Enos : The Framework for Conducting Scientific Evaluations of OpenStack

Contributors: Ronan-Alexandre Cherrueau, Adrien Lèbre, Dimitri Pertin, Mathieu Rohon, Anthony Simonet, Matthieu Simonin

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My goal today...

... is to convince you to

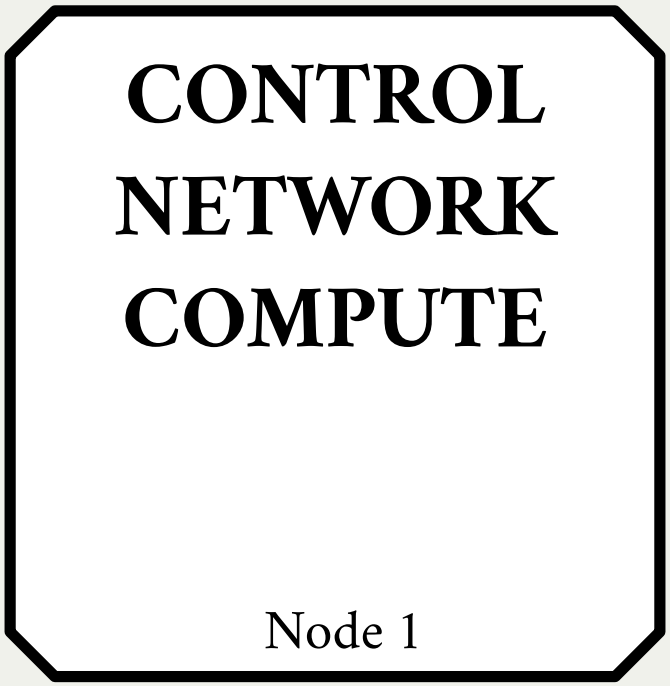
- use Enos (or tell a friend to use Enos)
- or contribute to Enos (or tell a friend to contribute to Enos)

