

# What's New in IBM's IaaS Platform Solution - Cloud Infrastructure Center

Wilhelm Mild  
IBM Executive IT Architect  
Architectures with Linux, Red Hat OpenShift  
with IBM Z & LinuxONE  
[wilhelm.mild@de.ibm.com](mailto:wilhelm.mild@de.ibm.com)

Stev Glodowski  
Product Management Lead IBM Cloud Infrastructure Center, Red  
Hat OpenShift, and Red Hat Synergy  
[stev.glodowski@de.ibm.com](mailto:stev.glodowski@de.ibm.com)

Srirama Sharma  
STSM and Product Owner  
[sriramsh@in.ibm.com](mailto:sriramsh@in.ibm.com)

Stefan Schmitt  
Chief Architect IBM Z / LinuxONE infrastructure management  
platform  
[st.schmitt@de.ibm.com](mailto:st.schmitt@de.ibm.com)



# IBM Cloud Infrastructure Center

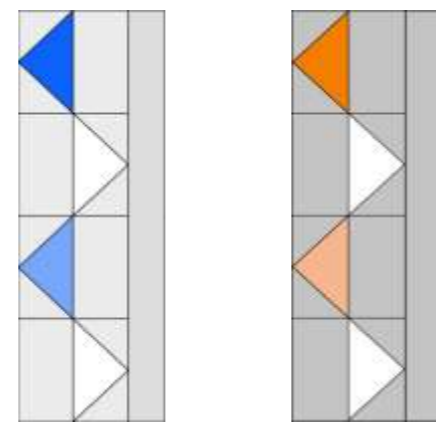
## Infrastructure-as-a-Service for IBM Z and IBM® LinuxONE



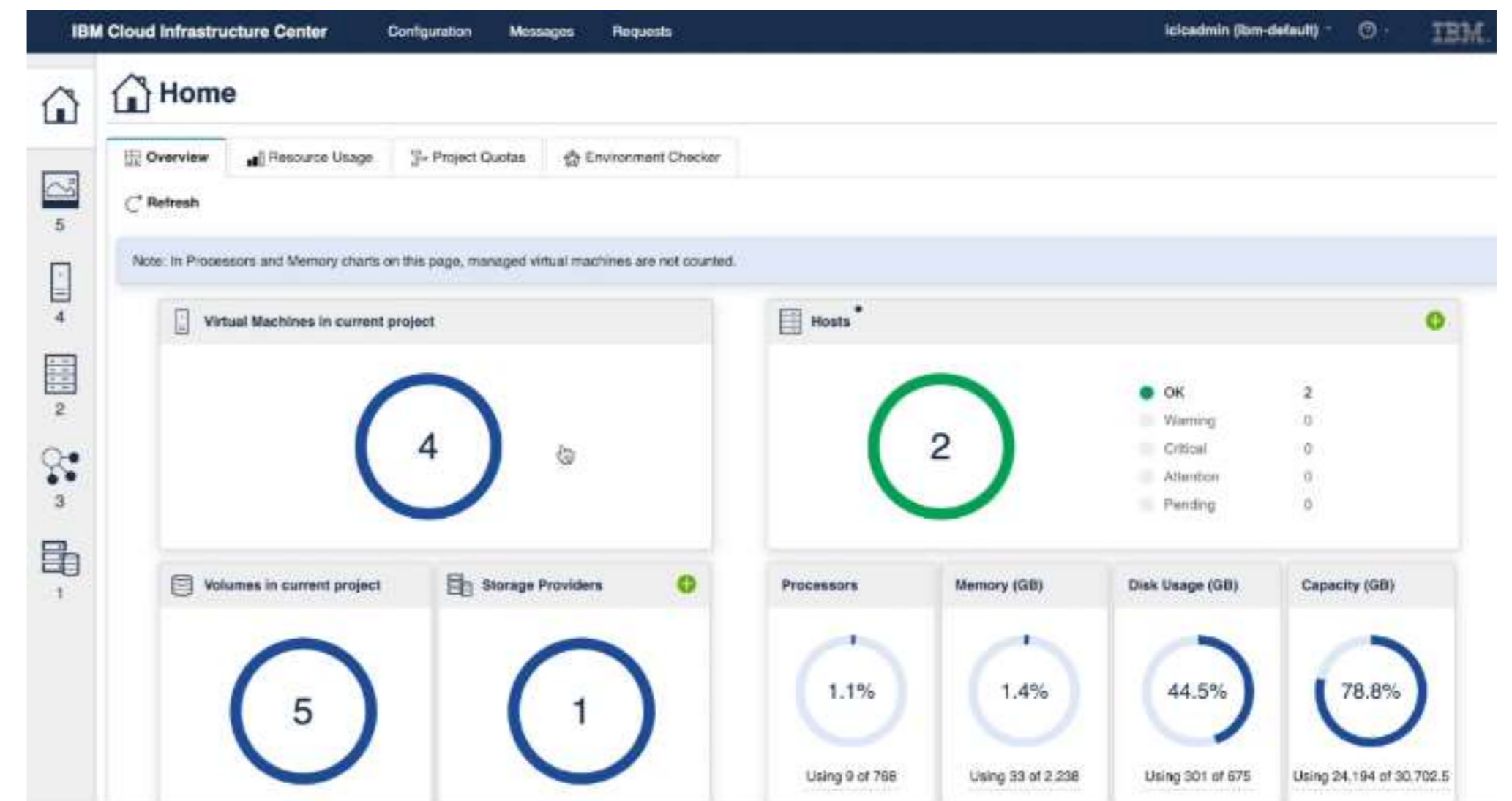
Foundation for scalable Infrastructure-as-a-Service (IaaS) management of traditional and cloud workloads across the enterprise and hybrid cloud



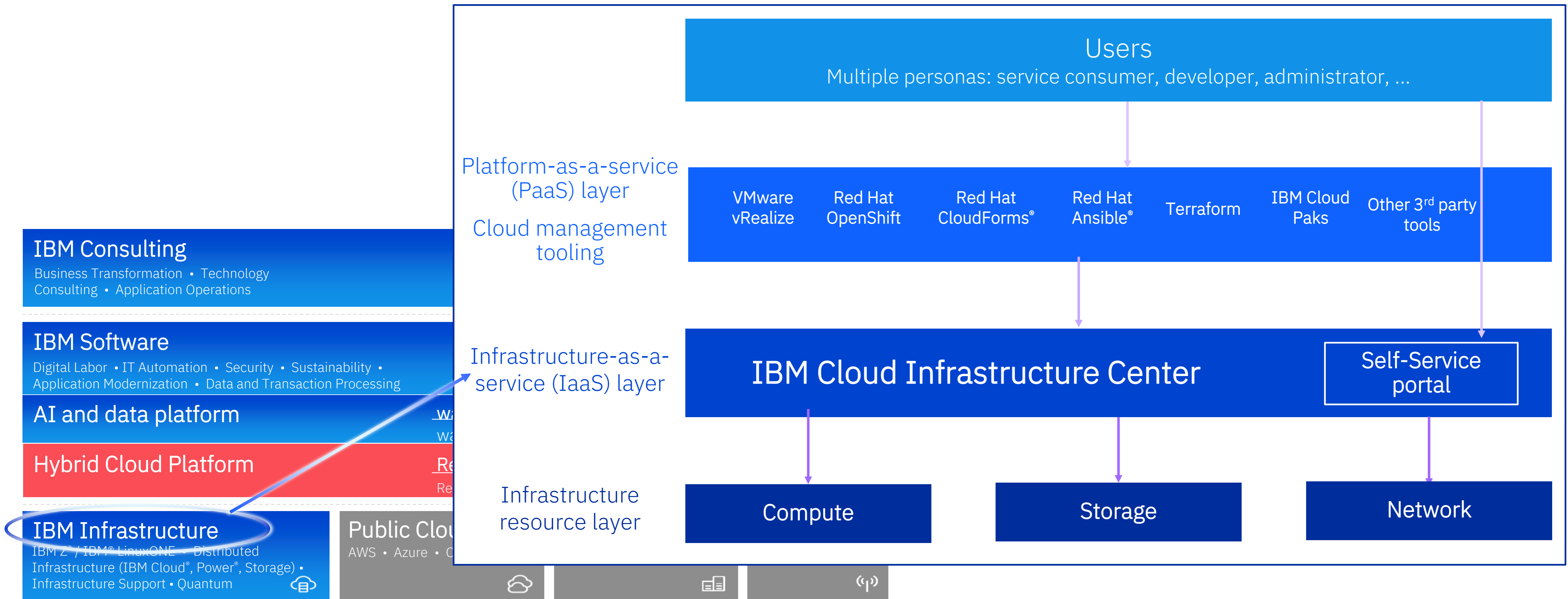
IaaS layer for Red Hat OpenShift deployments  
'Hybrid cloud stack'



Guest provisioning for noncontainerized workloads



# IBM Cloud Infrastructure Center provides the Infrastructure-as-a-Service layer



# Existant pain points

Need infrastructure management throughout compute, storage, network

- Need to leverage industry-standards
- Need to manage and optimize infrastructure assets across multiple platforms

Need integration with x86 operations & hybrid infrastructure/cloud management

- Need integration into tools like VMware vRealize or Red Hat tooling, etc.
- Need self-service capabilities for:
  - users, developers, admins, etc. to provision / manage infrastructure on-demand
  - deployment of composite business apps across multiple platforms

Need to improve operational efficiency, profitability of infrastructure admins

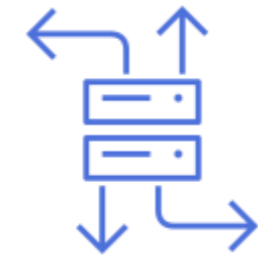
- Need to automate management tasks, e.g., using Red Hat Ansible or Terraform
- Need fast infrastructure deployment based on pre-defined images (VM + workload)
- Need installation support for Red Hat OpenShift

Need to reduce specific platform skill requirements

- Users, developers, admins should provision and manage infrastructure services *without* platform knowledge

# Capabilities

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



## Infrastructure management

Instantiate, define, capture, and manage the full lifecycle of the virtual machines based on IBM z/VM<sup>®</sup> and Red Hat KVM on IBM Z / IBM<sup>®</sup> LinuxONE via ‘infrastructure as code’.



