

Infrastructure

Compute

- Provide dynamically scale compute capacity
- Resources can be provisioned on demand in the form of virtual machines
- Cloud providers provide different shapes of compute with standard configuration
- Compute shapes include certain amount of compute power and RAM



Compute

- Scalability
 - Allows rapid provisioning of as many resources as required
 - Provisioned capacity can be scale up and down to accommodate workload.
 - Scale Up — Increase computing power (usually moving to a larger shape)
 - Scale down — Decrease computing power (moving down to a smaller shape)
 - Auto-scaling can be done automatically or manually
 - Can be triggered when monitored activity goes above threshold values.



Compute

- Flexibility
 - Different shapes, sizes, Operating systems are available.
 - With or without operation systems
 - With or without Hypervisor
 - Regions
 - Most cloud providers have data centers in different regions for high-availability
 - Choose different regions



Compute

- Secure
 - Provide wide range of security features that control access.
 - Security groups, access control list, Network firewalls
 - SSH, VPN, Direct connection



Compute

- Cost-effective
 - Most cloud providers offer variety of billing options including on demand instances
 - Pay as you go (metered)
 - Pre pay (non-metered)
 - Spot instances — where user can place an offer
- One size does not fit all.



Storage

- Provides high capacity and scalability
- Different tiers of storage services are available
- Automatic replication of data is provided
 - Data is written to multiple places (HA)
- Different level of security policies are provided
- Strong data consistency is provided for all upload and delete operations
- Encryption options are available to encrypt all of the data.



Platform

Cloud Database Service

- Offers self-service capabilities to create and operate relational and non-relational DBs
- Relieves IT and developers from DB admin tasks
- Like compute:
 - Database also comes in different shapes
 - Shapes can scale up and down to accommodate needs
- Automatic backups and snapshot capabilities are provided
- Most providers offer data encryption at rest and in-transit.



Private Cloud Overview

Private Cloud

- Open Source tools available to facilitate development of private cloud
- Full control of resources
- Security and Governance issues are minimized
- All cloud configuration is managed by internal resources



Cloud Stack

- Manages the network, storage, and compute nodes
- CloudStack installation consists of:
 - Management Server and
 - the Cloud infrastructure that it manages



