IBM Cloud Infrastructure Center - IaaS solution for IBM Z and LinuxONE

Stev Glodowski
Offering Manager
IBM Cloud Infrastructure Center & OCP on Z
stev.Glodowski@de.ibm.com

IBM Z | IBM LinuxONE

Hybrid Cloud for the Enterprise with IBM Z and LinuxONE

Transform for Cloud

Transform infrastructure, applications and data by exposing and connecting existing assets with simplified and intelligent operations across infrastructure

Cloud native experience

A cloud-native ecosystem on IBM Z® and LinuxONE for access and use by administrators, developers and architects with no special skills required

Private Cloud

Integrate Z and LinuxONE into a hybrid multicloud environments and manage everything from behind the firewall

Public Cloud

Tailor your environment with a choice of IBM Z-backed services delivered via IBM Cloud®

No matter where you are, where you are going, or how you want to operate

Build an efficient hybrid multicloud experience with IBM Z and LinuxONE and unlock the unmatched value of the platform for mission critical workloads

IBM Z and IBM LinuxONE

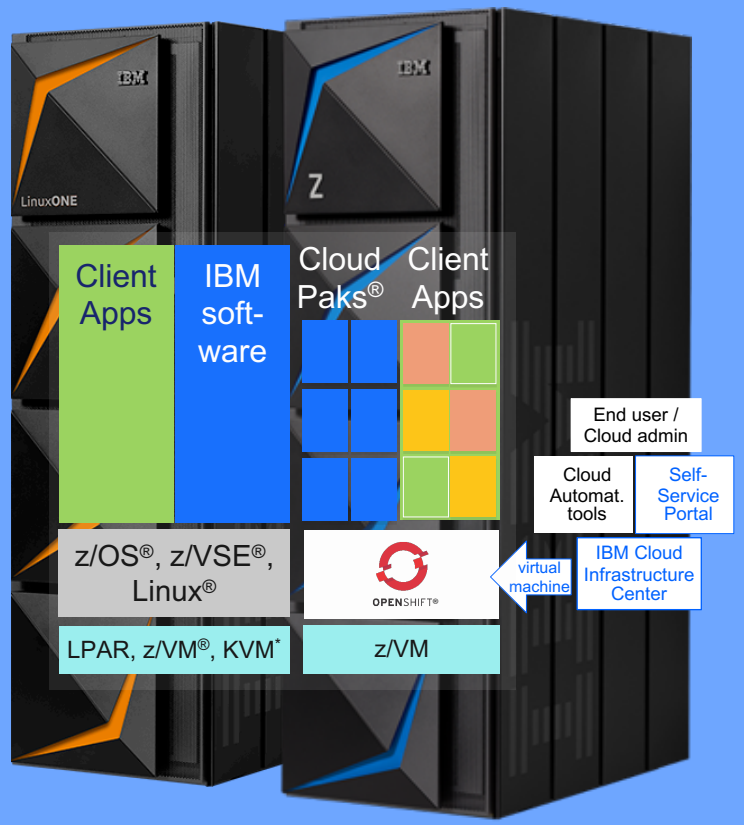
The private cloud you want – with the privacy and security you need

Build a cloud native experience by leveraging your existing Z / LinuxONE infrastructure

Create cloud native applications, modernize existing applications

Integrate with existing business critical applications

Centralized management across multiple architectures



* KVM supports Linux only

Hybrid Multicloud Strategy for IBM Z and LinuxONE

Build your Hybrid Multicloud with the platform that provides …

Flexibility and Confidence
- 100% service level compliance
- Superior reliability, scalability and security

Protected Future
- 100% of data protection everywhere
- Privacy with policy

PRIVATE

RED HAT® OPENSHIFT

HYBRID MULTICLOUD PLATFORM

Self-Service
Multi-language
Automation
Collaboration
Enterprise Grade

Standards-based
Web-scale
Open Source
Multi-tenant
Secure

PUBLIC

Build Once
- Optimize IT to accelerate Digital Transformation
- Modernize applications to increase agility

Deploy Anywhere
- Build cloud native to accelerate innovation
- Unleash Data and AI for competitive advantage

Offerings designed for journey to cloud …

Cloud Native Development & API Management			IBM Cloud Hyper Protect Services
• Red Hat® OpenShift Container Platform • IBM Cloud Paks • **IBM Cloud Infrastructure Center** • IBM z/VM • IBM Hyper Protect Virtual Servers • IBM Blockchain Platform	• IBM z/OS® Cloud Broker • IBM ADDI • IBM z/OS Connect EE • IBM Z Operations Insight Suite • IBM Z APM Connect	• IBM Z Open Development • IBM Z Open Unit Test • IBM z/OS Container Extensions • IBM Z Distribution for Zowe	• Crypto Services • DBaaS MongoDB • DBaaS PostgreSQL • Virtual Servers

IBM Cloud Infrastructure Center

Empower how you deploy and manage Infrastructure as a Service (IaaS).

Delivers simplified IaaS management across compute, network, and storage resources.

Infrastructure Mgmt

Consistent, industry-standard user experience to define, instantiate, discover and manage the lifecycle of virtual infrastructure, deployment of images, and policies to maximize resource utilization.

