at ibm.com/docs/en/cic/1.2.1.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.2.0

Cloud Infrastructure Center 1.2.0 further enhances its solution capabilities, improving the availability and resiliency and helping to meet the demands of hybrid cloud by providing a ready-to-use solution for industry-standard infrastructure management that helps simplify the lifecycle management and improve administrator productivity.

Cloud Infrastructure Center, the infrastructure management solution on IBM Z and IBM® LinuxONE servers, will be updated in version 1.2.0 to provide:

- High availability of management node
  - *Install or upgrade to 3 management node cluster environments with the high available control plane to guarantee business resiliency during expected and unexpected outage of individual management node(s).*
- Layer 3 network support of Red Hat Enterprise Linux KVM based virtual machine
  - *Layer 3 support of a Red Hat KVM based software defined network enables to create project networks to achieve high flexibility and isolation for multiple tenants.*
- Multiple FLAT network support
  - *Multiple FLAT networks allow multiple NICs on one virtual machine to guarantee various network connectivity as needed, such as company internal and external network interfaces.*
- Boot from volume support of Red Hat KVM based virtual machine
  - *The boot from volume support of Red Hat KVM based virtual machine through the FCP protocol is designed to provide better performance of the root disk and provides the capability of data consistency for both, boot and data disks.*
- iothreads on RHEL KVM VM
  - *Cloud Infrastructure Center choose iothreads based on pre-define pattern to the disks to gain performance improvement.*
- 2 factor authentication
  - *2-factor authentication enhances the security at login.*

For more information go to “What is new” in the documentation of 1.2.0 at ibm.com/docs/en/cic/1.2.0.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.1.6

Cloud Infrastructure Center, the infrastructure management solution on IBM Z and IBM® LinuxONE servers, will be updated in version 1.1.6 to provide:

- A snapshot for multiple disks at the same time on IBM z/VM and Red Hat KVM for backup and restore
  - *Consistency group support on IBM DS8000 series and IBM FlashSystem™ storage on z/VM and Red Hat KVM, enabling a snapshot for multiple disks at the same time.*
- Manage the FCP devices lifecycle with fine granularity on z/VM
  - *The ability to manage the FCP devices lifecycle on z/VM allows clients to add and delete FCP devices with fine granularity for more efficient FCP usage.*
- Manage the access control (security group) of a Red Hat Enterprise Linux KVM based virtual machine
  - *The ability to manage the access control (security group) of a Red Hat KVM based virtual machine, allowing clients to manage the firewall of a virtual machine, and therefore achieving higher security and access control of the workload.*
- Hybrid hypervisor support for z/VM and Red Hat KVM
  - *The hybrid hypervisor support allows clients to manage both hypervisors, z/VM and Red Hat KVM, in one instance of Cloud Infrastructure Center to gain improved user experience.*
- Backup and restore of Red Hat KVM virtual machines with one or multiple IBM Storage Scale volumes, enabling clients to back up virtual machines with workloads through UI/API.
  - *Clients can take a `full` backup of their virtual machine, including all disks, and can choose to restore the virtual machine back with guarantee that no data inconsistency exists between the disks.*
- Performance enhancement in several Day 2 operations such as environment checker, healthy checker, and diagnostic data collection to support a scale-out environment.
  - *Clients can benefit from the performance improvements in the way that day2 operations in large environments, up to hundreds of LPARs/hypervisors, complete faster.*
- Visualization of the network, subnet, and virtual machines topology that provides clients an overview on the topology by showing the relationship between the components.
  - *Client administrators can visualize the relationship between network/subnet/VM for system operation and trouble shooting.*

For more information go to “What is new” in the documentation of 1.1.6 at ibm.com/docs/en/cic/1.1.6.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.1.5

Cloud Infrastructure Center 1.1.5 enhancements include:

