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# 0–60 with Private Cloud Director

## Hands-On Lab

# Agenda

- Platform9 & Private Cloud Director
- Infrastructure Concepts
  - Transitioning from VMware
  - Multi-tenancy
  - Hosts, Clusters, Blueprints, and more
- VM Networking
- VM Deployment
- vJailbreak

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# Lab Logistics

## Expectations

- You'll get a hands-on, real world operational experience
- You'll leave with a deeper understanding of Private Cloud Director
- Everything learned applies to all form factors of Private Cloud Director

## Questions?

- ✅ Use Zoom's Q&A function

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# Platform 9 & Private Cloud Director

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# Platform9 Overview

**Vision:** Democratizing cloud computing by providing enterprises with the best way to deploy, operate and scale private clouds

**Team:** Founding team developed VMware vCloud Director, VMware's original private cloud offering used by the world's largest enterprises that is a precursor to VMware Cloud Foundation - the engineering team has deep systems infrastructure expertise

**Product:** Private Cloud Director gives enterprises the simplest private cloud experience with all of the critical enterprise features of VMware

**Enterprise grade, Massive Scale:** A US multinational chain of coffeehouses and roastery reserves is running more than 20,000 hypervisors and growing, and 50,000 VMs globally today

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# Why Enterprises Are Choosing Private Cloud Director

1

## Familiar VM Management, admin friendly

Run VMs and containers on the same integrated platform with a single management plane

2

## ALL critical VMware features

VM High Availability, VMware DRS, vMotion, Distributed Virtual Switches, Software Defined Networking, vVol, and more

3

## Integrates with existing storage and server infrastructure

Protect existing investment in storage and server hardware - we don't lock you into our HCI stack or our OS

4

## BEST migration experience in the industry with vJailbreak

Can execute live / cold migration of entire vSphere clusters to Private Cloud Director in weeks or months, vs years, at 1/10th the industry cost substantially lowering switching costs

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# Integrate with Existing Infrastructure

Works seamlessly with existing storage

- PURESTORAGE®
- DELL EMC
- NetApp
- Hewlett Packard Enterprise
- Tintri

Enterprise Platforms

- DATADOG
- new relic.
- OpenTelemetry
- splunk>
- Grafana
- servicenow
- argo
- harness
- f5
- FORTINET

Backup Native Incremental Forever

- Commvault
- VERITAS
- rubrik
- TRILIO
- storware

Backup Agent-Based

- VEEAM
- COHESITY

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# Flexible Deployment Options

## Same product, different install form factors

### Community Edition

- Mgmt plane on single host
- Full-featured, and 100% free
- Community support

### Learn more

- platform9.com/docs
- reddit.com/r/platform9

### Self-hosted Mgmt Plane

- Runs entirely on-premises
- Highly available and scalable
- Airgapped optional

### SaaS Mgmt Plane

- Single customer, private
- Proactive support with Always-On Assurance

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# Your Lab

## Lab Server Overview

2 servers with Ubuntu 22.04

- ‘A’ Server running PCD CE, and is the management plane
- ‘B’ Server will be used as your hypervisor / image / VM host

Go to platform9.com/hol/ to grab a lab

**Login using local credentials, not SSO!**

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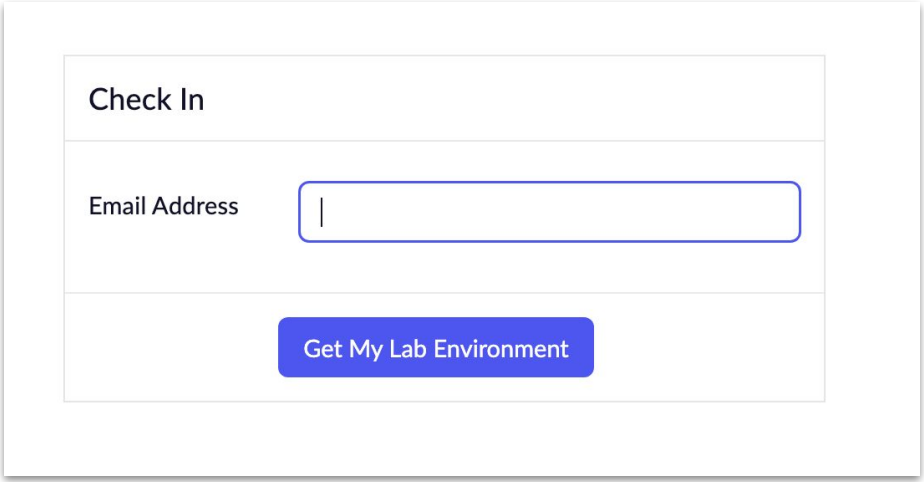
# Get Your Lab!




Get your environment:

platform9.com/hol/

Use the email you used to register

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## Thank you for joining Platform9's 0-60 Workshop!

Your lab environment details can be found below.

| Lab ID | Management Plane URL | Compute Server | Lab Pass |
|---|---|---|---|
| Lab-[redacted] | https://[redacted]-community.pf9.io | ssh root@[redacted]-b.pf9.io | [redacted] |

### Lab Credentials

**Management Plane Credentials (Web Browser/UI):**

```
Username: labuser@platform9.com
Password: [See your assigned value in the Lab Pass column above]
```

**Compute Server Credentials (SSH):**

```
Username: root
Password: [See your assigned value in the Lab Pass column above]
```

**Example Command:**

```
ssh root@[Compute Server]
Use the hostname from the "Bare Metal Server 1 Hostname" column and the password from the "Lab Pass" column above.
```

### Reference - Cluster Blueprint

**Host Interface Details**

**bond0:**
- **Physical network label:** physnet
- **Checkboxes:** Leave all unchecked

**pf9-mgmt:**
- **Physical network label:** leave blank
- **Ensure all boxes are checked:**
  - Management
  - VM Console
  - Image Library I/O
  - Virtual Network Tunnels
  - Host Liveness Checks

**NFS Server Details (Cluster Blueprint):**

```
192.168.100.254:/cloud/platform9
```

### Reference - Network Creation

**VM Networking:**

```
Network CIDR: 172.16.100.0/24
Network Gateway: 172.16.100.1
```

After entering your email, you'll be shown this page with all of the lab details.