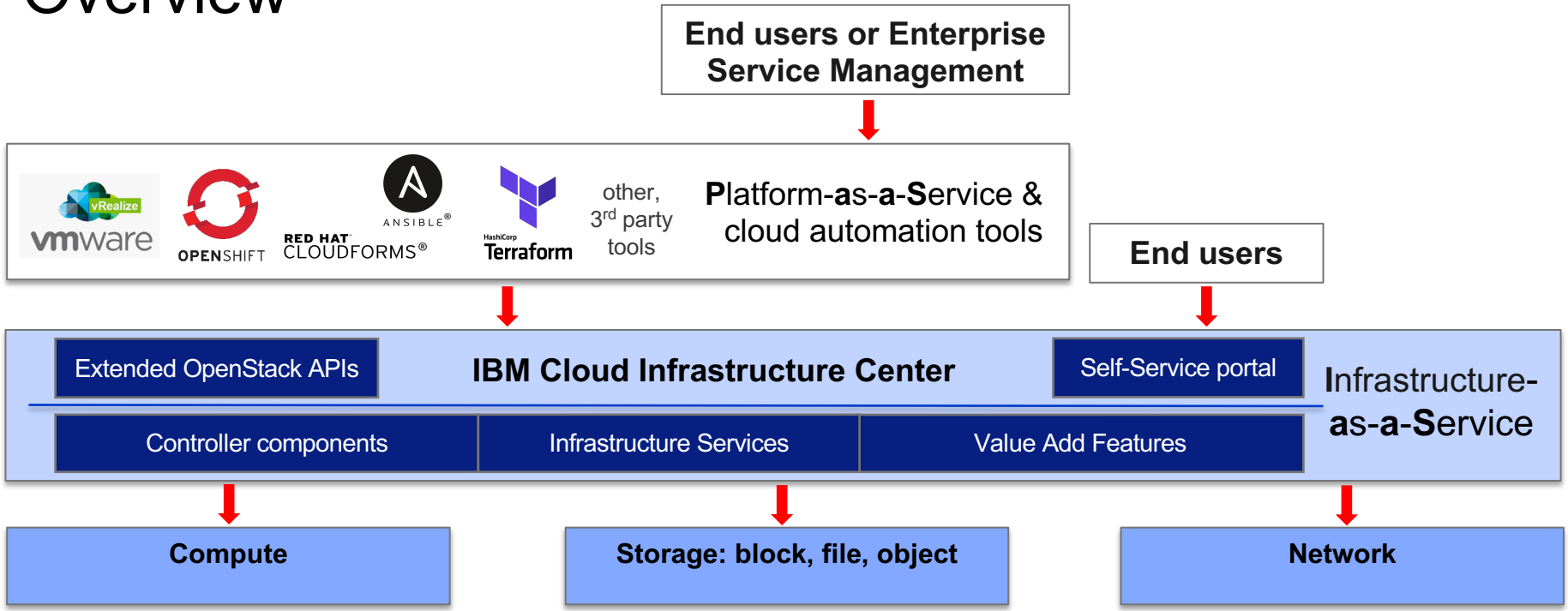
Automation

Capture and maintain a library of virtual machine images to quickly deploy a virtual machine environment by launching a stored image, and move virtual machines to available systems expediting the deployment.

Cloud Integration

Built-in OpenStack® compatible APIs provide vendor-agnostic IaaS management, and the integration with higher-level cloud automation tools, such as IBM Cloud Automation Manager and VMware vRealize Automation / Orchestration.

Architecture Overview



** All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.*

New IBM Cloud Infrastructure Center 1.1.1

IaaS management for Private Cloud deployments on IBM Z and LinuxONE

Today, June 19

General Availability of
IBM Cloud Infrastructure Center 1.1.1

NEW with 1.1.1

- Optional discovery and on-boarding of pre-existing VMs
- LDAP support to meet enterprise identity mapping requirements
- Boot volume support from persistent storage
- Red Hat CoreOS provisioning
- Support of additional RHEL versions as base OS and as guest environment

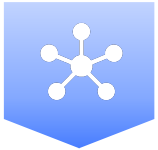
Supported Features in 1.1.1

GA
June 19, 2020

Software and Operation System Version
- z/VM 7.1.0
- Supported as host os: RHEL7.7 and *(NEW)* RHEL7.8
- Supported as guest os: RHEL 7.7, and *(NEW)* RHEL7.8, RHEL8.1, RHCOS4.2, and RHCOS4.3

Virtual Machine Capabilities
- Lifecycle management, incl. *(NEW)* optional discovery of existing virtual machines
- Capture / Snapshot
  - Image stored in management node now
- Image management

Storage
- Ephemeral Storage
  - ECKD™ & FBA (EDEV)
  - Boot disks
- Persistent Storage
  - FCP data volumes via dynamic FCP LUN allocation (SAN)
  - IBM Storwize® family & IBM FlashSystem® V9000/V9100/ V9200
  - 3rd party storage support via IBM SAN Volume Controller
  - *(NEW)* Boot disk



General Features
- Simple install experience
- Multiple tenants
- Environment checker
- Openstack standard API Support
- *(NEW)* LDAP support for enterprise identity mapping

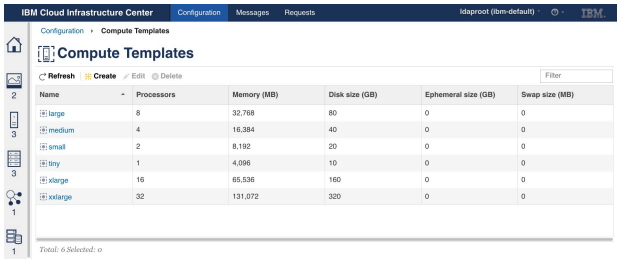
Cloud Capabilities
- Approvals & Expirations
- Deploy Templates
- Self Service Portal

Network
OSA VSWITCH:
- Flat
- VLAN

Self-service User Experience

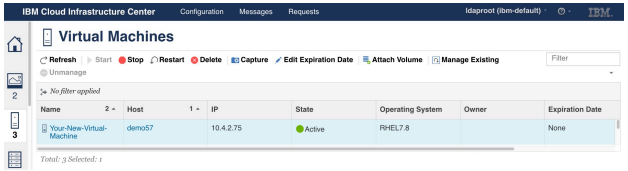
Self-service Portal

Simplified user experience for developers and private cloud consumer requiring self-service virtual machine provisioning and management



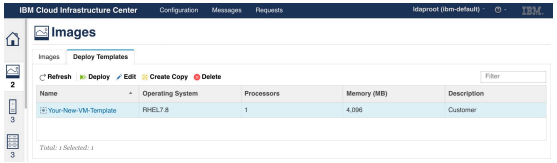
Virtual machine Expiration, Limits and Project Quotas

- Automated VM shut down for expired VMs
- Ensures VMs continue to be validated by owners Limit capacity allocated to each project
- Project administrators can approve VM extensions and user requests without the need for a sys admin



