

Openstack

Cloud computing with Openstack



SWITCH

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Roma, 19/04/2016

Cloud is already 10 years old

- AWS: Started in March 2006 (10 years ago)
- Openstack: Started in 2010



Virtualization before Cloud Computing

- How to manage a datacenter with many hypervisors ?
 - Most of the management is by hand with GUI/WEB based tools
- What happens if I lose a physical host ?
 - Hypervisors are built with a lot of redundancy to prevent failures
 - All the hypervisors in a legacy datacenter are **Pets**, you really have to make sure they are healthy
- How to manage multi-tenant use cases ?
 - Not all the VMs belong to the same project
 - Separation is possible but configured by hand

Public and Private Cloud

- In a Public cloud the services are offered to anyone over the Internet.
 - Operators and users of the cloud are usually in different domains
- In a Private cloud the access is restricted to some users for private use
 - Operators and users of the cloud are usually from the same company

What is new with Cloud Computing?

- **It is design to fail**

- Hardware is divided in two main categories, **Pets** and **Cattle**
- You will need to introduce redundancy only for your Pets
- Cattle are allowed to fail
 - Uptime responsibility is shifted to the applications

- **API based Control Plane**

- The configuration of new VMs is done interacting with a Controller
- API interfaces make possible to automate the configuration.

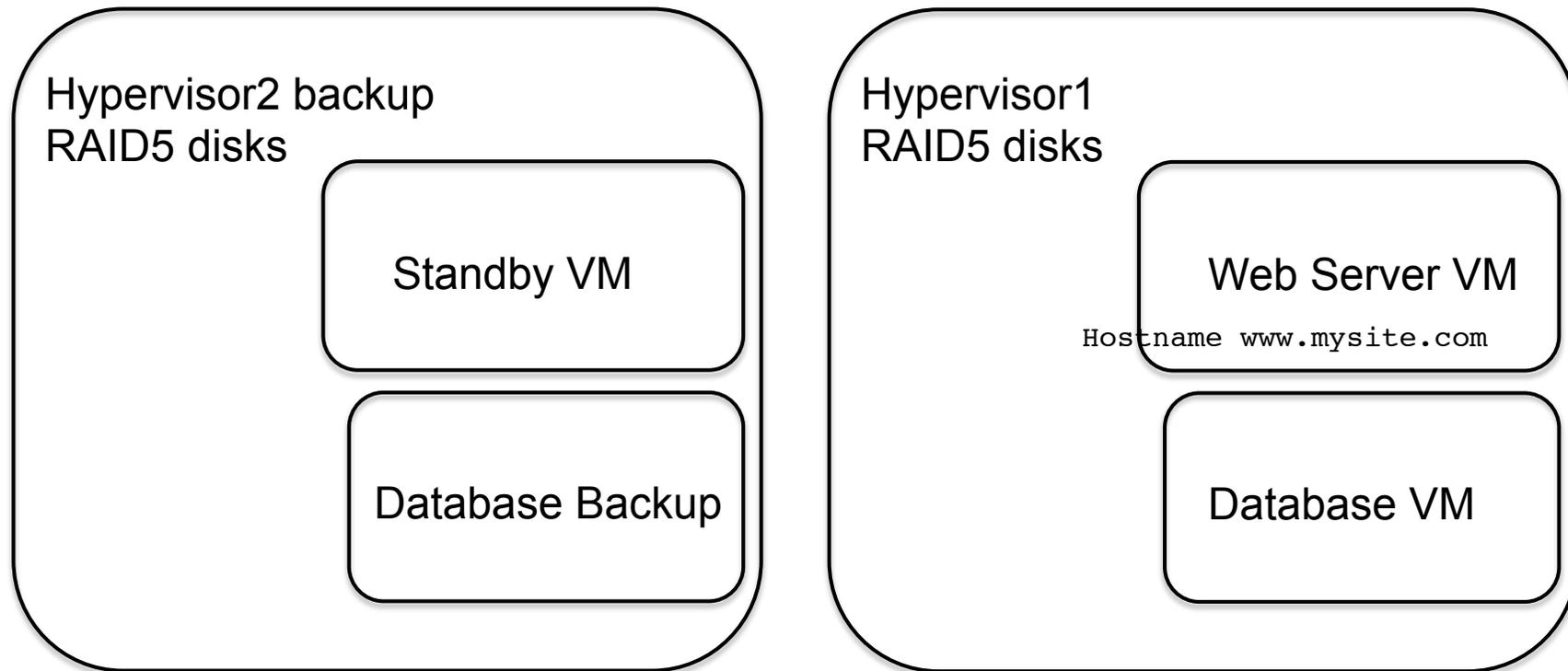
- Automation tools to deploy both infrastructure and applications

