



Live Tour of IBM Cloud Infrastructure Center



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IBM Cloud Infrastructure Center

Infrastructure as a Service on IBM Z and LinuxONE

- Lifecycle management for z/VM and KVM virtual infrastructure
- Automation of deployed services on Z
- OpenShift UPI using Ansible
- Integration into hybrid cloud models
- Self-service portal for end user provisioning
- On-boarding management of existing z/VM instances



IBM Cloud Infrastructure Center 1.2.0

z/VM pre-requisites

Hardware platforms:

- IBM z16™ (all models)
- IBM z15™ (all models)
- IBM z14® (all models)
- IBM z13® and IBM z13s®
- IBM® LinuxONE 4 (all models)
- IBM® LinuxONE III (all models)
- IBM® LinuxONE II (all models)
- IBM® LinuxONE I (all models)

Environment:

z/VM 7.2 or 7.3
SMAPI
Directory Manager
VSWITCH
External Security Manager
Template profile
ECKD/FBA diskpool or
Storage through FCP (DS8K,
IBM Storage FlashSystem)

Management Node:

RHEL 8.6 or 8.8
~0.5 IFL, 16 GB RAM, 40 GB disk

Compute Node:

RHEL 8.6 or 8.8
~0.2 IFL, 8 GB RAM, 80 GB disk

Live Tour of IBM Cloud Infrastructure Center

- IBM Cloud Infrastructure Center dashboard
 - Add host, add network, add image, deploy virtual machine
- Using terraform to deploy virtual machines
 - Infrastructure as code
- Openshift deployment using UPI Ansible Playbooks
 - Ansible playbook deployed using Jenkins server
- Monitoring and chargeback considerations
 - Prometheus, node exporter to Grafana