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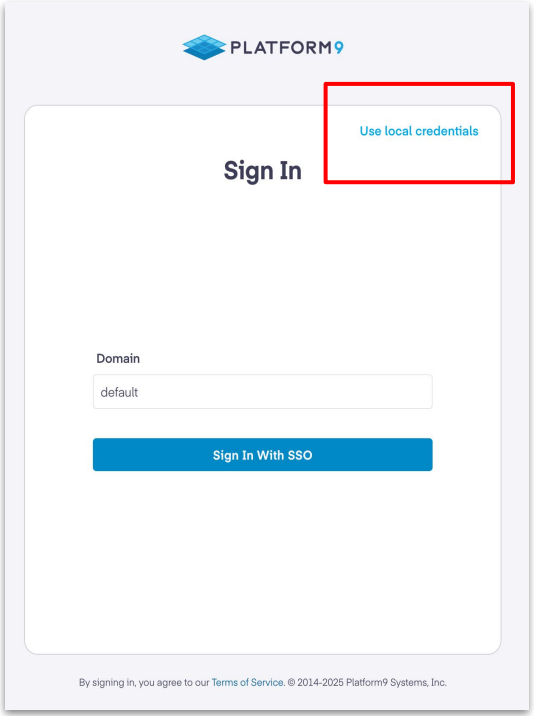
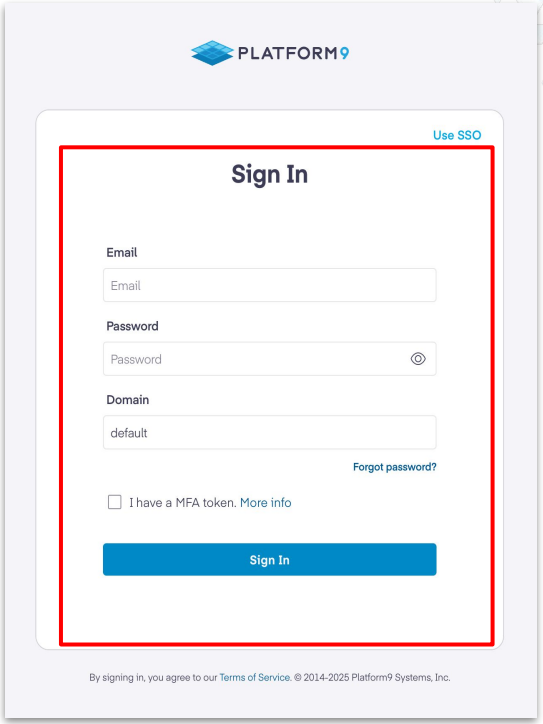
# Lab login

URL, user name, and password are listed in your lab environment details

**Use local credentials!**

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# Infrastructure Concepts

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# Transitioning from VMware

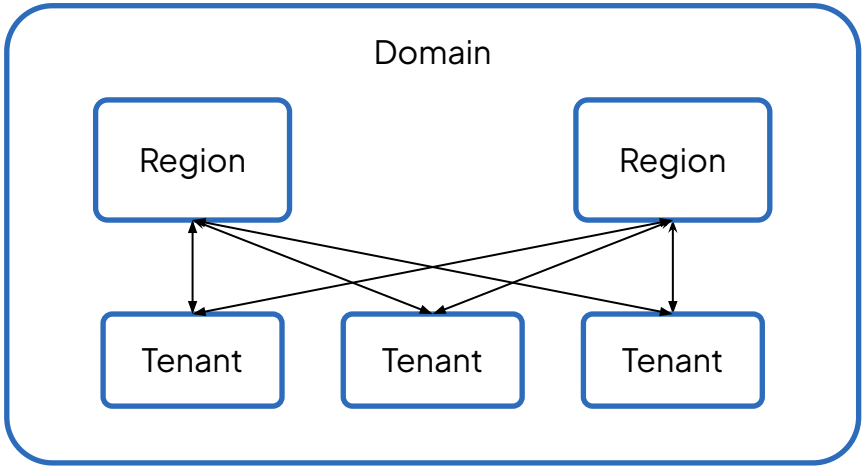
| VMware vSphere features | Private Cloud Director features |
|---|---|
| VMware DRS (Distributed Resource Scheduler) | DRR (Dynamic Resource Rebalancing) |
| VMware HA | HA (high availability) |
| vMotion | VM Live Migration |
| VMware Template | Flavors & Images |
| VMware Snapshot | Snapshot to Image |
| VMware Datacenter | Regions, Domains, Tenants and much more |
| VMware VMFS Datastore | Direct mount storage LUNs (no shared file system) or storage LUNs on shared block storage (NFS, FC, iSCSI) |
| VMware vVol | Volumes, Volume Types, Volume Snapshots |
| VMDK disk format | QCOW2 disk format |
| vCenter Storage Policies | Volume Types |

# Multi-Tenancy Model

Domain
- Defines administrative boundaries
- Organizes users, groups, and tenants