Case Studies

with the help of Enos

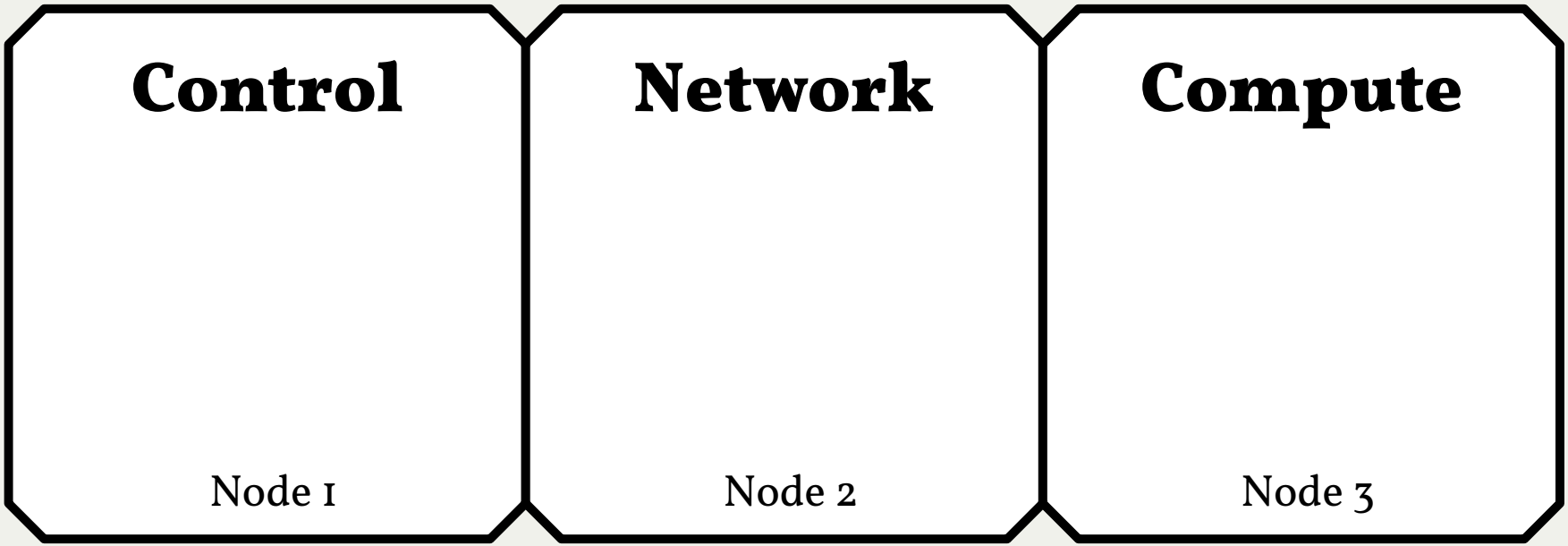
Enos : Case Study 1/

- Start with a small deployment on your local machine



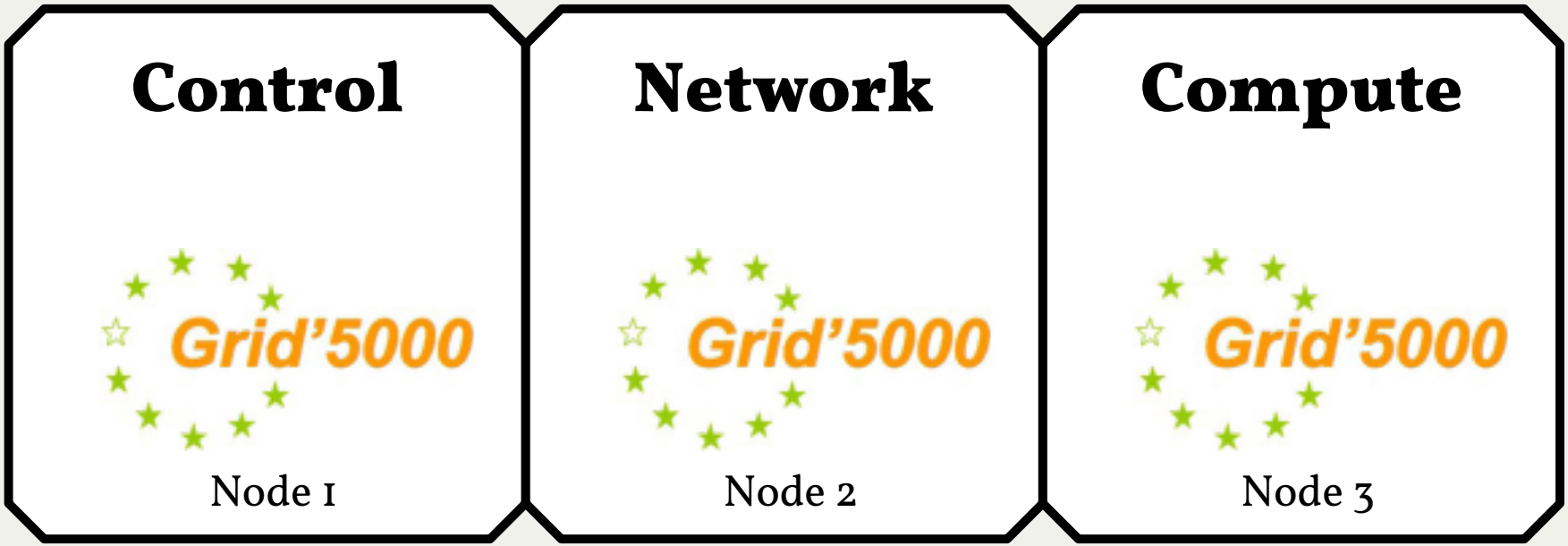
Enos : Case Study 2/

- Isolate logical group of services.



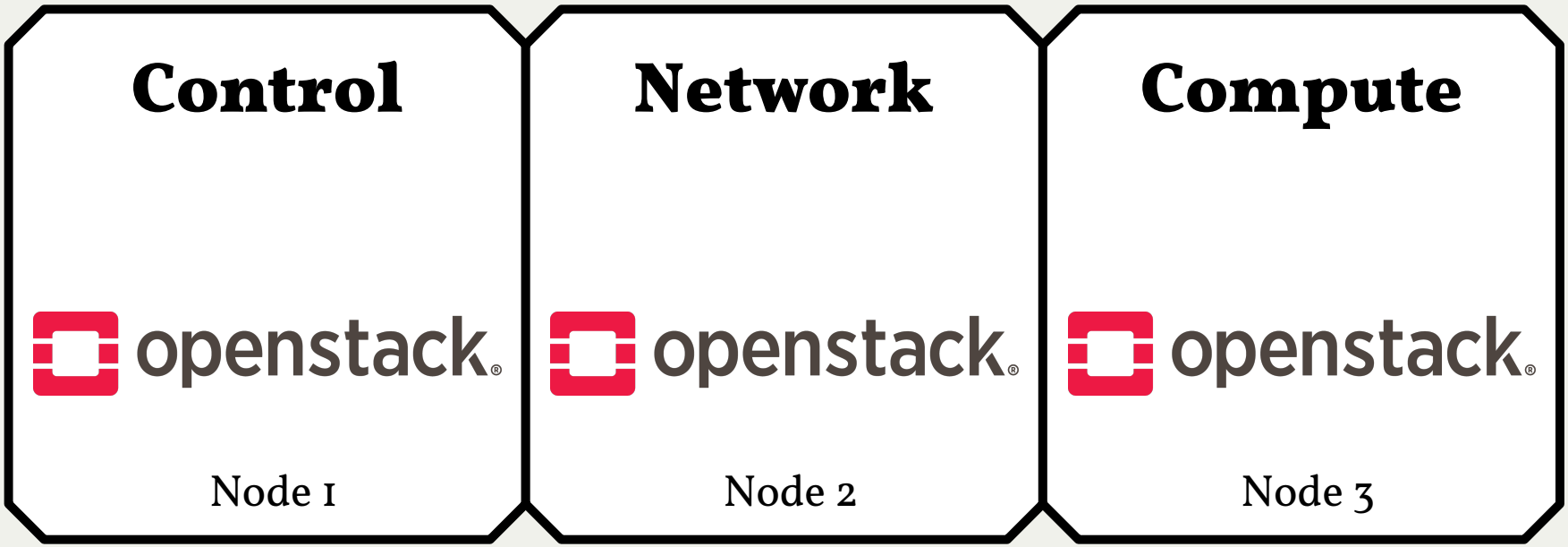
Enos : Case Study 3/

- Your machine isn't beefy enough → nodes can be provided by Grid'5000.