IBM Cloud Infrastructure Center

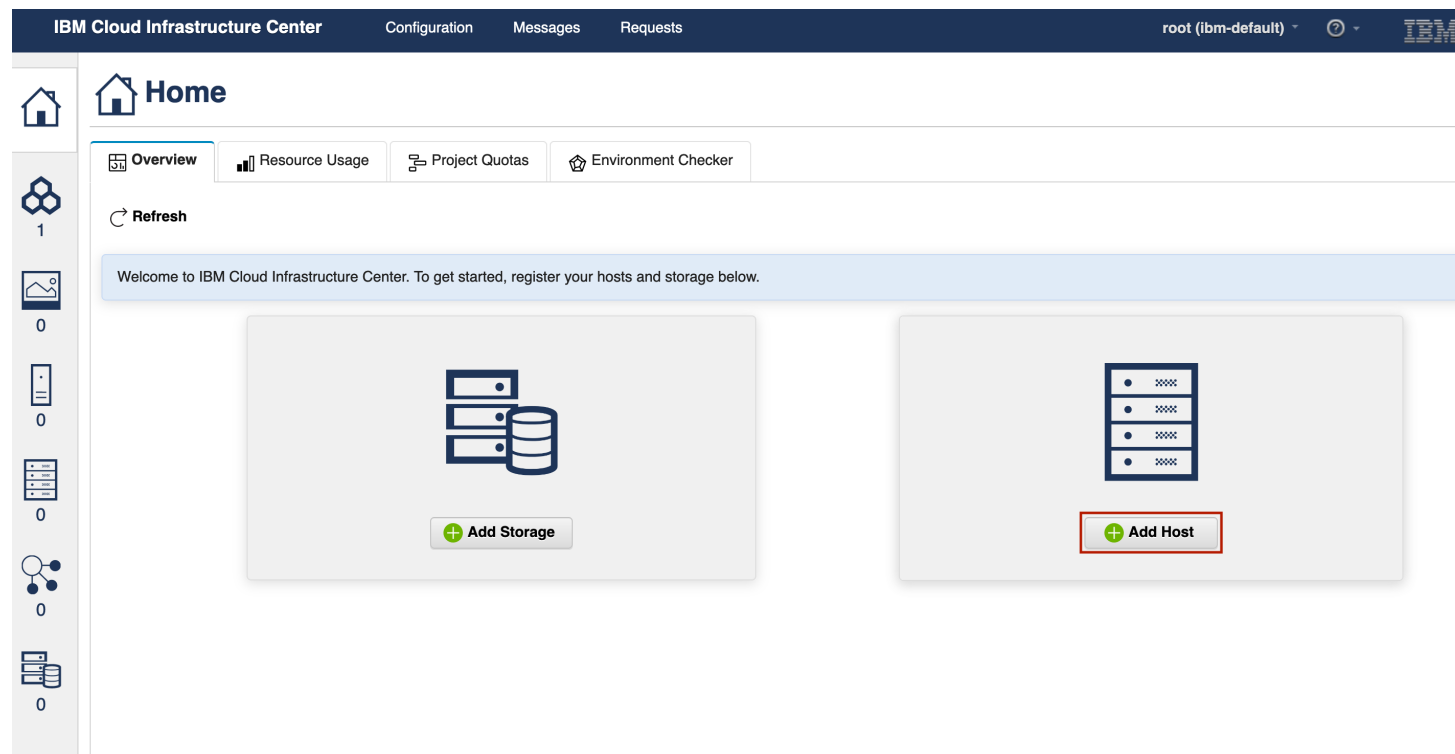
Setup and configure ICIC environment

- Add host through web interface
- Add flat network using web interface
- Add images using command line interface
- Deploy virtual machine

IBM Cloud Infrastructure Center

Setup and configure ICIC environment

- Add host through web interface



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Setup and configure ICIC environment

- Add host through web interface

Add Host

Specify the details for host registration.

Host management type:
 z/VM KVM

* Hostname or IP address: * User ID:

Display name: ? Authentication type:
 Password SSH key

* Vswitch Name: * Password:

DASD group ?

▼ FCP vHBA Devices ?

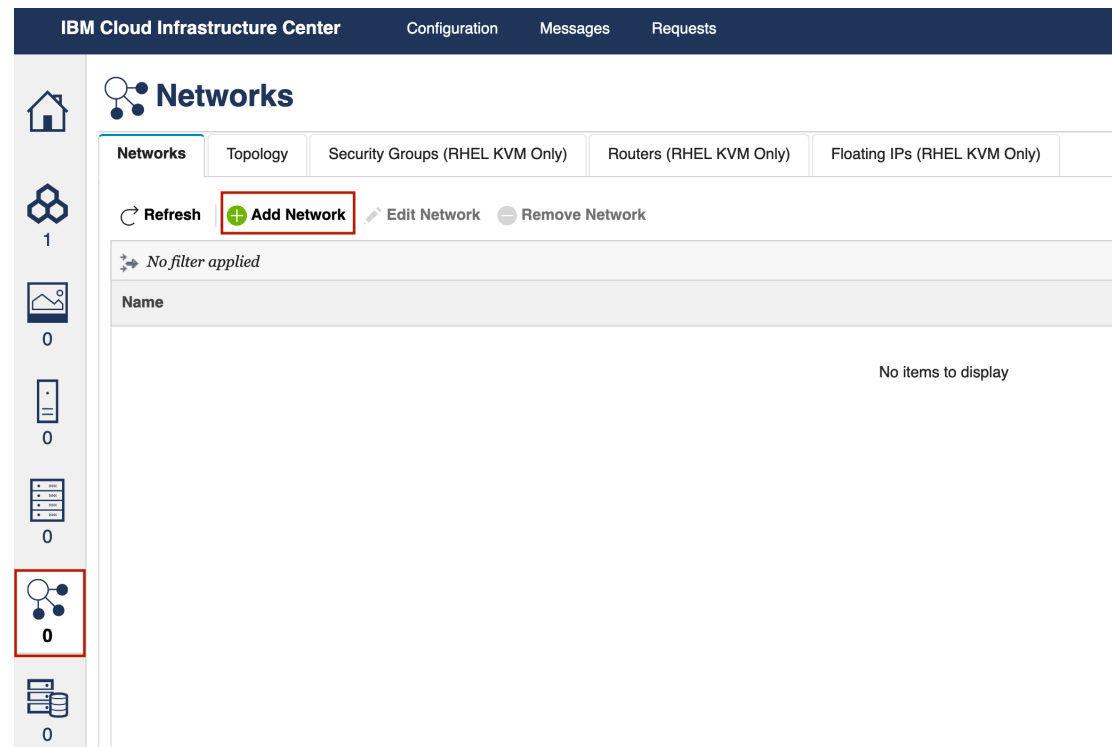
Path Number	Single FCP Devices	Range FCP Devices	Total FCP Device Count
There is no FCP device path.			