## Integration

Connect the layers of infrastructure management and cloud computing to integrate and automate IBM Z<sup>®</sup> and IBM<sup>®</sup> LinuxONE across the enterprise.



## Service automation

Automate infrastructure management services for users via the Cloud Infrastructure Center self-service portal, while leveraging IBM Z / IBM<sup>®</sup> LinuxONE investments.

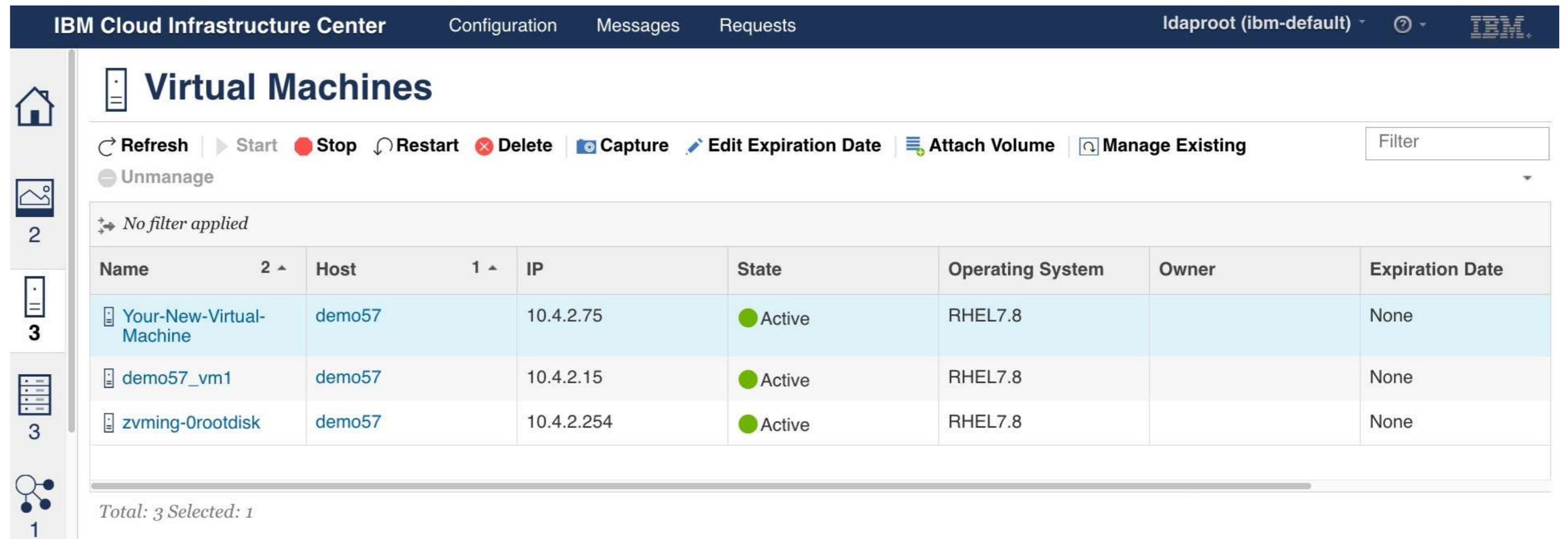
# Provision & manage lifecycle

Start, stop, delete, and restart of virtual machines

Quickly deploy new virtual machine by launching a stored image or utilizing a template

Maintain image library

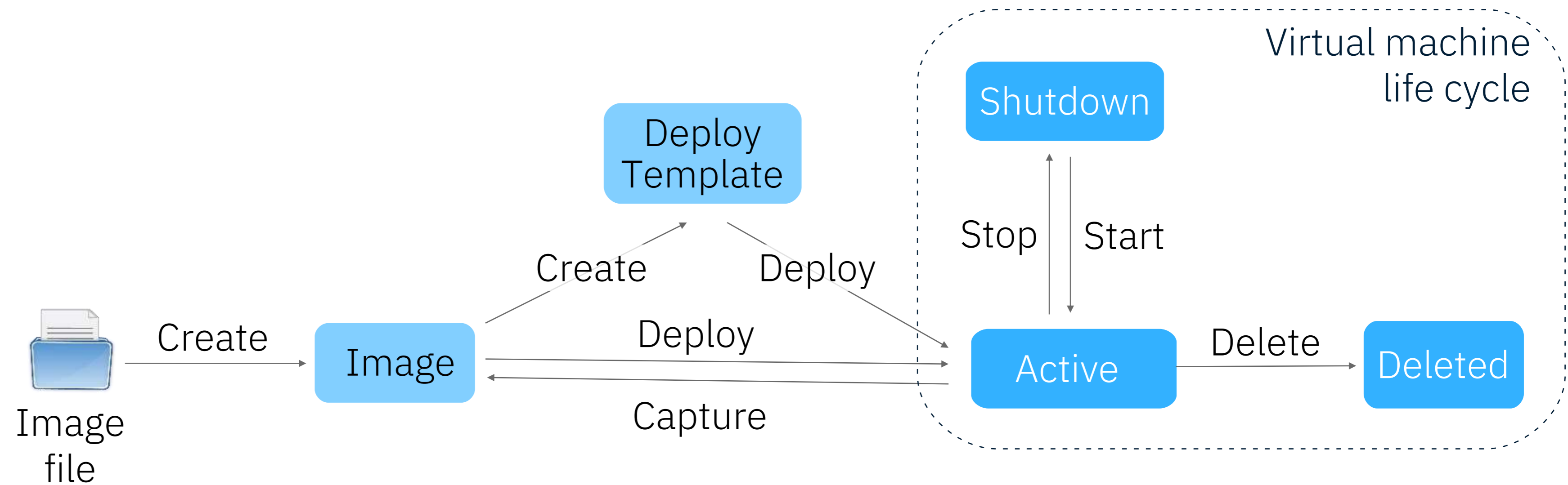
- Create and capture images and store them in the library for usage



The screenshot shows the IBM Cloud Infrastructure Center interface for managing virtual machines. The page title is "Virtual Machines" and it includes navigation links for Configuration, Messages, and Requests. The user is logged in as "Idaproot (ibm-default)". The interface features a toolbar with actions: Refresh, Start, Stop, Restart, Delete, Capture, Edit Expiration Date, Attach Volume, and Manage Existing. A table lists three virtual machines:

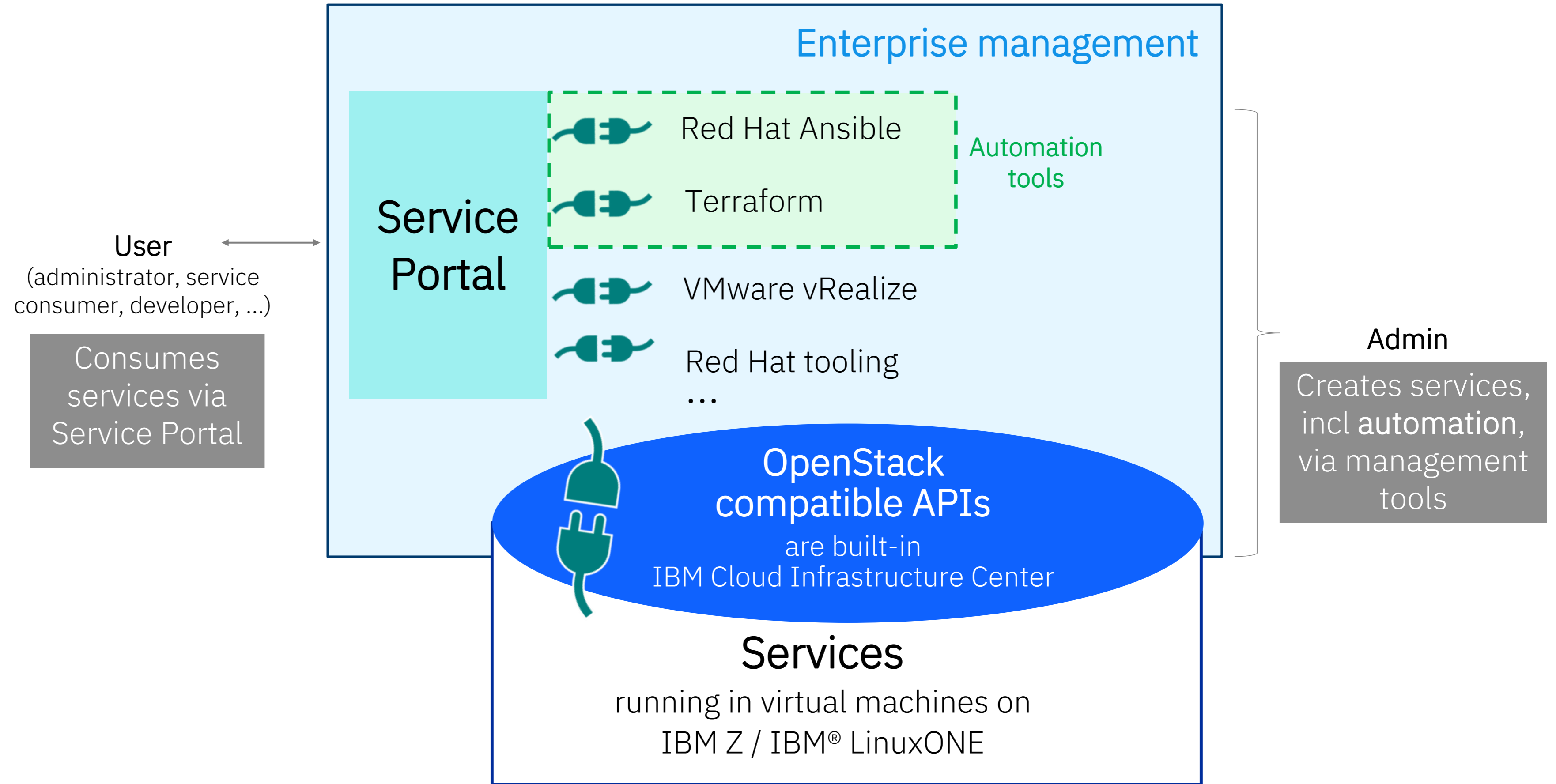
Name	Host	IP	State	Operating System	Owner	Expiration Date
Your-New-Virtual-Machine	demo57	10.4.2.75	Active	RHEL7.8		None
demo57_vm1	demo57	10.4.2.15	Active	RHEL7.8		None
zvmimg-0rootdisk	demo57	10.4.2.254	Active	RHEL7.8		None

At the bottom, it indicates "Total: 3 Selected: 1".



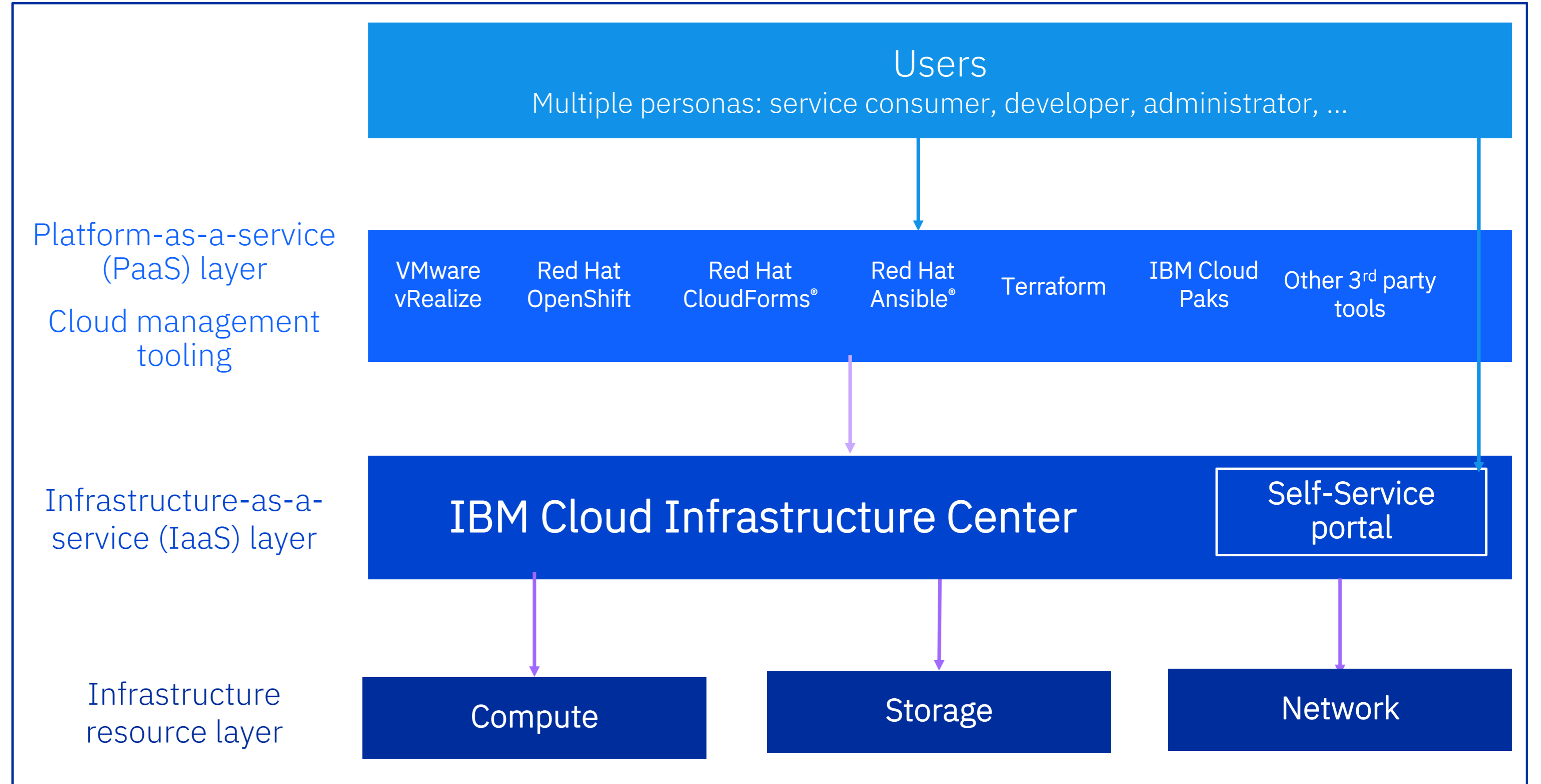
# Enterprise automation & infrastructure management

Via OpenStack compatible APIs, Cloud Infrastructure Center allows for easy automation & integration with infrastructure & cloud management tools to provide an out-of-the-box experience to the users.