- Live Guest Relocation (LGR) for z/VM virtual machines
  - *Administrators can move virtual machines through the Cloud Infrastructure Center UI/API from one z/VM to another z/VM with the LGR enablement to achieve business continuity.*
  - *z/VM LGR enables to move workloads to other z/VM systems in the Single System Image (SSI) cluster to keep workloads up and running, e.g., when doing maintenance.*
- Attaching persistent storage to multiple z/VM virtual machines
  - *A volume (persistent storage) can be attached to multiple z/VM virtual machines. This is beneficial for solutions like a clustered database that need shared block storage across its nodes that run in multiple virtual machines. e.g., Oracle RAC is using shared block storage, so that the data can be shared among the RAC cluster.*
- Red Hat Enterprise Linux KVM based on Secure Execution protection
  - *Cloud Infrastructure Center can do lifecycle management: create, delete, start, stop, cold migrate, etc.*
  - *IBM Secure Execution for Linux is a z/Architecture® security technology that protects data of workloads that run in a KVM guest from being inspected or modified by the server environment.*
- Allocation-based chargeback of metrics captured by Cloud Infrastructure Center using IBM Cloud Pak for AIOps
  - *The integration of Cloud Pak for AIOps with Cloud Infrastructure Center through the OpenStack cloud provider (OpenStack API) enables administrators/users to monitor and consume the resource allocations of the resources, which are managed by Cloud Infrastructure Center, through IBM Cloud Pak for AIOps.*
- Improved reliability, availability, and serviceability (RAS) with enhanced environment checker rules and health status precise report
  - *An improved virtual machine and storage health status report helps administrators / users to detect abnormal status of a virtual machine and storage faster and provides more detailed information about the status.*
- An upgrade validation tool to improve upgrade user experience
  - *The upgrade validation tool, providing pre-upgrade & post-upgrade validation, helps the administrator to validate whether there are potential issues before/after the upgrade.*
- Red Hat Enterprise Linux 8.5 and Red Hat Enterprise Linux CoreOS 4.9 as part of Red Hat OpenShift Container Platform as guest operating systems
  - *Additional operating systems and Red Hat Enterprise Linux CoreOS are supported.*

For more information go to ibm.com/docs/en/cic/1.1.5.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.1.4

Cloud Infrastructure Center 1.1.4 enhancements include:

- Fabric zoning support for Red Hat KVM-based VMs
  - *Support of fabric zoning management for Red Hat KVM-based VMs environment for Brocade switch.*
- Monitoring to be consumed by chargeback tools
  - *The metering data are provided via the OpenStack Ceilometer service.*
- Extended onboarding capabilities and onboarding of z/VM-based VMs running Red Hat Enterprise Linux CoreOS
  - *A compute node can be used for onboarding and deploying purposes.*
- Red Hat Enterprise Linux 8.4 and Red Hat Enterprise Linux CoreOS 4.8 as guest operating systems and Red Hat Enterprise Linux 8.4 as hosting environment
  - *Additional operating systems are supported.*
- Improved performance and robustness of boot support for Red Hat Enterprise Linux and Red Hat Enterprise Linux CoreOS on z/VM-based VMs
- Provisioning of z/VM-based VMs from a network with multiple subnets using the user interface
  - *When provisioning z/VM-based VMs, at least one network must be provided, and now multiple subnets are allowed.*
- Fine granularity customization of z/VM-based VMs user direct
  - *'PROFILE' and 'ACCOUNT' statements can be defined in z/VM-based VMs user direct through input from the user interface.*
- Support of the shared-disk model
  - *Multiple compute nodes can share the storage of z/VM, through SSI, and Red Hat KVM, through NFS or Spectrum Scale.*
- Provisioning of z/VM-based VMs using persistent storage-based boot volumes building on LVM volume groups, leveraging FCP storage
  - *On persistent storage-based boot volumes of z/VM, leveraging FCP storage, the support of LVM volume groups, based on the VM image, is added.*
- Enhancement of the healthy report status feature
  - *More periodic health checks have been added to report more status check results, such as storage, management node etc.*
- Network teaming support for Red Hat KVM-based VMs
  - *'bonding' is supported in the formal version of the Red Hat KVM-based VMs network connections, now Teaming is added.*

- Resizing of z/VM- and Red Hat KVM-based VMs using the user interface
  - *Memory and processor capacity is resizable for z/VM-based VMs, and memory, processor capacity, and storage for Red Hat KVM-based VMs via the user interface.*

For more information go to “What is new” in the documentation of the version you are interested in at ibm.com/docs/en/cic/1.1.4.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.1.3

Cloud Infrastructure Center 1.1.3 enhancements include:

- Resizing of IBM z/VM and Red Hat Enterprise Linux (RHEL) KVM-based virtual machines through a command-line interface or API.
- Live migration for RHEL KVM-based virtual machines from one host to another host with little or no downtime.
- Telemetry support through API to consume telemetry monitoring data.
- Support for the definition of availability zones and collocation rules to place infrastructure resources into a desired location.
- Boot support for persistent storage from IBM System Storage® DS8000 series, IBM SAN Volume Controller (SVC), and IBM FlashSystem family (FS9200, FS9250, and others) for z/VM.
- Attach and detach persistent storage volumes supported for KVM-based virtual machines from DS8000 series, SVC, and FlashSystem family.
- Support for RHEL 7.9 and RHEL 8.3 as guest operating systems.