Total: 0 Selected: 0

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Setup and configure ICIC environment

- Add network through web interface



IBM Cloud Infrastructure Center

Setup and configure ICIC environment

- Add network through web interface

The screenshot shows the 'Add Network' page in the IBM Cloud Infrastructure Center. The page has a dark blue header with the title 'IBM Cloud Infrastructure Center' and navigation links for 'Configuration', 'Messages', and 'Requests'. Below the header, a breadcrumb trail shows 'Networks > Add Network'. The main content area is titled 'Add Network' and contains a form for specifying network details. The form includes fields for 'Name' (set to 'net1'), 'Type' (set to 'Flat'), 'Virtualization type' (set to 'z/VM vSwitch'), and 'MTU' (set to '1500'). There is a checkbox for 'Shared across projects' which is checked. Below these fields is a section for 'Network type' where the 'IP address type' is set to 'Static'. Underneath, there is a 'Subnet' section with an 'Add Subnet' button highlighted in red, along with 'Edit Subnet' and 'Remove Subnet' options. A table with columns for 'Name', 'Subnet mask', 'Gateway', 'Primary DNS', 'Secondary DNS', and 'IP ranges' is present, but it is currently empty. A message at the bottom of the table says 'Click Add Subnet to add subnets.' The page also features a left-hand navigation sidebar with icons for home, clusters, images, volumes, networks, and subnets, each with a count (1 for networks, 0 for others). At the bottom of the page, it shows 'Total: 0 Selected: 0'.

IBM Cloud Infrastructure Center Configuration Messages Requests

Networks > Add Network

Add Network

Specify the default values for this network. After the network is added, you can select it when deploying images.

* Name: * Type:

* Virtualization type:

MTU:

Shared across projects

Network type

IP address type: **Static**

Subnet

[+ Add Subnet](#) [Edit Subnet](#) [Remove Subnet](#)

Name	Subnet mask	Gateway	Primary DNS	Secondary DNS	IP ranges
Click Add Subnet to add subnets.					

Total: 0 Selected: 0

IBM Cloud Infrastructure Center

Setup and configure ICIC environment

- Add network through web interface

Add Subnet

* Name

* Subnet mask:

* Gateway:

Primary DNS:

Secondary DNS:

Starting IP address: Ending IP address:

[Add additional ranges](#)