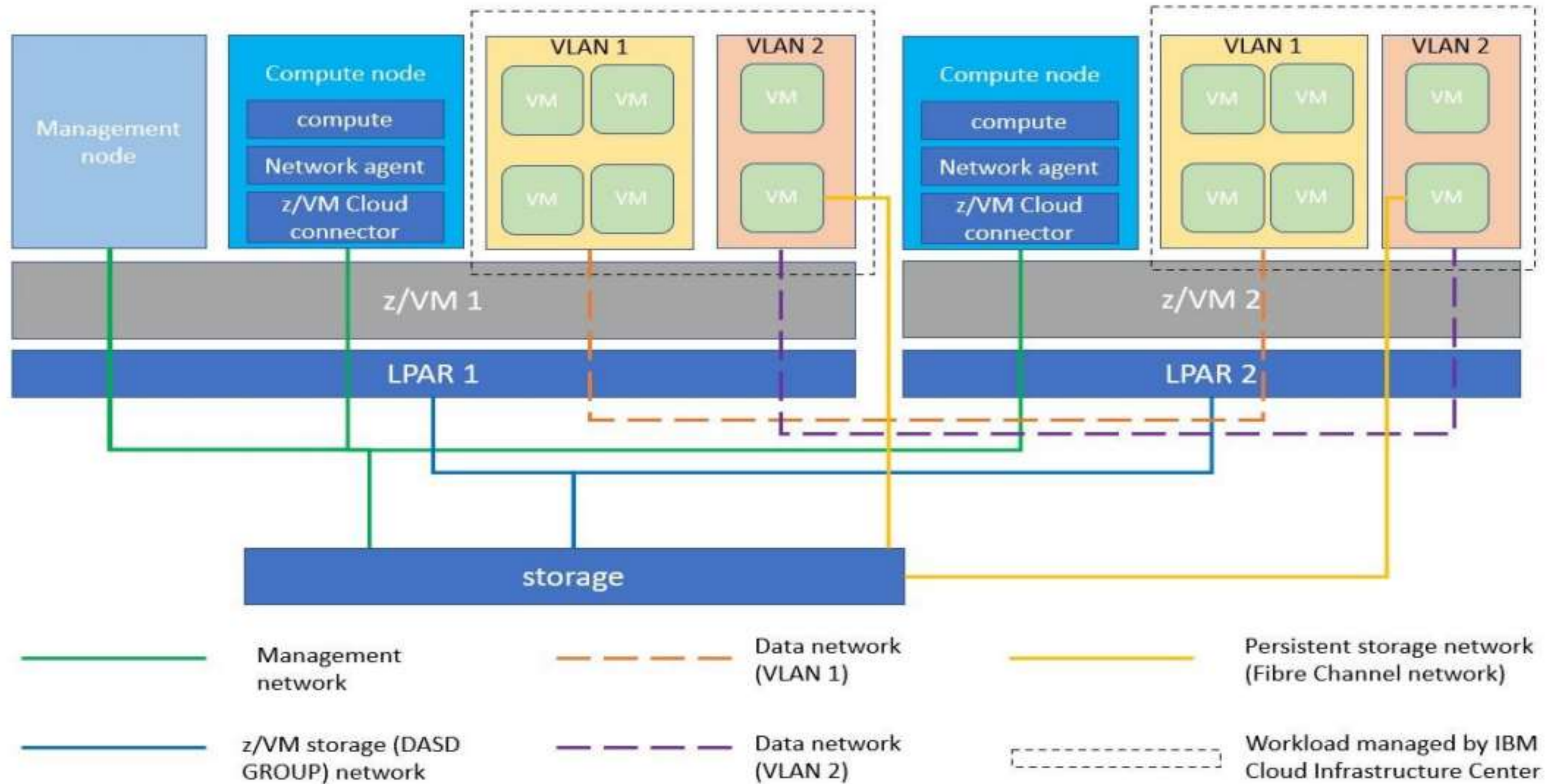


# Automation & integration with infrastructure & cloud tooling

Connecting the layers of infrastructure management and cloud computing enables to integrate IBM Z<sup>®</sup> and IBM<sup>®</sup> LinuxONE across the enterprise.

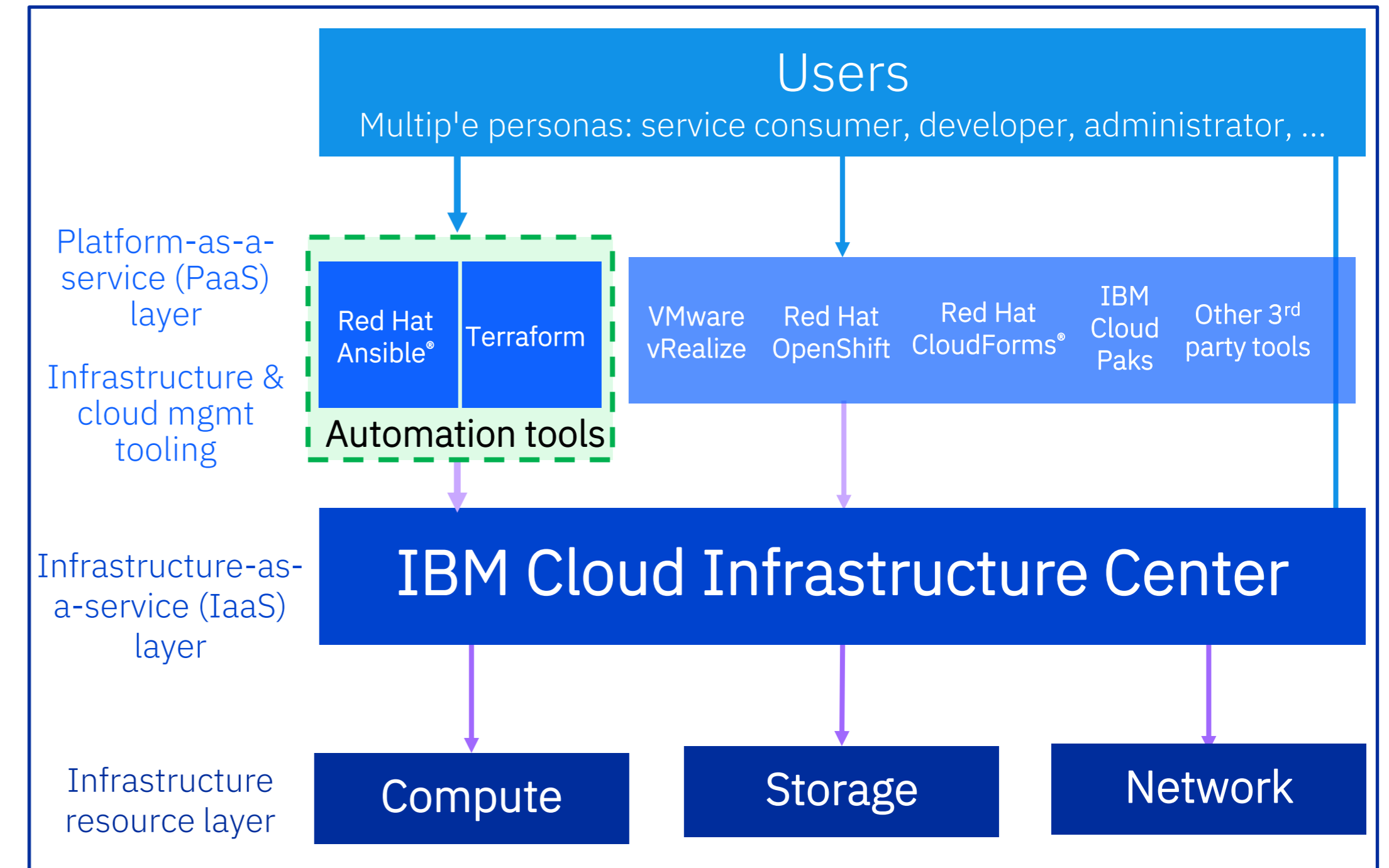


# ICIC – High Level Architecture (z/VM)



# Enterprise automation management

- **API driven consumption**
  - Leverage built-in OpenStack compatible APIs
  - Ansible playbooks and Terraform templates are available
  - “Infrastructure as Code” – manage infrastructure using code instead of manual processes and settings
- **Value of automation**
  - Time to market - time to value
  - Minimize risk and prevent human errors
  - Potential for lower cost
  - Embrace bigger ecosystem
- **End to end scenario**
  - Management of the infrastructure lifecycle
  - Hardware and application management can be integrated



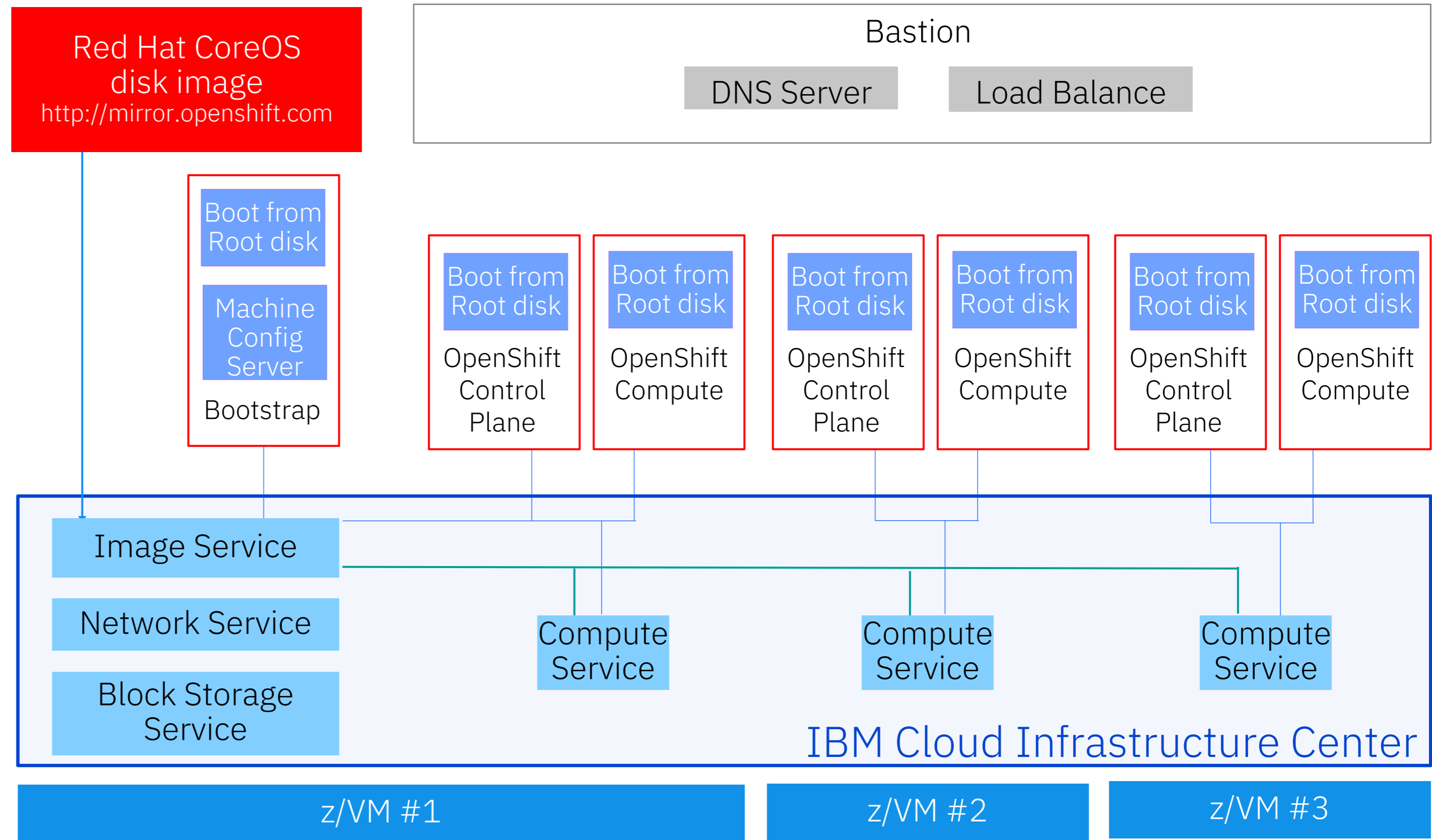
See [Ansible playbook examples](#)