Zone

Management Server manages
1 or more zones, each zone is
typically a DC

Pod

Each zone has 1 or more Pod —
a rack with 1 or more clusters

Cluster

Host

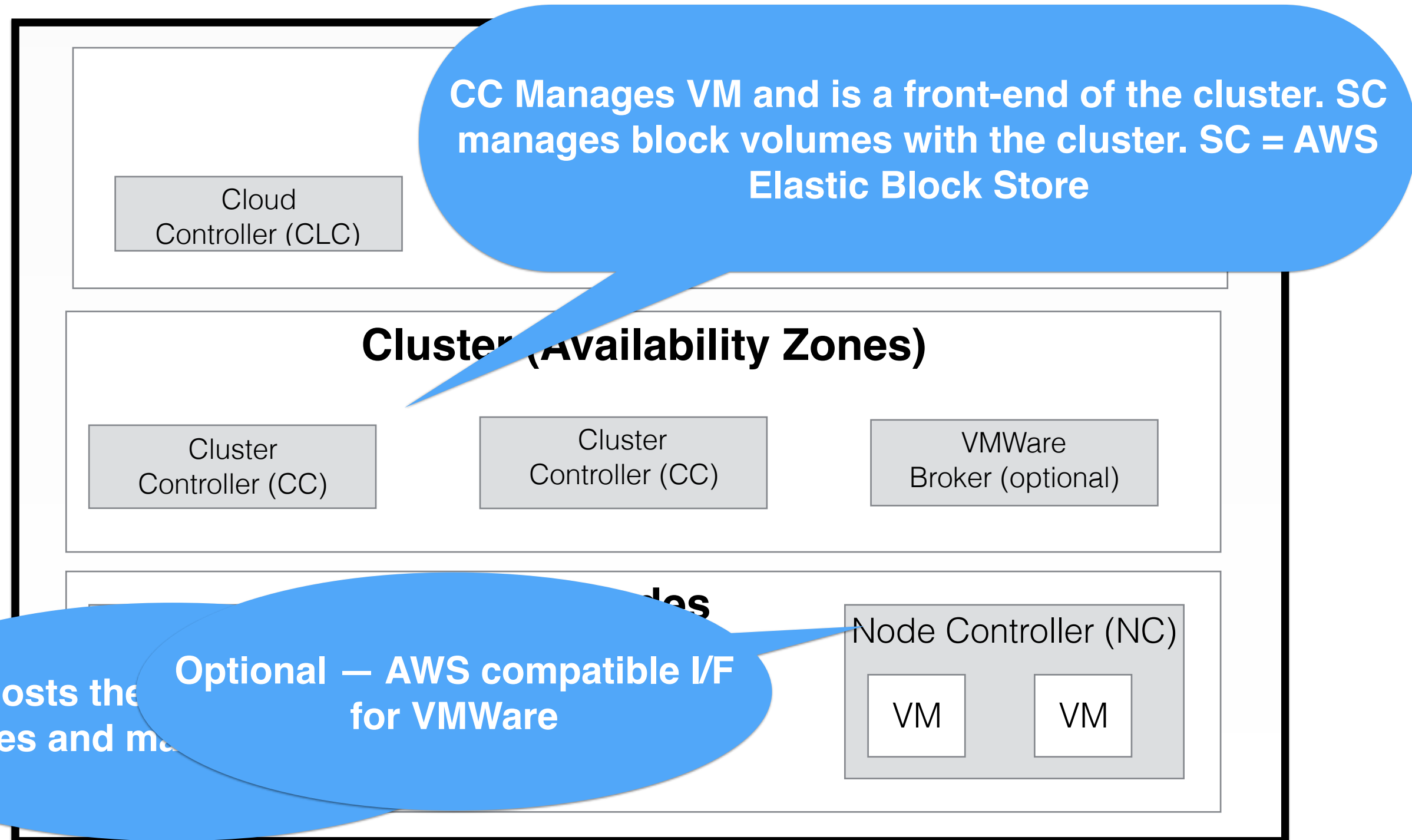
Primary
Storage

Secondary
Storage

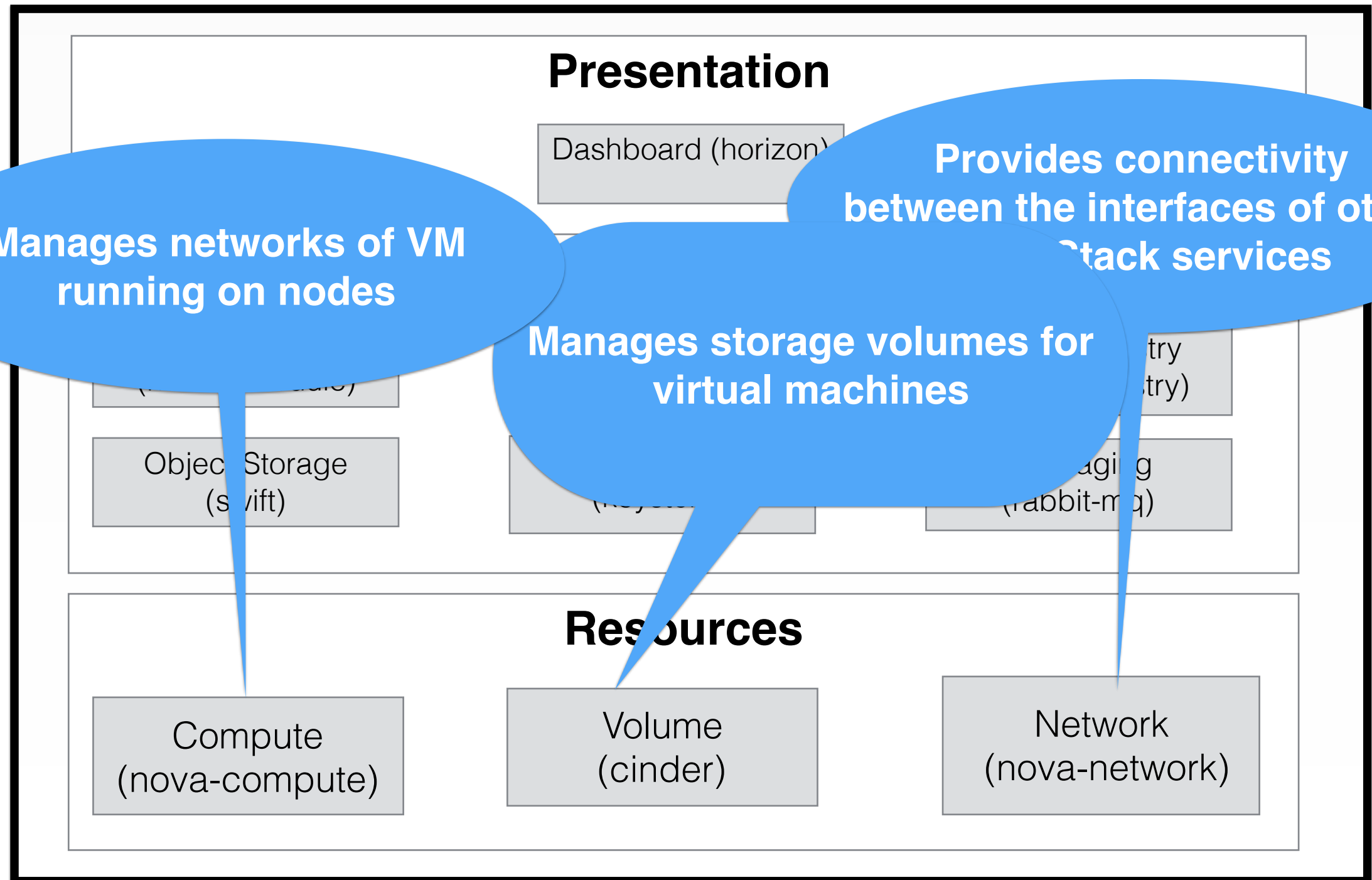
Clusters consists of 1 or more
hosts



Eucalyptus



OpenStack



OpenStack

Provides authentication and authorization for other services

Allows users to store and retrieve files

Presentation

Dashboard (horizon)

Logic

Scheduling
(nova-schedule)

Orchestration
(nova api)

Image Registry
(glance-registry)

Object Storage

Identity
(keystone)

Messaging
(rabbit-mq)

Acts as a repository for virtual machines

Resources

Compute
(nova-compute)

Volume
(cinder)

Network
(nova-network)



OpenStack

Takes the VM requests from queue and determine where they should run

Acts as a central node for message passing between nodes

Presentation

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Summary

- Benefits of Private Cloud
- Challenges of Private Cloud