For more information go to “What is new” in the documentation of the version you are interested in at ibm.com/docs/en/cic/1.1.3.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# New with IBM Cloud Infrastructure Center 1.1.2

Cloud Infrastructure Center 1.1.2 enhancements include:

- Cloud deployments for Red Hat Enterprise Linux (RHEL) Kernel-based Virtual Machine (KVM)
- Support for IBM System Storage DS8000 through Fibre Channel Protocol (FCP) as persistent storage with guests on IBM z/VM
- Support for additional Linux distribution as guests on z/VM, including Red Hat, SUSE, and Canonical Linux versions
- Per Engine pricing as an additional pricing metric.

For more information go to “What is new” in the documentation of the version you are interested in at ibm.com/docs/en/cic/1.1.2.

Please see the Cloud Infrastructure Center documentation to search and find detailed information: ibm.com/docs/en/cic.

# Resources

## Where do I find detailed information about Cloud Infrastructure Center?

The documentation for Cloud Infrastructure Center is available at the IBM Knowledge Center, available at: ibm.com/docs/en/cic, select the version you are interested in.

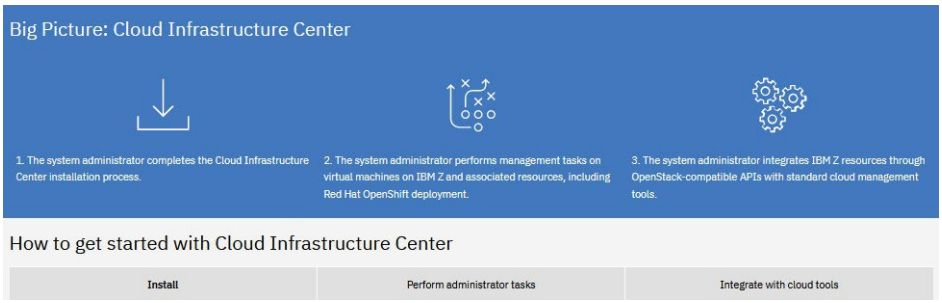
## Where do I find a demo about Cloud Infrastructure Center?

IBM has a demo available, please ask your IBM or Business Partner representative.

## Where do I find more information about Cloud Infrastructure Center?

- Read the IBM Whitepaper: Empower how you deploy, manage, and integrate infrastructure as a service (PDF 1.28 MB).
- Ask your IBM or Business Partner representative or look at the 'IBM Cloud Infrastructure Center' web page at: ibm.com/products/cloud-infrastructure-center.
- Watch the overview video about Cloud Infrastructure Center.
- Read the technical blogs:
  - How to setup IBM Instana integration with IBM Cloud Infrastructure Center on IBM Z and IBM® LinuxONE
  - Ansible-automated installation of Red Hat OpenShift on the IBM Cloud Infrastructure Center on IBM Z and IBM® LinuxONE
  - How to setup IBM Cloud Infrastructure Center and IBM Cloud Pak for AIOps for consumption-based chargeback
  - How to use backup and restore in the IBM Cloud Infrastructure Center standalone deployment environment
  - How to use multi-attach volumes in the IBM Cloud Infrastructure Center
  - New fabric zoning feature helps to automate the zoning management
  - Using the Ansible playbook to operate Cloud Infrastructure Center
  - Installing Red Hat OpenShift with User-Provisioned Infrastructure via Cloud Infrastructure Center
  - IBM Cloud Infrastructure Center – Integration and Management
  - How to manage persistent storage of multiple datacenters in Cloud Infrastructure Center
  - z/VM Network topology introduction in Cloud Infrastructure Center
  - Securing Cloud Infrastructure Center web interface with self-signed certificates
  - Create a virtual machine in Cloud Infrastructure Center by Terraform
  - Configure Web Proxy (NGINX) in Red Hat Enterprise Linux 8 for Cloud Infrastructure Center
  - Utilize Cloud Infrastructure Center in Development Infrastructure Management

– Check out the Cloud Infrastructure Center content solution, your homepage for technical resources:




- Web pages overview

| | |
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| Cloud Infrastructure Center | ibm.com/products/cloud-infrastructure-center |
| IBM Whitepaper | ibm.com/downloads/cas/PN9AE9YK |
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