Cloud Control Workshop (Feedback)

Friiberghs Herrgård, Sweden
June 27–29, 2016

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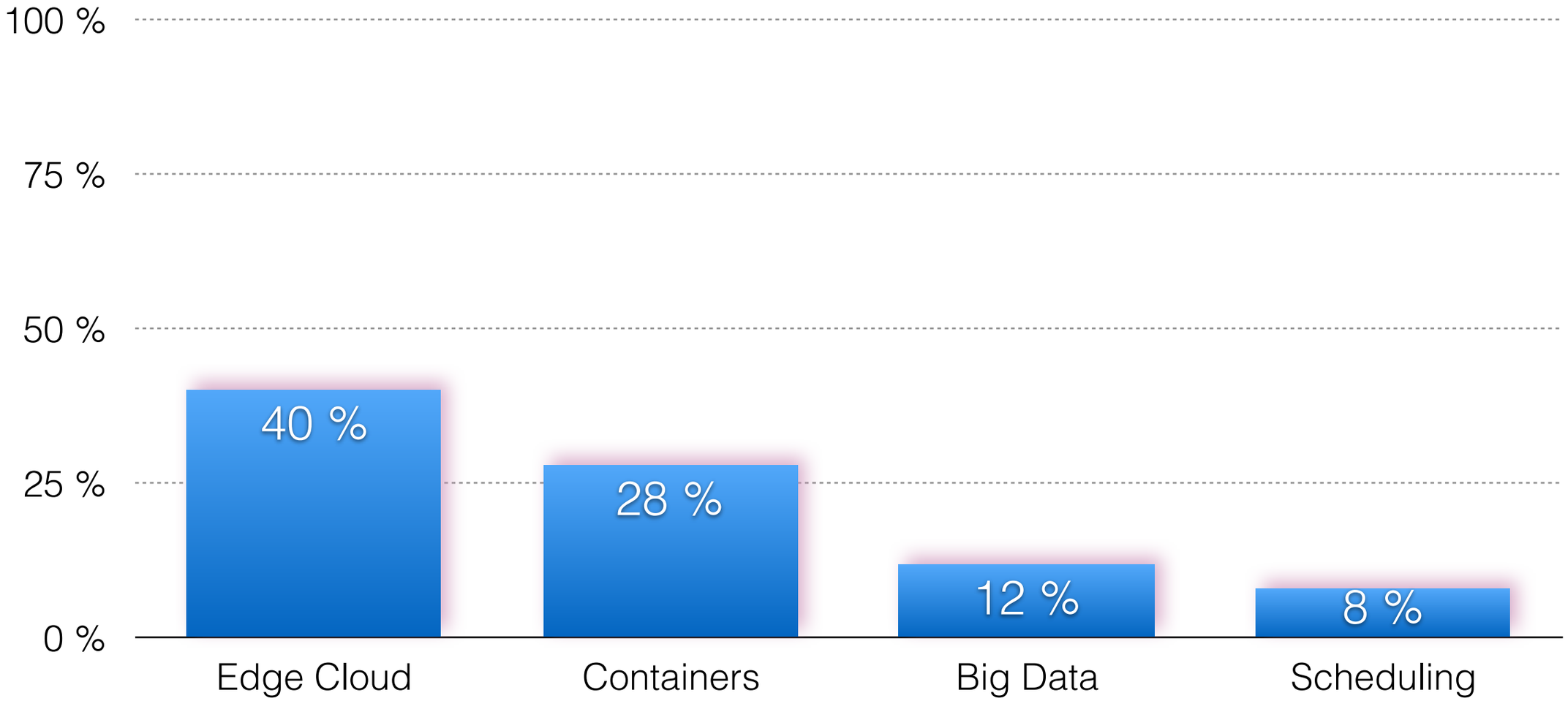
Inria – École des Mines de Nantes – LINA

Cloud Control

- 50% academics / 50% industry
- Short presentations
- Group discussions
- Informal chats
- Sauna & Boating