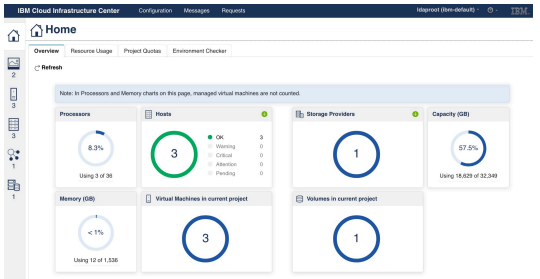
Virtual Machine Lifecycle & Image Management

- Discover and on-board existing virtual machines
- Capture and maintain a library of VM images
- Quickly deploy a VM by launching a stored image
- Migrate and move VMs to available systems expediting deployment



Capacity Overview

- Understand how capacity is being used within the project

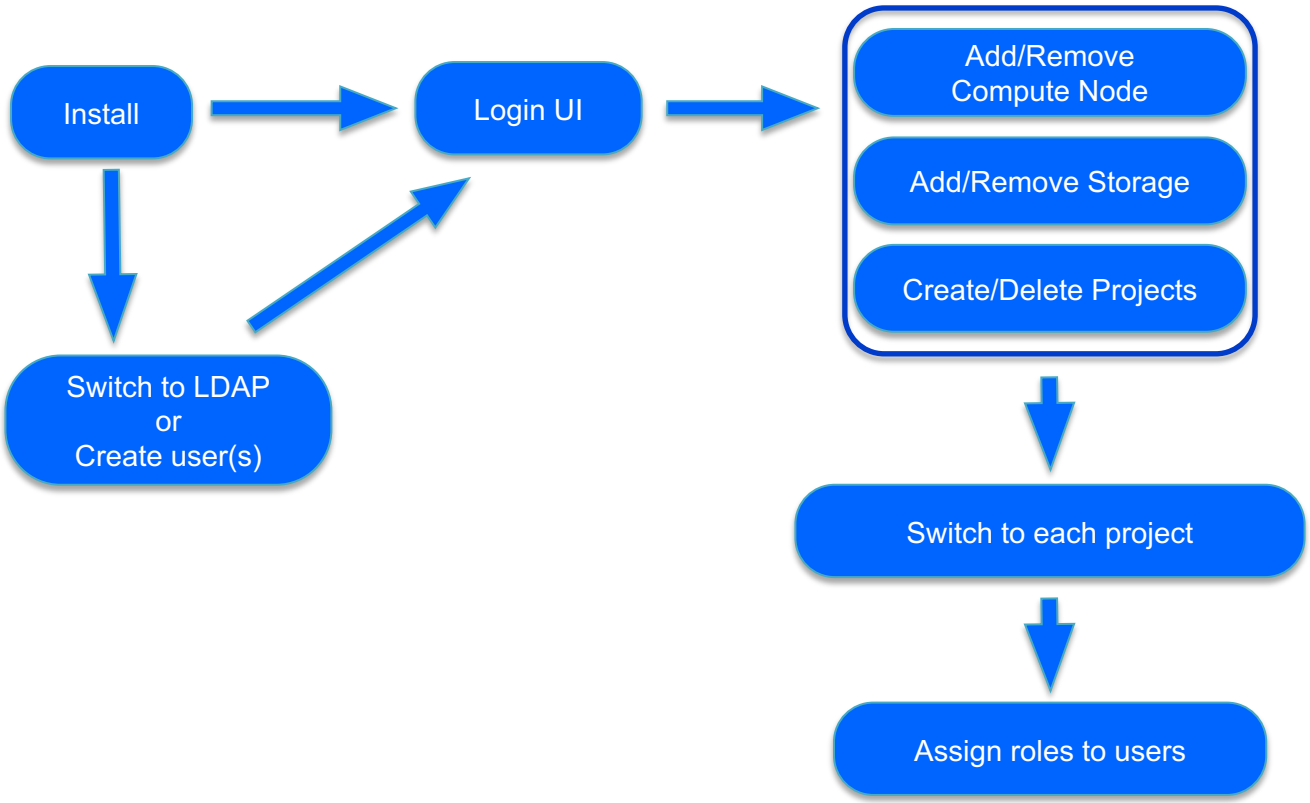


Self-service User Experience – Cloud administrator task list

As admin

Harry
Cloud Admin (IaaS)

Ensures the stability, integrity and performance of all infrastructure environments.



Self-service User Experience – Individual project lead task list

As administrator
of specific project

Marshall
Project Lead

Responsible for the deployment of services within a project or tenant

Login UI with specific project

Approve/deny self-service user VM deploy request and expiration edit request

- Create/Delete Image
- Create/Delete Network
- Create/Delete DeployTemplate
- Create/Attach Volume(s)
- Assign roles to users
- Start/Stop/Delete/Capture roles to users

Self-service User Experience – self-service user task list

As a self-service user

Ella
Application Architect
End User

Creates new apps or improve existing apps, run software tests, develop product prototypes and create technical documents.

Login UI → Send Deploy VM request.

