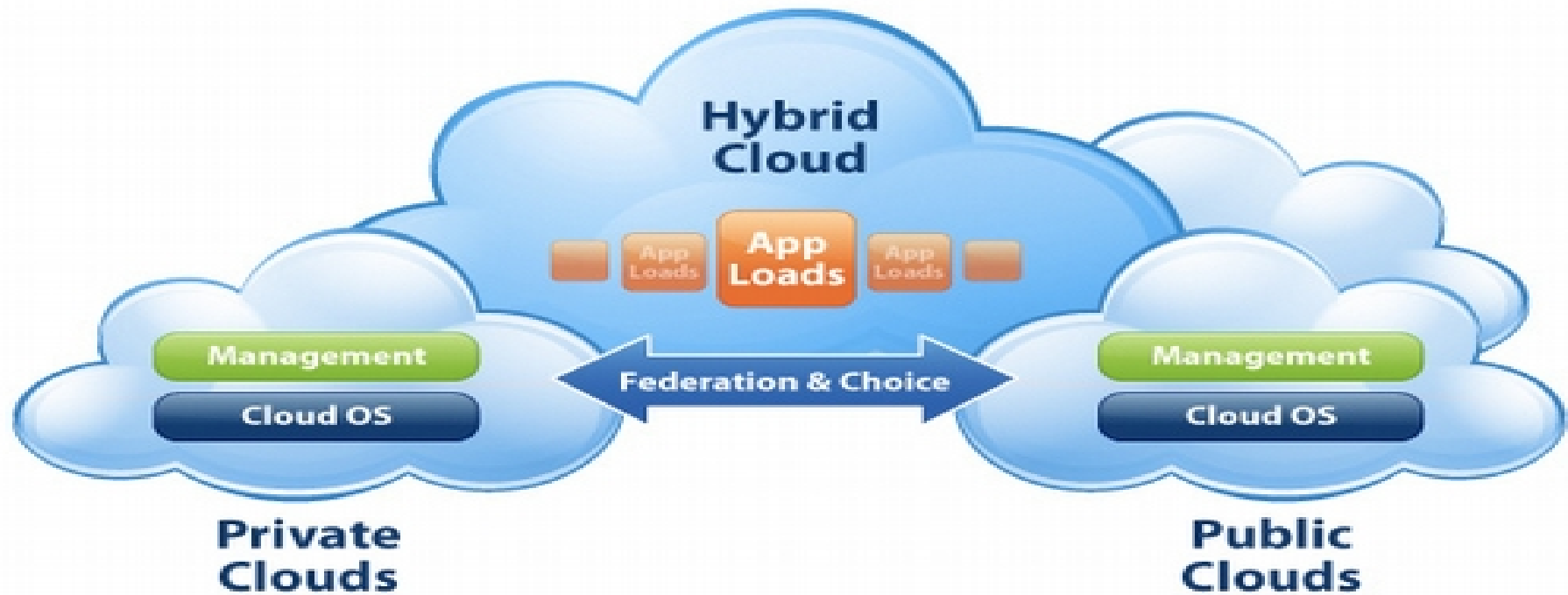
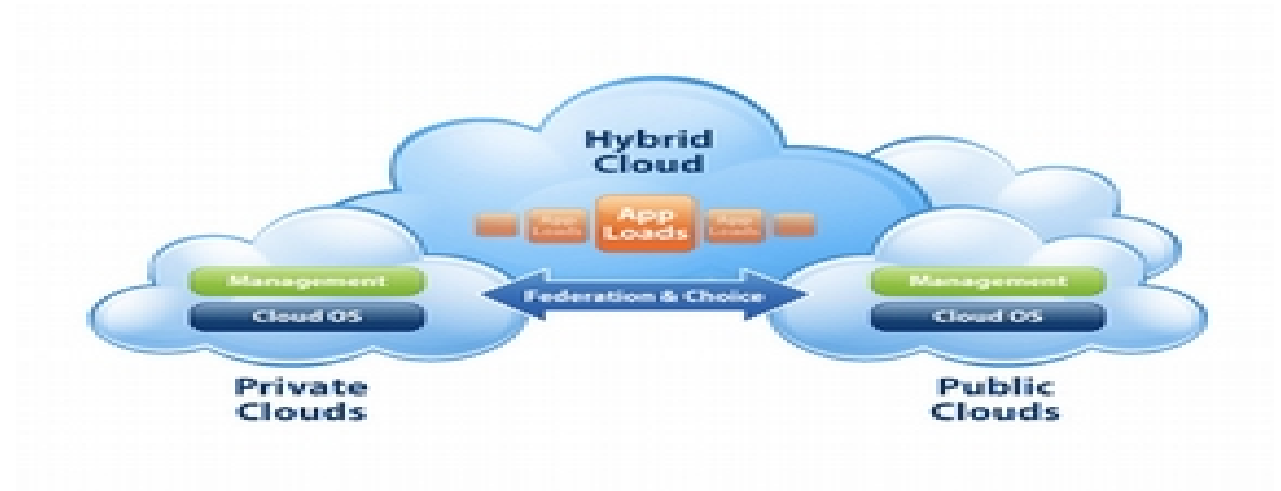


HYBRID CLOUD

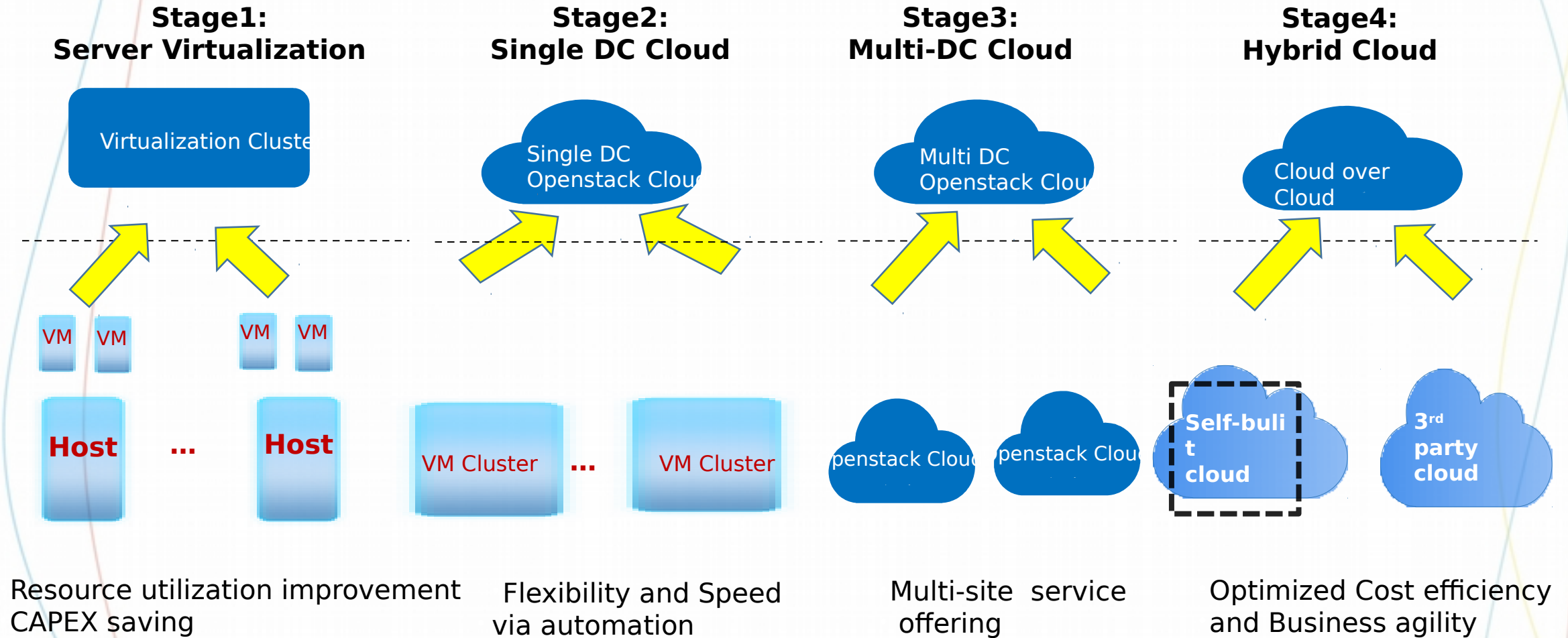


Efrizal Zaida S.Kom, M.M, M.Kom

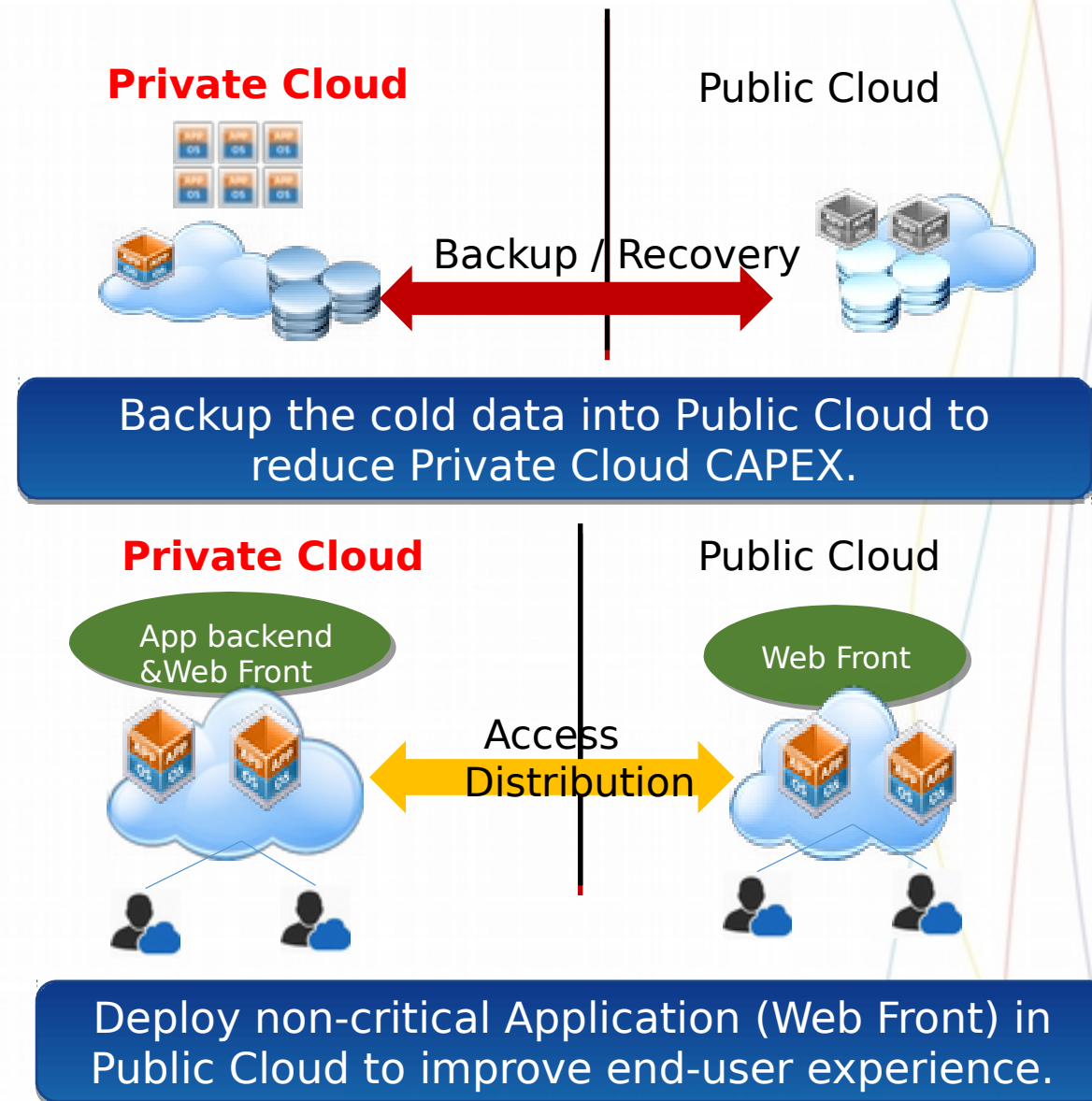
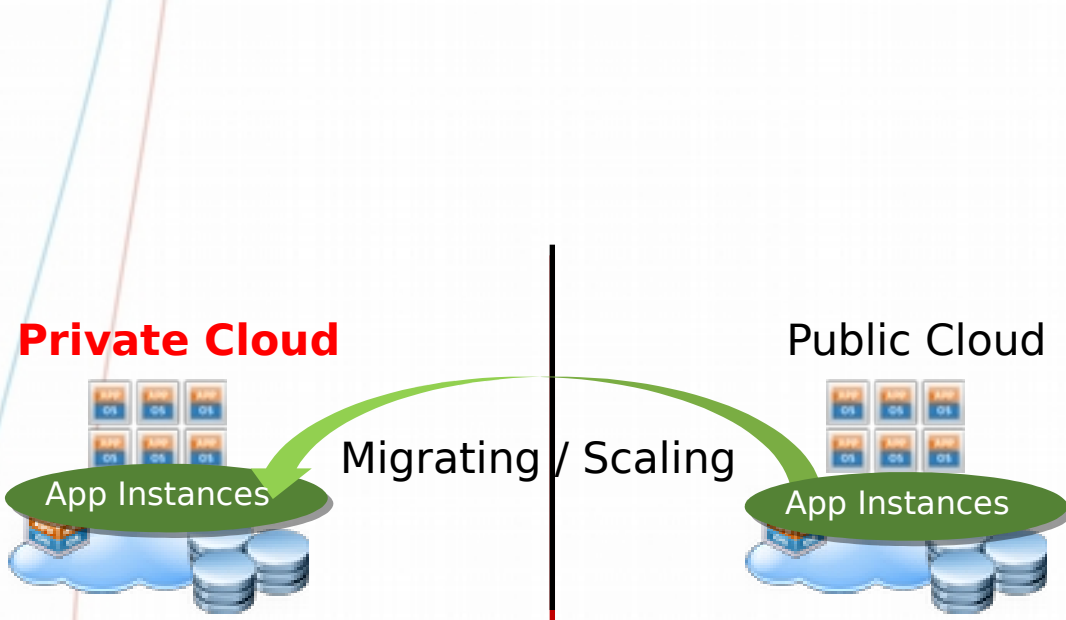