Trending Buzzwords



Use-cases

Autonomous cars

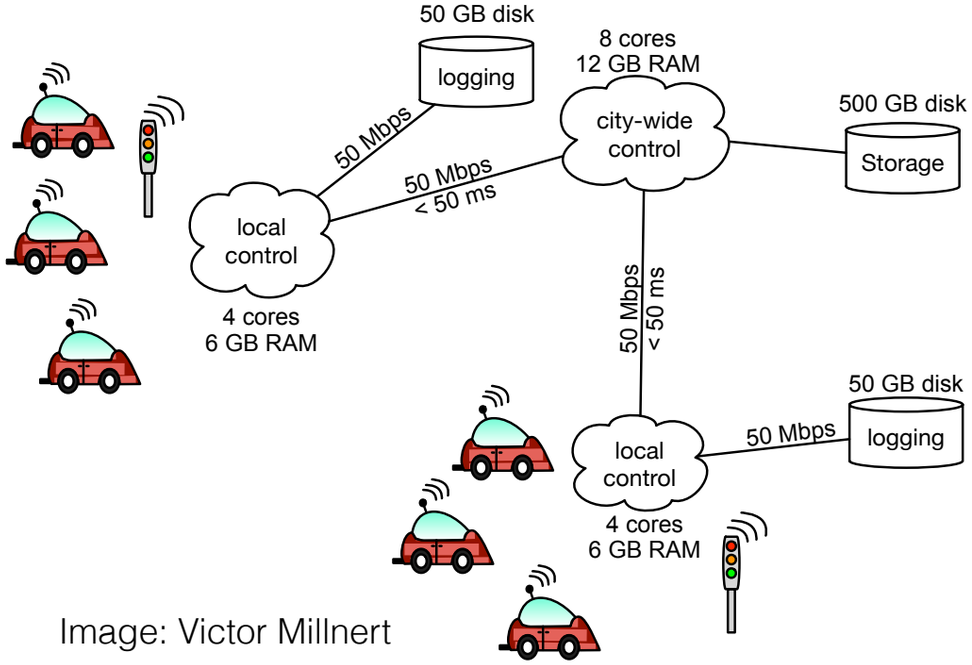


Image: Victor Millnert

Tactile Internet

Image: Fettweis, G.; Alamouti, S., "5G: Personal Mobile Internet beyond What Cellular Did to Telephony," Communications Magazine, IEEE , vol. 52, no. 2, pp. 140-145, February 2014

