



IBM Cloud Infrastructure Center

Modernize for hybrid cloud –
empower how you deploy,
manage, and integrate
infrastructure as a service



Many IT organizations worldwide have turned to the agility of hybrid cloud solutions to facilitate their digital transformation journeys for all types of containerized and noncontainerized workloads. They are shifting workloads to a hybrid cloud that blends an on-premises infrastructure with private and public cloud models.

The IBM Z® and IBM LinuxONE platforms, especially IBM z16™, are designed to accelerate modernization as you integrate IBM Z and LinuxONE seamlessly into your hybrid cloud.

With IBM Cloud Infrastructure Center, IBM provides an infrastructure management solution in support of the infrastructure-as-a-service computing.

Cloud Infrastructure Center meets the demands of hybrid cloud by providing a ready-to-use solution for the:

- Lifecycle management of the infrastructure, including on-premises deployments of virtual machines based on IBM z/VM® and Red Hat® KVM.
- Deployment of Red Hat OpenShift® Container Platform¹ clusters.
- Deployment of Linux® images that can include non-containerized workloads; the Linux distributions can be from Canonical, Red Hat, and SUSE.
- Deployment of services via the self-service portal.
- Integration cloud management tools, such as IBM Cloud Paks®, Red Hat tools, e.g., Ansible®, Terraform, or VMware vRealize, to provision and orchestrate workloads across the enterprise using OpenStack-compatible APIs.

Cloud Infrastructure Center is based on industry standards and leverages common skills for cloud management.

Highlights

- Advanced infrastructure management
- Easy lifecycle management of virtual machines
- Fast deployment of Linux images and Red Hat OpenShift clusters
- Self-service portal for consistent user experience
- Integration with cloud management tools via OpenStack compatible APIs

“IBM Cloud Infrastructure Center allows us to substantially improve our infrastructure management and reduce cost & complexity to manage from simple to complex environments.”

Infrastructure as a Service

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

Cloud infrastructure on IBM Z and IBM LinuxONE

With hybrid cloud, companies can more effectively manage speed and security, innovation with latency and performance.

Managing the infrastructure as-a-service enables the integration into hybrid cloud across the enterprise. The workloads can be containerized and noncontainerized, and IBM’s hybrid cloud approach leverages Red Hat OpenShift across all IBM environments, including on-premises deployment on IBM Z and LinuxONE.

The IBM Z and LinuxONE platforms are designed to empower developers with the agility to accelerate cloud-native development, modernize existing

workloads, and integrate these workloads with digital services across hybrid cloud.

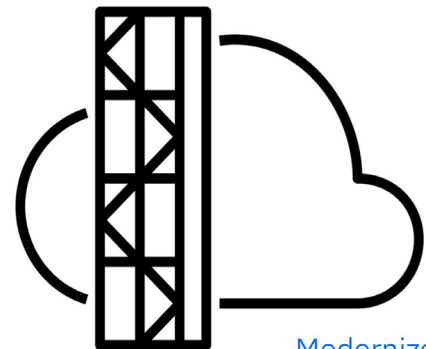
IBM Z and LinuxONE deliver a flexible and agile on-premises cloud platform, that provides a security-rich, scalable, and reliable environment for cloud-native development and deployment.

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

When accessing your database while running an OLTP workload on OpenShift Container Platform, achieve 4.2x more throughput by co-locating the workload on IBM z16 versus running the workload on compared x86 platform connecting remotely to the IBM z16.²

As well, IBM z16, with its industry first integrated on chip AI accelerator, delivers latency-optimized inferencing designed to enable customers to analyze real-time transactions, at scale.³

“I manage my infrastructure as a service.”



Modernize for hybrid cloud

IBM Cloud Infrastructure Center efficiency

Cloud Infrastructure Center is a ready-to-use infrastructure management solution, helping to manage, automate, and integrate the IBM Z / LinuxONE based infrastructure.

Infrastructure Management

Cloud Infrastructure Center provides a consistent, industry-standard user experience to define, instantiate, and manage the lifecycle of the z/VM and Red Hat KVM-based virtual infrastructure.

Projects can be created, and users assigned to their roles. The resource usage can be defined, how much processors and memory can be being used, how many virtual machines the user owns, policies can be set, and much more.

The virtual machines can be stopped, restarted, deleted, and captured via the user interface, as well as an expiration date can be set, or a volume attached.

Virtual machines can be moved via the user interface or APIs from one z/VM to another z/VM within the z/VM Single System Image cluster with the Live Guest Relocation (LGR) support to achieve business continuity.

There are many more features in support to manage the full lifecycle of the virtual infrastructure with Linux images and Red Hat OpenShift clusters.

Automation

Cloud Infrastructure Center enables administrators to capture and maintain a library of virtual machine images to quickly deploy a virtual machine environment by launching a stored image from the library, instead of manually recreating a virtual machine image, and moving virtual machines to available systems expediting the deployment and improving productivity.