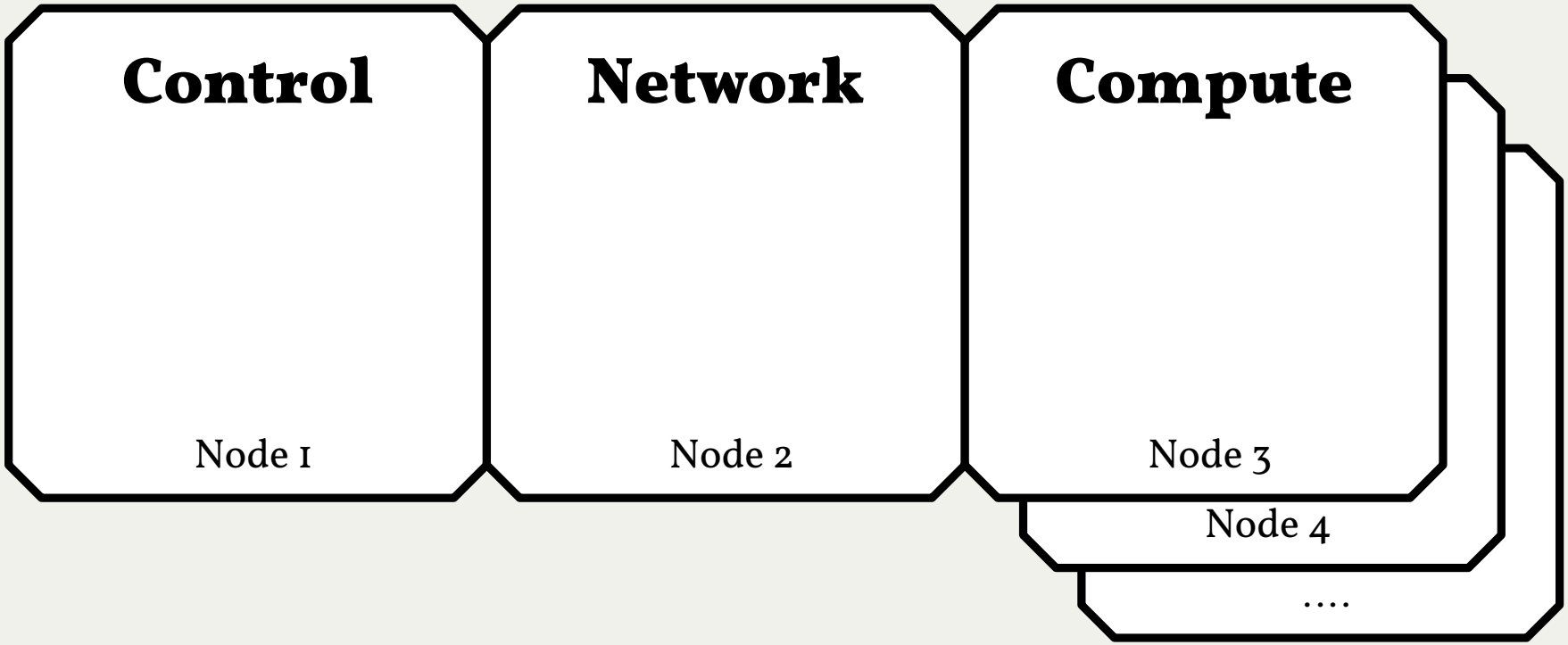
Enos : Case Study 3/

- Fun fact : OpenStack on OpenStack → Resources can be provided by another OpenStack.