Hybrid Cloud adalah gabungan dari layanan Public Cloud dan Private Cloud yang di-implementasikan oleh suatu organisasi atau perusahaan. Dalam Hybrid Cloud ini, kita bisa memilih proses bisnis mana yang bisa dipindahkan ke Public Cloud dan proses bisnis mana yang harus tetap berjalan di Private Cloud.

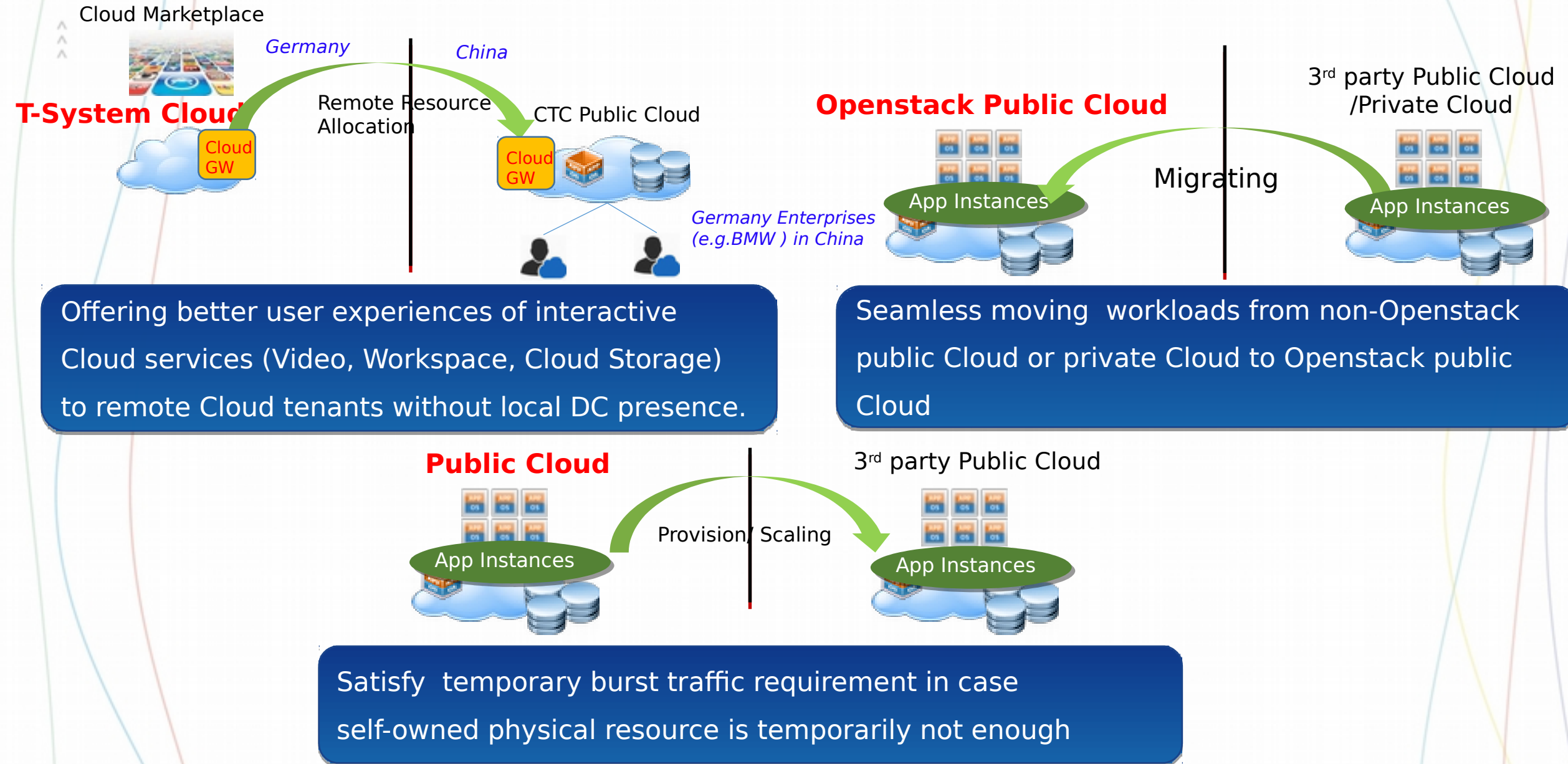
Hybrid Cloud is the next hop of Infrastructure Consolidation



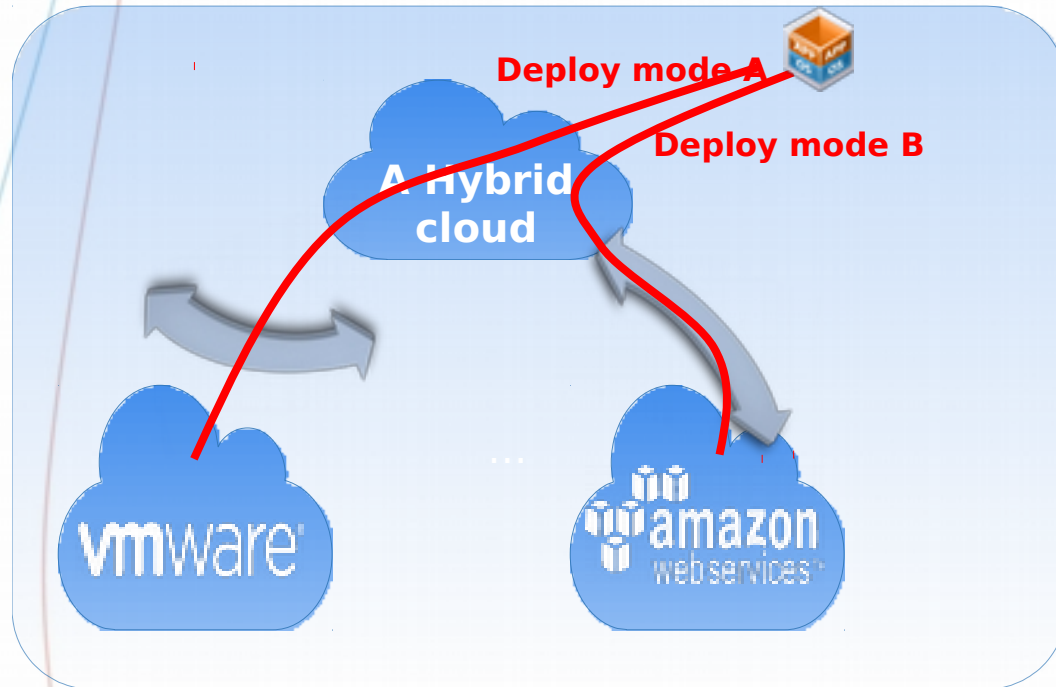
Hybrid Cloud Benefits for Enterprise Private Cloud



Hybrid Cloud Benefits for Public Cloud

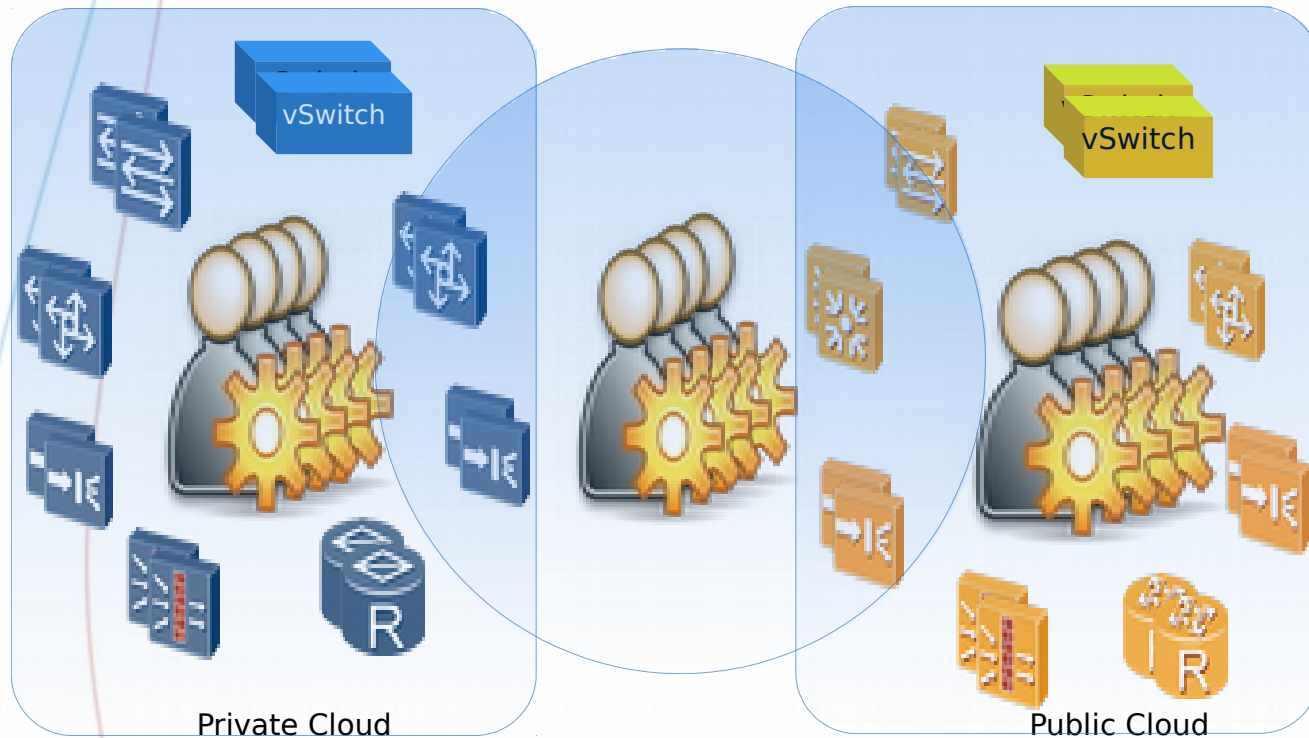


However, Challenges still ahead



	AWS	vCloud	Azure	Openstack
Image	AMI	VMDK	VHD	qCow2
Meta data	Yes	No	No	Yes
Data Vol	Yes	No	Yes	Yes
Security Rule	Subnet + VM	Tenant	Tenant + VM	Tenant + VM
API Difference	90%	60%	70%	100% (base)

