Centre de Calcul de l'Institut National de Physique Nucléaire et de Physique des Particules

IN2P3-CC cloud computing (IAAS) status

Feb '17

Use cases : R&D, HA and computing clouds

R&D : academic labs and experiments desiring to develop and evaluate new solutions.

→ average availability, mainly private networking, average performance

Public cloud : offload IT services on a public IAAS cloud

Main caracteristics :

- GPFS backend : horizontal capacity and IOPS scaling
- LACP rr 2x10Gbps NICs
- Live migration

→ highest availability, public networking, requested performance

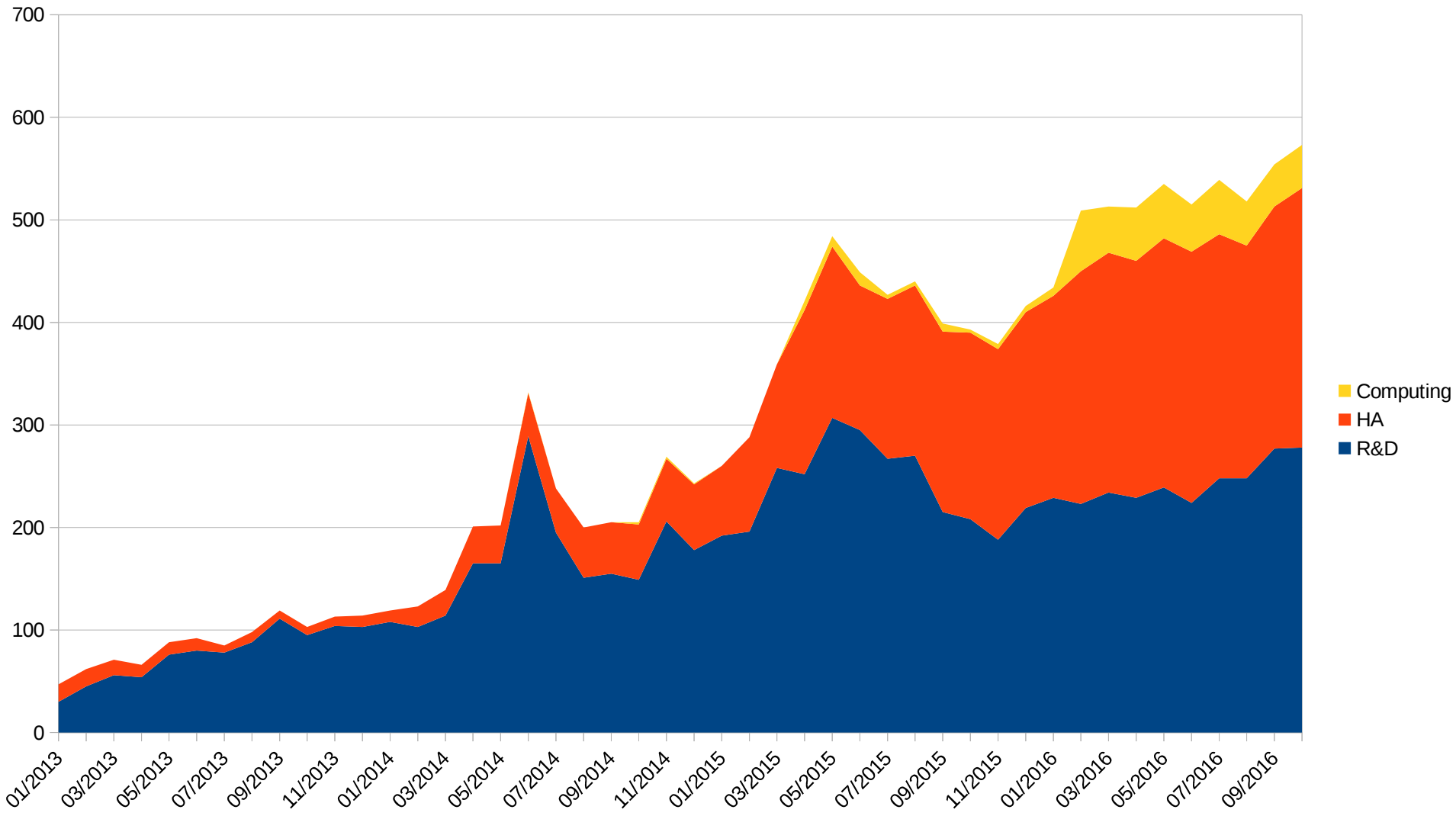
Computing : designed to handle HTC workloads