See [Terraform resources](#)

# Automate

## User-provisioned infrastructure (UPI) via IBM Cloud Infrastructure Center

Cloud Infrastructure Center supports provisioning of Red Hat OpenShift Container Platform clusters as part of Red Hat Enterprise Linux CoreOS



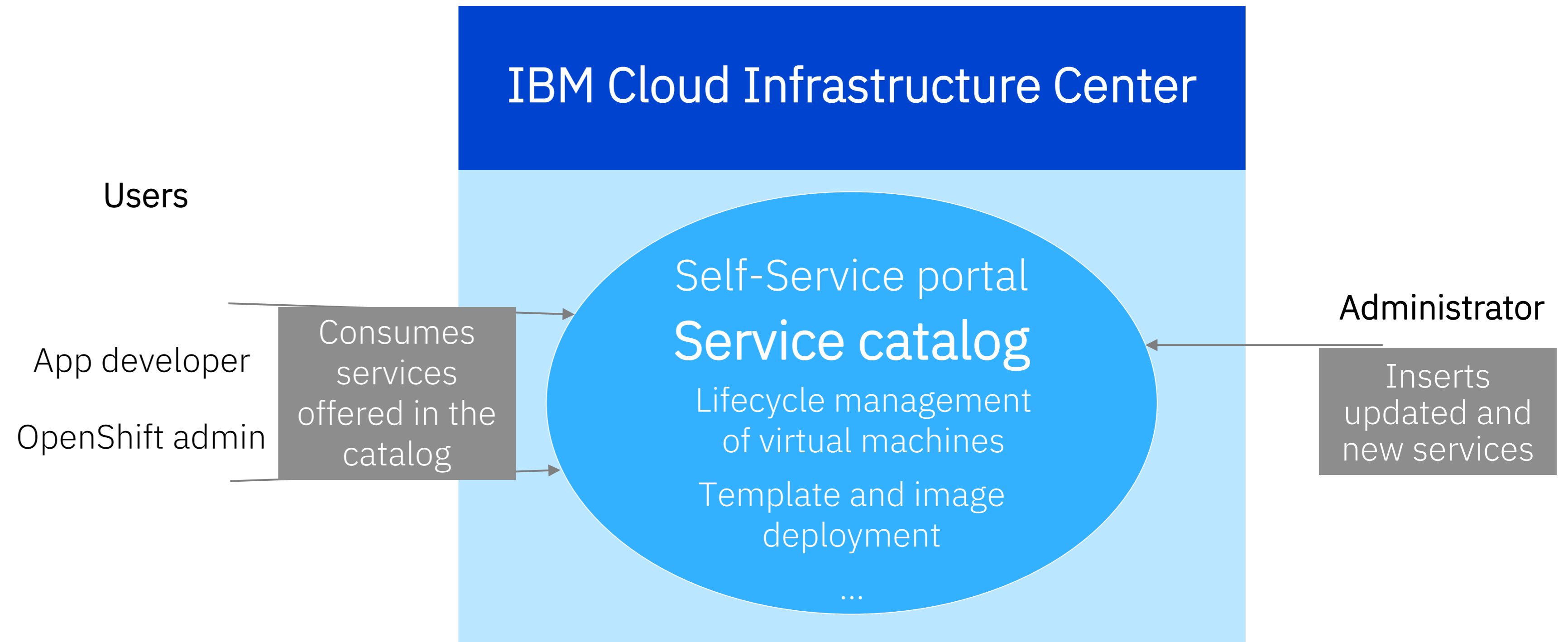
Overview: Red Hat OpenShift z/VM UPI via IBM Cloud Infrastructure Center

Blogs: [Installing Red Hat OpenShift Container Platform \(UPI\) via IBM Cloud Infrastructure Center](#) , [Using the Ansible playbook to operate IBM Cloud Infrastructure Center](#)

Download: [Ansible playbooks for Red Hat OpenShift installation with IBM Cloud Infrastructure Center](#)

# Service automation

Service automation, built on industry-standard OpenStack-compatible APIs, provides high level of investment protection as the cloud and traditional infrastructure is abstracted by the IaaS layer.



End users can consume required services from the service catalogue in the self-service portal, without worrying about infrastructure details or acquire deep technical skills.

# Use cases

Simplified  
virtualization  
experience

***“Simplify”***

Industry standard based  
and vendor-agnostic  
technology for  
simplified IaaS  
management

Infrastructure  
management for  
service providers

***“Tenant-safe  
services”***

Service providers can  
offer tenant-safe IaaS,  
in a virtual environment

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

***“Data Gravity”***

Select a database and  
automate deployments  
in an as-a-service  
model at scale.

Deployment of Red  
Hat OpenShift  
clusters

***“User Provisioned  
Infrastructure”***

Support to help simplify  
and automate Red Hat  
OpenShift cluster  
deployments

# Simplified virtualization experience

As the platform's infrastructure solution, Cloud Infrastructure Center simplifies client experience with IBM Z / IBM® LinuxONE

## Challenges

- Get started fast with first deployments
- New clients lack of skills
- Clients want to leverage exist skills and tooling

## Solution

- Consistent, industry-standard user experience to manage lifecycle of virtual infrastructure based on IBM z/VM® and Red Hat KVM
- Built-in OpenStack compatible APIs enable usage of common mgmt. tools, such as IBM Cloud Paks, Red Hat tools, Terraform, or VMware vRealize Automation

## Benefits

- Simplify client experience with virtualization
- Vendor-agnostic IaaS management
- Provide 'private cloud' infrastructure as a service via OpenStack for z/VM, KVM
- IaaS automation via Terraform, VMware vRealize, etc... using the API/CLI layer

# Simple management of z/VM virtual machines and tooling integration

## Challenge

The client has a large Linux environment running in z/VM based virtual machines (VM) and was looking to

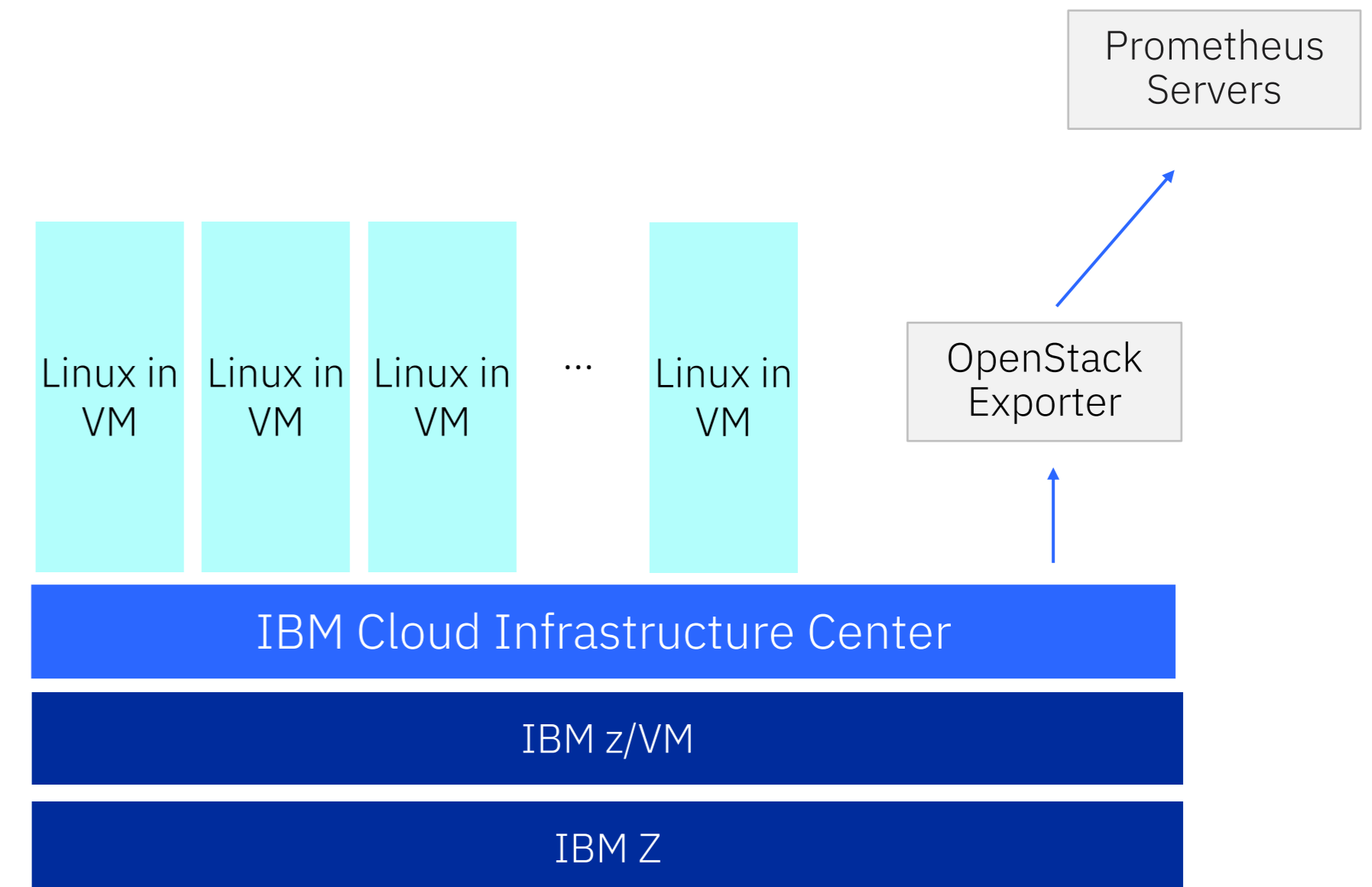
- simply the management of the existing environment, including the automation of services,
- benefit from Live Guest Relocation (LGR) for z/VM virtual machines,
- build monitoring of the services with telemetry services, and
- integrate advanced tooling.