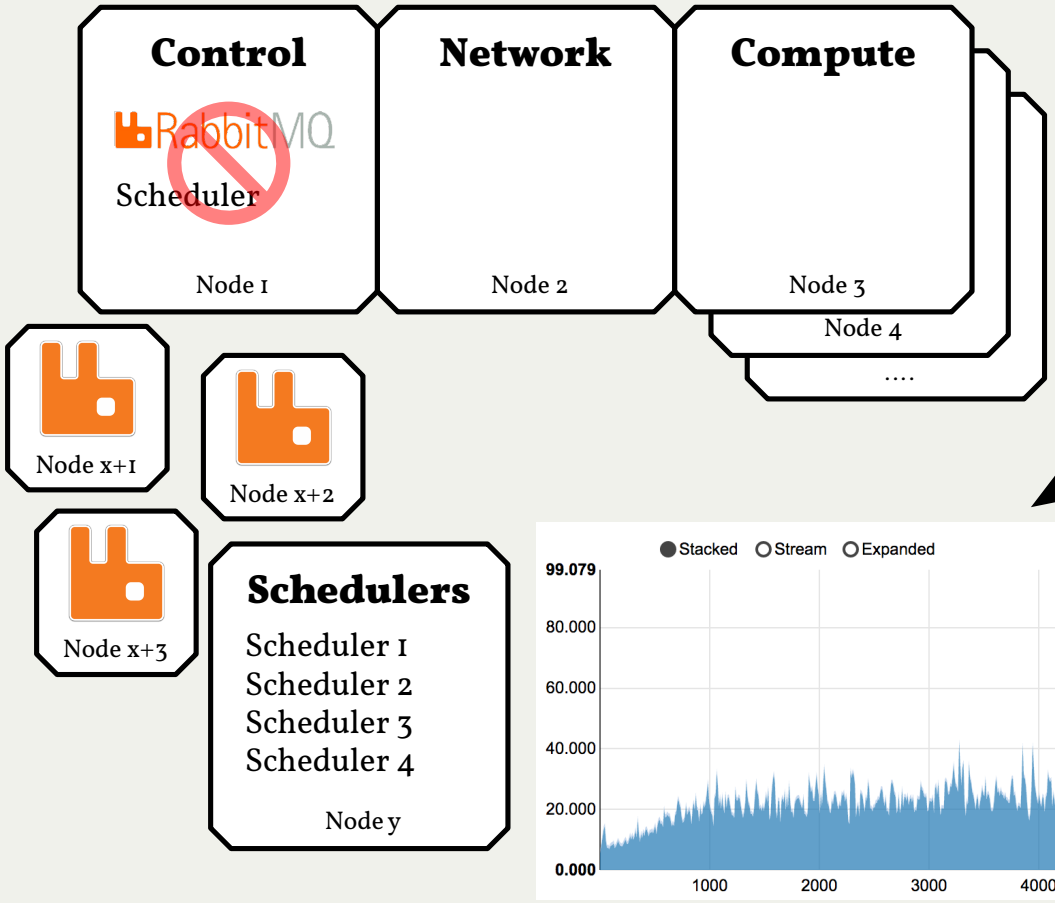
Enos : Case Study 4/

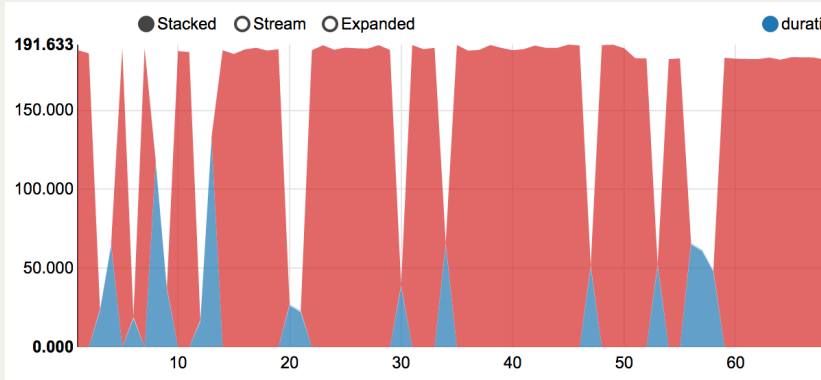
- Scale compute services

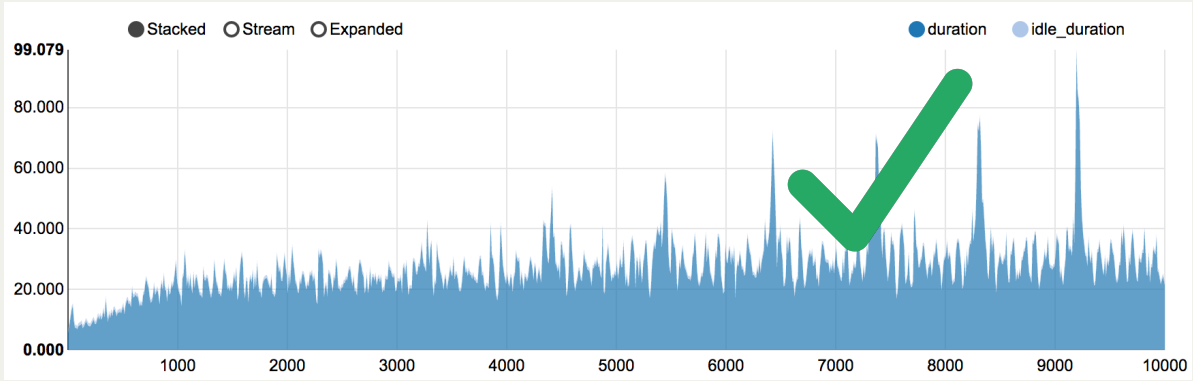


Enos : Case Study 5/

- Your control plane is probably suffering : scale your rabbitMQ, schedulers ...