IBM Cloud Infrastructure Center

Setup and configure ICIC environment

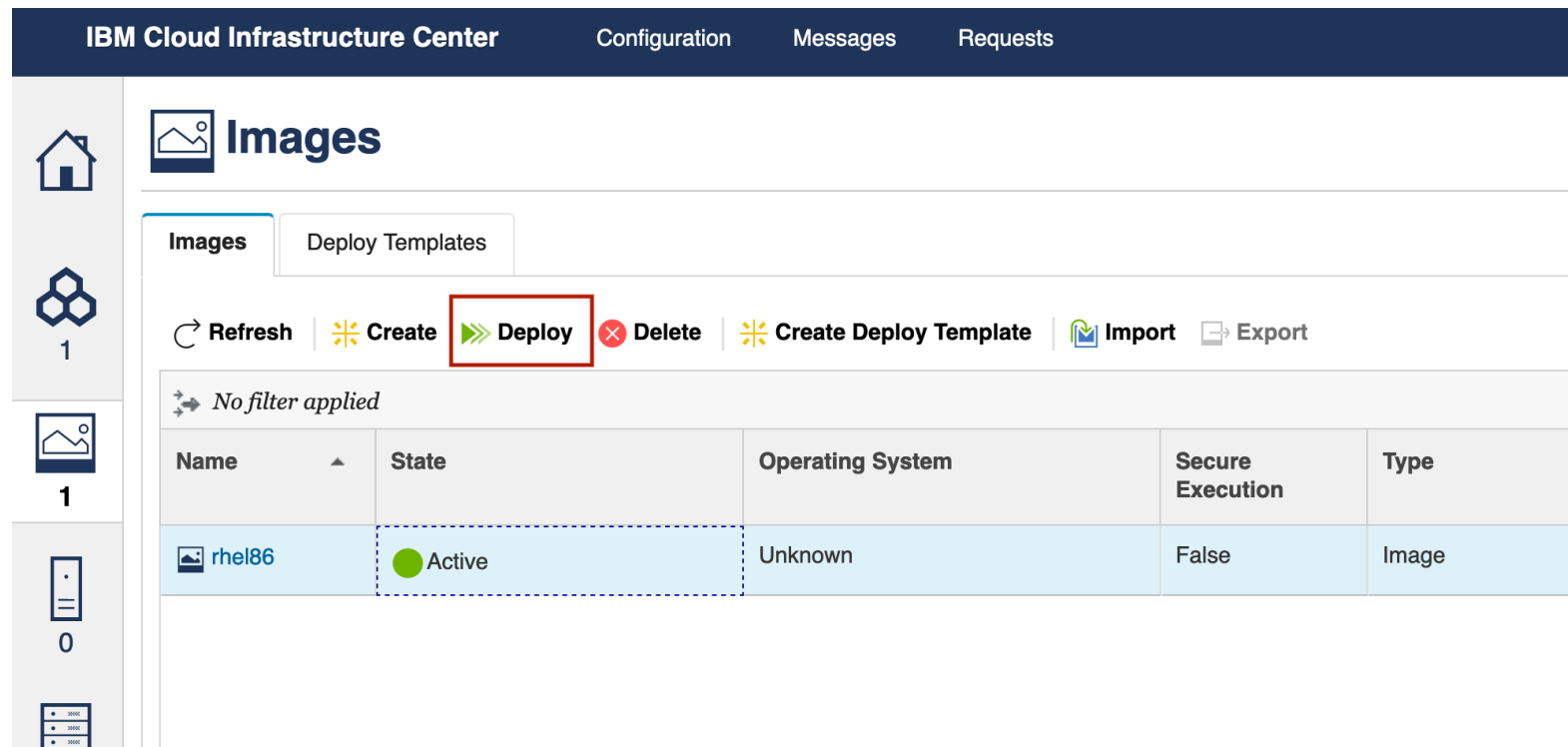
- Add image using openstack CLI

- `source /opt/ibm/icic/icicrc`
- `openstack image create --disk-format=raw \`
`--file=/root/images/rhel86_multipath_ext4_eckd.img rhel86`
- `openstack openstack image set --property architecture=s390x \`
`--property hypervisor_type=zvm --property os_distro=RHEL8.6 \`
`--property disk_type=DASD <image-uuid>`

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Setup and configure ICIC environment

- Deploy virtual machine




IBM Cloud Infrastructure Center Configuration Messages Requests

Images

Images Deploy Templates

Refresh Create **Deploy** Delete Create Deploy Template Import Export

No filter applied

Name	State	Operating System	Secure Execution	Type
 rhel86	● Active	Unknown	False	Image

IBM Cloud Infrastructure Center

Setup and configure ICIC environment

- Deploy virtual machine

The screenshot shows the 'Deploy rhel86' configuration page in the IBM Cloud Infrastructure Center. The page has a dark blue header with the title 'IBM Cloud Infrastructure Center' and navigation links for 'Configuration', 'Messages', and 'Requests'. A left sidebar contains navigation icons: a home icon, a cluster icon with a '3', a server icon with a '3', a server rack icon with a '2', and a network icon with a '1'. The main content area is titled 'Images > Deploy rhel86' and features a 'Deploy rhel86' button. Below this is a 'General' section with the following fields: 'Virtual machine name' (text input with 'rhel86'), 'Instances' (spin box with '1'), 'Description' (text input with 'test_vm'), 'Tags' (empty text input), 'Deploy target' (dropdown menu with 'Default_Group'), 'Collocation rule' (dropdown menu with 'None'), and 'Key pair' (dropdown menu with 'None').