## Solution benefits

IBM Cloud Infrastructure Center is used to

- Web user interface simplifies daily operations greatly: instantiate, define, capture, and manage the lifecycle of VMs
- provide Live Guest Relocation (LGR) for z/VM virtual machines
- manage monitoring data via monitoring/telemetry APIs
- easily expose and integrate IBM Z resources with other tools via OpenStack-compatible API

## Solution



# Infrastructure management for service providers

Service providers can accelerate the deployment of Linux images in a virtual environment, integrate the environment across the enterprise, and thereby reduce cost and complexity.

Examples:

- [Read the full IBM CIO Office story](#)
- [IBM® LinuxONE Community Cloud](#)

## Challenges

- Traditional IT ops-model is complex to manage infrastructure across multiple platforms
- Individual management for infrastructure pillars
- Existing management requires manual admin activities

## Solution

- Manage the infrastructure as-a-service for
  - containerized, and
  - non-containerized / traditional workloads
- Lifecycle mgmt: define, instantiate, and manage the virtual infrastructure based on z/VM and Red Hat KVM
- Deployment of Linux images including workloads

## Benefits

- Act as a service bureau for IaaS services to a multiplicity of tenants
- Consistent, industry-standard user experience
- Quickly deploy machines from an image library
- Built-in OpenStack compatible APIs enable easy integration
- Tenant-safe service management via a self-service portal

# Integrating IBM Z into hybrid cloud

## Business problem

Using a traditional IT ops-model, it was complex to manage the infrastructure assets across multiple platforms. Individual management pillars existed for the infrastructure components. Existing management required scripting and many admin tasks had to be done manually.

## Solution

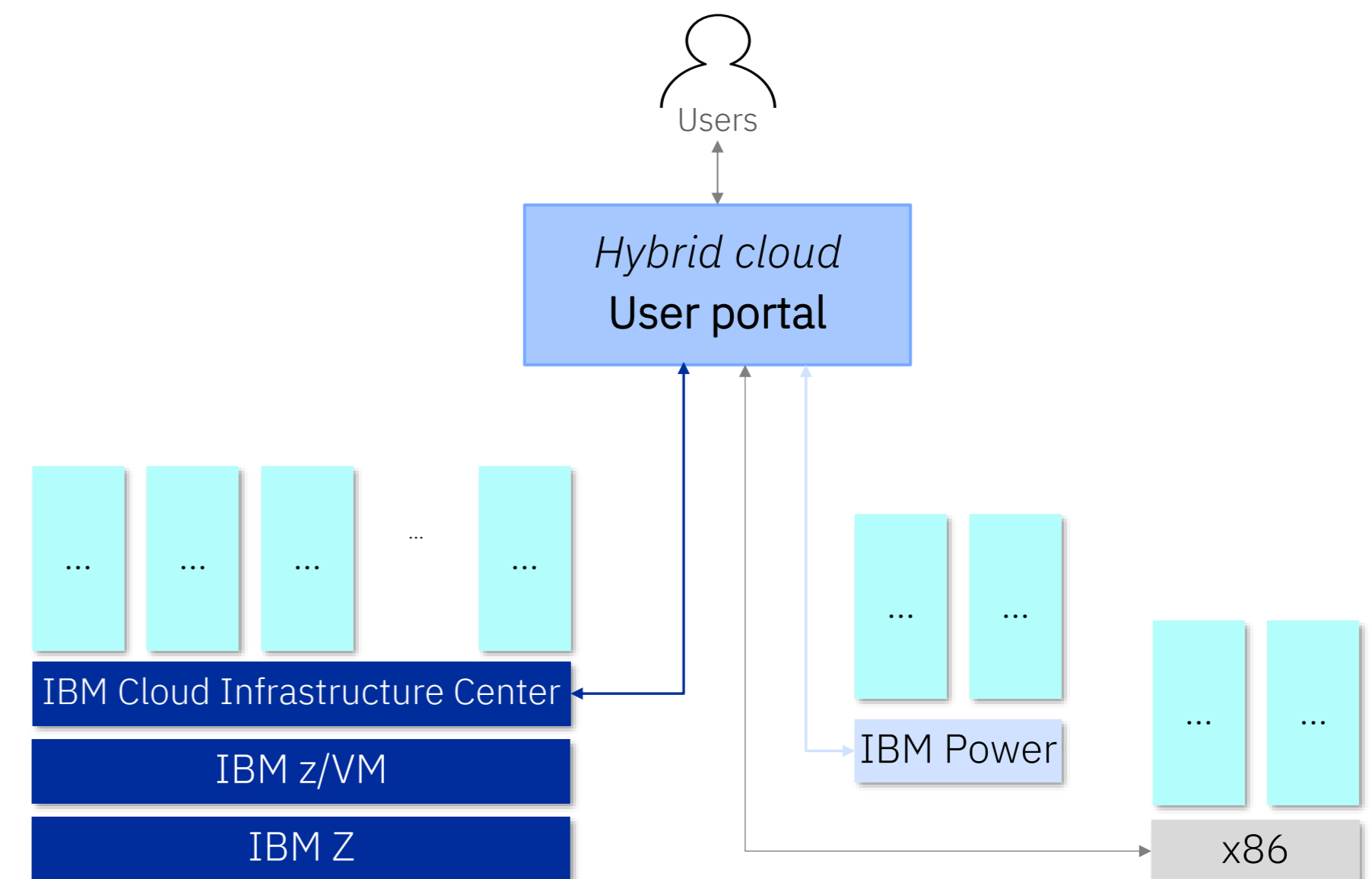
The new tooling is a cloud ops-model, based on standard OpenStack APIs, which enables the integration of the IBM Z environment into CIO Office's hybrid cloud. With the new user portal, the user experience is strongly improved.

IBM CIO Office transformed to a cloud operations model and integrated IBM Z into a hybrid cloud approach. The **standardization** enabled the integration across platforms, **accelerated** the environment setup, and **reduced** costs and complexity.

[Read the full story](#)