Request Approved

Start/Stop/Delete VM
Request VM expiration date

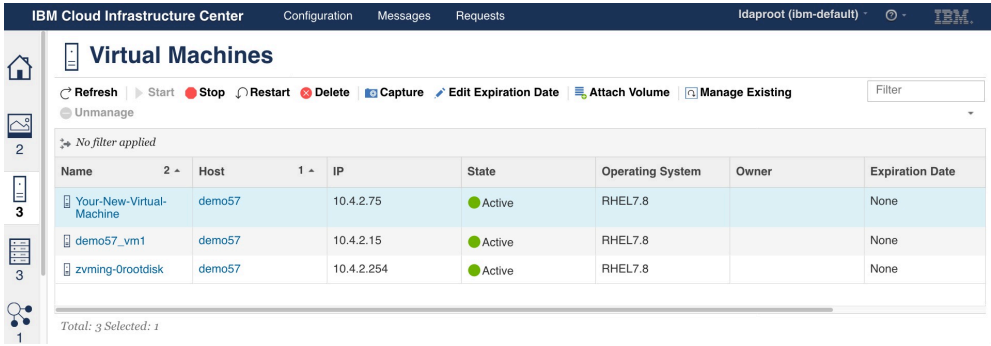
Project administrator

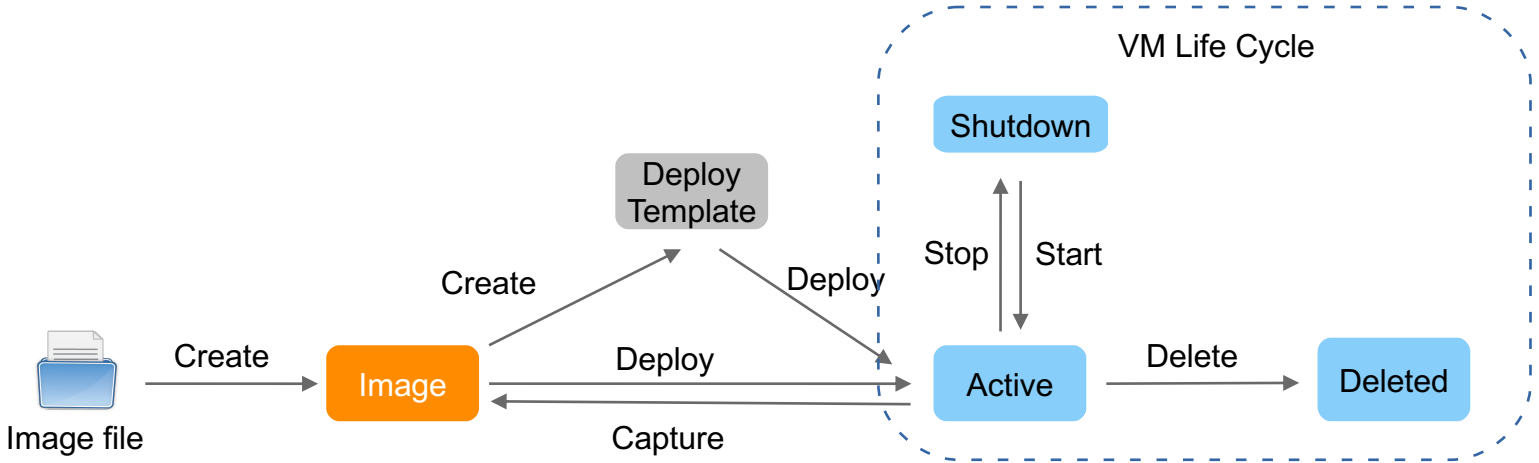
Marshall
Project Lead

Virtual Machine Lifecycle and Provisioning

Value

- 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

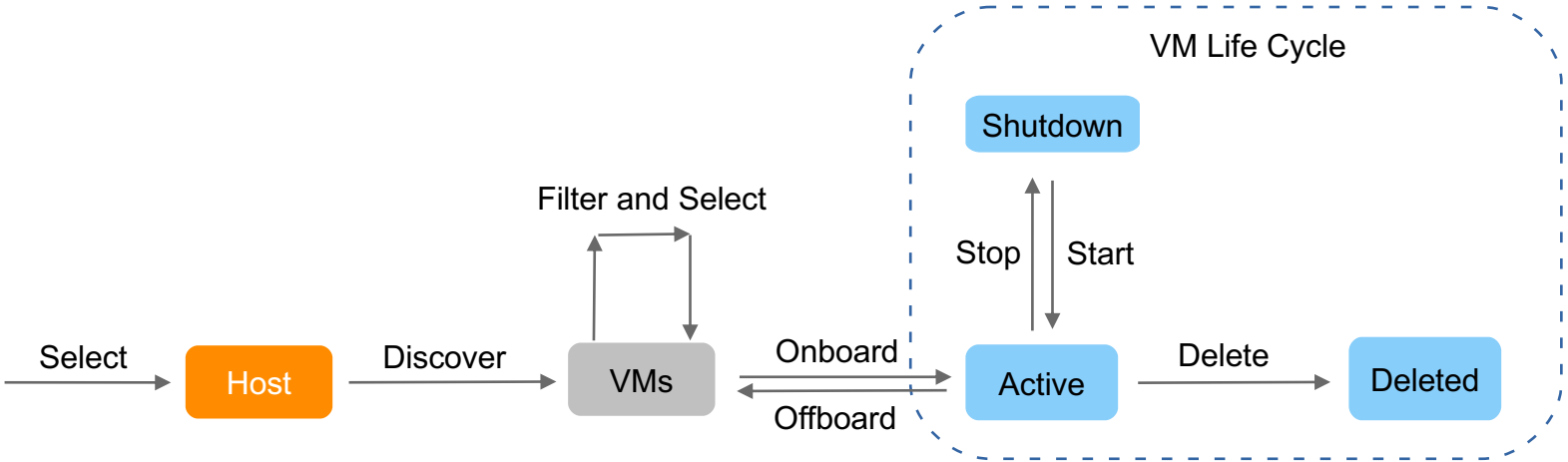




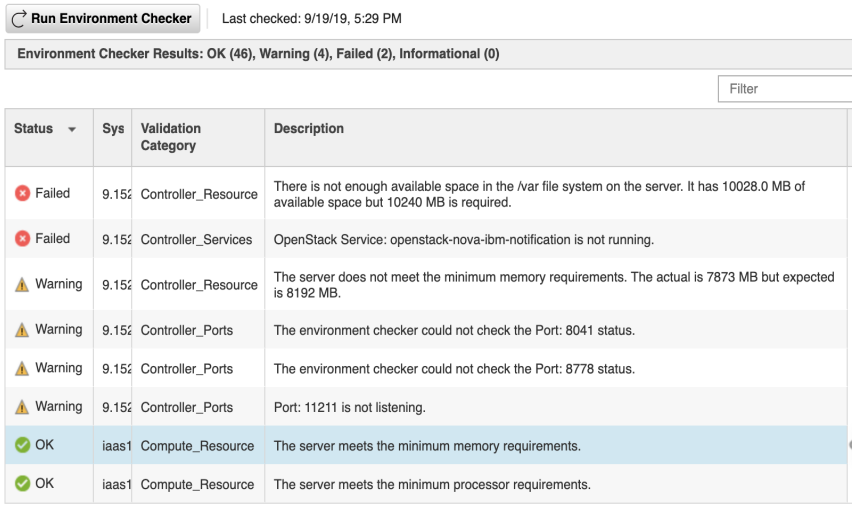
Virtual Machine Discovery and Onboarding