Region
- Physical/functional separation of infrastructure

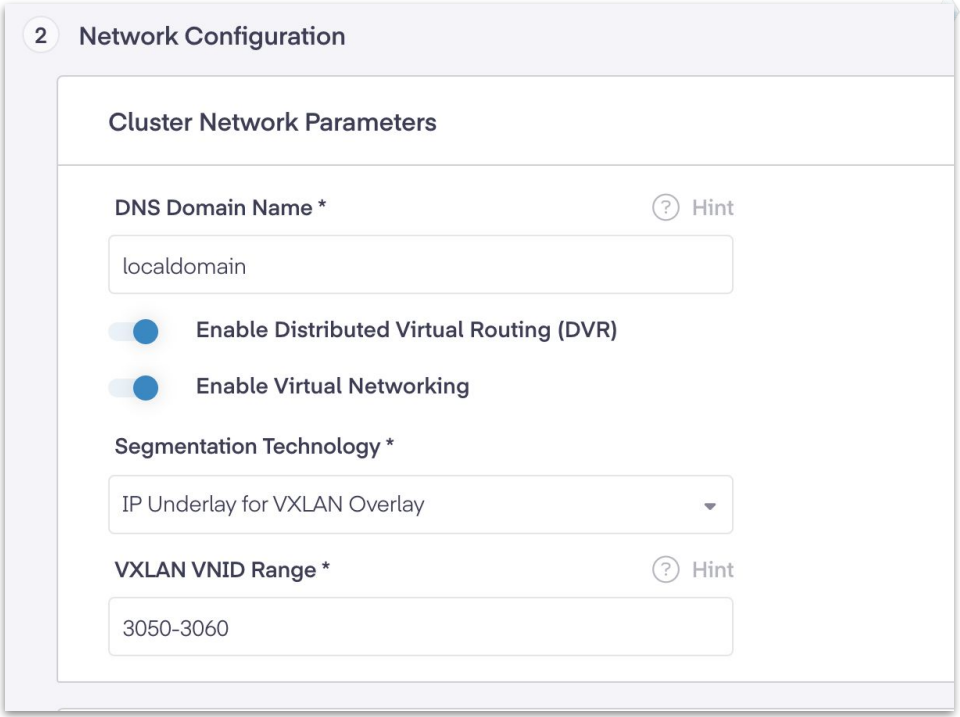
Tenant
- Organizes cloud resources



# Cluster Blueprint

Defines how all clusters & hosts in a region will be configured, providing consistency of base configuration

- VM virtual networking
- Host physical networking
- External storage
- Cluster defaults

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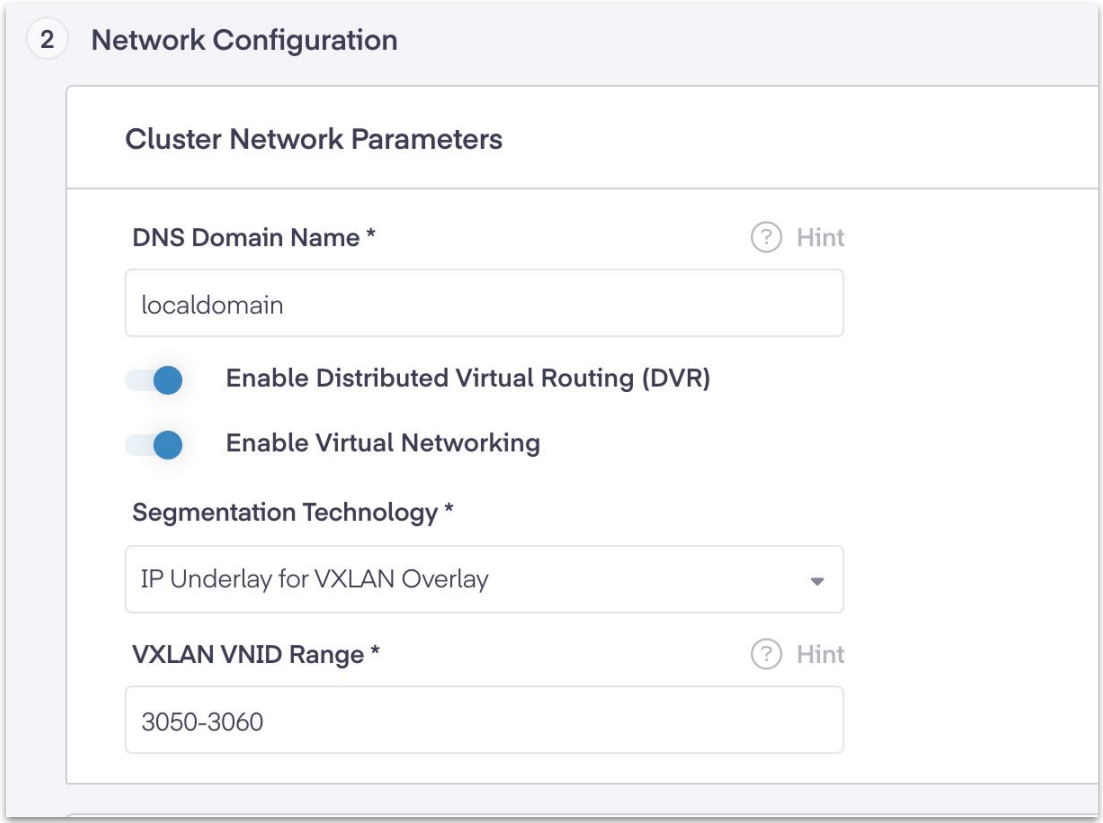
# Cluster Blueprint