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

Eric Everson Mendes Marins,  
PCS\_ZVM squad at IBM CIO Office



# Provide and manage services

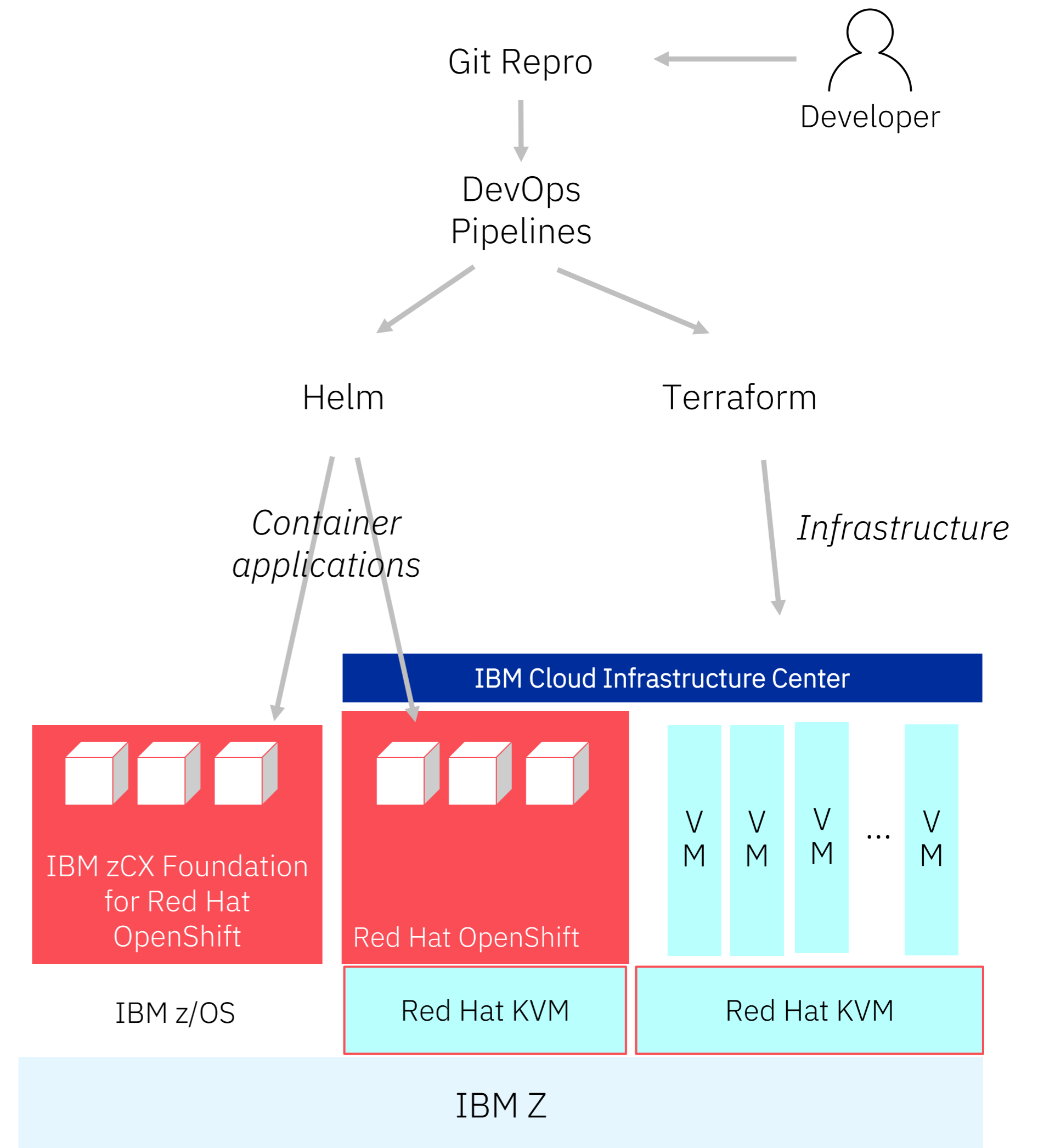
by using the same logic for every environment

## Business Requirements

- Provide high quality for cloud services to customers
  - Leverage advantages of all platforms by using a "Fit for Purpose" model
- Deliver services on cloud – on-prem and public
  - Application transformation
  - Data governance
  - Leverage AI capabilities of IBM Z
- Provide and manage services using the same logic

## Solution Benefits

- Flexible management of infrastructure with IBM Cloud Infrastructure Center
- Easy integration of IBM Z via OpenStack compatible APIs available with IBM Cloud Infrastructure Center
- Fast integration with cloud native tools like Terraform
- Image provisioning is based on the same flow, using same framework, the only change is the target platform



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

Select a database and deploy it in an as-a-service model with simple IaaS management via Cloud Infrastructure Center

*Production example:  
MongoDB-as-a-service is used as a caching database for read-only queries of the backend database.*

MongoDB
Linux distribution
IBM Cloud Infrastructure Center
IBM z/VM or RHEL KVM
IBM Z / IBM® LinuxONE

## Challenges

- Modernization of apps and data to improve scalability, response time, and security.
- Capability to scale up and down a large amount of database instances
- x86 infrastructure fails to support the required quality of service
- x86 systems lack on scalability, resilience, and security

## Solution

- Cloud Infrastructure Center
  - manages the infrastructure, running on-premises z/VM- and Red Hat KVM-based Linux virtual machines,
  - deploys Linux images with a database
- IBM Z/IBM® LinuxONE and IBM Storage providing high levels of scalability and qualities of service

## Benefits

- Workloads in the as-a-service environment adheres to the industry regulation and sustainability objectives
- Fast database recovery
- Agility to support large scale database instances
- Superior performance, scalability, reliability and security
- Automated deployment of database instances at scale based on pre-defined playbooks

# MongoDB-as-a-Service

Cloud-native as-a-Service environment that adheres to industry regulation and sustainability business objectives

## Business requirements

FFIEC Appendix J compliant technology solution for Franchise Critical applications running MongoDB (cyber resilient)

Sub-second recovery speed for multi-TB instances to meet strict RTO requirements

## 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

## In Production

>15:1 core consolidation vs X86  
Cyber-resilient  
High Performance  
Highly Available

## Solution Benefits

50% more efficient in terms of Data Center Space, Power, Cooling  
FFIEC Appendix J support for Franchise Critical Applications  
Support for backup and restore via FS  
Automate deployments of MongoDB instances at scale using IBM Cloud Infrastructure Center

# Deployment of Red Hat OpenShift clusters

Cloud Infrastructure Center supports the simplification and automation of Red Hat OpenShift Container Platform cluster deployments

## Challenges

- Lack of automation for large deployments
- Manual deployment of Red Hat OpenShift cluster

## Solution

- OpenStack compatible API, can be consumed by tools such as Red Hat Ansible, Red Hat CloudForms, or Terraform
- Ansible scripts can be written to support the Red Hat OpenShift cluster creation steps
- Deployment support for Red Hat OpenShift clusters

## Benefits

- Simplification and automation of Red Hat OpenShift cluster provisioning
- Flexible and easier life-cycle management of Red Hat OpenShift
- No requirement for DHCP, FTP services for simple cluster creation

### Blogs:

- [Installing Red Hat OpenShift Container Platform \(UPI\) via IBM Cloud Infrastructure Center](#)
- [Using the Ansible playbook to operate IBM Cloud Infrastructure Center](#)

### Download:

- [Cloud Infrastructure Center OpenShift UPI Ansible Playbooks](#)

# Managing your infrastructure lifecycle is easier than before

## Fast deployment



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

## Integrated tooling



Integrate your IaaS platform on IBM Z / IBM® LinuxONE with your service platforms of choice

Seamless integration with automation tools such as Red Hat tooling and VMware vRealize

Automated deployment via CloudForms and Terraform

## Convenient usage



Contract, create and allocate infrastructure from a self-service portal

Deliver fast service to multiple tenants and different roles (developers, admins, users, etc.)

Built on the devOps-model to support consistency and agility across all platforms



# IBM Cloud Infrastructure Center Services

## Overview

IBM Systems Lab Services will work with you to plan and deploy IBM Cloud Infrastructure Center for your IBM Z and IBM® LinuxONE Infrastructure as a Service (IaaS) virtualization environment.

## Target Audience

- IBM Z and IBM® LinuxONE clients looking for an OpenStack standards-based deployment
- Linux IaaS at scale
- Clients investigating private cloud options

## Benefits

- Simplify deployment and lifecycle management of virtual servers
- Easily integrate with other systems via standard REST APIs and open standards.
- Ready to use Portal
- Build your own on-premises cloud infrastructure in just a couple of days.

## Key Features

Implement Cloud Infrastructure Center with:

- Self-service portal
- Industry standardization and REST API integration capability
- Automate not only the virtual server, but network and storage provisioning for them
- Automated lifecycle management
- Core based in OpenStack

## Deliverables

After the implementation, the details of the IBM Cloud Infrastructure Center deployment are documented. Optional skills transfer can be added for an additional fee.

## Duration

The service varies depending on the size and complexity of the implementation but can be customized to specific client requirements.

# Latest new functions with Cloud Infrastructure Center



## 1.2.3

- Redefine Control Pane: Optimize compute node assignment
  - *Ability to split the management node and assign existing set of compute nodes to each of new management nodes providing better admin experience*
- Utilize the capability of z/VM directory management regarding CPU sharing and max memory setting
  - *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 High 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 CoreOS 4.16, 4.17, and 4.18

## 1.2.2

- Advanced scheduler for volume creation with IBM FlashSystem® FC host awareness
- Set blocked/allowed storage providers per compute node
- Volume protection enhancements for IBM FlashSystem
- Attach/detach a NIC to given virtual machine on the fly
- Indicate max memory during deployment for a z/VM VM
- Use a VDISK as swap disk for deployment of a z/VM VM
- Attach volume with the multi-attach capability to multiple KVM VMs
- RoCE card support as KVM VMs uplink port through macvtap
- Security & network administrator roles added
- SMTP TLS client certificate during the SMTP setup
- Various user experience improvements

# Learn more

- Understand the use cases, read the IBM Whitepaper: [Empower how you deploy, manage, and integrate infrastructure as a service](#)
- Watch [IBM Cloud Infrastructure Center](#) webpage
- Check out the [IBM Documentation](#)
- Get started using the [Content solution](#)
- Leverage the IBM Redbook®: [Hybrid cloud with on-premises cloud on IBM Z or IBM® LinuxONE](#)
- Read [blogs](#)
- *Request a demo* from your IBM or business partner representative