Main caracteristics :

- ease software deployment and allows specific environment
- specific job management & computing model implementation

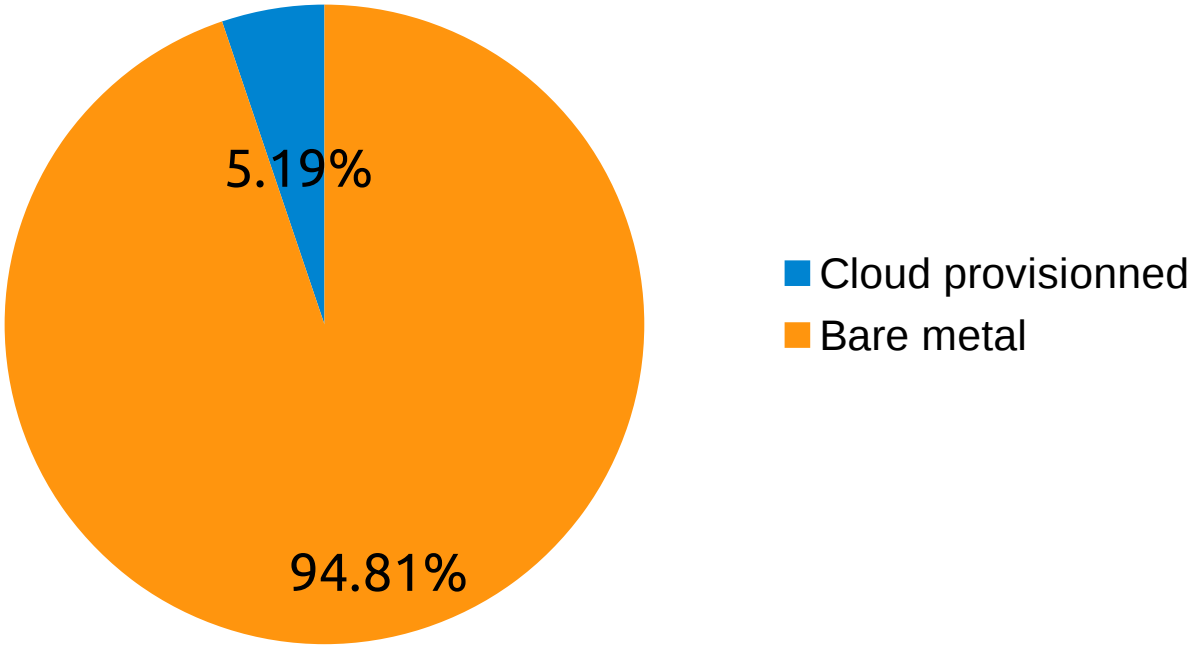
→ low availability, private networking with outgoing internet connectivity, huge CPU cycle accesses (high latency & throughput)