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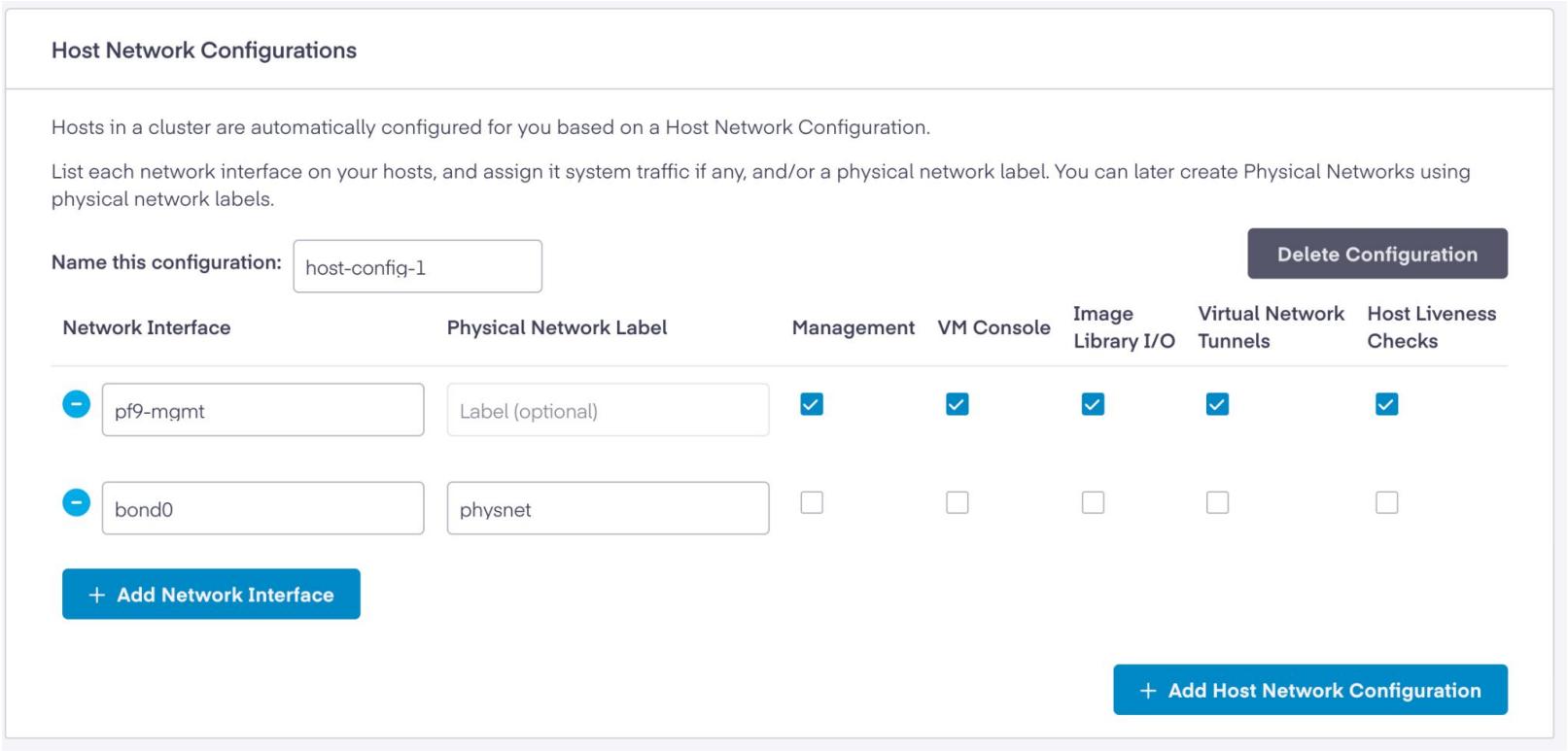
# Cluster Blueprint

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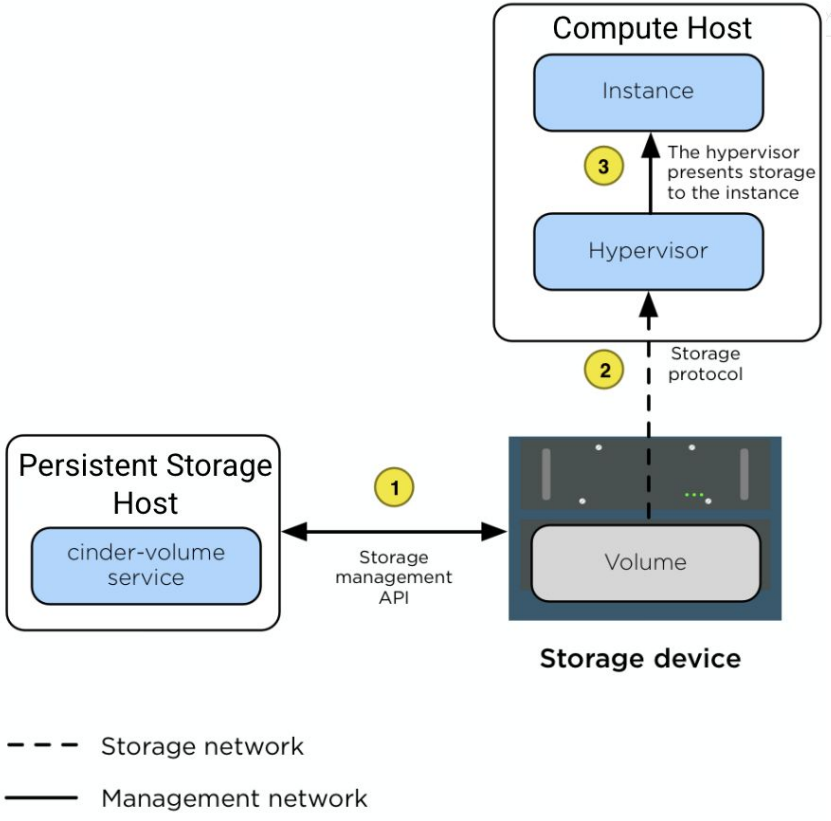
# Persistent Storage

## Overview

- Designed to manage storage resources for virtual machines (VMs).
- Provides persistent storage, with the ability to retain data even when a VM is deleted.

## Key Features

- Supports NFS, iSCSI, and Fibre Channel
- Uses storage drivers provided by NetApp, Pure, Tintri, Dell EMC, HPE, IBM, and more
- Offers snapshot functionality for data backup and instance creation