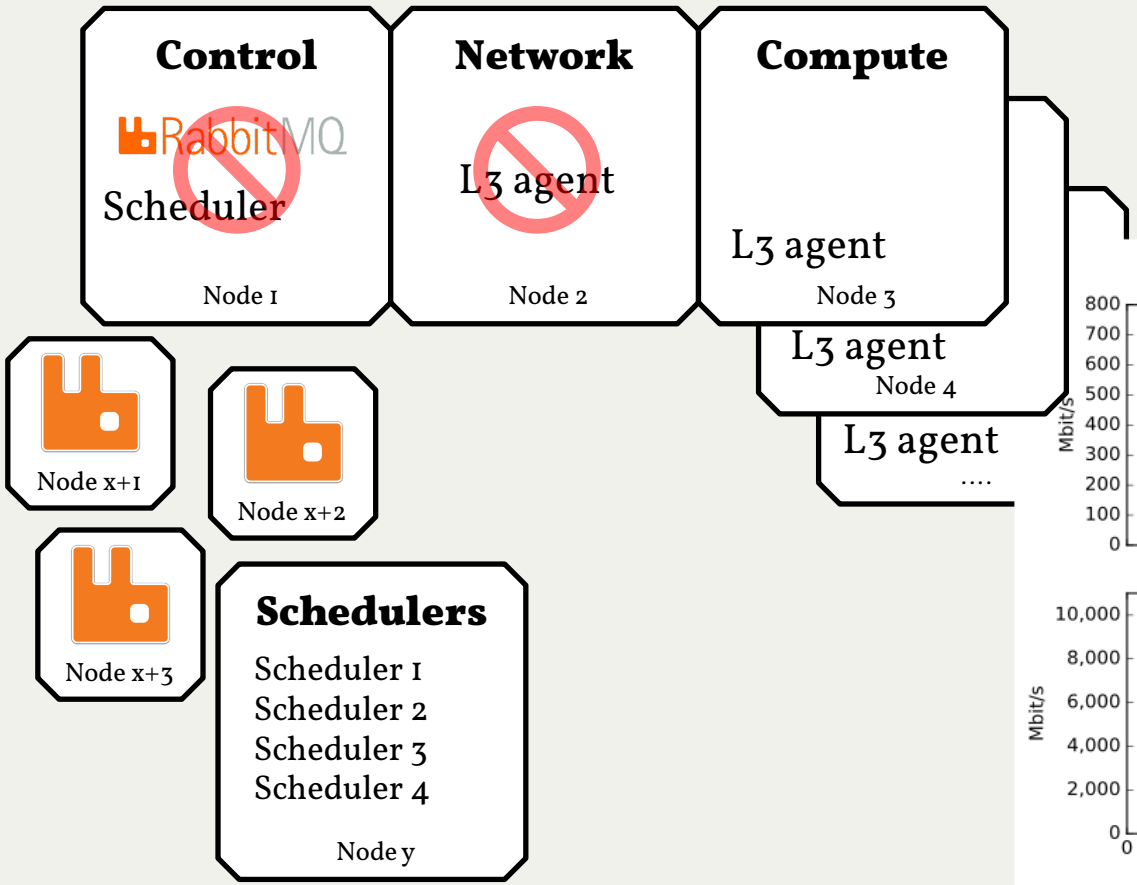


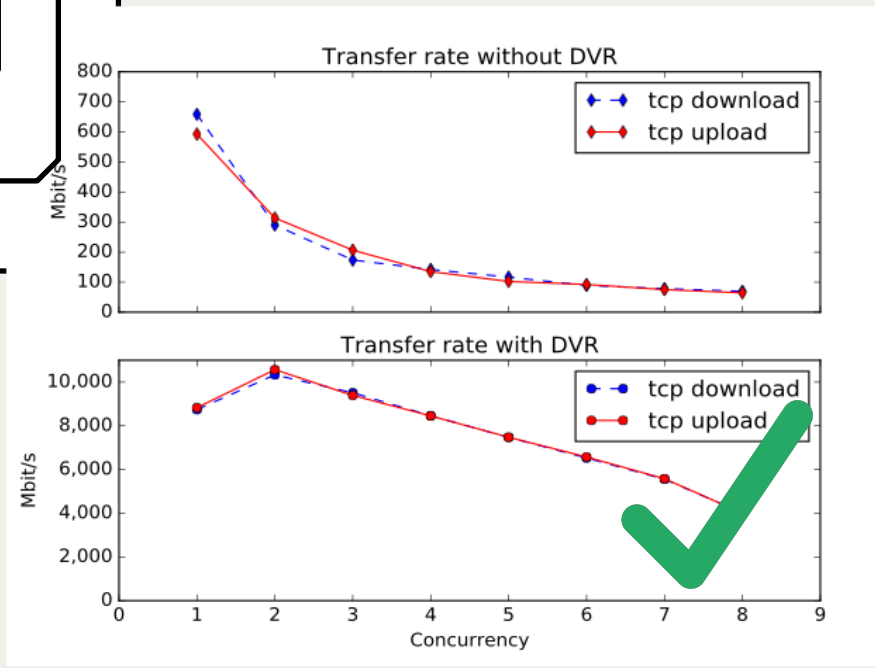




Enos : Case Study 6/

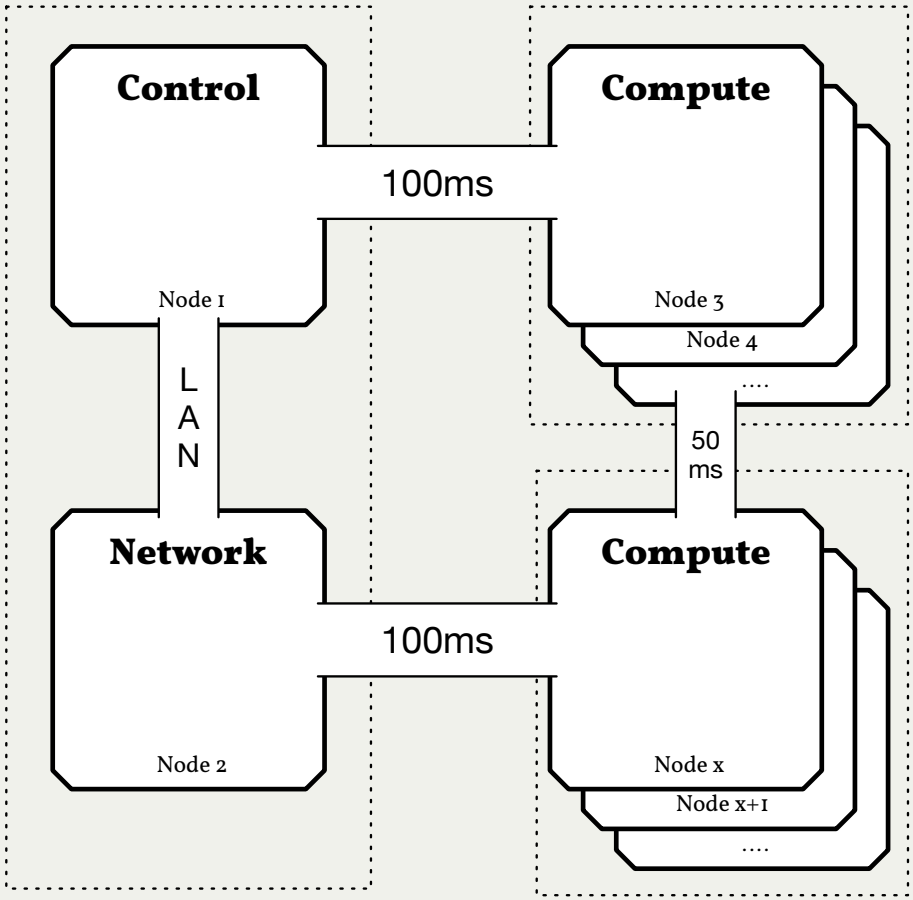
- Your data plane is probably suffering : enable distributed virtual routing (DVR)