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Setup and configure ICIC environment

- Deploy virtual machine

The screenshot shows the 'Deploy rhel86' configuration page in the IBM Cloud Infrastructure Center. The page is divided into several sections:

- Navigation:** Home, Images, Configuration, Messages, Requests.
- Deploy target:** Default_Group
- Collocation rule:** None
- Key pair:** None
- Specifications:**
 - Compute template: Tiny
 - Processors: 1
 - Memory (MB): 4,096
 - Disk size (GB): 10
 - Ephemeral size (GB): 0
 - Swap size (MB): 0
 - Instance Extra Specs: {}
- Network:**
 - Buttons: Add Network, Edit Network, Remove Network
 - Table with columns: Name, IP Address
 - Row: 172network (primary network), Selected from IP pool
 - Total: 1 Selected: 0
- Activation Input:**
- Buttons:** Deploy, Cancel

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Using terraform to deploy virtual machines

- Install terraform, install provider and add as a plugin
 - <https://github.com/linux-on-ibm-z/docs/wiki/Building-Terraform>
 - <https://github.com/terraform-provider-openstack/terraform-provider-openstack>
- Use terraform-provider-openstack to provision virtual machines
 - Make changes and apply
 - Destroy created resources

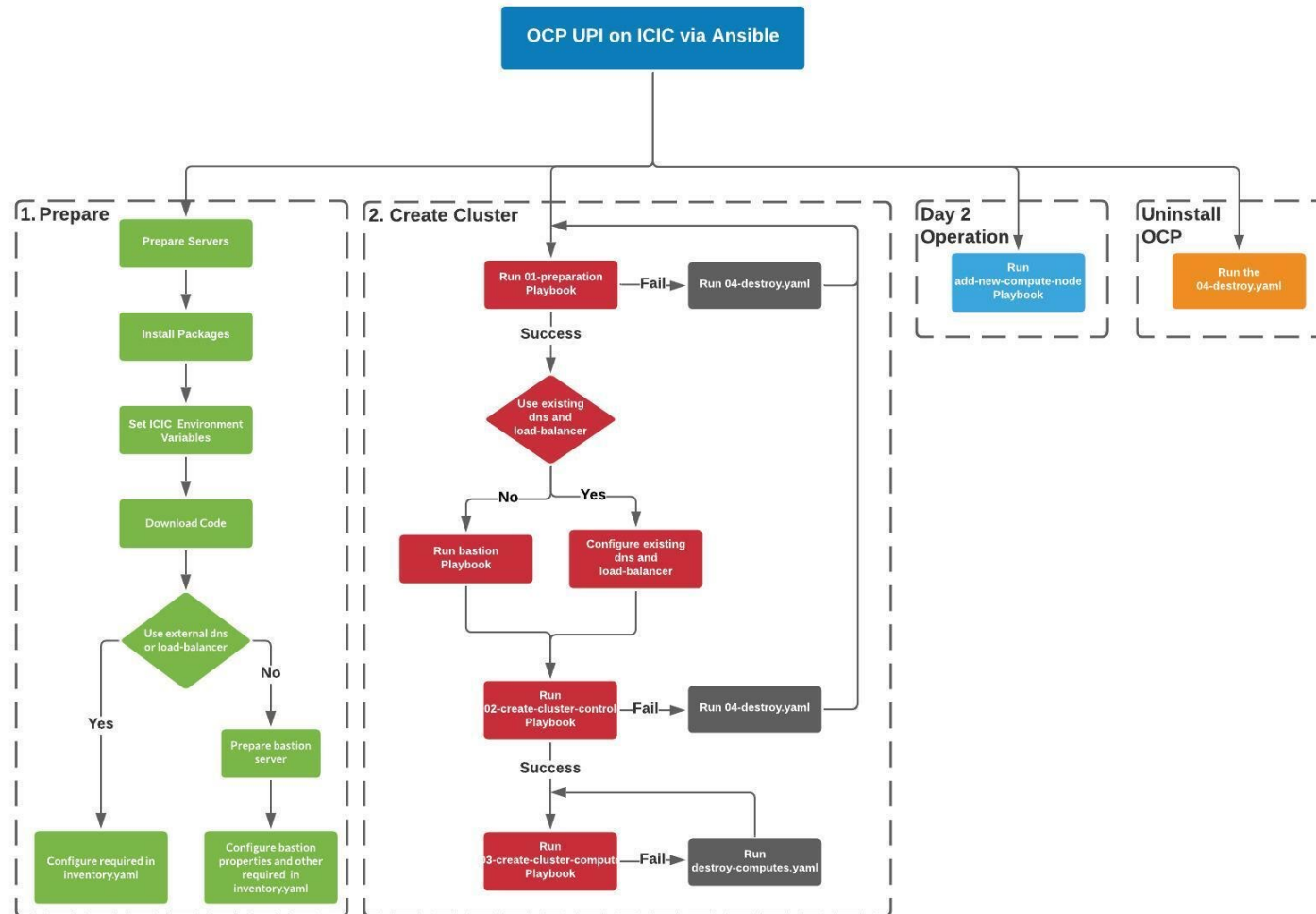
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Openshift UPI ansible playbooks as part of pipeline