Cloud robotics

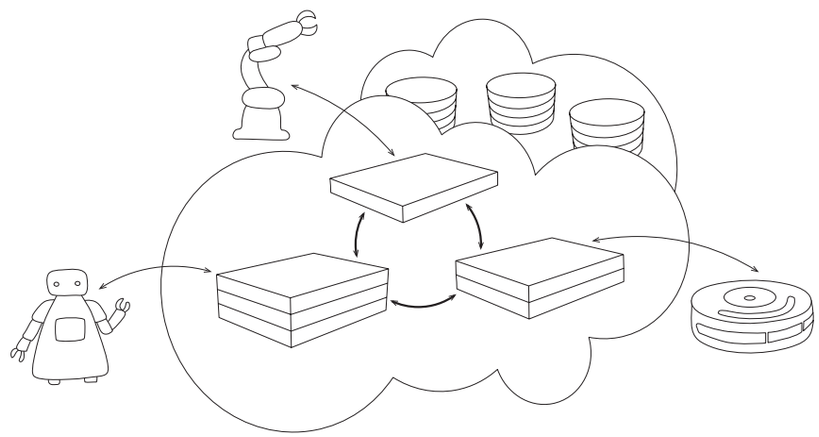
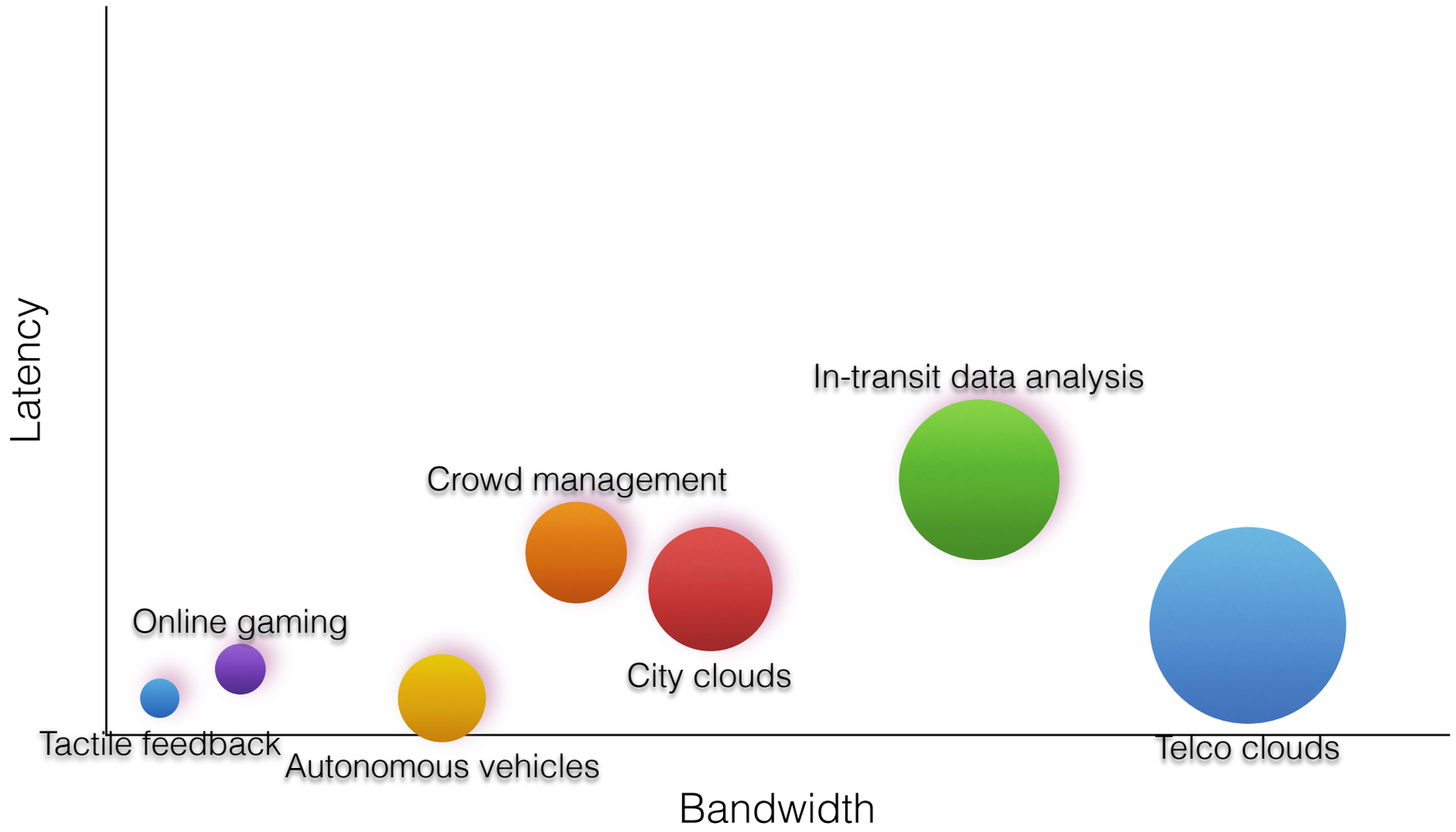


Image: Mohanarajah, G., et al. “Rapyuta: A Cloud Robotics Platform" IEEE Transactions on Automation Science and Engineering

Use-cases

Our sweet spot:

Applications that need **High Bandwidth** & **Low latency**



Fog/Edge:application needs

- A model/language to express app requirements
  - Latency, distance, QoS, etc.
- Programming models to enable developers to benefit from infrastructure unique features
- A distributed control-loop to auto-manage the infrastructure
- Extreme Edge?