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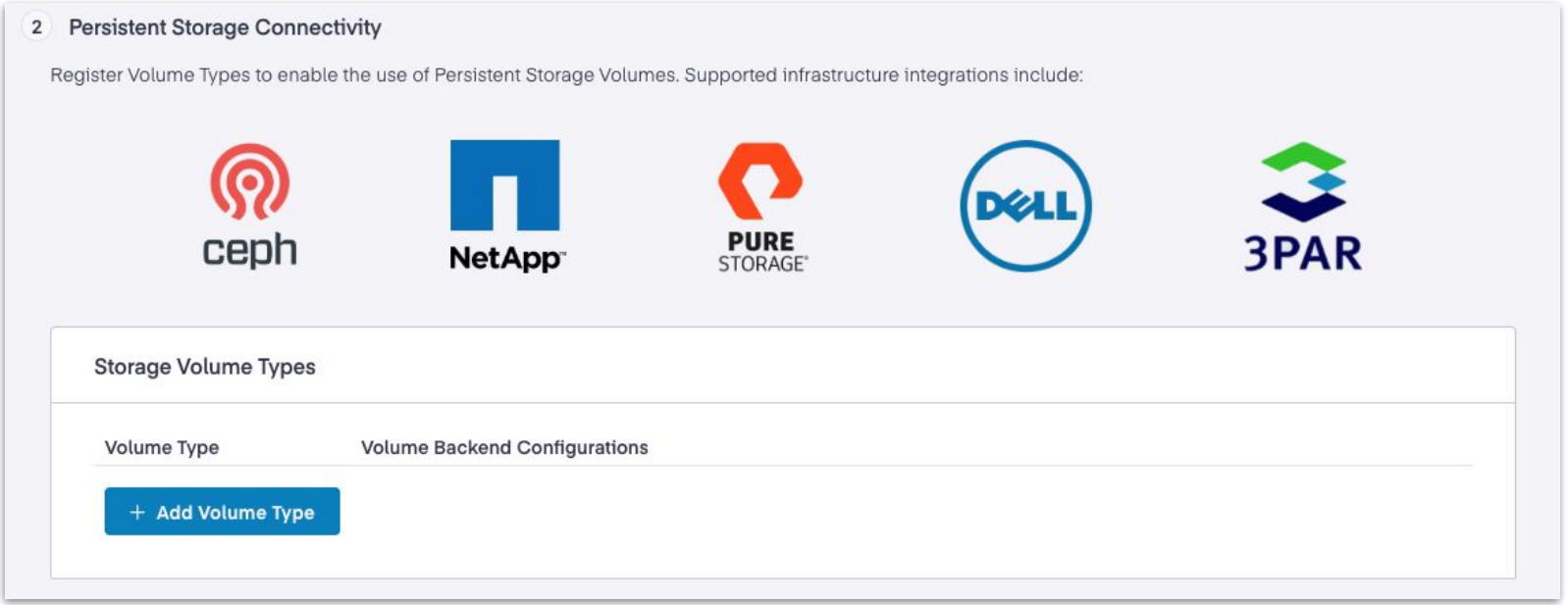
# Cluster Blueprint

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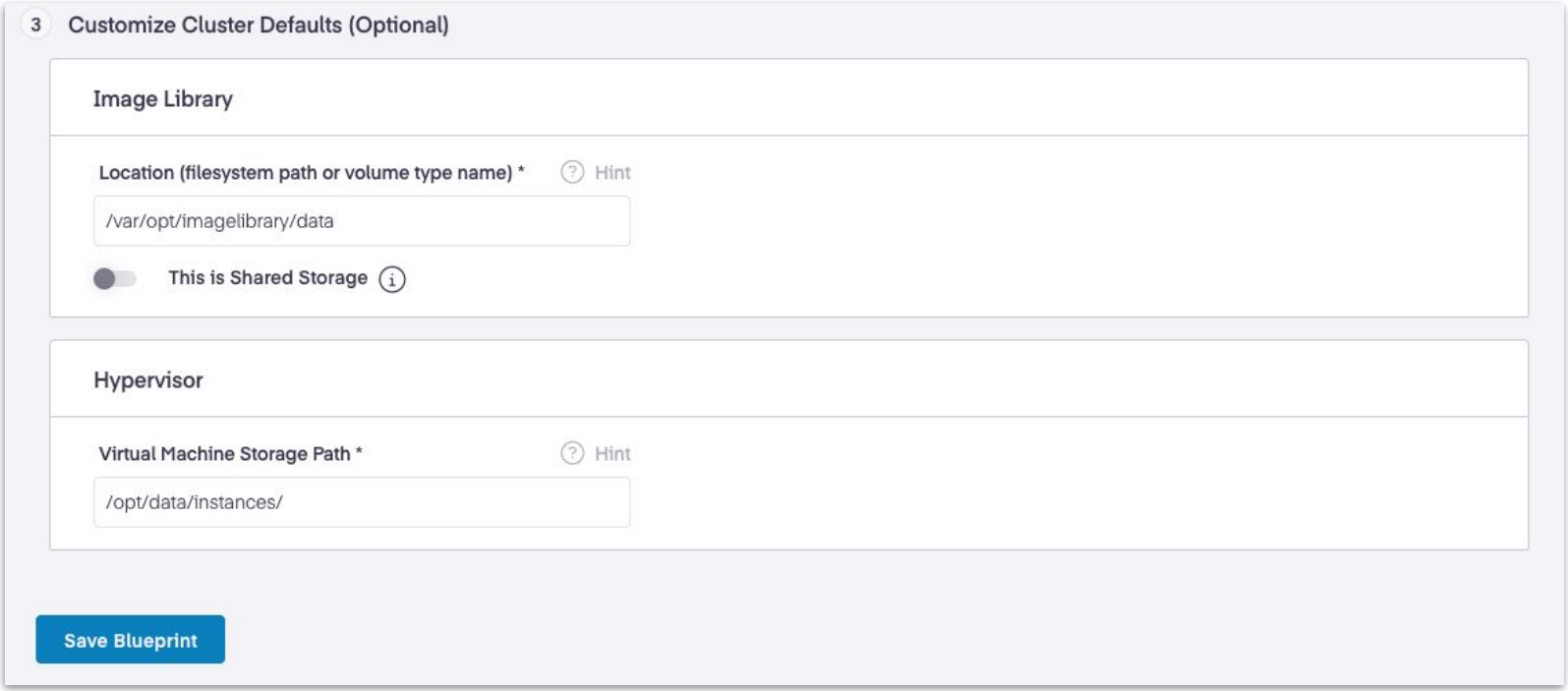
# Cluster Blueprint