However, Challenges still ahead

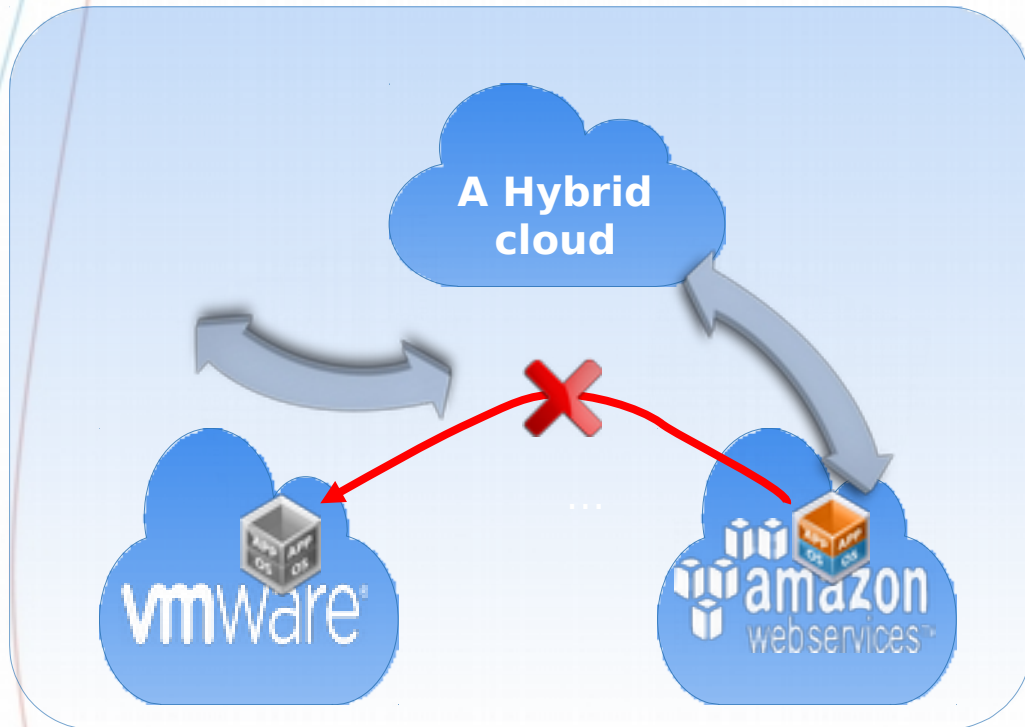


Challenge 2:

Hybrid Brings More Complicated
Manual Work in Network
management

Address is not managed across clouds
ACL and communication matrix need to be setup manually
Manually VPN connection is complex

However, Challenges still ahead



Challenge 3:

Hard to move across clouds

Is your hybrid cloud a continent or many islands?

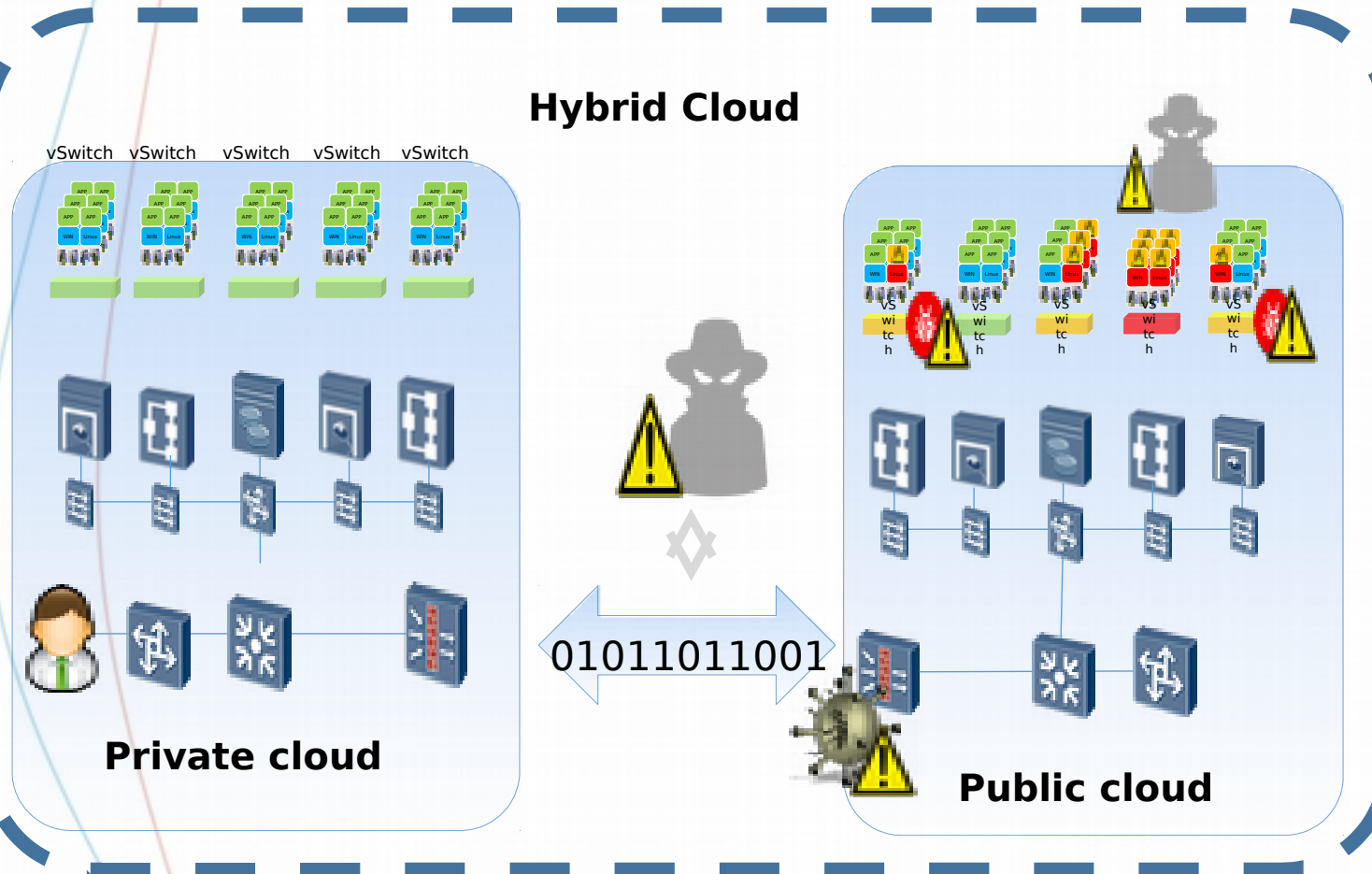
Image can not shared across clouds
SG/FW/LB is not managed across clouds

Move workloads across clouds? It is a big task!

Automatically scale across clouds? No!

However, Challenges still ahead

Hybrid Cloud

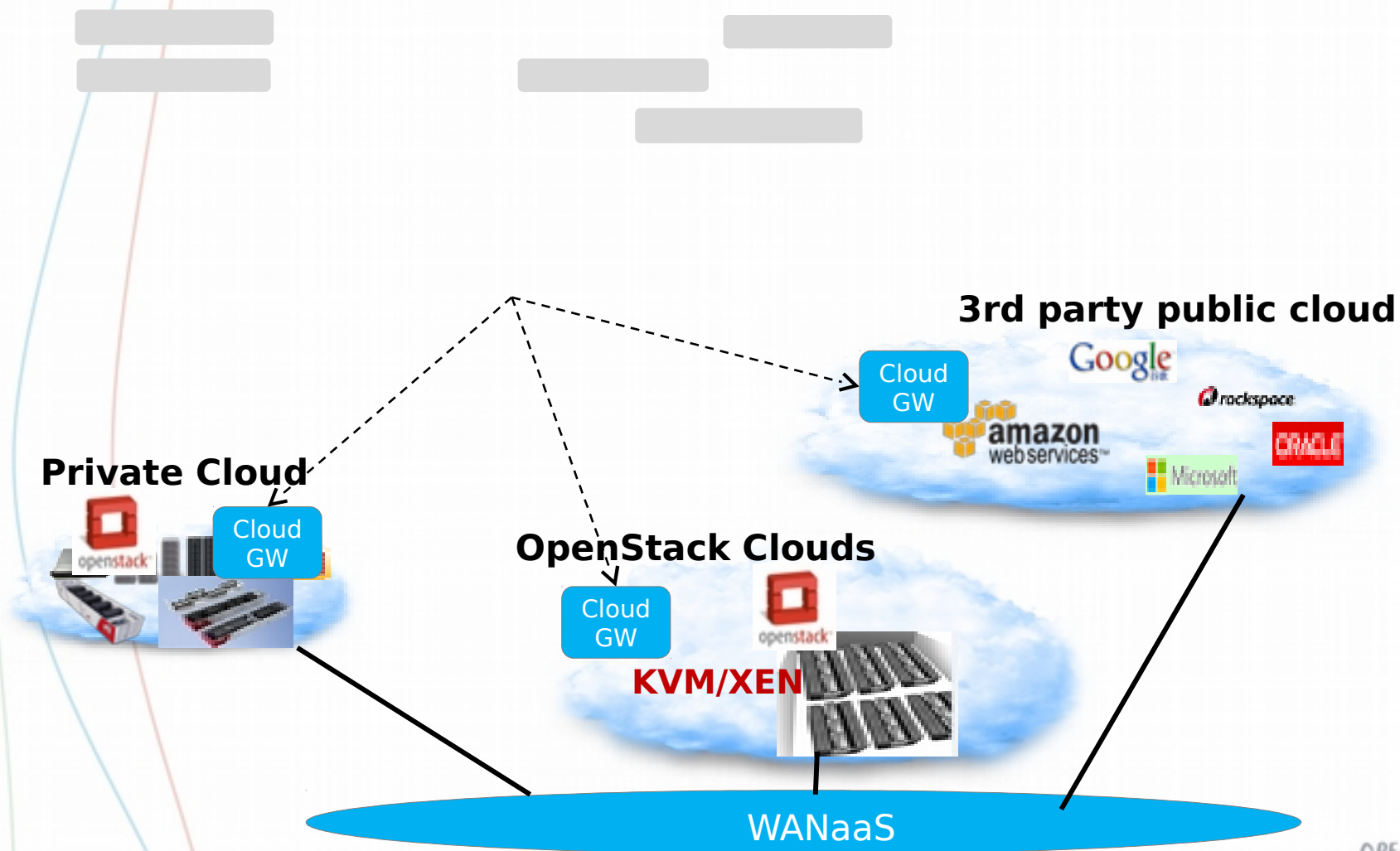


Challenge 4:

