



Why to build a Cloud

Antonio Messina <antonio.messina@uzh.ch>

Cloud Architect

University of Zurich, S³IT

Who are we

S³IT is a central service of the University of Zurich.

We provide solutions for researcher's data analysis usecase:

- Usecase analysis
- Solution engineering and implementation
- tools to run large scale data analysis and to automate the infrastructure provisioning:
 - GC3Pie
 - ElastiCluster
- Development to implement large-scale data analysis solutions
- and the infrastructure where to run it.

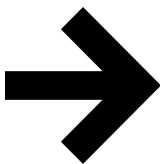
Researcher's FAQ

- How can I run this data analysis on 1000 cores since on my laptop is too slow? (btw, I need to submit for publication by end of this month)
- Where can I put this 100TB of data that I need to analyze and share with my colleagues? (did I tell you I have a deadline end of this month?)
- How can I automate all of this? Can you do it for me? BTW: I only know Matlab.
- Do I need to adapt my application to run on your system? Can you do it for me?

Researchers care about speed

but what is speed?

Researchers care about speed



speed is *time to solution*

- actual computational time can be a small part
- not providing an infrastructure where the researcher can run means *no research*
- learning curve of adapting an application can be a blocking factor

What is a cloud?

An infrastructure to provide users with the most flexible way to allocate computational power and storage space.

- **self-provision** of resources when needed
- **customization** of the infrastructure to the use case
- **automation** of the provisioning of the infrastructure *programmatically* (via RESTful APIs)
- **scalability** of the infrastructure
- **Highly Available** infrastructure

Services a cloud can offer (1/2)

- **Compute:** start a VM somewhere
- **Block Storage:** create a block device and attach it to your VMs
- **Object Storage:** a infinite, distributed, highly available storage accessible via HTTP (with ACLs)
- **Autoscaling:** the ability of automatically spawn or destroy VMs based on triggers
- **Network:** ability to create complex network configurations in the cloud, possibly integrated cloud resources with your own network

Services a cloud can offer (2/2)

- Network File system: an elastic POSIX network filesystem that scales on demand
- Relational databases: create and manage a scalable relational database
- NoSQL databases: create and manage a scalable NoSQL database
- MessageQueue systems

OpenStack services that we will use

- **Horizon:** the web interface
- **Nova:** the compute service
- **Neutron:** the network service
- **Glance:** the image service
- **Cinder:** the block storage service