Administrators can use the images to build 'deploy templates', which have the necessary resources assigned, and include them as ready-to-use services into the self-service portal that is coming with Cloud Infrastructure Center, to be used by the end users to rapidly deploy services.

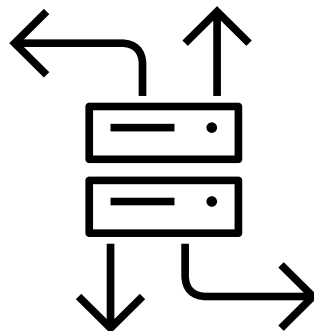
Cloud Infrastructure Center also provides an environment checker, a diagnosis tool, and an upgrade validation tool. The environment checker helps to verify resources, versions, and the service status for both management nodes and compute nodes. The diagnose tool helps users to collect diagnostic data, for example information about the product, operating system, configuration, database, message queue, service status, error logs, and more. The upgrade validation tool, provides pre-upgrade and post-upgrade validation, helping the administrator to validate whether there are potential issues before and after the upgrade.

Integration with cloud management tools

Cloud Infrastructure Center provides foundational, scalable IaaS cloud management to connect, provision, and orchestrate Linux-based and/or Red Hat OpenShift virtual machine instances on the IBM Z and LinuxONE platforms.

With its built-in OpenStack compatible APIs, Cloud Infrastructure Center is based on the de facto standard for vendor-agnostic IaaS management, enabling an easy integration to cloud management tools, such as IBM Cloud Paks, Red Hat tools, Terraform, or VMware vRealize.

Together, the integration of Cloud Infrastructure Center with the cloud management tools can simplify the lifecycle management of the virtual machines across the enterprise and can provide a unified hybrid cloud with a single pane of glass for the IBM Z and LinuxONE platforms. This helps to increase the flexibility and to improve operational efficiency since common skills, such as Red Hat Ansible®, Terraform, or VMware, can be leveraged.

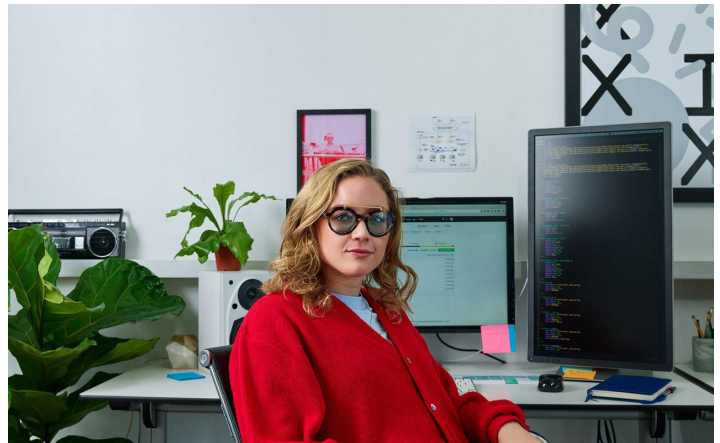


IBM Cloud Infrastructure Center 1.1.5 delivers

- Fast provisioning of virtual infrastructure, designed for easy provisioning of virtual machine (VM) instances based on z/VM or Red Hat KVM into an on-premises cloud using either a self-service portal that includes network and storage bindings or, optionally, image or automated deployment
- Provisioning of VMs running Linux distributions from Canonical, Red Hat, and SUSE
- Deployment of Red Hat OpenShift clusters with the deployment of Red Hat CoreOS as part of Red Hat OpenShift
- FCP fabric zoning support
- Attaching persistent storage to multiple z/VM virtual machines
- Allocation-based chargeback of metrics captured by Cloud Infrastructure Center using IBM Cloud Pak for Watson® AIOps, open source tools like ManageIQ, or like 3rd-party products
- Image management that includes VM image capture, catalog, deployment, and multitenancy support
- Discovery and onboarding of pre-existing VMs to be managed by Cloud Infrastructure Center
- Resizing of VMs through the user interface, command-line interface, or API
- Live Guest Relocation for VMs
- Red Hat KVM based on Secure Execution protection
- Infrastructure provisioning that can be confined by workflow-driven policies, such as approval flows, expiration dates, or resource quotas
- Provisioning of z/VM-based VMs on a network with multiple subnets using the user interface
- Creation of z/VM-based VMs with PROFILE and ACCOUNT statements for fine granularity customization via the user interface
- Support for Lightweight Directory Access Protocol (LDAP) to meet enterprise identity mapping requirements
- Enablement of Fibre Channel Protocol (FCP) SCSI-only VMs and their automated configuration of I/O and network resources
- Support for Red Hat KVM-based compute nodes to store data on software-defined storage (IBM Spectrum® Scale, Network File System (NFS)), such as VM images
- 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
- Provisioning of z/VM-based VMs using persistent storage-based boot volumes building on LVM volume groups, leveraging FCP storage
- Attach and detach persistent storage volumes supported for Red Hat KVM-based VMs from DS8000 series, SVC, and FlashSystem family
- Support for the definition of availability zones and collocation rules to place infrastructure resources, such as a VM, into a desired location with fine granularity and rule control that can span multiple sites
- Designed for easy integration into higher-level cloud automation and orchestration tools, such as IBM Cloud Paks, Red Hat tools like Ansible, Terraform, or VMware vRealize Automation Federation of an on-premises cloud with other Red Hat OpenStack clouds using OpenStack compatible APIs establishing a multi-region cloud
- Network teaming support for Red Hat KVM-based VMs