Security Risks Hided in Hybrid Cloud

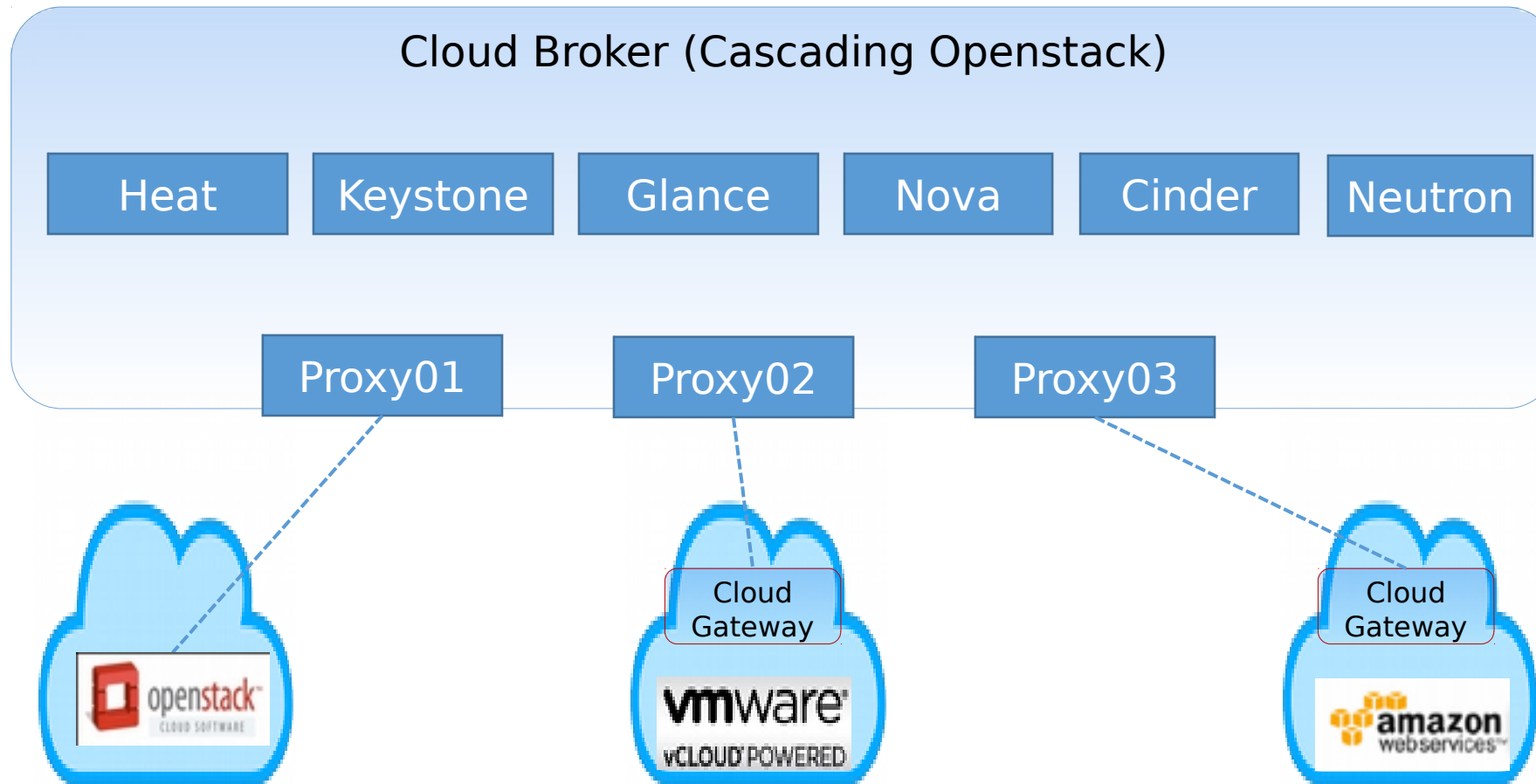
Inter cloud Data inspection
Attack from public network
Attack from other tenant

Open Hybrid Cloud driven by unified Openstack API



OPEN CLOUD POWERED BY OPENSTACK

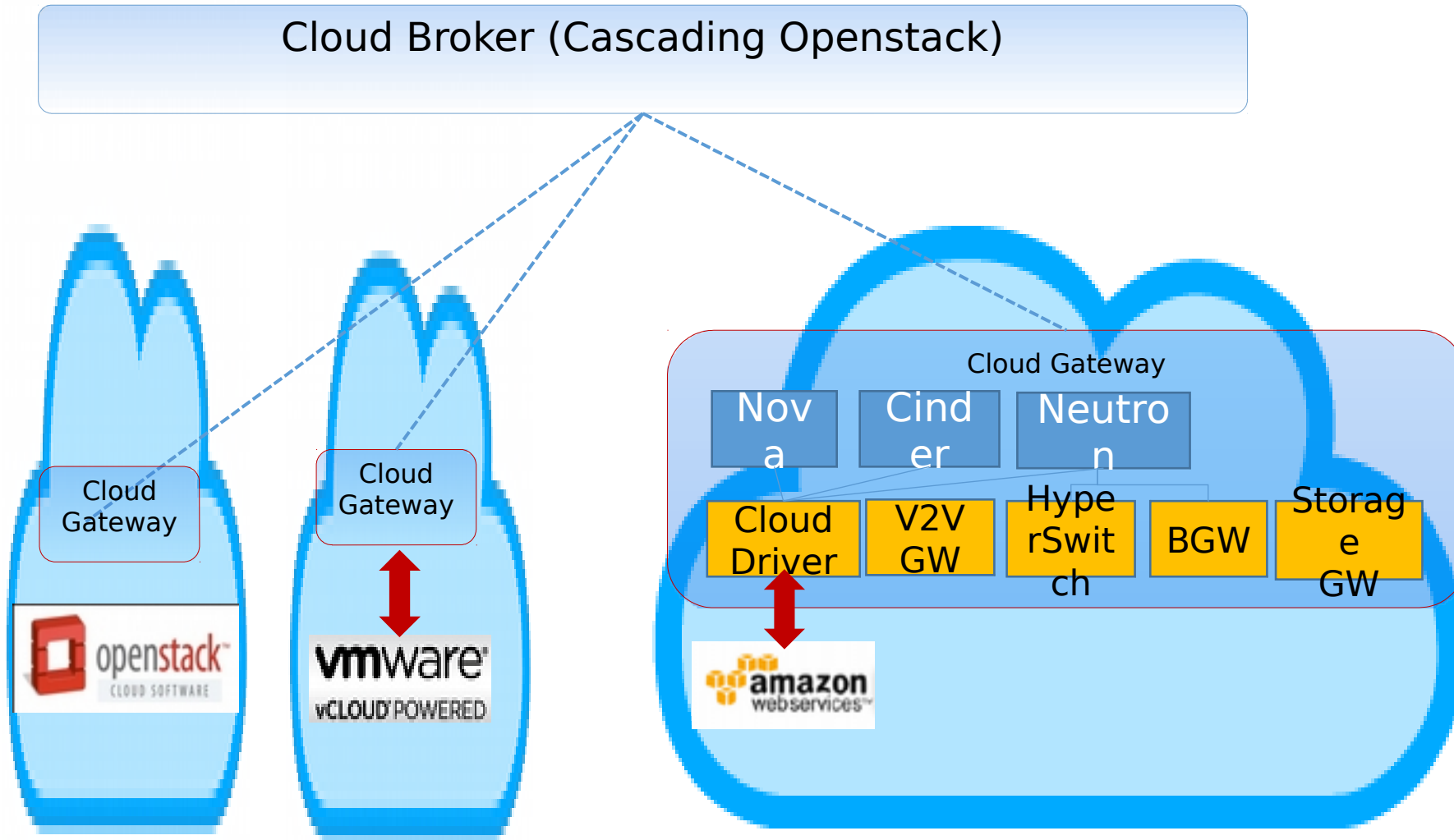
Cloud Broker in “Openstack Hybrid Cloud”



Standard cascading Openstack project (Tricircle) is used to orchestrate & connect multiple clouds.

<https://github.com/openstack/tricircle>

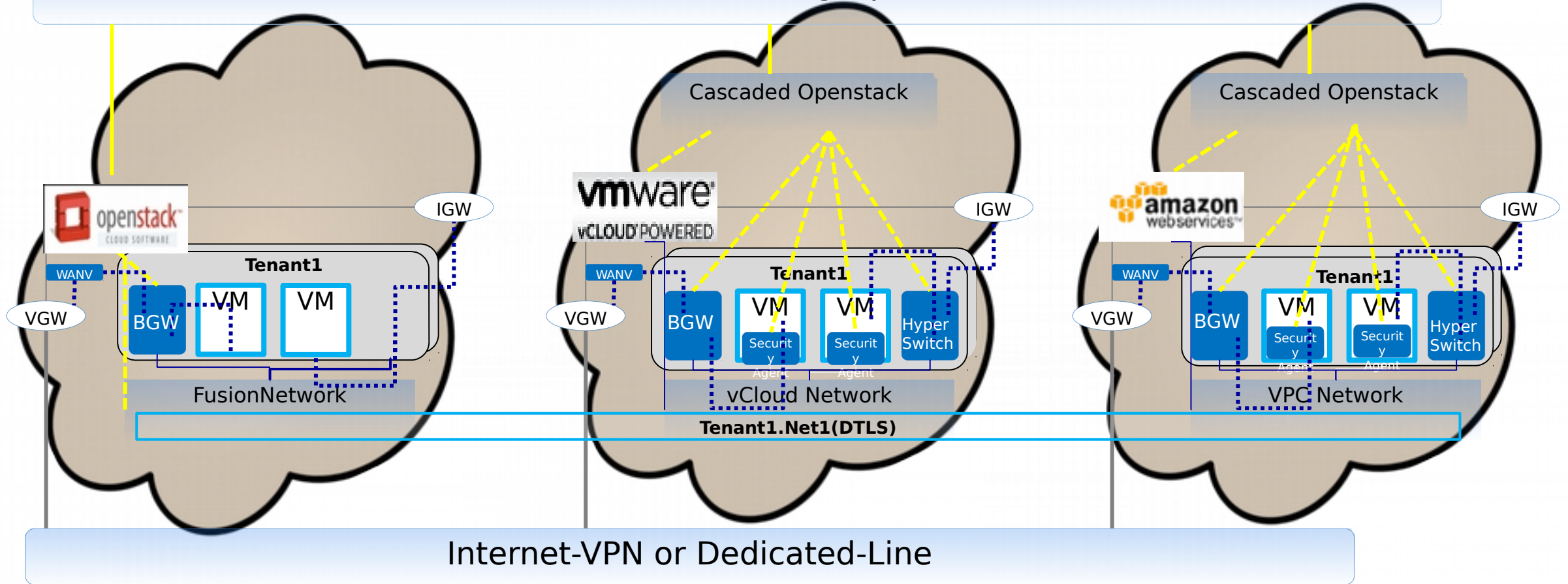
Cloud Gateway in “Openstack Hybrid Cloud”