Enos : Case Study 7/

- Put everything on an emulated Wide Area Network.

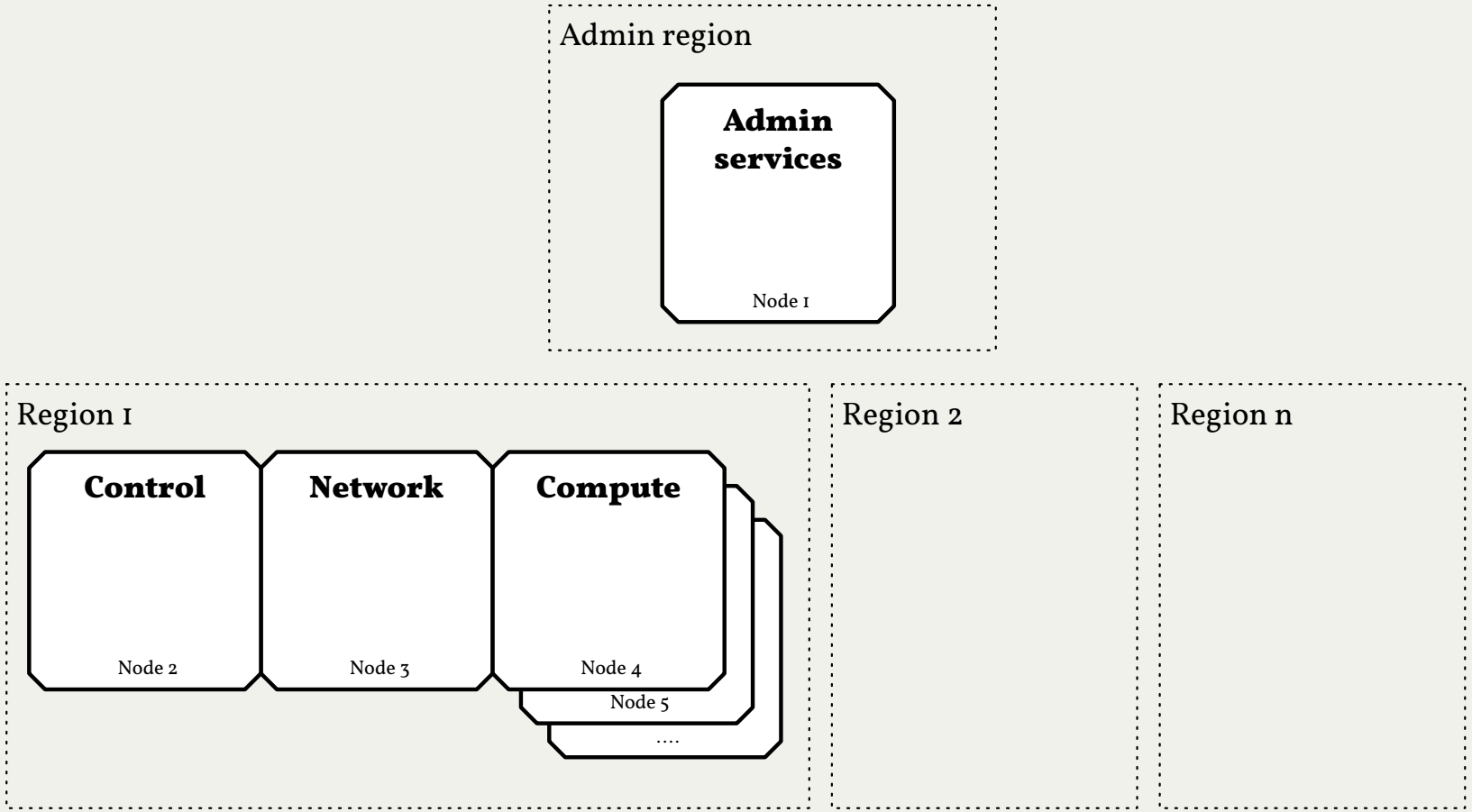



```
topology:
  grp1:
    m1.large
      control: 1
      network: 1
  grp[2-3]:
    m1.medium:
      compute: 10

network_constraints:
  constraints:
    - src: grp1
      dst: grp[2-3]
      delay: 50ms
      symetric: true
    - src: grp2
      dst: grp3
      delay: 25ms
```