Value

- Discover pre-existing virtual machines
- Selectively filter and onboard
- Manage onboarded virtual machines with IBM Cloud Infrastructure Center



Health Check & Diagnose



Status	Sys	Validation Category	Description
Failed	9.152	Controller_Resource	There is not enough available space in the /var file system on the server. It has 10028.0 MB of available space but 10240 MB is required.
Failed	9.152	Controller_Services	OpenStack Service: openstack-nova-ibm-notification is not running.
Warning	9.152	Controller_Resource	The server does not meet the minimum memory requirements. The actual is 7873 MB but expected is 8192 MB.
Warning	9.152	Controller_Ports	The environment checker could not check the Port: 8041 status.
Warning	9.152	Controller_Ports	The environment checker could not check the Port: 8778 status.
Warning	9.152	Controller_Ports	Port: 11211 is not listening.
OK	iaas1	Compute_Resource	The server meets the minimum memory requirements.
OK	iaas1	Compute_Resource	The server meets the minimum processor requirements.

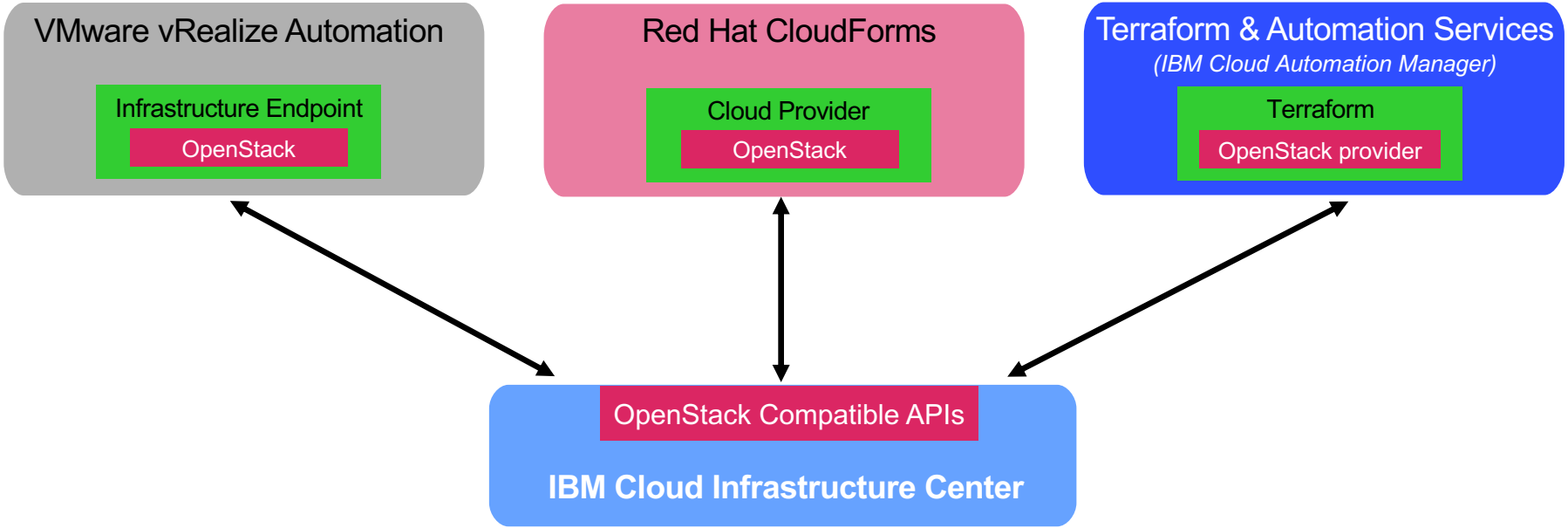
Easy to verify environment
- resources
- versions
- services status

```
[root@zvminstall5 ~]# icic-diag
GMR report will not be collected as SELinux is in 'Enforcing' mode.
Disable SELinux (setenforce 0;getenforce) on the ICIC Management Server to be able to collect GMR report.
Continue without collecting GMR report? [y/n] y

+--------------------------------------+
| Summary of the opts you specified |
+--------------------------------------+
Services to process            : nova,cinder,glance,neutron,keystone,bumblebee,ttv-validation,swift,clerk
Output directory               : /tmp
Archive filename               : icic-diag_190920-011327
Interactive mode               : True
Maximum wait time (secs)       : 300
Collect zVM Host Information   : None
User                           : root


Diagnostic information will be captured from ICIC configuration files, log files, databases etc.
Data captured may contain email-id, ip-address etc, which will be used only for serviceability.
Do you want to continue? [y/n] y

WARNING: There are 3 existing archive files (/tmp/icic-diag*.tgz) in output directory /tmp.

Do you want to delete existing archive files now to increase available disk space? [y/n] y

INFO: Collecting product version information...
INFO: Collecting product install, icic-config, backup and restore logs...
INFO: Collecting installation information...
INFO: Collecting runtime information...
INFO: Collecting user roles and group information...
INFO: Collecting detailed system information...
```

- Collect diagnostic data
- Includes product info, OS info, configurations, databases, MQ, httpd, services, install, uninstall, error loggs. etc.