- Retrieve UPI ansible playbooks
 - https://github.com/IBM/z_ansible_collections_samples/tree/main/z_infra_provisioning/cloud_infra_center/ocp_upi
- Automation to run the playbooks with our custom inventory.yaml
 - Jenkins pipeline to call playbooks
- Destroy the Openshift Cluster during failure or using cleanup job

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Openshift UPI ansible playbooks as part of pipeline



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Monitoring and chargeback

- Enable and start openstack telemetry services
- Use prometheus and node exporter into Grafana
- Connect openstack environment for chargeback based on allocation model

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Monitoring and chargeback

- Enable openstack telemetry services

```
icic-config metering manage-service --enable ceilometer  
icic-config metering manage-service --enable gnocchi  
icic-config metering manage-service --enable panko
```

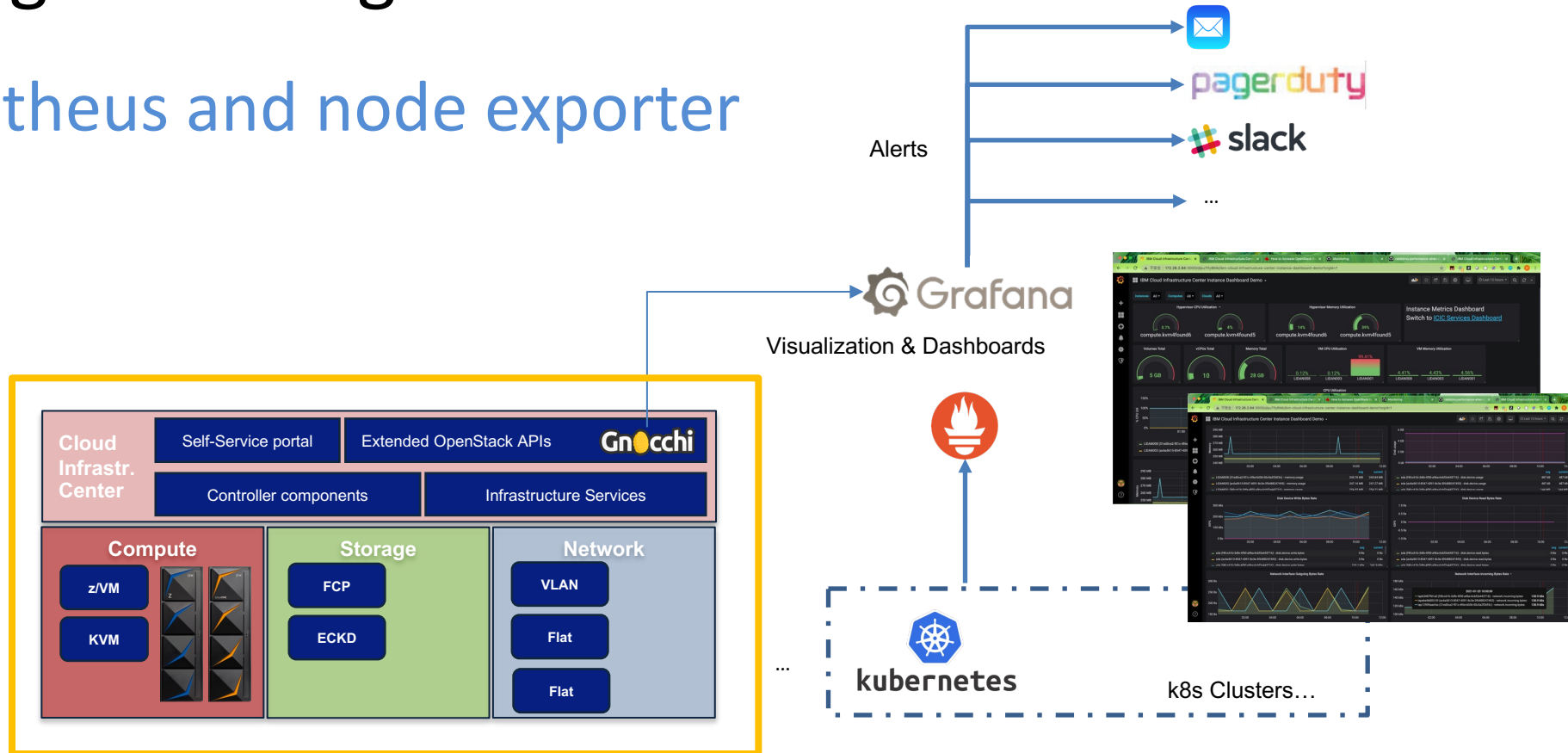
- Start services

```
icic-services start
```