Overall usage



Projects : 50
Users : 150
Hosts : 80
Aggregates : 16

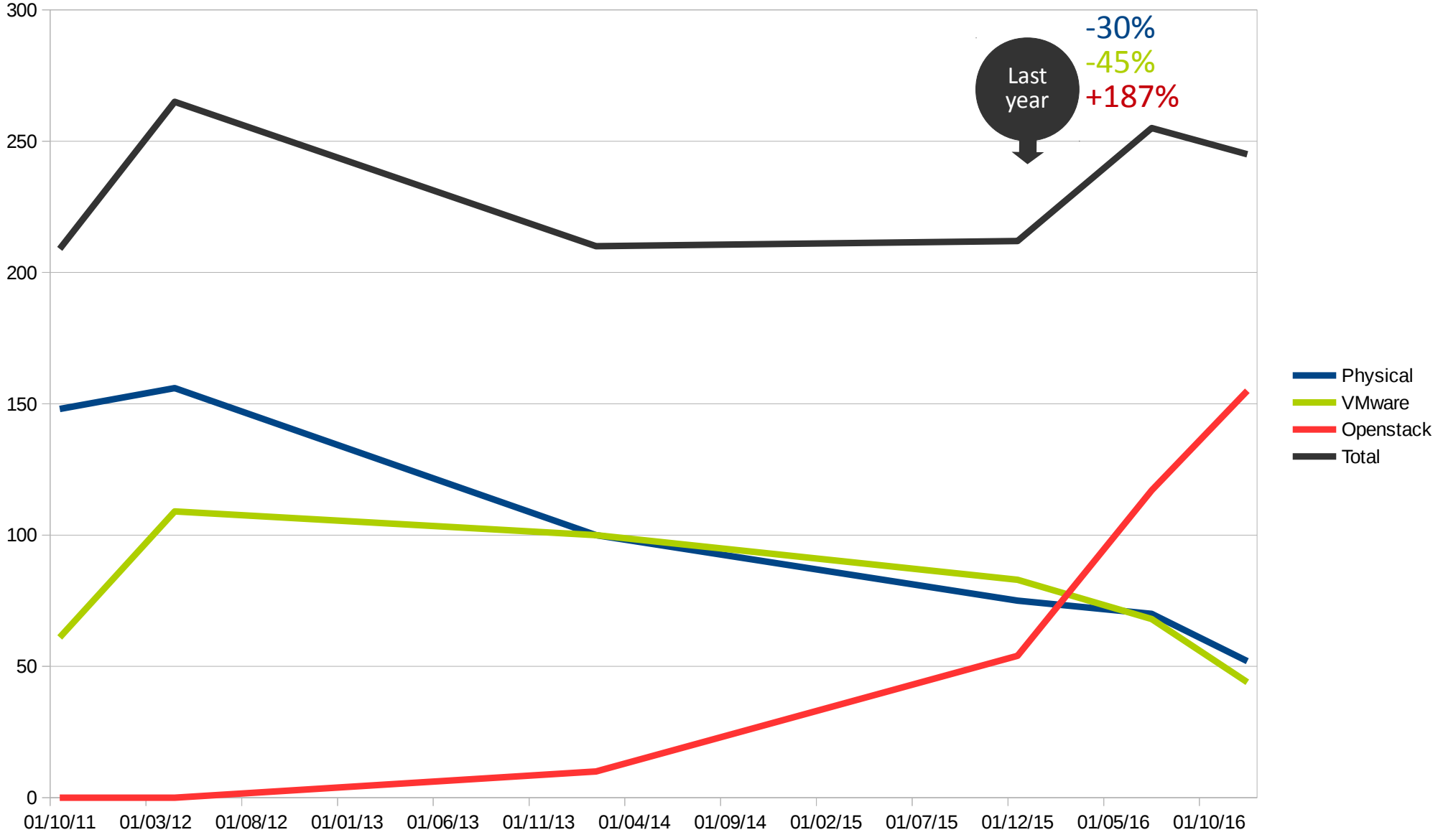
Computing usage



Computing resources :