A Standard Openstack VM is deployed on top of heterogeneous back-end clouds corresponding to specific Openstack AZs, in order to take over the control of the infra. resources

Unified networks across clouds

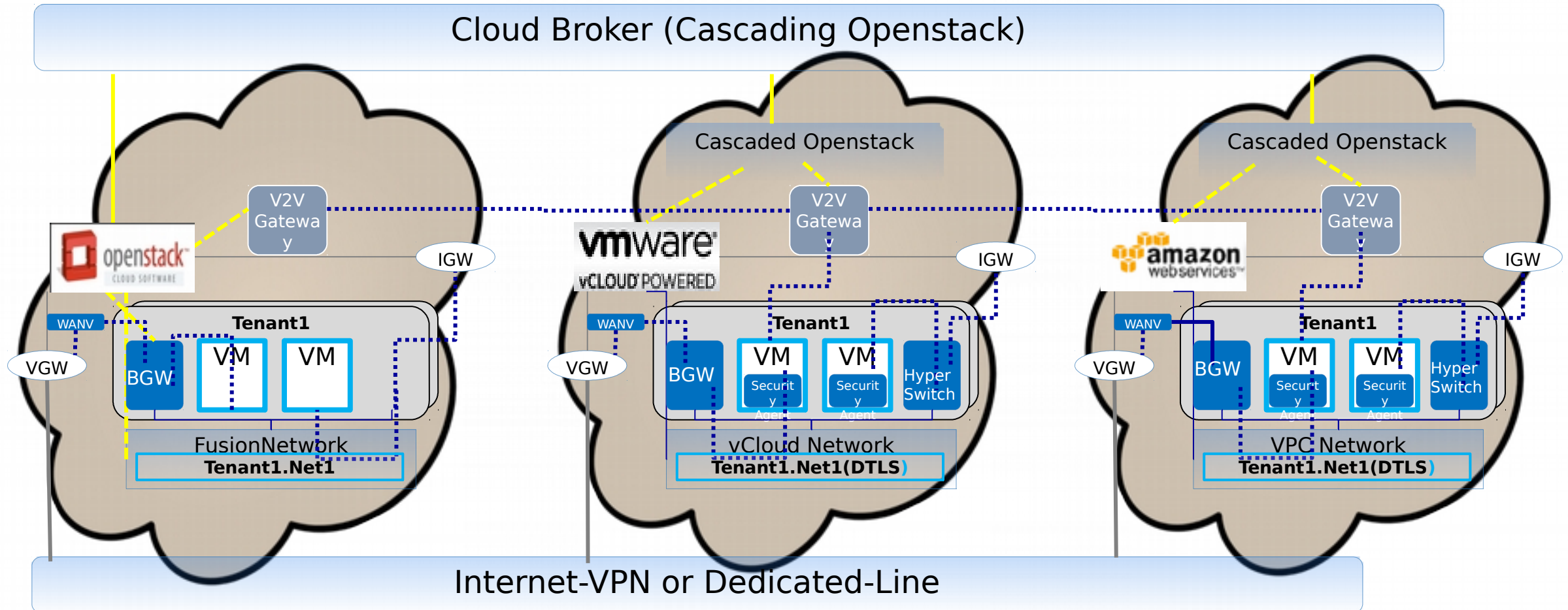
Cloud Broker (Cascading Openstack)



One network across clouds
Unified IP address Management
Layer2/3 connection across clouds

ACL configure across clouds
DTLS secure tunnel across clouds
Multi-tenant vxLAN networks

Smoothly migrate App across Clouds



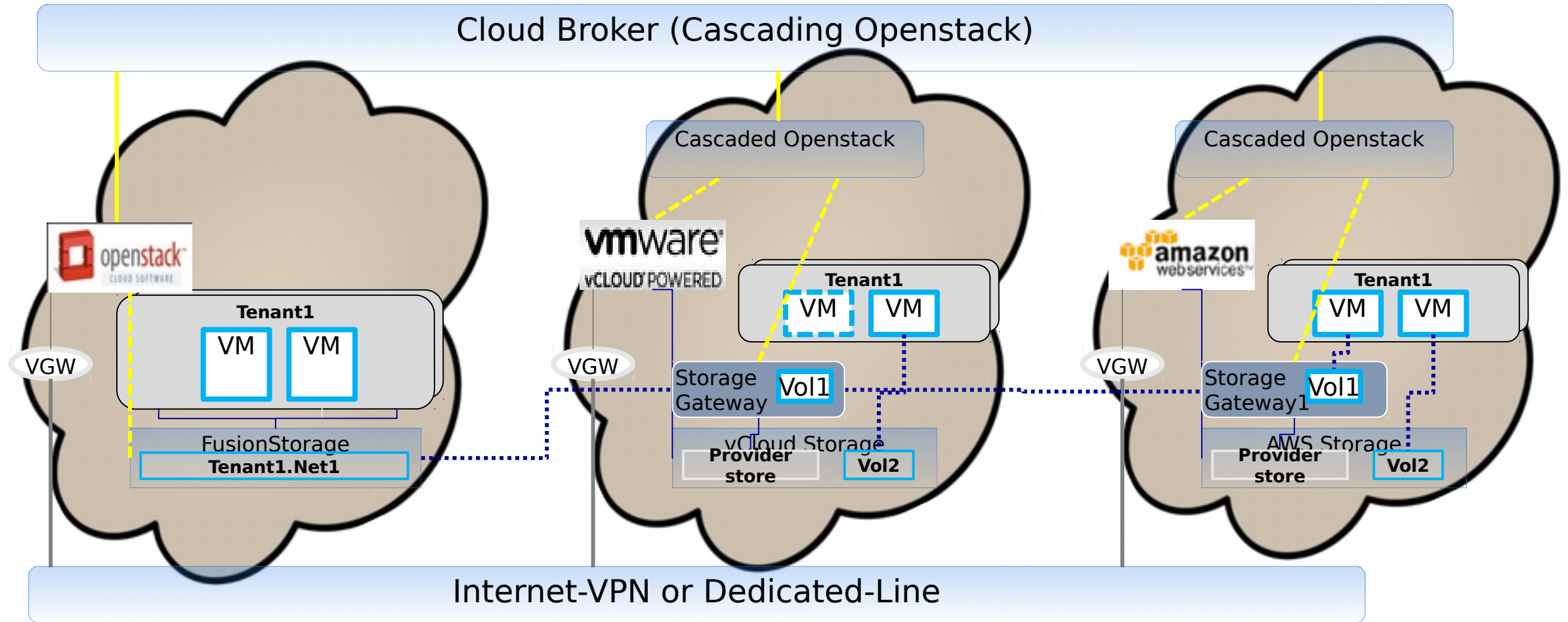
Auto V2V across clouds

One image for all clouds

One touch migration across clouds

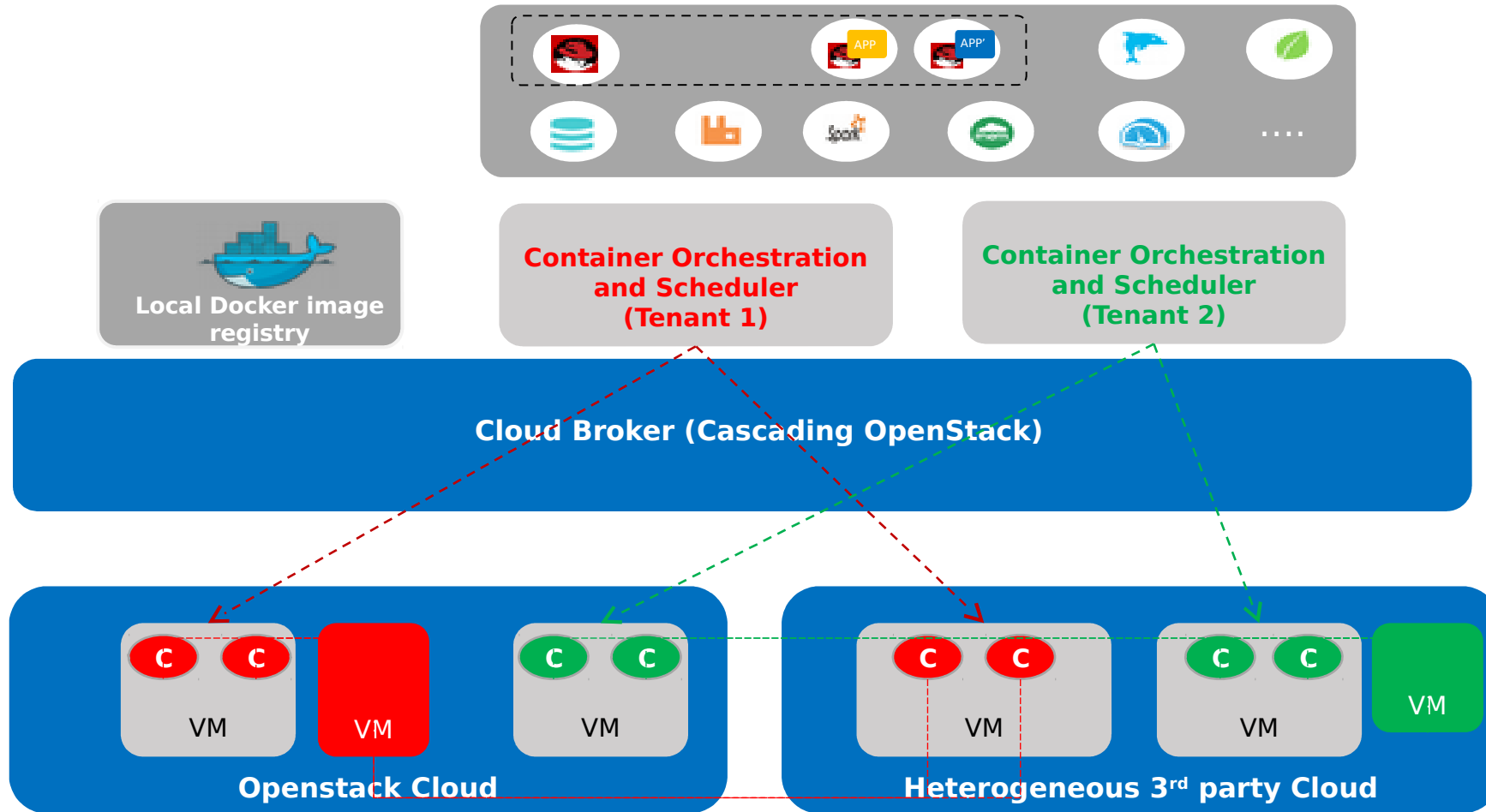
Auto scaling across cloud

DR across Clouds



DR from any cloud to any other cloud
RPO: 15min ~ 24hours
RTO: 1hours

Docker over OpenStack Hybrid Clouds



Key Benefits:

- Unified networking policy & security governance for Docker deployments across clouds
- No need for VM image transformation between different hypervisors
- “Hyperswitch driver” (in Hypervisor) not visible to end user