Pet and Cattle

- It is a change regarding Uptime responsibility.
- Hypervisors can fail, this means that **VMs should be disposable.**
- Developers are required to design the application in a way that a server can be lost.
- The application should exploit the new abstractions provided by the cloud.

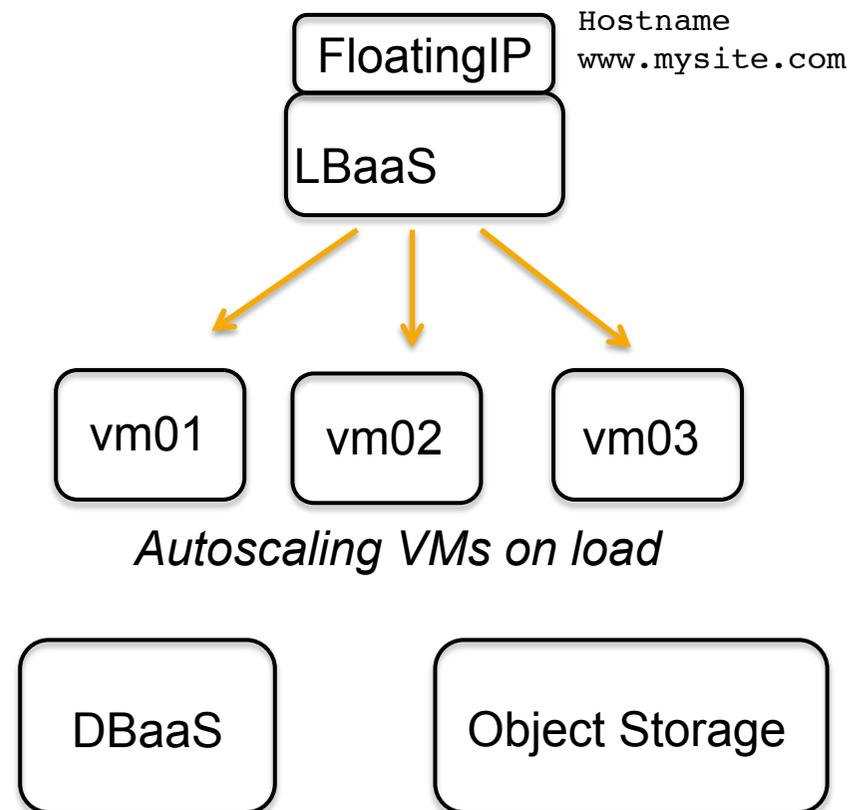
Web Application Example: Legacy

- Scale-up mindset
 - Make a server redundant and powerfull



Web Application Example: Cloud

- Scale-out mindset
- VMs are disposable
- Database is provided by the Cloud Infrastructure
- Object Storage is persistent



Scale out

- To make scale-out possible, a cloud computing provides the following abstractions:
 - Web Services
 - FloatingIPs and LBaaS
 - Databases
 - DBaaS : the user receives the endpoint and credentials
 - Real DB is managed by Cloud Ops in multi master replication
 - Storage
 - Object store

Conclusion

- Openstack is a great Open Source software ecosystem
 - It makes possible to anyone to deploy a cloud
- Application should be designed to exploit the new abstractions
 - Cloud Native Applications
- Cloud design with Pets and Cattles reduces infrastructure costs

Questions ?