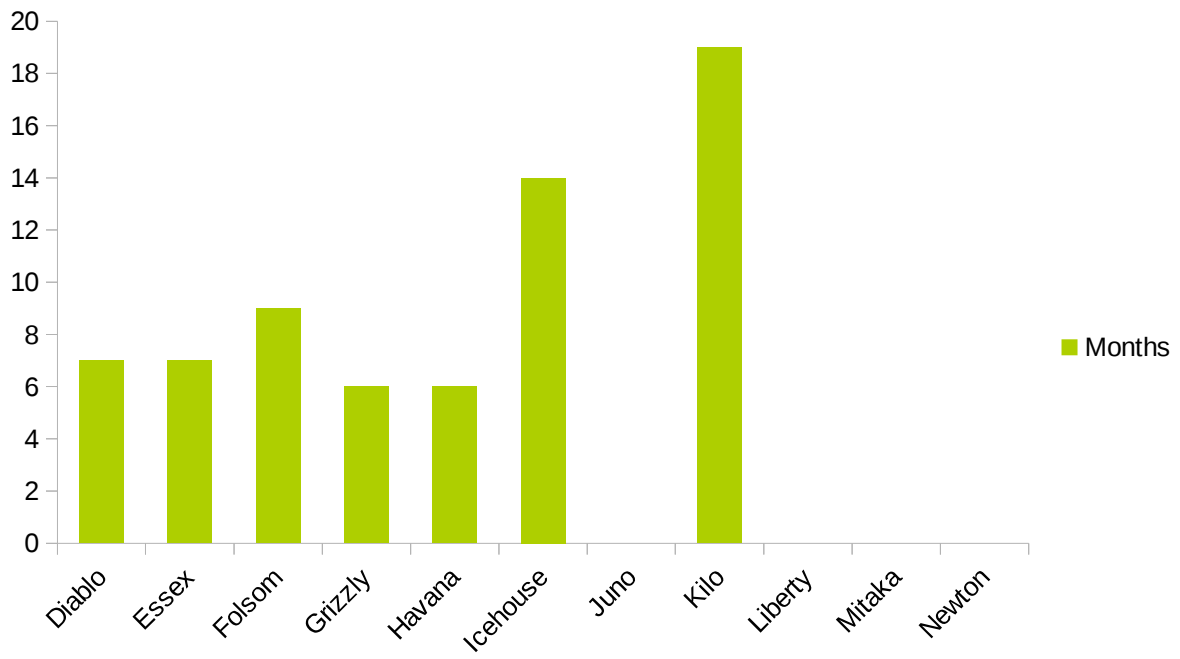
- ~1k HT cores in regard with 25k on HTC farm

Core services deployment (HA private cloud)



Some implementation details

Openstack deployments



Operational components :

Keystone
Glance
Nova
Neutron
Horizon
Cinder
Ceilometer
Swift

In deployment/evaluation :

Heat
Magnum
Rally
Manila

Hardware resources (as of feb '17)

Deployment :

- CentOS 7
- RDO packages
- Puppet configuration

Compute clusters (may '16) :

	Cores	RAM	Storage
HA	544	3.6 TB	36 TB
R&D	288	1.2 TB	24 TB
Computing	1216	5.2 TB	40 TB