IBM Cloud Infrastructure Center

Monitoring and chargeback

- Prometheus and node exporter



IBM Cloud Infrastructure Center

Chargeback Report with IBM Automation

IBM Automation | Infrastructure Management

operations

Find

Overview > Reports > Reports > 2021-12-28 02:55:20 UTC

Configuration | Download

Notifications

Overview > Services > Compute > Network > Storage > Automation > Control > Monitor > Settings

Reports

- Storage
- Migration Readiness
 - Virtual Machines
 - Providers
- Events
 - Operations
 - Policy
- Running Processes
 - Virtual Machines
- Provisioning
 - Activity Reports
- VM Sprawl
 - Candidates
- Tenants
 - Tenant Quotas
- My Company (All Groups)
 - Custom
 - 179 allocation
 - 179 consumption
 - 2021-12-28 02:55:20 UTC
 - 2021-12-27 03:14:48 UTC
 - 2021-12-26 02:28:26 UTC
 - 2021-12-26 02:12:31 UTC

cpu consumption

Tue, 28 Dec 2021 02:55:19 +0000

Vm Name	Date Range	CPU Total Cost	vCPUs Allocated Cost	vCPUs Allocated Rate	vCPUs Allocated over Time Period	Chargeback Rates	Provider Name	Memory Allocated Cost	Memory Allocated Rate	Memory Allocated over Time Period	Memory Total Cost	Memory Used Cost	Network I/O Used Cost	Network I/O Used Rate
rhel8-2-1	12/24 /2021	\$24.48	\$24.48	\$1.00 / Hourly + \$0.02 / Hourly / CPU	1	k179c	kvm179c	\$1,966.08	\$0.02 / Hourly / MiB	4 GB	\$2,055.24	\$89.16	\$12.00	\$0.50 / Hourly
rhel8-2-1	12/25 /2021	\$24.48	\$24.48	\$1.00 / Hourly + \$0.02 / Hourly / CPU	1	k179c	kvm179c	\$1,966.08	\$0.02 / Hourly / MiB	4 GB	\$2,073.07	\$106.99	\$12.00	\$0.50 / Hourly
rhel8-2-1	12/26 /2021	\$24.48	\$24.48	\$1.00 / Hourly + \$0.02 / Hourly / CPU	1	k179c	kvm179c	\$1,966.08	\$0.02 / Hourly / MiB	4 GB	\$2,073.12	\$107.04	\$12.00	\$0.50 / Hourly
rhel8-2-1	12/27 /2021	\$24.48	\$24.48	\$1.00 / Hourly + \$0.02 / Hourly / CPU	1	k179c	kvm179c	\$1,966.08	\$0.02 / Hourly / MiB	4 GB	\$2,073.18	\$107.10	\$12.00	\$0.50 / Hourly



Thank You

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