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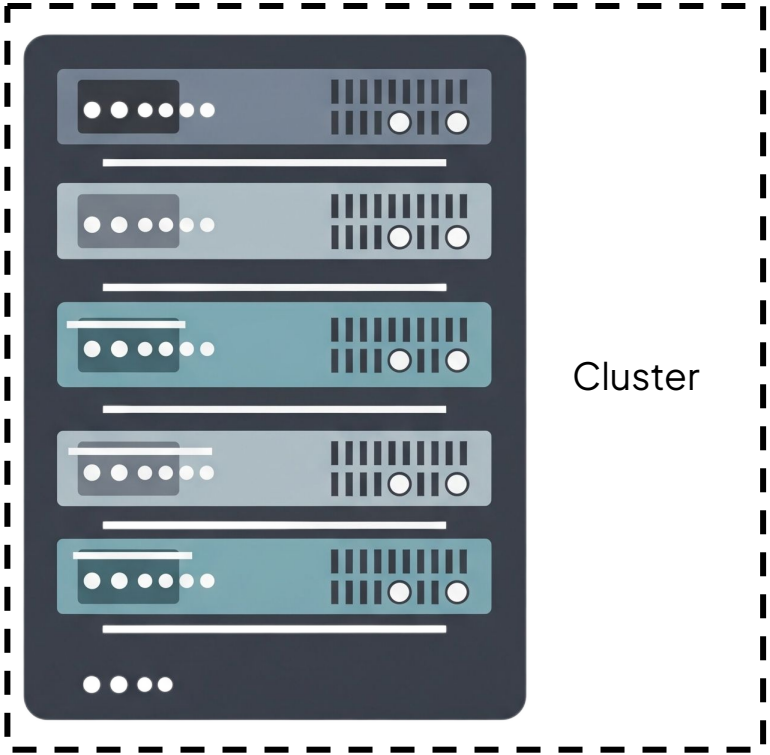
# Clusters

A grouping of hypervisor hosts, with cluster-level features defined at the group level.

- VM High Availability (VM HA)
- Distributed Resource Rebalancing (DRR)
- GPU (physical or virtual)

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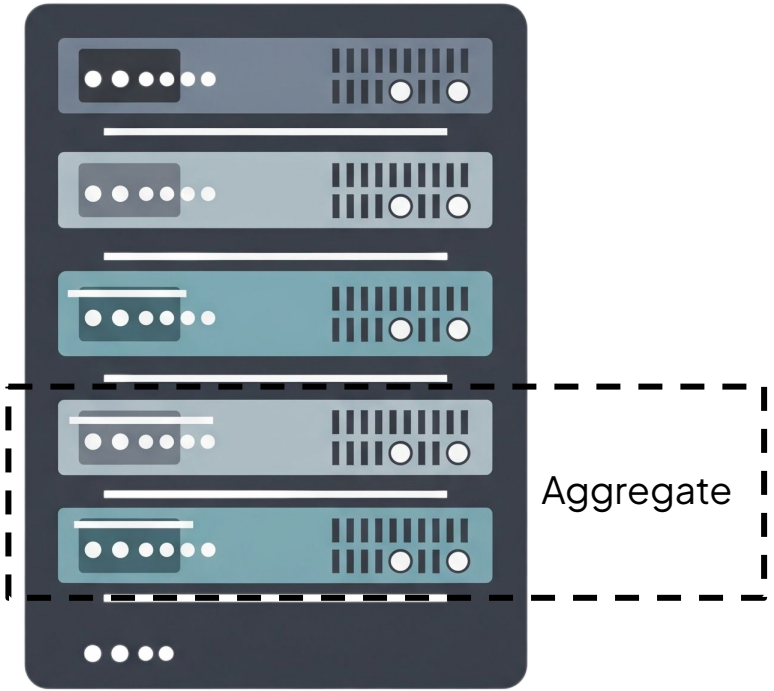
# Clusters & Host Aggregates

**Clusters** can be used to separate workload types, or group types of servers together.

**Host aggregates** are a group of hosts within the cluster that share common characteristics.

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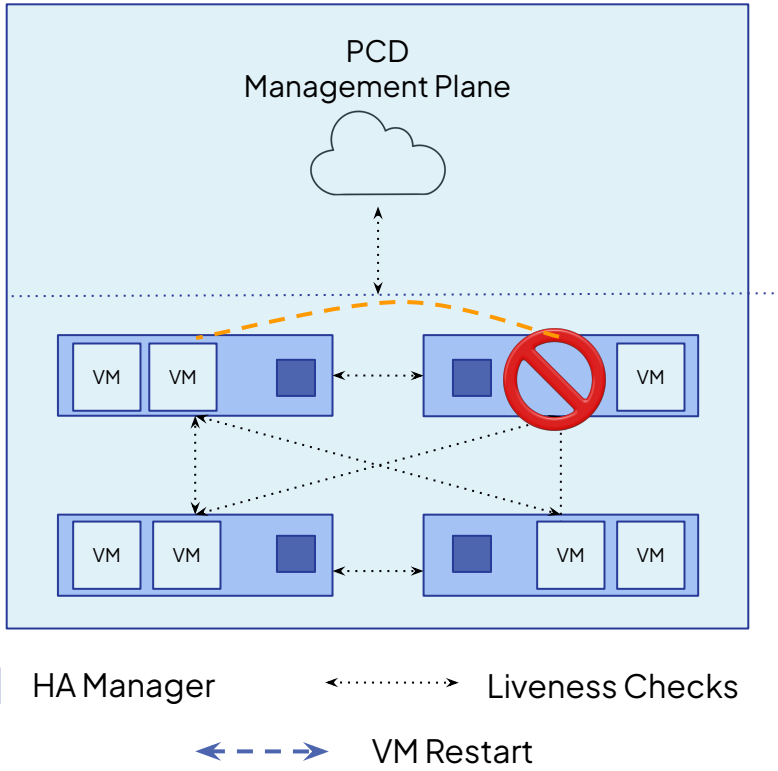
# VM High Availability (VM HA)




- Minimum of 2 hosts
- Liveness checks between management plane and hosts to check real-time health and identify failed hosts
- Platform9 management plane orchestrates the recovery of workloads running on the failed host(s)

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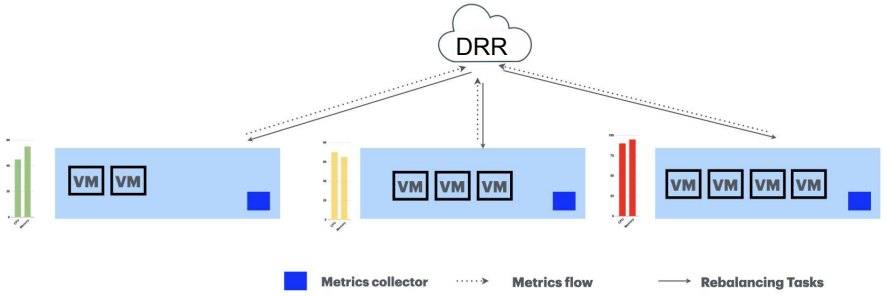
# Dynamic Resource Rebalancing (DRR)