Agenda

1

Trend of Hybrid Cloud & Key Challenges

2

Architecture of Openstack powered Hybrid Cloud

3

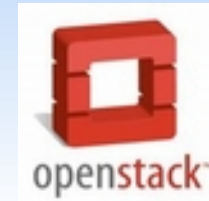
Live Demo

4

Summary

Demo environment

Hybrid Cloud Powered by Openstack



**Located in
Shenzhen, China**
(Private Cloud based
on Openstack)

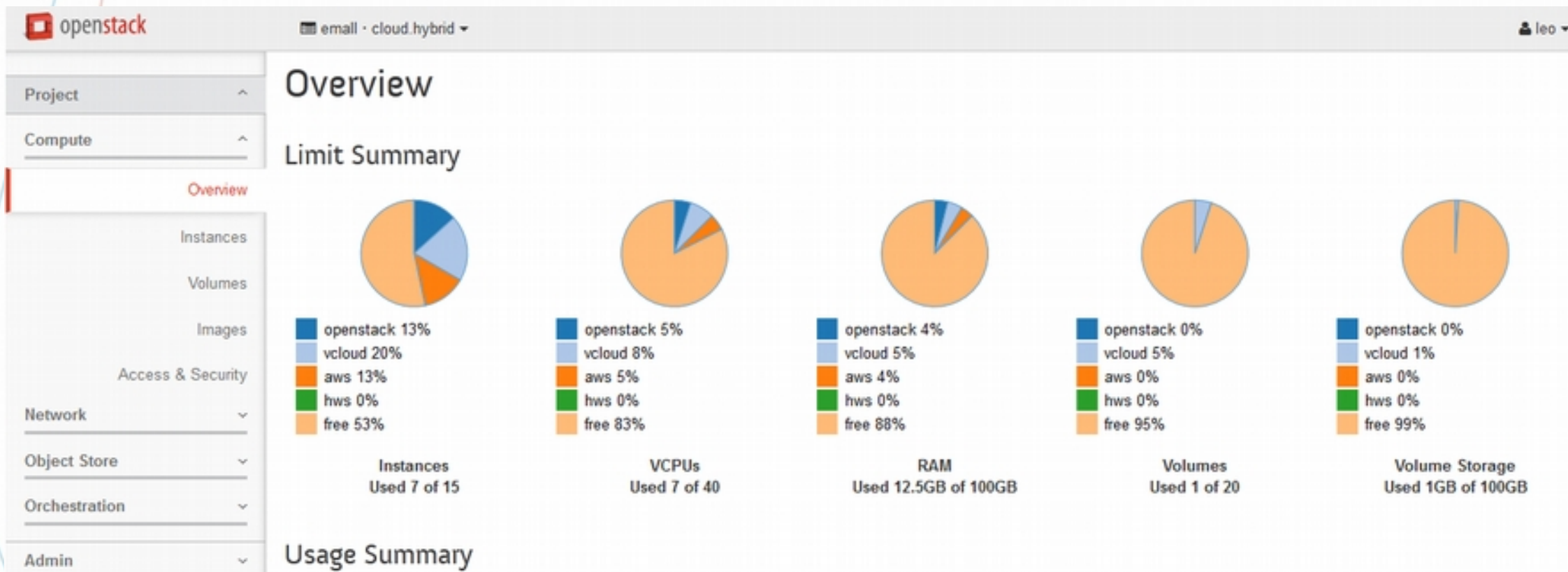


**Located in
Shenzhen, China**
(Private Cloud based
on Vmware vCloud)



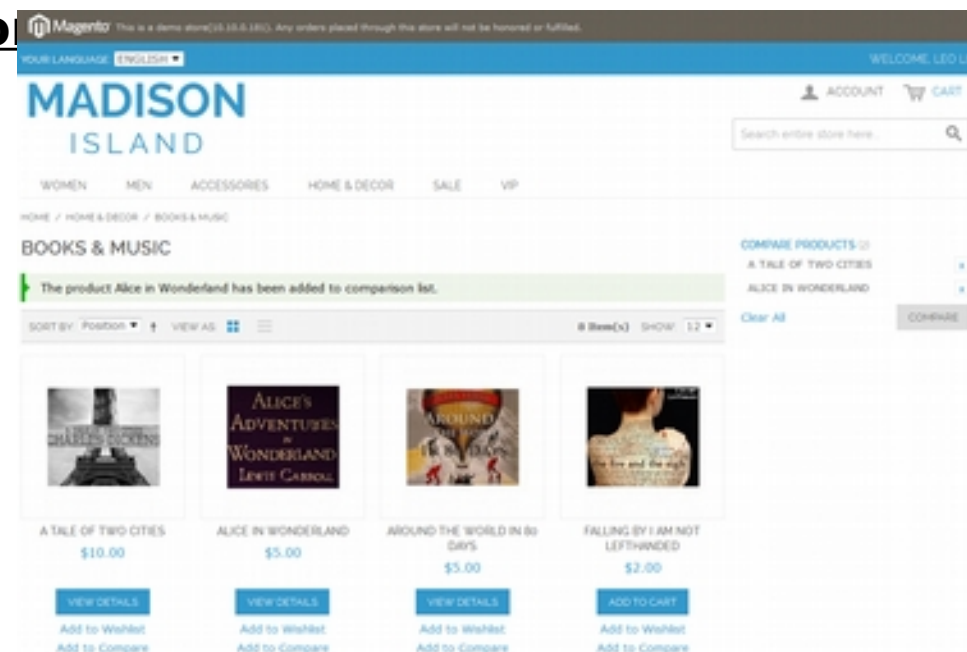
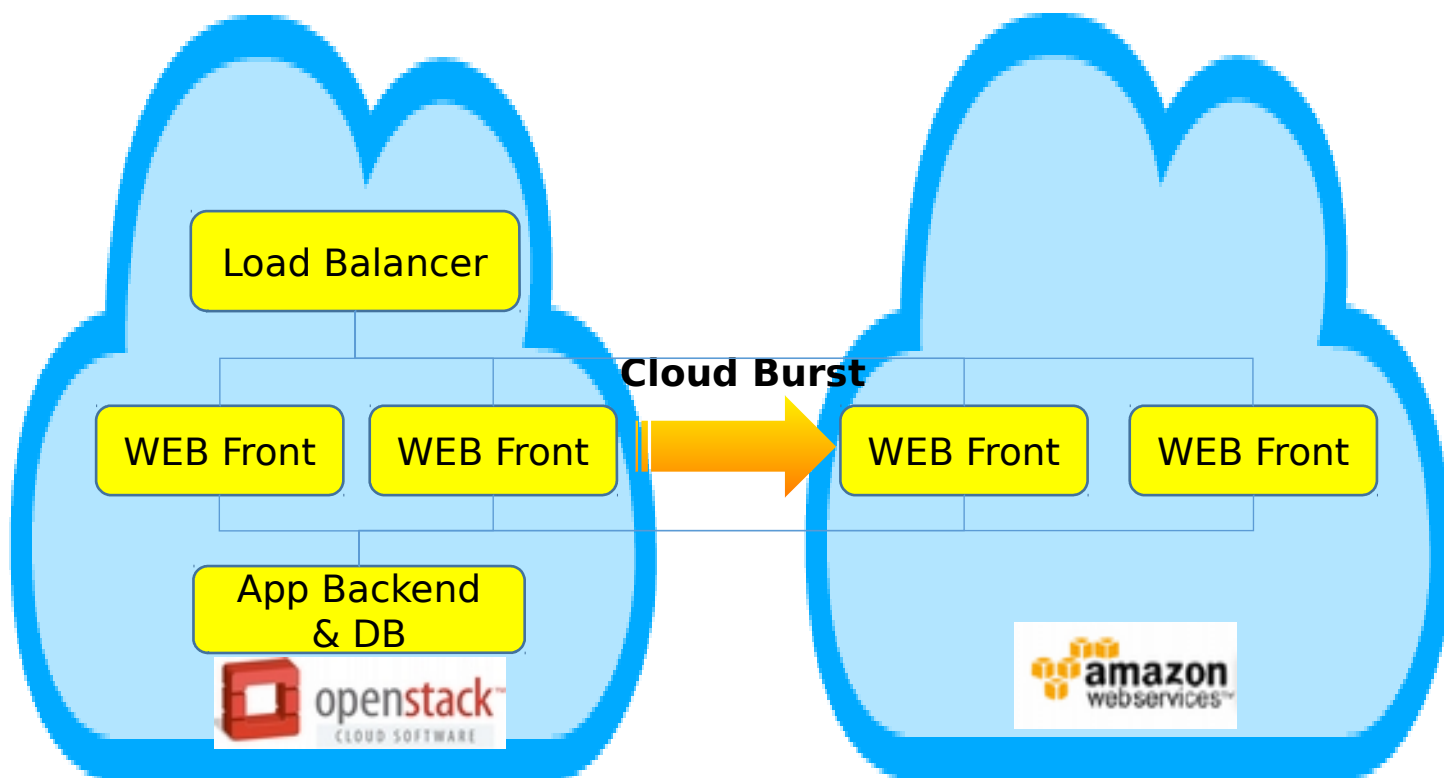
**Located in
Singapore, AP**
(Region of Amazon
Public Cloud)

Demo 1: Unified Management of multiple clouds



Example App for Scaling across Clouds

<http://www.email.co>



Use case introduce:

- Email is an online shopping mall.
- Main site is deployed in Private Cloud.