The good news

- No one talked about operating an Edge Cloud (except me)
- For now, researchers…
  - use simulations
  - mimic Edge Clouds on AWS
  - …without considering the manager

Collaboration opportunities

- Omer Rana, University of Cardiff
  In-transit computing

- William Tärneberg (Lund) & Amardeep Mehta (Umeå): need a test infrastructure

- Niklas Carlsson, Linköping University
  Network monitoring (including energy)

- …

Performance Evaluation of the Discovery PoC

2nd Discovery Plenary Meeting
Rennes

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Energy consumption

- Measure **Discovery PoC** vs. **Vanilla OpenStack**
- Answering the question '*Will Discovery allow to save anergy?*'
- Methodology
  - Deployment of Discovery OpenStack on **Grid'5000** (Taurus)
  - **Nova**, **Glance**, **Neutron** isolated on dedicated nodes
  - All other services on a **controller** node
  - All nodes equipped with high-accuracy power sensors
  - Run Rally benchmarks to execute simple operations and measure the energy consumed by all the nodes

Rally benchmarks

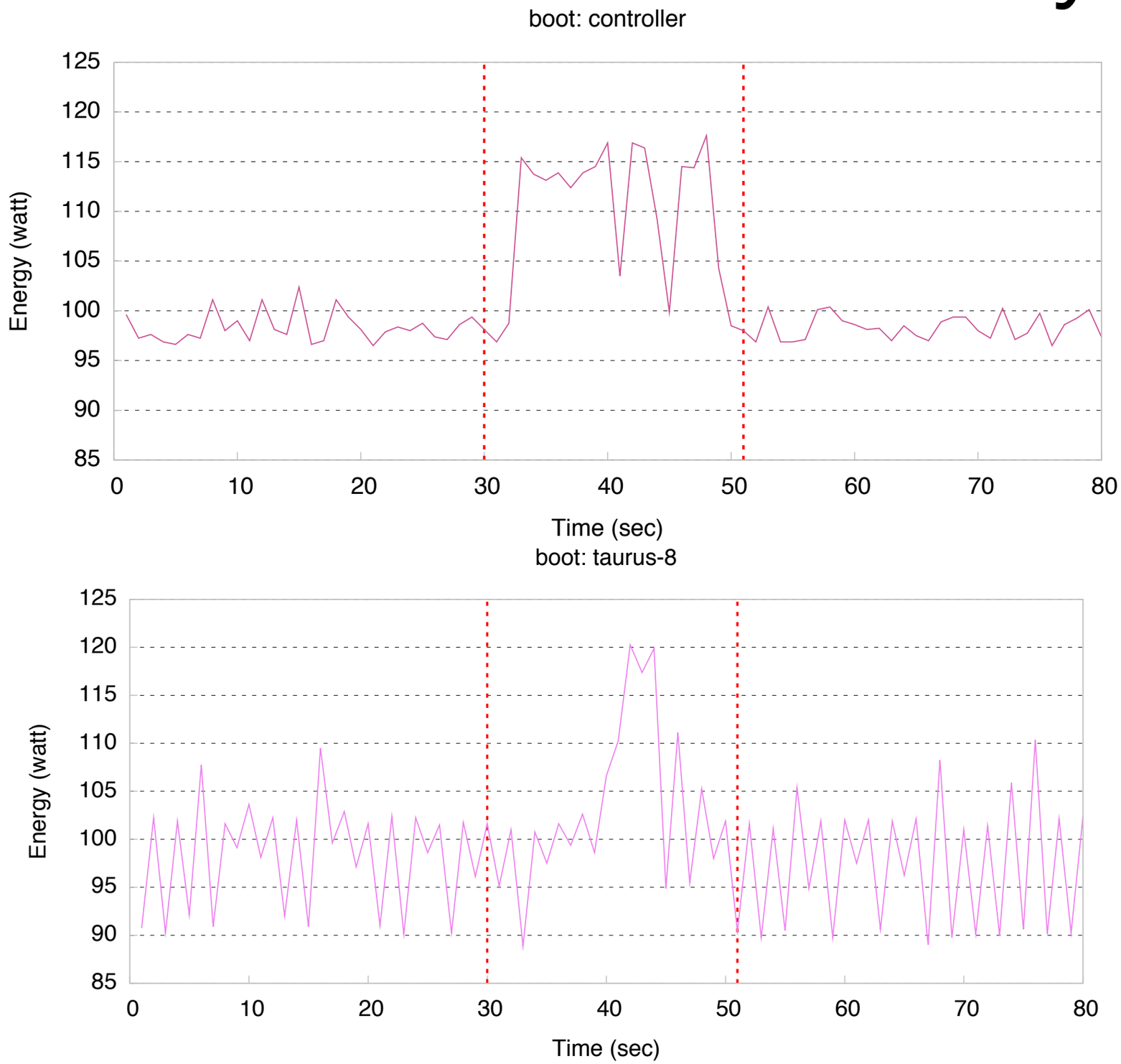
- Rally is the official benchmarking suite for OpenStack
- Benchmarks are defined by customizable ‘scenarios’
- Rally is shipped with hundreds of scenarios, grouped by services:

authenticate	glance	neutron	vm
ceilometer	heat	nova	workload
cinder	ironic	quotas	zaqar
designate	keystone	requests	
dummy	manila	sahara	
ec2	mistral	swift	
fuel	murano	tempest-do-not-run-against-production	

Grid’5000 + openstack Rally = Rally-G5K

http://github.com/asimonet/rally-g5k

Energy consumption:
early results



Energy consumption:
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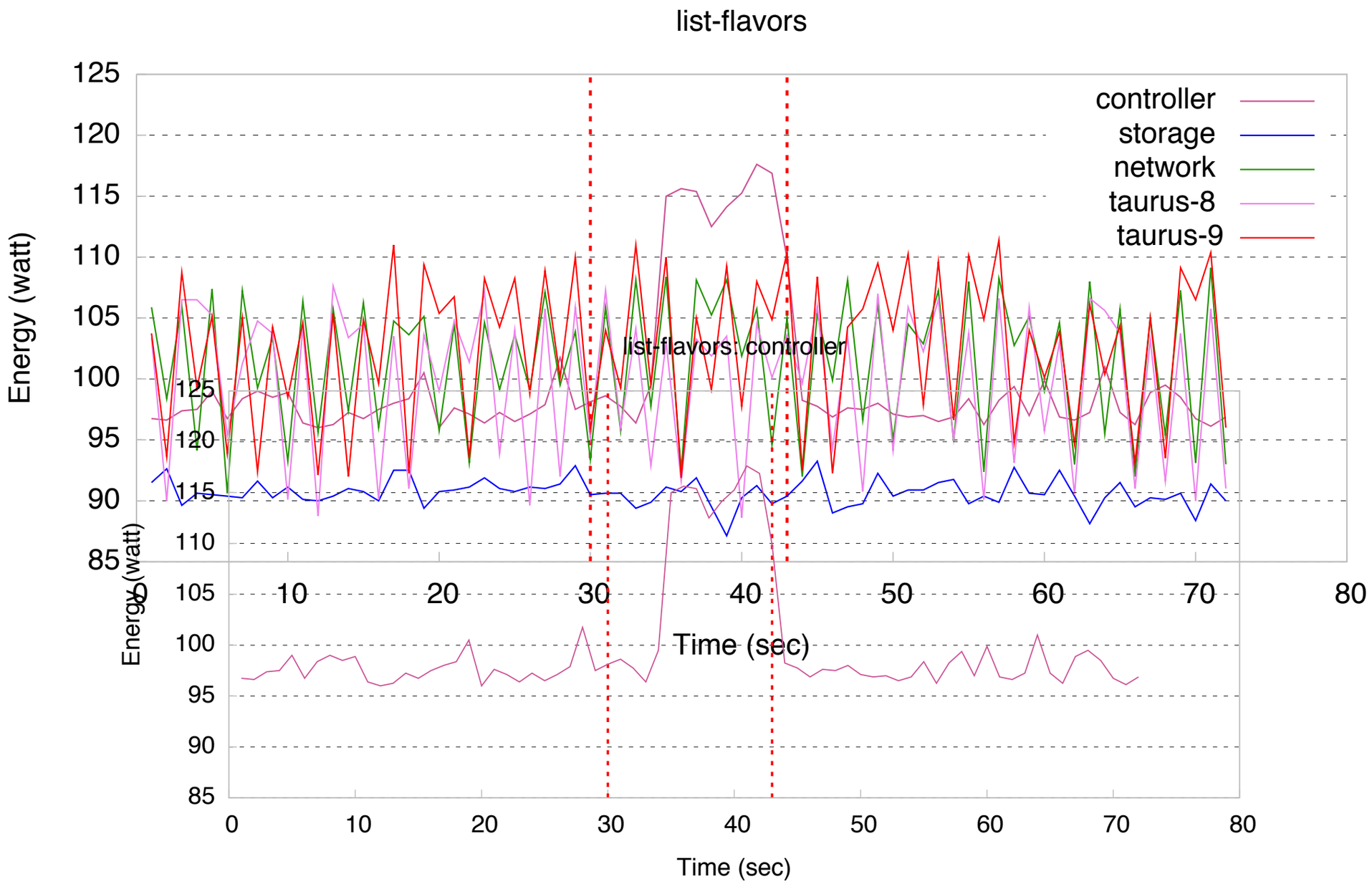
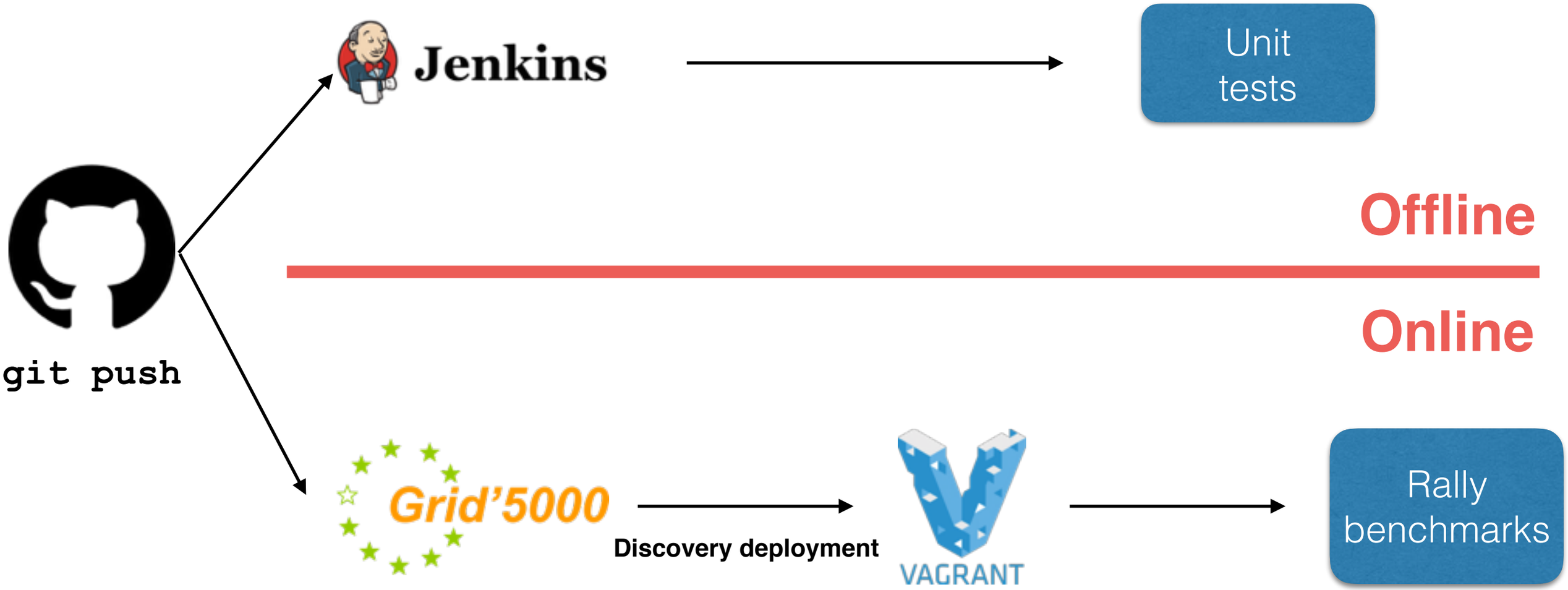