## Read blogs:

- [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 Cloud Infrastructure Center](#)
- [Using the Ansible playbook to operate Cloud Infrastructure Center](#)
  - Ansible Playbooks to deploy Red Hat OpenShift UPI with Cloud Infrastructure Center:  
[https://github.com/IBM/z\\_ansible\\_collections\\_samples/tree/master/z\\_infra\\_provisioning/cloud\\_infra\\_center/ocp\\_upi](https://github.com/IBM/z_ansible_collections_samples/tree/master/z_infra_provisioning/cloud_infra_center/ocp_upi)
- [Installing Red Hat OpenShift Container Platform with User-Provisioned Infrastructure via Cloud Infrastructure Center](#)
- [How to manage persistent storage of multiple datacenters](#)
- [z/VM Network topology introduction in Cloud Infrastructure Center](#)
- [Create a virtual machine in Cloud Infrastructure Center by Terraform](#)

# Thank you

Stev Glodowski  
Product Management Lead IBM Cloud  
Infrastructure Center, Red Hat  
OpenShift, and Red Hat Synergy  
[stev.glodowski@de.ibm.com](mailto:stev.glodowski@de.ibm.com)

Srirama Sharma  
STSM and Product Owner  
[sriramsh@in.ibm.com](mailto:sriramsh@in.ibm.com)

Stefan Schmitt  
Chief Architect IBM Z / LinuxONE  
infrastructure management platform  
[st.schmitt@de.ibm.com](mailto:st.schmitt@de.ibm.com)

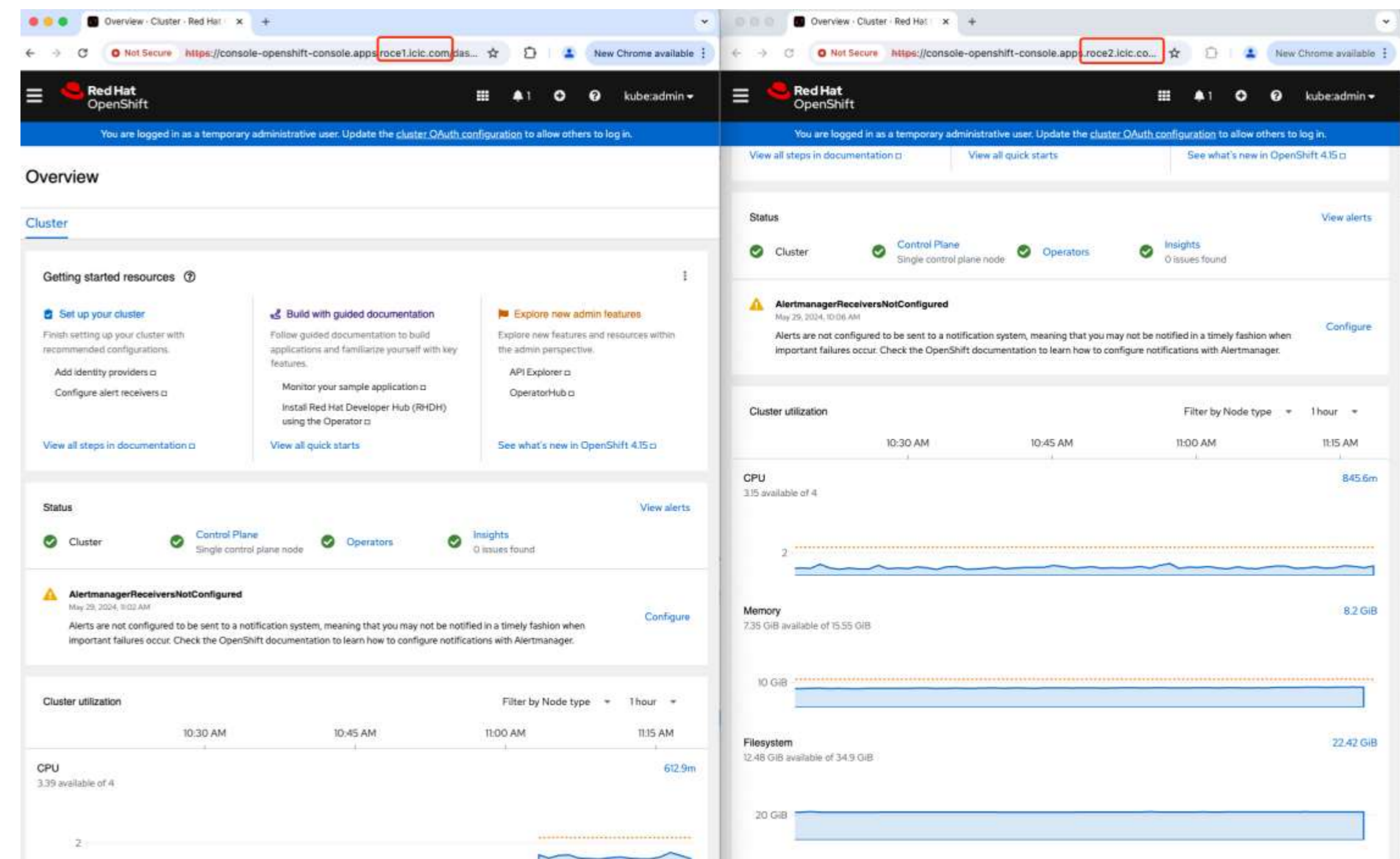
© Copyright IBM Corporation 2025. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. Any statement of direction represents IBM's current intent, is subject to change or withdrawal, and represent only goals and objectives. IBM, the IBM logo, Db2, FlashSystem, IBM Cloud, IBM Cloud Paks, IBM Spectrum, IBM Z, Power, z14, z15, IBM z16, IBM z17, and z/VM are trademarks or registered trademarks of International Business Machines Corporation, in the United States and/or other countries. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on [ibm.com/trademark](https://ibm.com/trademark).



# IBM Cloud Infrastructure Center 1.2.2 enhancements affecting Red Hat OpenShift

- **RoCE card deployment on KVM**
  - **Enhanced flexibility:** support of Red Hat OpenShift deployment through RoCE card on KVM offers a more efficient and flexible deployment option
  - **Automated DHCP server configuration:** including the port IP, MAC address, and DNS, reduces the manual setup time and minimizing errors
  - **Multi-cluster support:** the deployment of multiple Red Hat OpenShift clusters on a single RoCE card can optimize the resource utilization and simplifies the management
- **Support for single-node OpenShift (SNO) deployment:**
  - **Single-node deployment:** support of Red Hat OpenShift deployment on a single node, simplifying setups for small / test environments
- **Support for custom node name deployment:**
  - **Personalized deployment:** support of Red Hat OpenShift deployment with custom node names, offering more personalized and organized node management

Name	Host	IP	State	Health	Operating System	Online CPU	VM Type	Hypervisor Type	Instance id	Owner	Expiration Date
roce1-9k8f8-master-0	KVM-RoCE-Hypervisor	172.26.103.14	Active	OK	RHCOS4.15	4	deployed	KVM	hl00037		None
roce2-d2g6k-master-0	KVM-RoCE-Hypervisor	172.26.103.20	Active	OK	RHCOS4.15	4	deployed	KVM	hl00035		None



# Most securable, zero trust environment, high performance

## IBM Z and IBM® LinuxONE

**Cost optimization:** 52%+ Lower TCO (5 Yr) – Reduce VM & License / S&S costs when charged per core

**Data center consolidation:** average 10:1 x86 consolidation ratio - More VMs and workloads per core/server

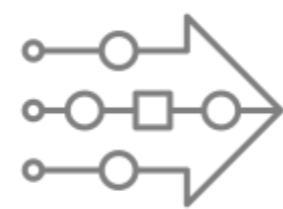
**Sustainability:** 75% smaller datacenter footprint & 50% lower power envelope



Cost

Process up to **450 billion inference operations per day** with **1 ms** response time\*

Use an **Accelerator for AI on OLTP workload** to match the throughput of running inferencing on a **remote x86 server with 13 cores**\*



AI

Run **1000s of Linux workloads** per system

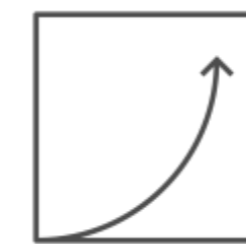
Up to **35 billion HTTPS requests** per day with OLTP microservice applications running on the Red Hat OpenShift\*

Consolidate multiple database platforms

Run **production, test, dev, QA** for all workloads **in parallel**



Scalability



Performance

**Fastest cores** up to 5.5 GHz

I/O offloading, Large Caches

**AI, data compression and encryption accelerator, on-chip Java optimization, Databases run faster** (Oracle, PostgreSQL, MongoDB, Open-Source)



Confidential Computing

**Industry best security:** 100% encryption - data protected & **quantum safe** at rest, in flight, in use  
Isolate all VMs, data, containers from each other – prevent data breaches - **Secure Execution**

**FIPS-140-2** and EAL5+/EAL4+

Up to **1.6x more throughput** run OpenSSL bulk encryption with AES-256-XTS vs x86\*



Availability

Up to **99.999999% availability**\*

**No downtime** due to hardware failures or hacks

**Immune** to x86 security flaws