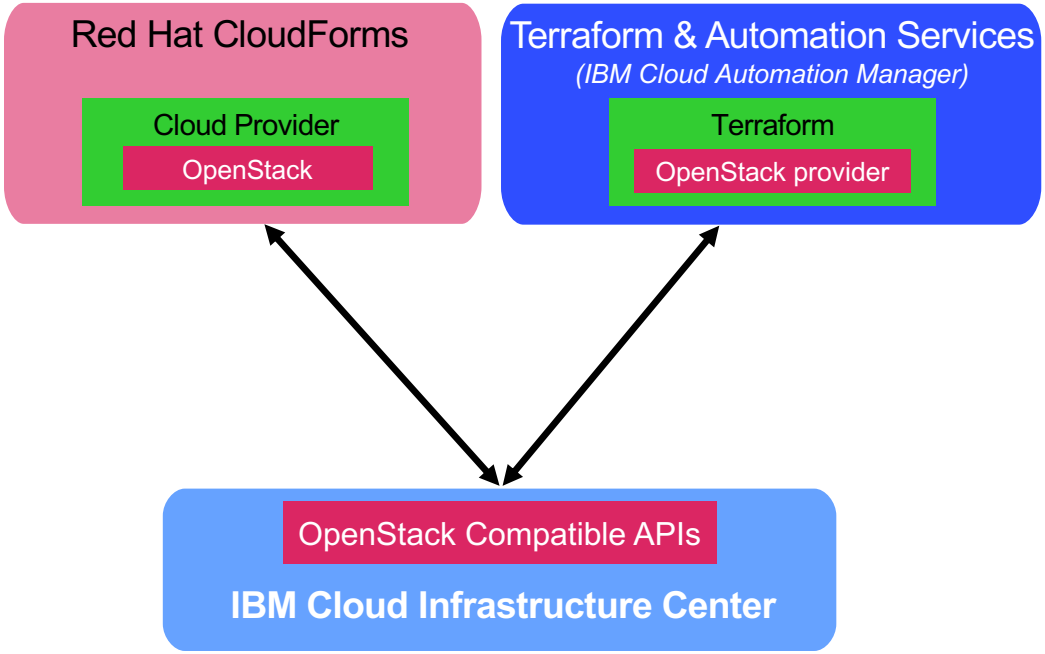
IBM Cloud Infrastructure Center Integrations

Integrations via OpenStack compatible REST API's consumed by upper layer Cloud Management Platforms to provision/orchestrate workloads for IBM Z & LinuxONE



IBM Cloud Pak for Multicloud Management (CP4MCM)

RH CloudForms and Terraform & Automation Services Integration



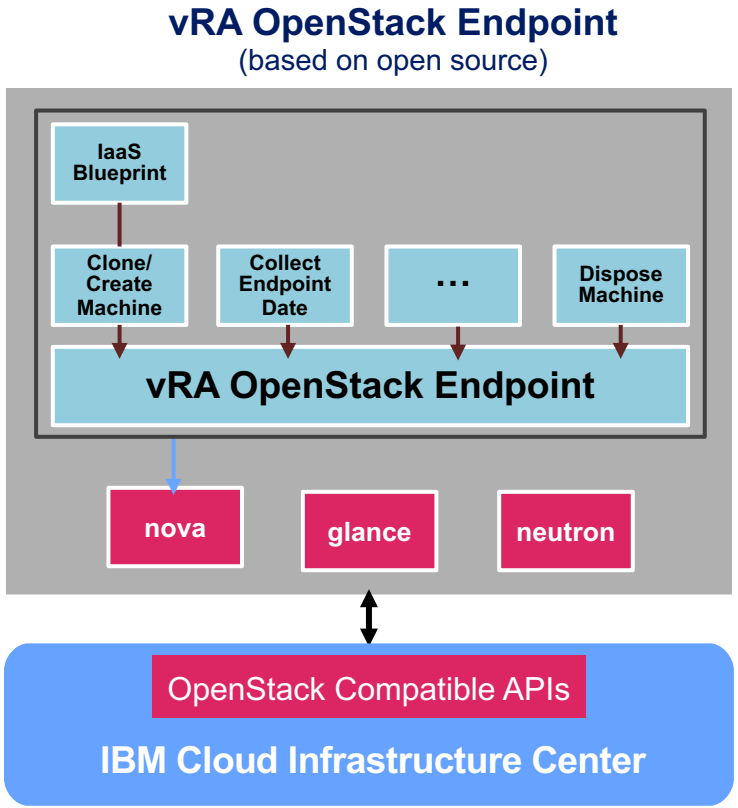
IBM Cloud Infrastructure Center provides OpenStack compatible APIs

Red Hat CloudForms, part of CP4MCM, consumes northbound OpenStack APIs via REST

Terraform & Automation Services, part of CP4MCM, calls Cloud Infrast. Center API's via terraform-provider-OpenStack

Supported OpenStack resource types depend on the features supported within Cloud Infrastructure Center releases

VMware vRealize Automation (vRA) Integration (1 of 2)



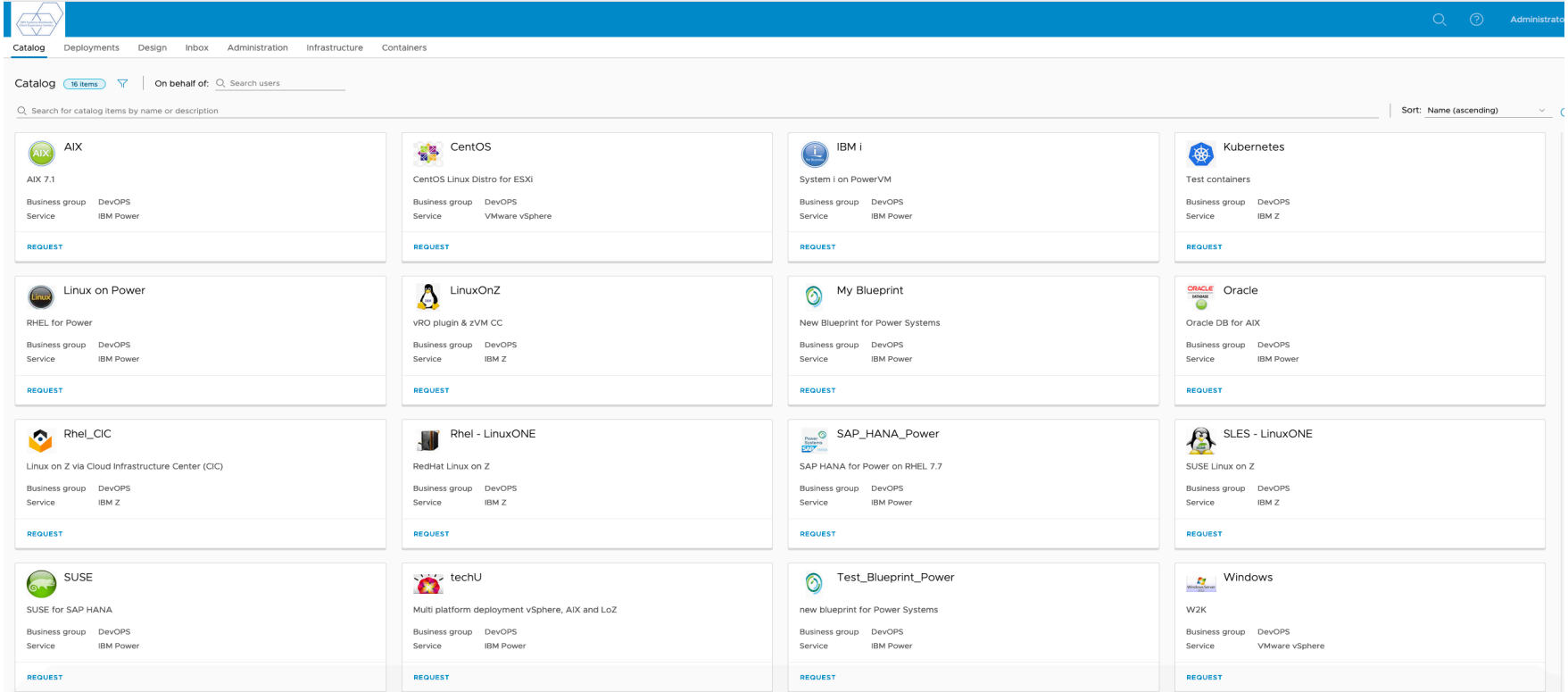
IBM Cloud Infrastructure Center provides OpenStack compatible APIs