- Metrics collector sends CPU and memory utilization from hosts and VMs
- DRR evaluates metrics on set interval to generate rebalancing recommendations

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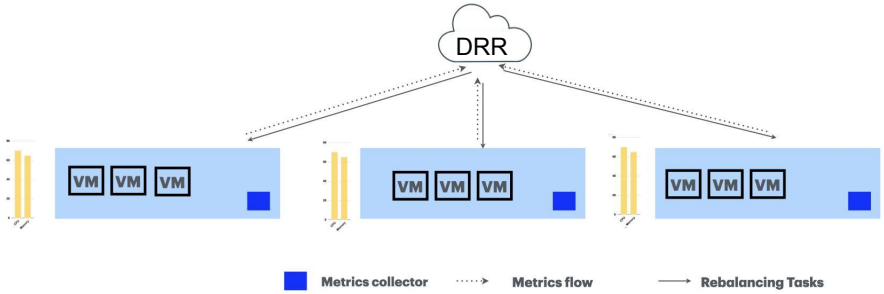
# Dynamic Resource Rebalancing (DRR)




- Rebalancing recommendations are dispatched to hypervisor for execution, including VM migration priorities
- Live Migration of VMs to complete rebalancing

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# Host roles

**Hypervisor** role enables the host to function as a KVM hypervisor

**Image Library** hosts the operating system images for VM deployment

**Persistent Storage** role enables a host or hosts to act as the control plane for external storage operations.

**Advanced Remote Support** used for Platform9 Support access. Disabled by default.

**DNS** enables DNS as a Service, which is optional

# VM Networking

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# Physical & Virtual Networks

## Physical

- Maps to existing datacenter networks
- Can be flat or segmented (VLAN, VXLAN)
- Can be designated as external (public)
- Can be shared between tenants
- Can use DNS as a Service

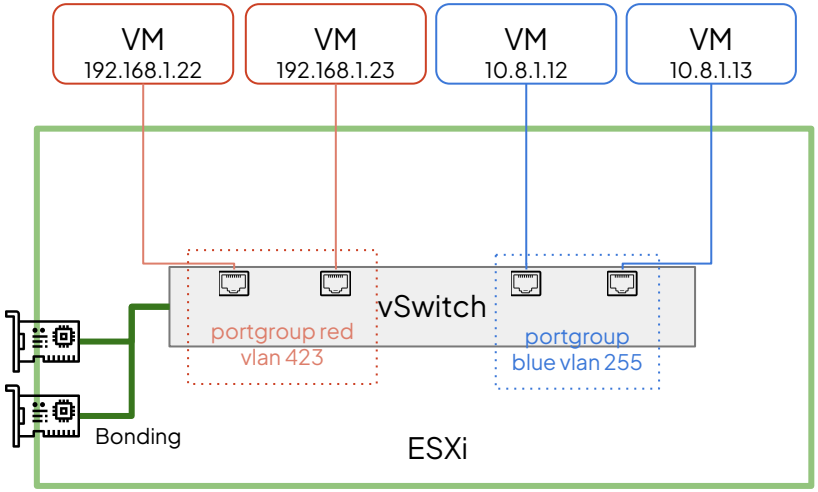
## Virtual

- Does not map to existing datacenter networks
- Uses the cluster blueprint segmentation type
- Connects to other networks with a virtual router
- Can be shared between tenants
- Can use DNS as a Service

# vSphere VM Networking

## vSwitch or dvSwitch, no NSX

- Simple VLAN based network
- No DHCP
- No IPAM
- No Security

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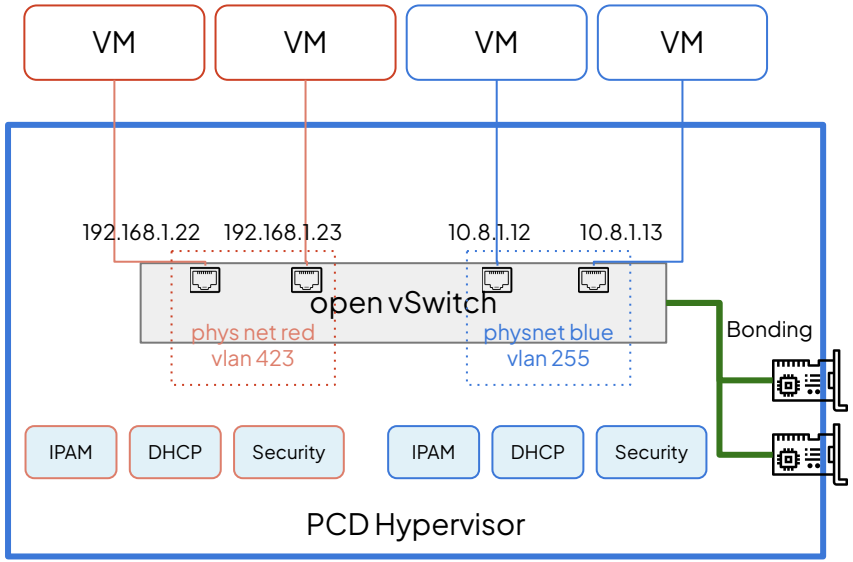
# Private Cloud Director VM Networking




- Fully integrated solution
- Uses subnet DHCP range to assign a fixed IP to the port
- Security groups define allowed ingress & egress traffic
- Can integrate with external DNS

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# Deploying Virtual Machines