Enos : Case Study 8/

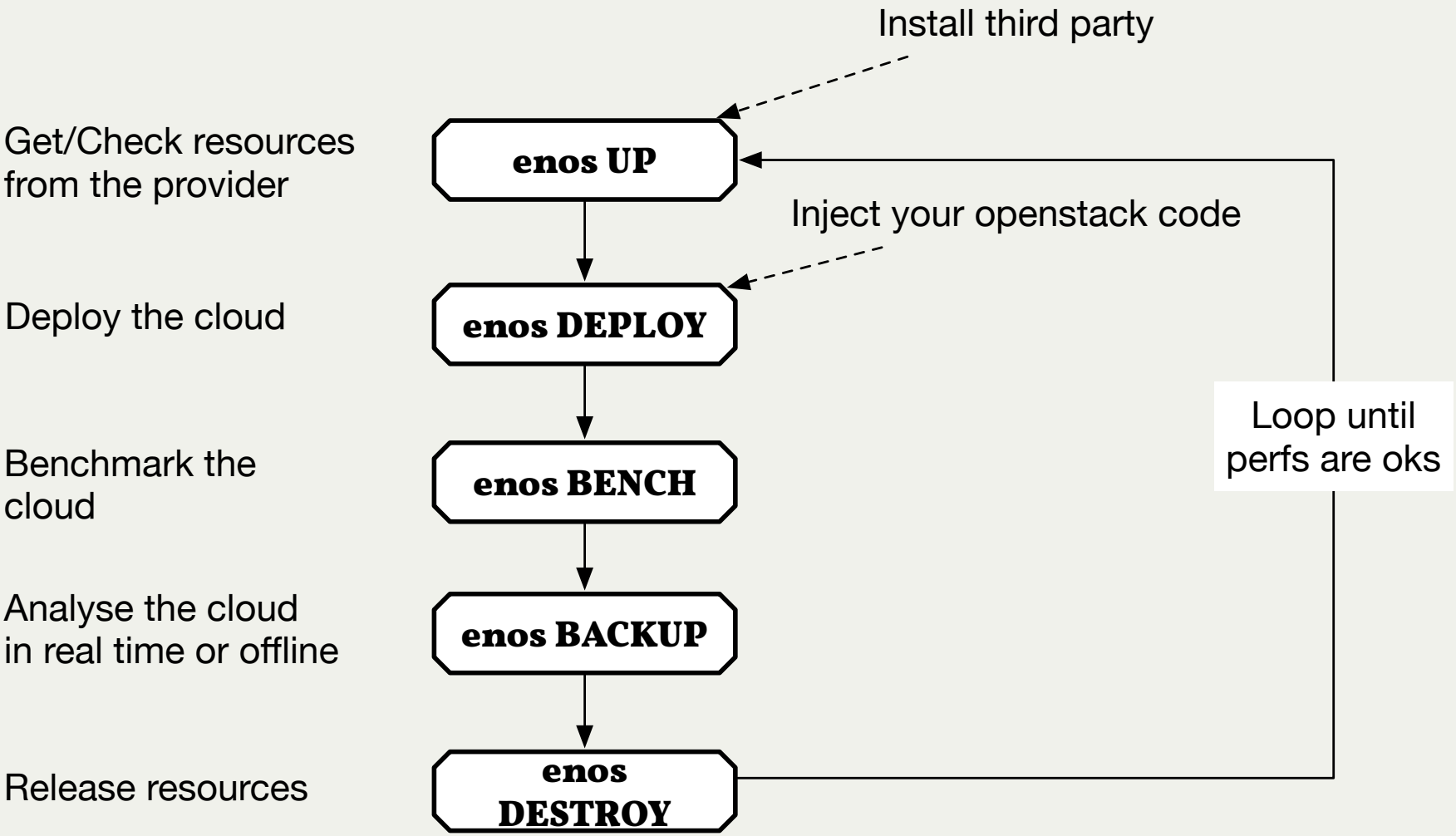
- Multi-Region deployment



Enos

The framework

Enos : Typical Workflow



enos up

- Get/Check resources from a provider (machines + network = pool of IPs)
- Prepare the machines for the OpenStack deployment (provider agnostic)
- Install a monitoring stack (optional - provider agnostic)

Writing a provider :

- Machine can be reached over SSH
- Virtual IPs should be taken from the pool of IPs
- Grid5000, VirtualBox, Libvirt ([WiP] Openstack and Chameleon Cloud) (300 Lines Of Code)

```
# configuration file
    (excerpt)
resources:
  paravance:
    control: 1
    network: 1
    compute: 50
```