vRA consumes northbound OpenStack APIs via REST

Supported OpenStack resource types depend on the features supported within Cloud Infrastructure Center releases

VMware vRealize Automation (vRA) Integration (2 of 2)

Configuring CIC as an OpenStack Endpoint in vRA



Why IBM Cloud Infrastructure Center?

- Easy provisioning of virtual machine (VM) instances into an on-premises cloud via a self-service portal
- Optional discovery and on-boarding of pre-existing VMs
- Support for LDAP to meet enterprise identity mapping requirements
- Image management that includes VM image capture, catalog and deployment
- Fast provisioning of virtual infrastructure to be consumed by Red Hat® OpenShift®.
- Multi-tenancy support
- Easy integration into higher-level cloud automation and orchestration tools
- Require no specific platform skills from the end user and minimal platform skills from the administrator

Comprehensive cloud management

Improves administrator productivity and simplifies the lifecycle mgmt of Linux® virtual machines

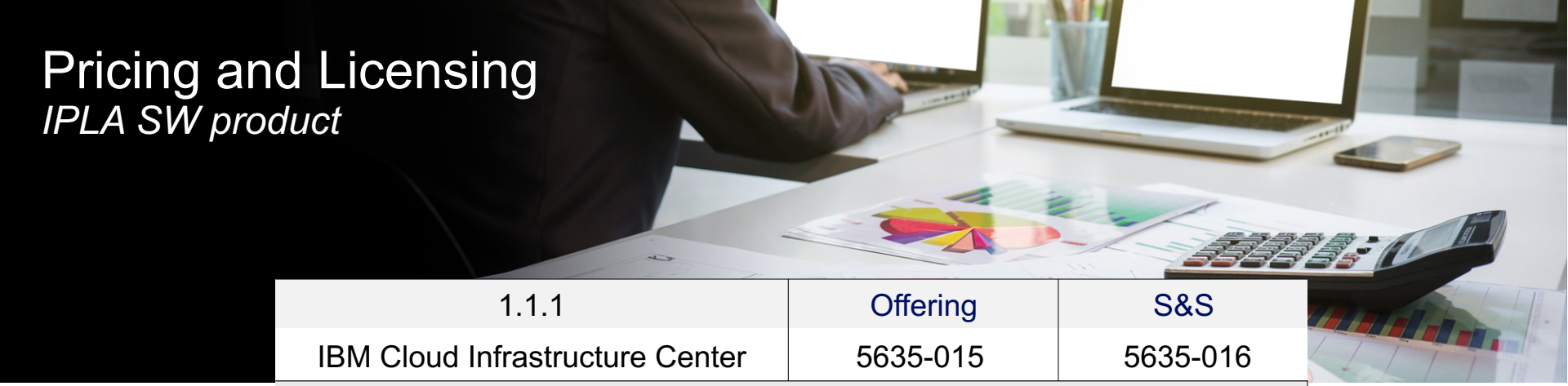
z/VM® -based software-defined infrastructure

Infrastructure mgmt of z/VM-based virtual machines

Integration with multicloud automation tooling

VMware vRealize Automation/Orchestration can consume Cloud Infrastructure Center via OpenStack compatible RESTful APIs

Pricing and Licensing
IPLA SW product



1.1.1	Offering	S&S
IBM Cloud Infrastructure Center	5635-015	5635-016

Pricing & Licensing

IBM Cloud Infrastructure Center is provided under standard license terms (IPLA)

One-time-charge(OTC) + Subscription and Support (S&S)

Value Unit: per "**Virtual Server**"
Simplified pricing with 1 single price point for **OTC** per Virtual Server
S&S is calculated based on the OTC price

No value unit exhibit
No tiers

IBM Cloud Infrastructure Center – per Virtual Server pricing

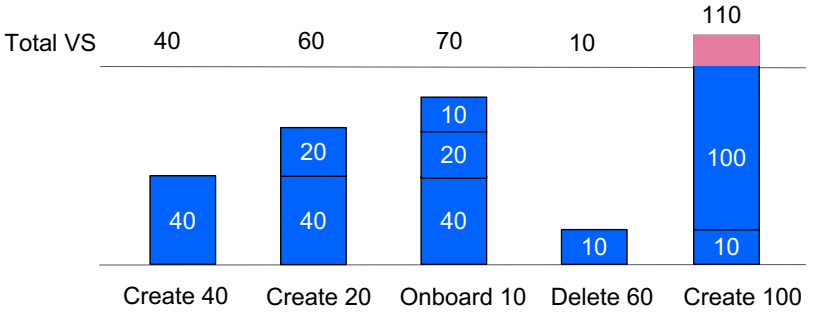
Virtual Servers are counted when Inventorize via either

1) Create

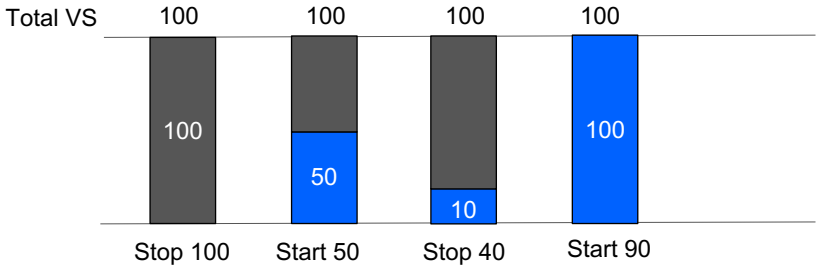
- Create new Virtual Server / Virtual Machine using IBM Cloud Infrastructure Center.