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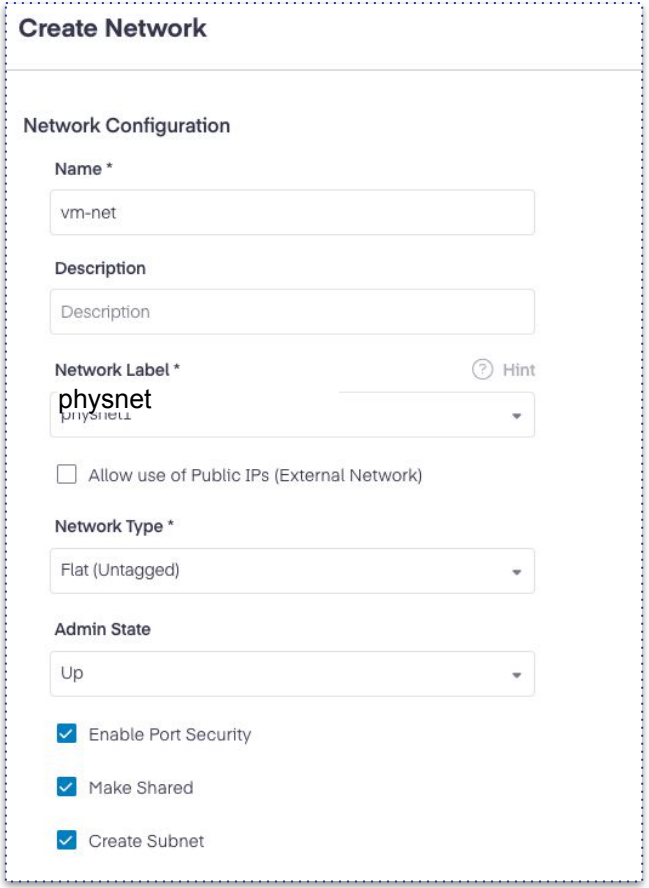
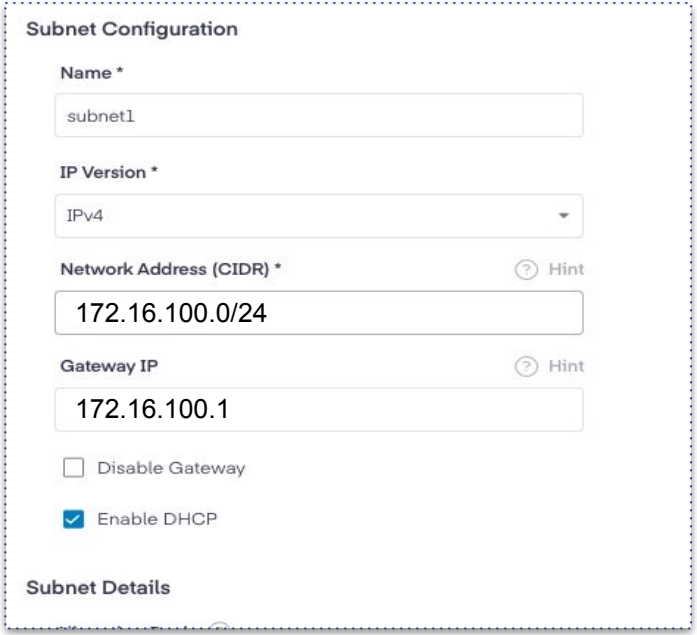
# Lab: Deploying Virtual Machines

## Create a physical network

- Give the network a meaningful name
- Network label: **physnet**
- Network type: **flat**
- Check "**Make Shared**"
- Give the subnet a meaningful name
- Network Address (CIDR): **172.16.100.0/24**
- Gateway IP: **172.16.100.1**

# Physical Network Creation

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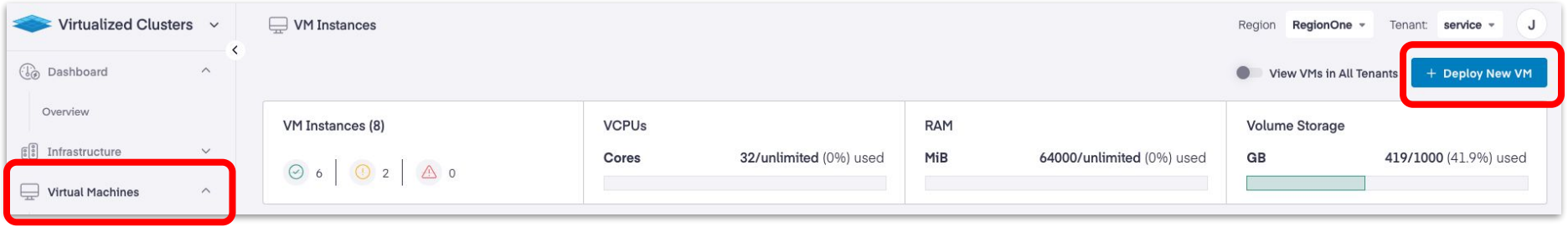
# Deploy Your 1st VM

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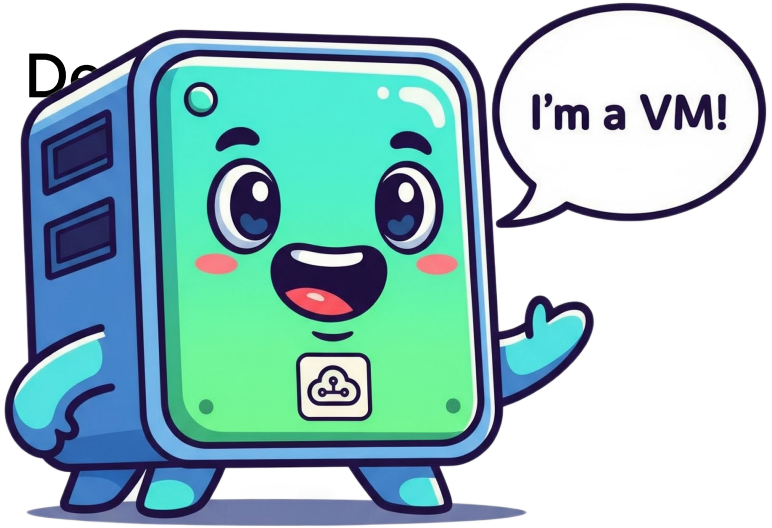
- Give it a **name**
- Choose **cluster**
- Boot from: **New Volume, 20GB**
- Choose **Ubuntu** image
- Choose **flavor**
- Select **network**
- Cloud-init settings (optional)

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# vJailbreak

# Thank you

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