•It would use public cloud resource to scale out the Web Front in case

*This demo is using Magento open source e-commerce platform

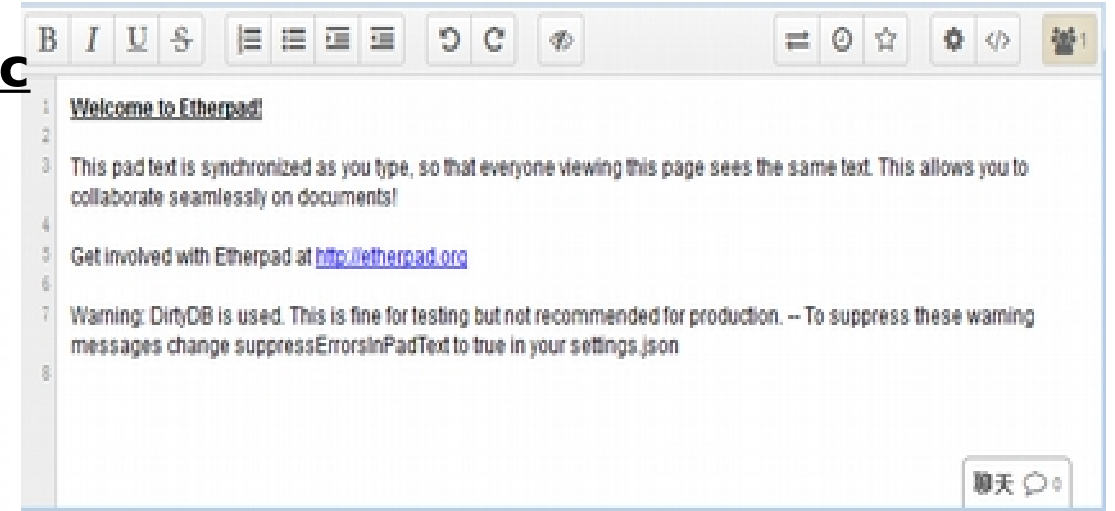
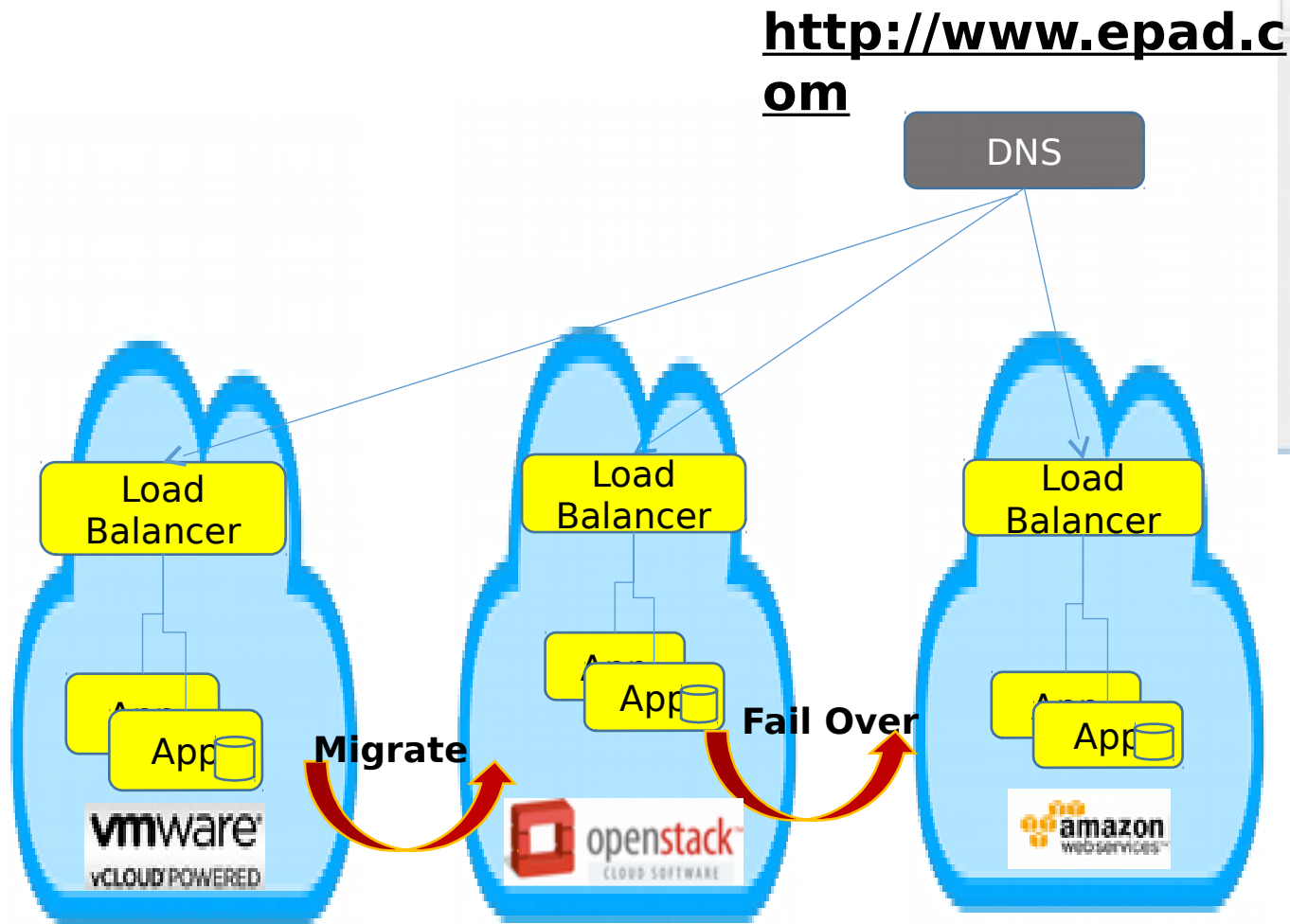
Demo 2: App Scaling across Clouds

The screenshot shows the OpenStack dashboard interface for managing scaling group members. The left sidebar contains navigation links for Project, Compute, Network, Object Store, Orchestration, Stacks, Scaling Groups, Resource Types, Admin, Identity, and Murano. The main content area is titled 'Manage Scaling Group Members: sg-01'. At the top right of this area are buttons for '+ Update Member' and 'x Clear Members'. Below these is a table with the following data:

<input type="checkbox"/>	Availability Zone	Instances Count	Status	Actions
<input type="checkbox"/>	az21.cn-north-1(hws)	2	CREATE_IN_PROGRESS	<button>Clear Member</button>
<input type="checkbox"/>	az31.singapore(aws)	1	CREATE_IN_PROGRESS	<button>Clear Member</button>
<input type="checkbox"/>	az11.shenzhen(vcloud)	1	CREATE_IN_PROGRESS	<button>Clear Member</button>
<input type="checkbox"/>	az01.shenzhen(fusionsphere)	0	NONE	<button>Clear Member</button>

At the bottom of the table, it says 'Displaying 4 items'.

Example App for Migration & DR across Clouds

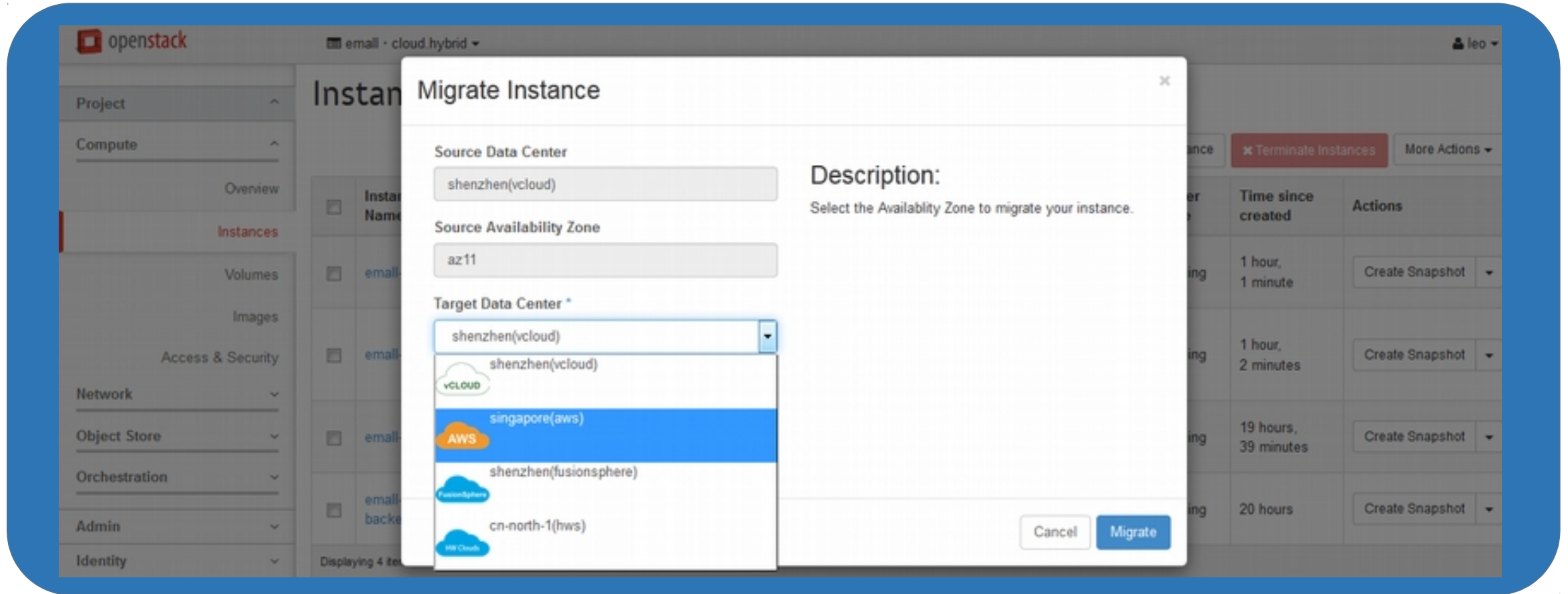


Use case introduce:

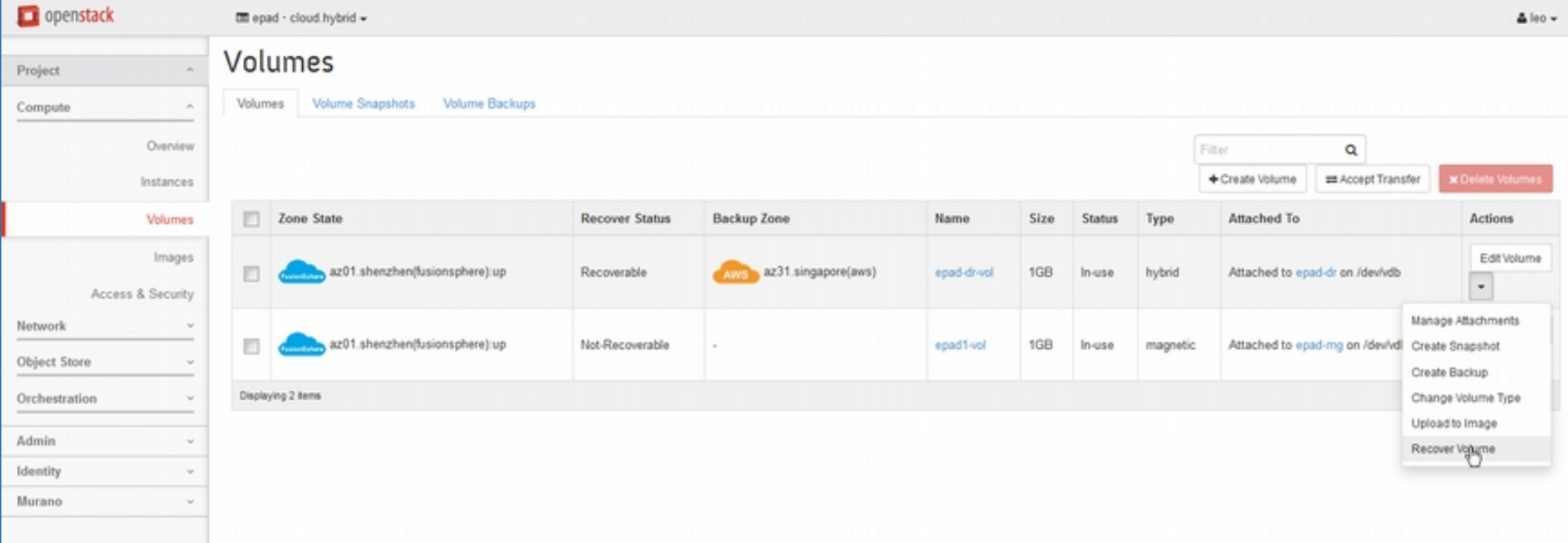
- Epad is an online editor.
- Main site is deployed in Private Cloud.
- It would use public cloud resource as DR point.