- Improved reliability, availability, and serviceability (RAS) with enhanced environment checker rules and health status precise report
- Improved upgrade user experience with an upgrade validation tool
- Designed to not require unique platform skills by the user and only require minimal platform skills from the administrator to accelerate cloud deployments

IBM Cloud Infrastructure Center can serve as the infrastructure as a service integration point to IBM Z and LinuxONE, so that IBM Z and LinuxONE can be easily consumed in the cloud management layer.



Software and hardware requirements

IBM Cloud Infrastructure Center 1.1.5 supports any of the following software⁴:

- As a managed hypervisor one of the following:
 - z/VM 7.2 or z/VM 7.1
 - KVM as part of Red Hat Enterprise Linux 8.4
- As a host environment on z/VM and Red Hat KVM one of the following:
 - Red Hat Enterprise Linux 8.2 or 8.4
- As guest operating system instance on z/VM any of the following:
 - Canonical Ubuntu 20.04
 - Red Hat Enterprise Linux 7.9, 8.2, 8.4, or 8.5
 - Red Hat CoreOS 4.6, 4.7, 4.8, 4.9, or 4.10 as part of Red Hat OpenShift
 - SUSE Linux Enterprise Server 15 SP2
- As guest operating system instance on Red Hat KVM any of the following:
 - Red Hat Enterprise Linux 7.9, 8.2, 8.4, or 8.5
 - Red Hat CoreOS 4.7, 4.8, 4.9, or 4.10 as part of Red Hat OpenShift

IBM Cloud Infrastructure Center 1.1.5 supports any of the following hardware:

- IBM z16, IBM z15™, IBM z14*, IBM z13*, IBM z13s*, and IBM LinuxONE

Why IBM?

As you transform your business and differentiate yourself in a trust economy, IBM remains your partner.

We have the total expertise in systems, software, delivery, and financing to help you create a secure and intelligent foundation for your on-premises cloud on IBM Z.

Our experts can help you configure, design, and implement the IBM Cloud Infrastructure Center optimized for your needs.

For more information

IBM Cloud Infrastructure Center is designed to improve administrator productivity, providing IaaS cloud management for your on-premises cloud environment on IBM Z and LinuxONE and the integration to cloud management tools. Cloud Infrastructure Center fits perfectly in your hybrid cloud approach.

To learn more about IBM Cloud Infrastructure Center, please contact your IBM representative, your Red Hat representative, or IBM Business Partner.

Learn more:

[IBM Z](#)

[IBM Cloud Infrastructure Center](#)

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The client is responsible for ensuring compliance with laws and regulations applicable to it. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the client is in compliance with any law or regulation.

1. Red Hat Enterprise Linux CoreOS is deployed, coming as part of Red Hat OpenShift Container Platform.
2. This is an IBM internal study designed to replicate banking OLTP workload usage in the marketplace deployed on OpenShift Container Platform (OCP) 4.9 on IBM z16 using z/VM versus on compared x86 platform using KVM accessing the same PostgreSQL 12 database running in an IBM z16 LPAR. IBM z16 configuration: The PostgreSQL database ran in a LPAR with 12 dedicated IFLs, 128 GB memory, 1 TB FlashSystem 900 storage, RHEL 7.7 (SMT mode). The Compute nodes ran on z/VM 7.2 in a LPAR with 30 dedicated IFLs, 188 GB memory, DASD storage, and OSA connection to the PostgreSQL LPAR. LPAR with 2 IFL, 4 GB memory and RHEL 8.5 with OCP Proxy server. x86 configuration: The Compute nodes ran on KVM on RHEL 8.5 on 32 Cascade Lake Intel® Xeon® Gold CPU @ 2.30 GHz with Hyperthreading turned on, 192 GB memory, RAID5 local SSD storage, and 10Gbit Ethernet connection to the PostgreSQL LPAR. Results may vary., RAID5 local SSD storage, and 10Gbit Ethernet connection to the PostgreSQL LPAR. Results may vary.
3. Cited by a third-party industry analyst.
4. Refer to the individual IBM hardware announcements for the certified Linux distributions and Red Hat OpenShift Container Platform versions (as an example: Red Hat OpenShift 4.10 is the first supported version on IBM z16).