→ 2048 cores in total, 10TB RAM, 100 TB storage

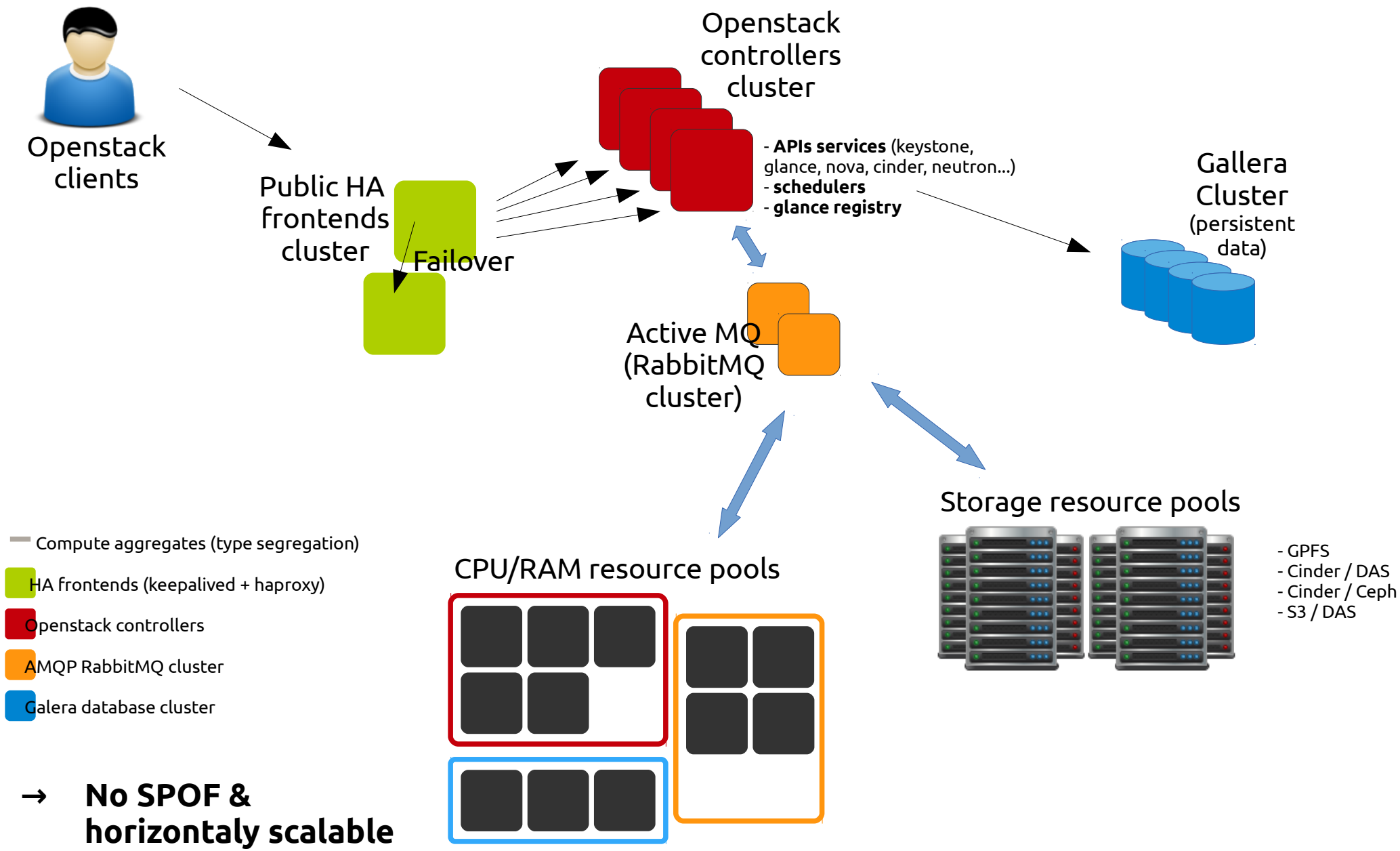
S3 Storage (Swift):

- 24TB DAS

Ceph Storage (Cinder):