Continuous Integration

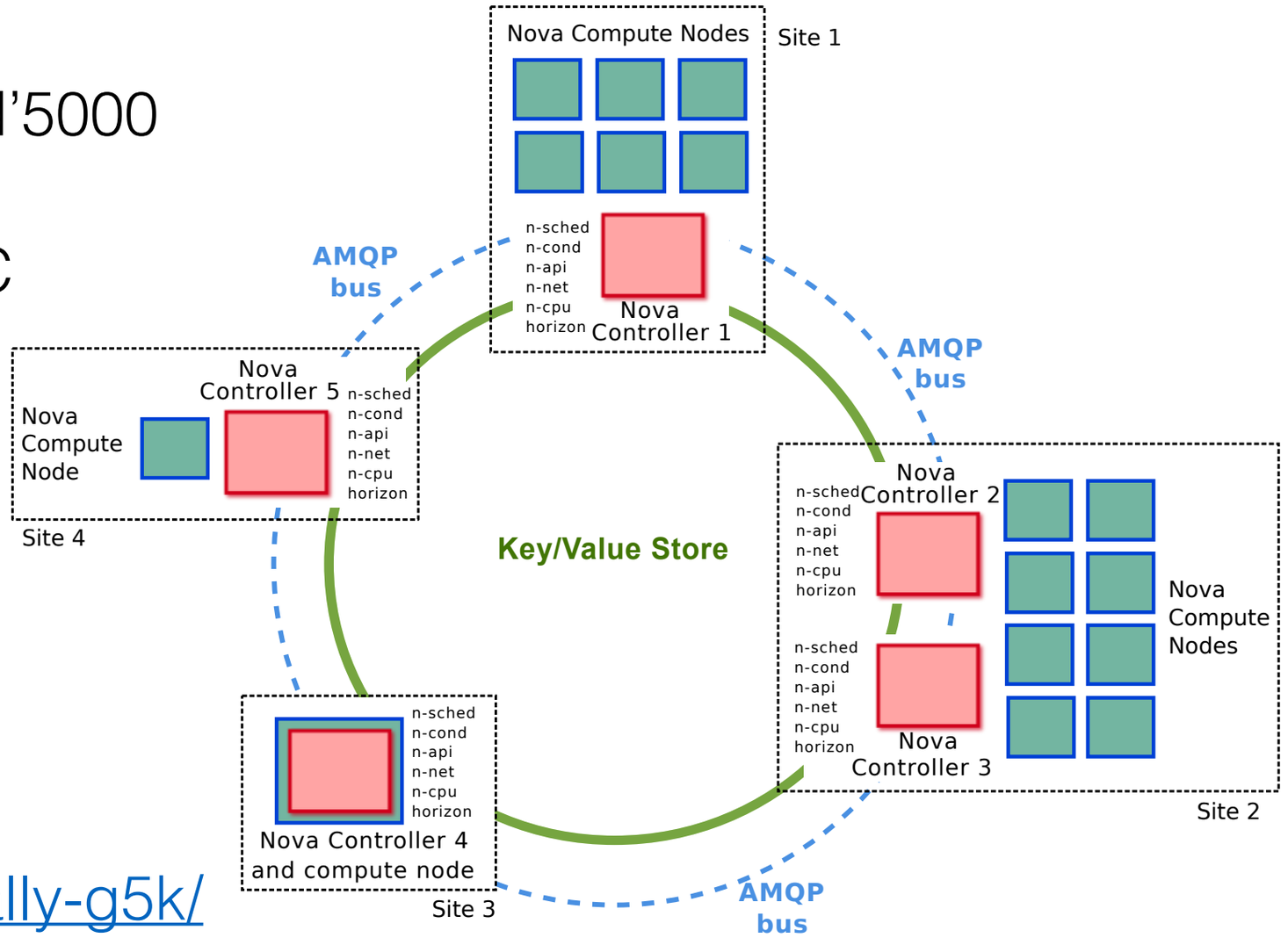


Performance evaluation

Current goal

- Multi-site deployment on Grid'5000
- Infrastructure tuning using TC
- 100 sites
- 5-10 compute nodes per site
- Inject load with Rally

http://github.com/asimonet/rally-g5k/



Performance evaluation

- Containerized deployment on Grid'5000 using Kolla
  - First test: 30 containerized nodes vs. 30 bare metal nodes
  - Our deployments:
    - 100 sites/1,000 compute nodes
    - Vanilla OpenStack
    - Discovery OpenStack
- Need to devise an experimental protocol
  - Boot n VMs on both deployments
  - What parameters? n=500; 1,000, 2,000?