2) Onboarding

- Existing Virtual Server/Virtual Machine is onboarded and made known to Cloud Infrastructure Center.
- Onboarding – adding Virtual Server/Virtual Machine virtual machine previously created outside of Cloud Infrastructure Center.



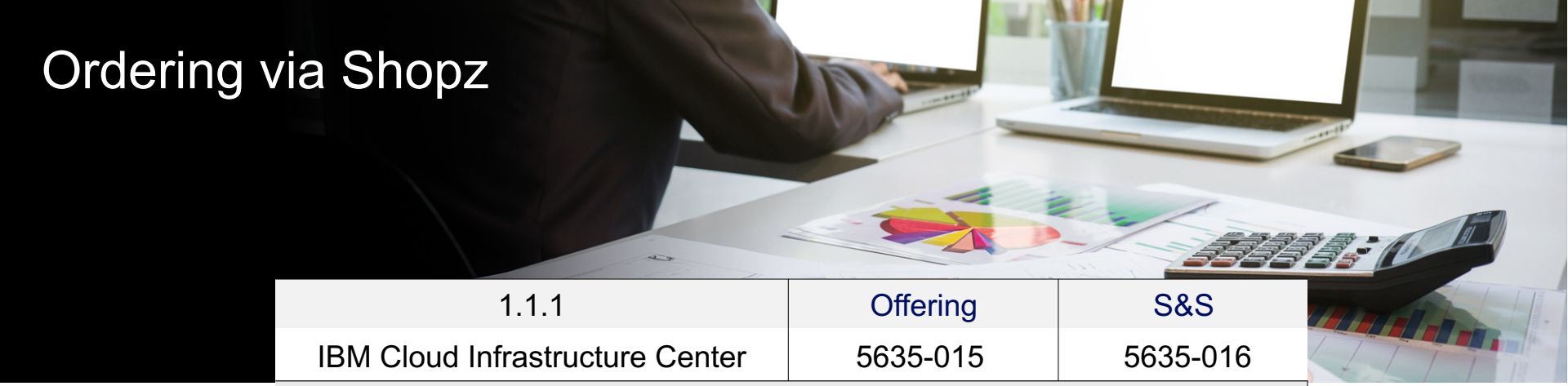
Create, Delete, Onboard – have effect on the # of Virtual Servers.



Start & Stop – do not affect the # of Virtual Servers.

Virtual Server:
Virtual Server is a unit of measure by which the Program can be licensed. A server is a physical computer that is comprised of processing units, memory, and input/output capabilities and that executes requested procedures, commands, or applications for one or more users or client devices. Where racks, blade enclosures, or other similar equipment is being employed, each separable physical device (for example, a blade or a rack-mounted device) that has the required components is considered itself a separate server. A virtual server is either a virtual computer created by partitioning the resources available to a physical server or an unpartitioned physical server. Licensee must obtain Virtual Server entitlements for each virtual server made available to the Program, regardless of the number of processor cores in the virtual server or the number of copies of the Program on the virtual server.

Ordering via Shopz



1.1.1	Offering	S&S
IBM Cloud Infrastructure Center	5635-015	5635-016

Ordering

IBM Cloud Infrastructure Center can be ordered via Shopz:
https://www-03.ibm.com/software/shopzseries/ShopzSeries_public.wss

Choose Product catalog:
“**Linux on z-Standalone products and fixes**”

Orderable supply ID: S018GG6

Shopz

IBM Cloud Infrastructure Center

Welcome to the IBM® Cloud Infrastructure Center documentation, where you can find information about how to install, configure, and use IBM Cloud Infrastructure Center.

Getting started

Overview

Terminology

What is new

Setting up the environment

Installing

Administrator and user tasks

Getting started as an administrator

Administrator tasks

User tasks

Command line interface

Troubleshooting and support

Troubleshooting

IBM Support

Resources and Contacts

- Marketplace at ibm.com
- Documentation at IBM Knowledge Center
- Shopz (“Linux on z-Standalone products” catalog)
- mySupport IBM Support Portal
- Request a Demo
- Request for Enhancement (RFE)
- Announcement (12/2019), Announcement (04/2020)

Contacts

- Stev Glodowski
  Cloud Infrastructure Center Lead Offering Manager
  stev.glodowski@de.ibm.com
- Ji Chen
  Cloud Infrastructure Center Architect
  jichenjc@cn.ibm.com
- Wu Jia
  Cloud Infrastructure Center Development Manager
  wujia@cn.ibm.com
- Ingo Adlung
  DE, Chief Architect & CTO, IBM Z and LinuxONE
  Virtualization and Linux
  adlung@de.ibm.com
- Jerry (Gerald) Hosch
  Cloud Infrastructure Center Sales Enablement
  hosch@de.ibm.com

Backup

IBM Z | IBM LinuxONE

Installation Prerequisites

- **z/VM Configurations**
  - z/VM 7.1 with SMAPI and DIRMAINT enabled
  - ECKD diskpool for VM root disks
  - Layer 2 vswitch with OSA configured
  - Define profile OSDFLT
  - Additional steps if RACF enabled
- **BYOL as z/VM guest, management node**
  - RHEL7.7 or RHEL7.8 with proper repository subscriptions
  - 4+ vcpus, 16G+ memory, 40G+ disk
- **BYOL as z/VM guest, compute node**
  - RHEL7.7 or RHEL7.8 with proper repository subscriptions
  - 4+ vcpus, 8G+ memory, 40G+ disk
  - Userid authorized to call SMAPI
  - IUCV ANY and OPTION LNKNOPAS in user direct