- 480TB DAS

Service architecture



→ **No SPOF & horizontaly scalable**

Neutron migration

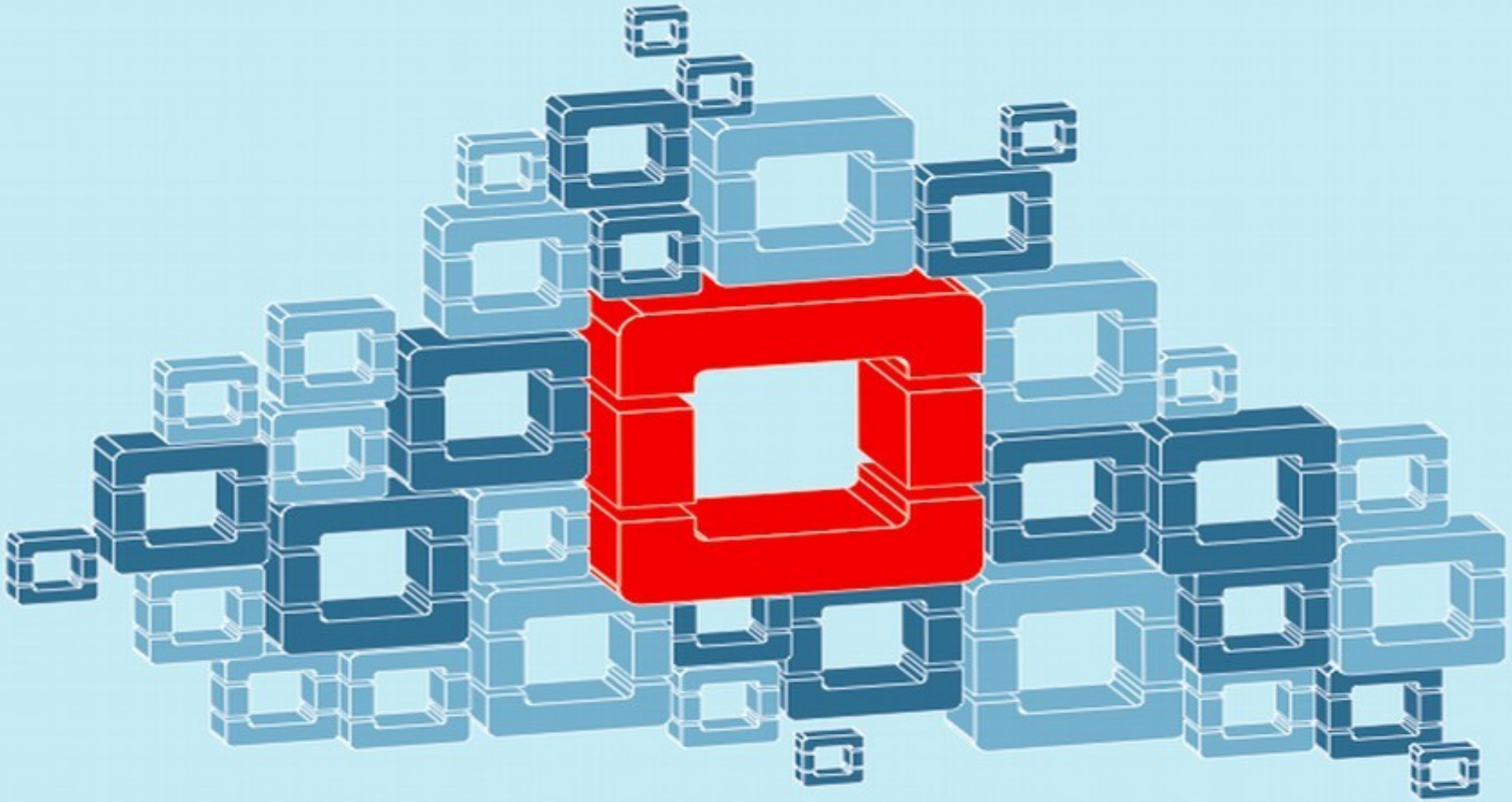
From legacy networking to Neutron, what's the challenge ?

- 50 different VLANs served (1 ↔ 1 projects)
- 6 different modes
  - Private isolated
  - Private internally routed
  - Private SNATED to the outside world
  - Floating IPs (SNAT/DNAT)
  - Public
  - Public distributed into existing networks
- Virtualized (non cloudish) production services implemented
- No supported migration process : you just rely on what's been done by others
- Linux bridges to OVS
- Static network provisionning to SDN
- HA/DVR

What's next ?

What’s next in the mid-term

- Public cloud platform enhancements (storage & CPU) : targeted usage within 3 years : 300 instances, 1.4TB RAM, 800 vCPUs, 50 TB storage
- FSS with Synergy for computing
- Finalize resources orchestration (Heat)
- Container orchestration (Magnum/Kubernetes)
- Cinder refactoring with Ceph backend
- AAI integration
- Interest in shared FS aaS (Manila)



(thank you)

Questions ?