=>

1. Get 52 nodes on paravance Rennes's cluster
2. IP pool is given by a Grid'5000 vlan

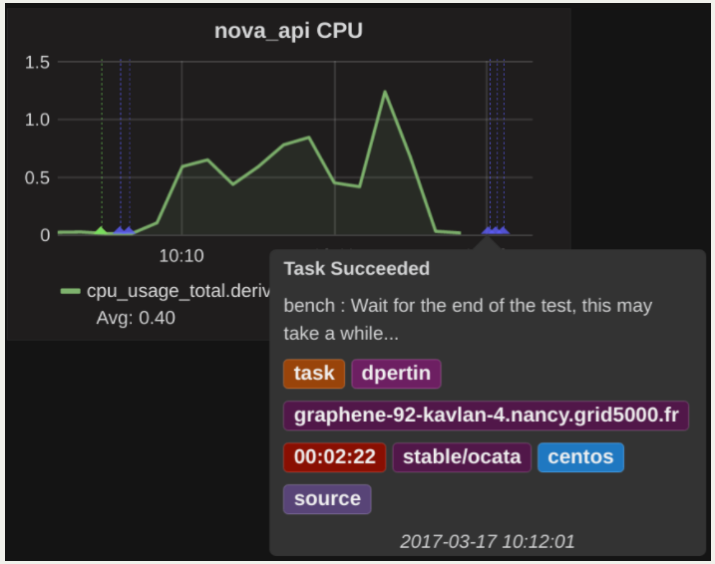
enos deploy

- **enos deploy** is a wrapper around Kolla deployment
- Containerized deployment (docker)
- Deployment is orchestrated by Ansible
- Well-defined inputs (inventory file + variables)

enos bench

- Rally benchmarks (control plane)/Shaker benchmarks (data plane) - [Wip] OSprofiler
- Analyse reports in various format (HTML, raw JSON)
- Query your measures with Grafana (Automatic annotations)
- Query your logs with ElasticSearch

```
rally:
  enabled: true
  args:
    concurrency:
      - 5
    times:
      - 100
    scenarios:
      - name: boot and list servers
        file: nova-boot-list.yml
```



enos backup

`enos backup` produces a tarball with:

- Benchmark reports
- OpenStack logs + Configuration files
- InfluxDB database with metrics

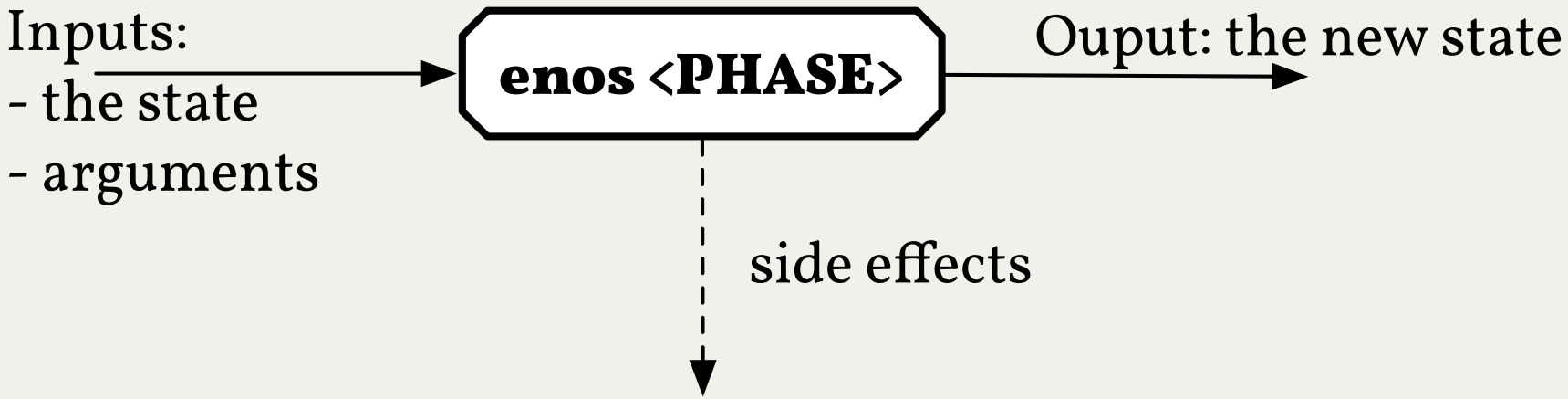
`Post-Mortem` analysis

- A Virtual Machine with the backup + tools to analyse
- Note: Need to be rewritten to be Grid'5000 independant

Enos

Extending Enos

A phase in Enos



Enos fully exposes its state so you can add your own phase.

The state in Enos

```
$ enos info

{
  'cinder_database_password': 'demo',
  ...
  'mariadb_password': 'demo',
  ...
  'vip': '10.24.61.254',
  'eths': ('eth0', 'eth1'),
  'provider_net': {'cidr': '10.24.0.0/18',
                   'start': '10.24.0.0',
                   'gateway': ...},
  'rsc': {'compute':[Host('paravance-16-kavlan-4.rennes.grid5000.fr'),
                     Host('paravance-15-kavlan-4.rennes.grid5000.fr')],
          'nova-conductor': ...}
}
```

Extending existing phase

Existing phases are often composed of :

- Python code
- Ansible code

We accept any idea / feature requests :)

Conclusion

and expectations

Conclusion

Enos

- deploys OpenStack on various platforms (providers : G5K, vbox, libvirt, openstack)
  - fine grained tuning of OpenStack services
  - handy definition of services topology
- benchmarks Openstack (Rally, Shaker, OsProfiler)
- backups your environment for analysis
- will be kept up-to-date with OpenStack development for the 2 next years (at least)

Expectations

Use cases

Important Links

- `https://github.com/BeyondTheClouds/enos` (you can even ⋆ it ;))
- `https://enos.readthedocs.io`
- `discovery-dev@inria.fr`
- `https://hal.archives-ouvertes.fr/hal-01415522v2`
  (extended version of CCGRID2017 paper)