*This demo is using etherpad open source platform

Demo3: App Migrate across Clouds



Demo4: App Disaster Recovery across Clouds

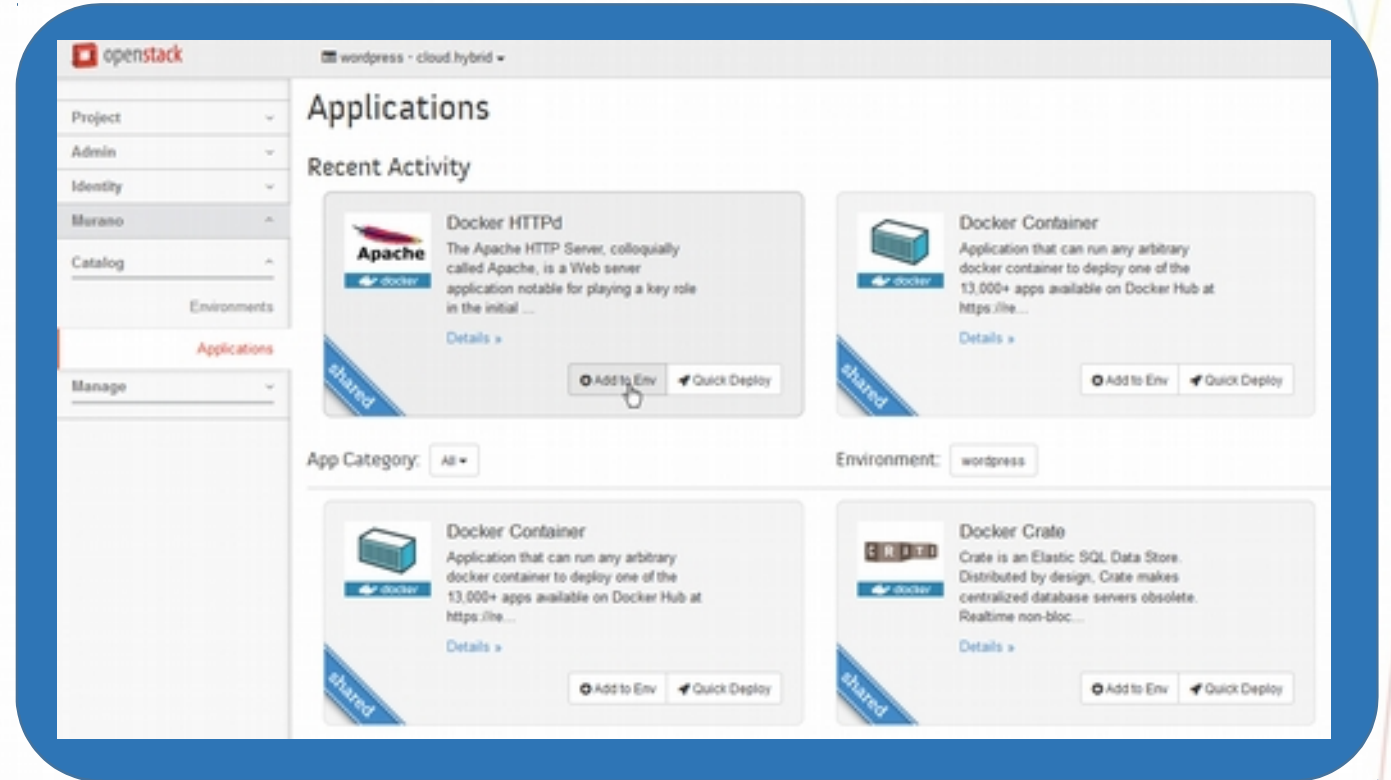
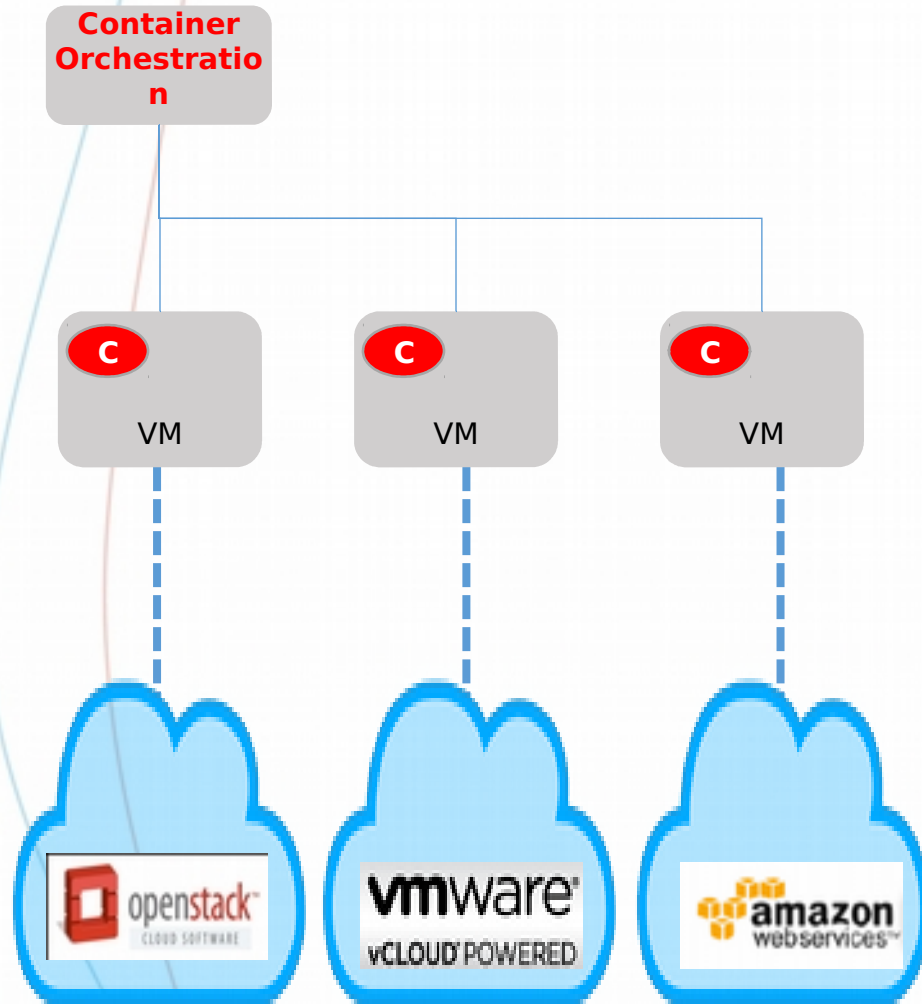


The screenshot displays the OpenStack Volumes dashboard for the 'epad' project in a 'cloud hybrid' environment. The interface includes a sidebar with navigation links for Project, Compute, Overview, Instances, Volumes (active), Images, Access & Security, Network, Object Store, Orchestration, Admin, Identity, and Murano. The main content area shows the 'Volumes' tab with a table of two volumes. The first volume, 'epad-dr-vol', is a 1GB hybrid volume in use, attached to 'epad-dr' on '/dev/vdb', and is in a 'Recoverable' state with a backup zone of 'az31.singapore(aws)'. The second volume, 'epad1-vol', is a 1GB magnetic volume in use, attached to 'epad-mg' on '/dev/vd', and is in a 'Not-Recoverable' state. A context menu is open for the first volume, showing options: Manage Attachments, Create Snapshot, Create Backup, Change Volume Type, Upload to Image, and Recover Volume (highlighted). Buttons at the top right allow for creating, accepting transfer, or deleting volumes.

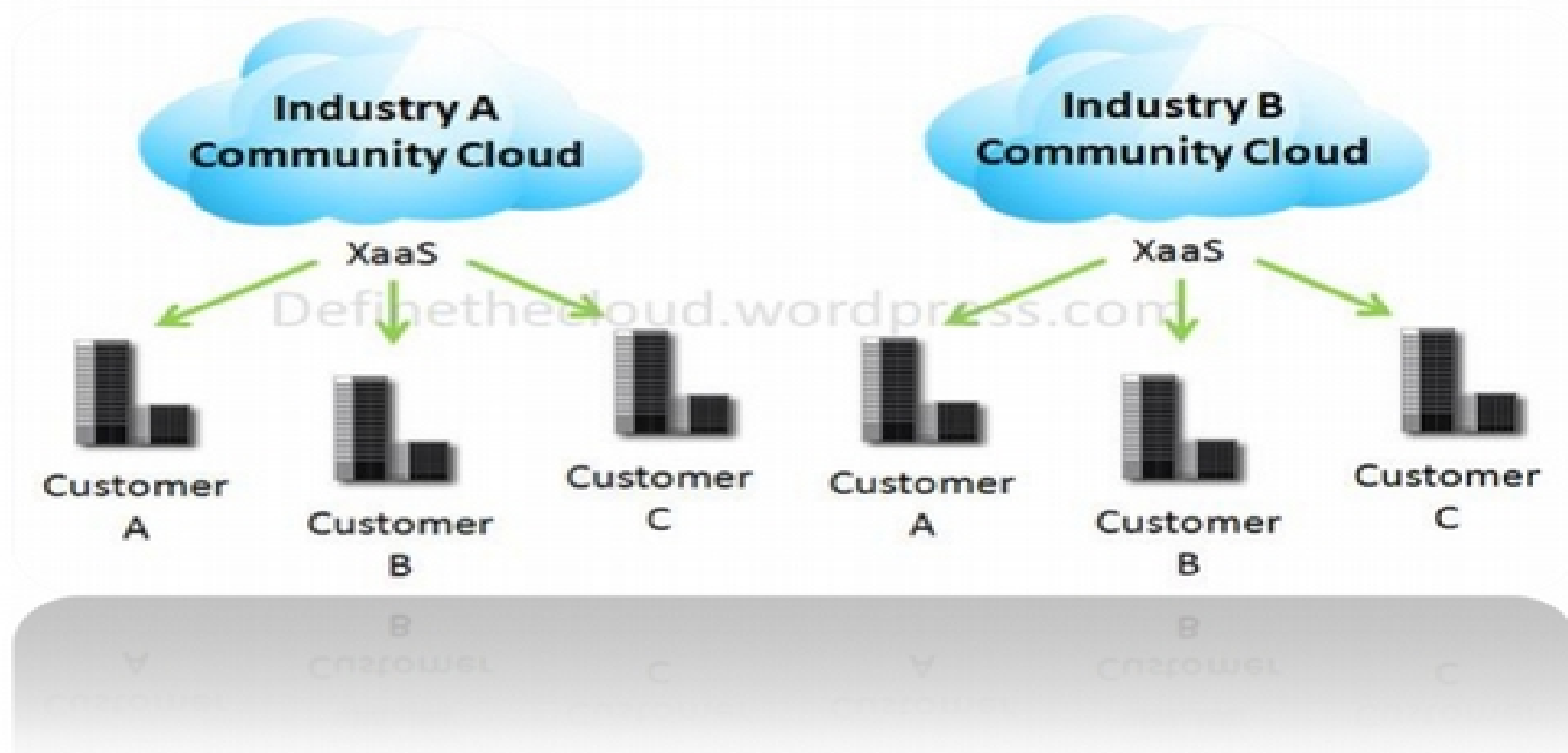
	Zone State	Recover Status	Backup Zone	Name	Size	Status	Type	Attached To	Actions
<input type="checkbox"/>	az01.shenzhen(fusionsphere):up	Recoverable	az31.singapore(aws)	epad-dr-vol	1GB	In-use	hybrid	Attached to epad-dr on /dev/vdb	Edit Volume
<input type="checkbox"/>	az01.shenzhen(fusionsphere):up	Not-Recoverable	-	epad1-vol	1GB	In-use	magnetic	Attached to epad-mg on /dev/vd	

Displaying 2 items

Demo 5: Deploy Container App across clouds



Community Cloud



Community Cloud

Tipe yang satu ini penggunaan infrastruktur cloudnya digunakan bersama-sama oleh beberapa organisasi yang memiliki kesamaan tujuan dan kepentingan. Misalkan dari sisi visi misinya, tingkat keamanan yang dibutuhkan, skalabilitas dan hal lainnya. Community cloud ini merupakan “limit development” dari private cloud. Sama dengan private cloud, infrastruktur cloud yang ada bisa dikelola oleh salah satu organisasi atau pun pihak ketiga.

Keuntungan community Cloud

- Biaya Efektif
- Berbagi Infrastruktur, software dll.
- Keamanan