

QoS in OpenStack with SDN

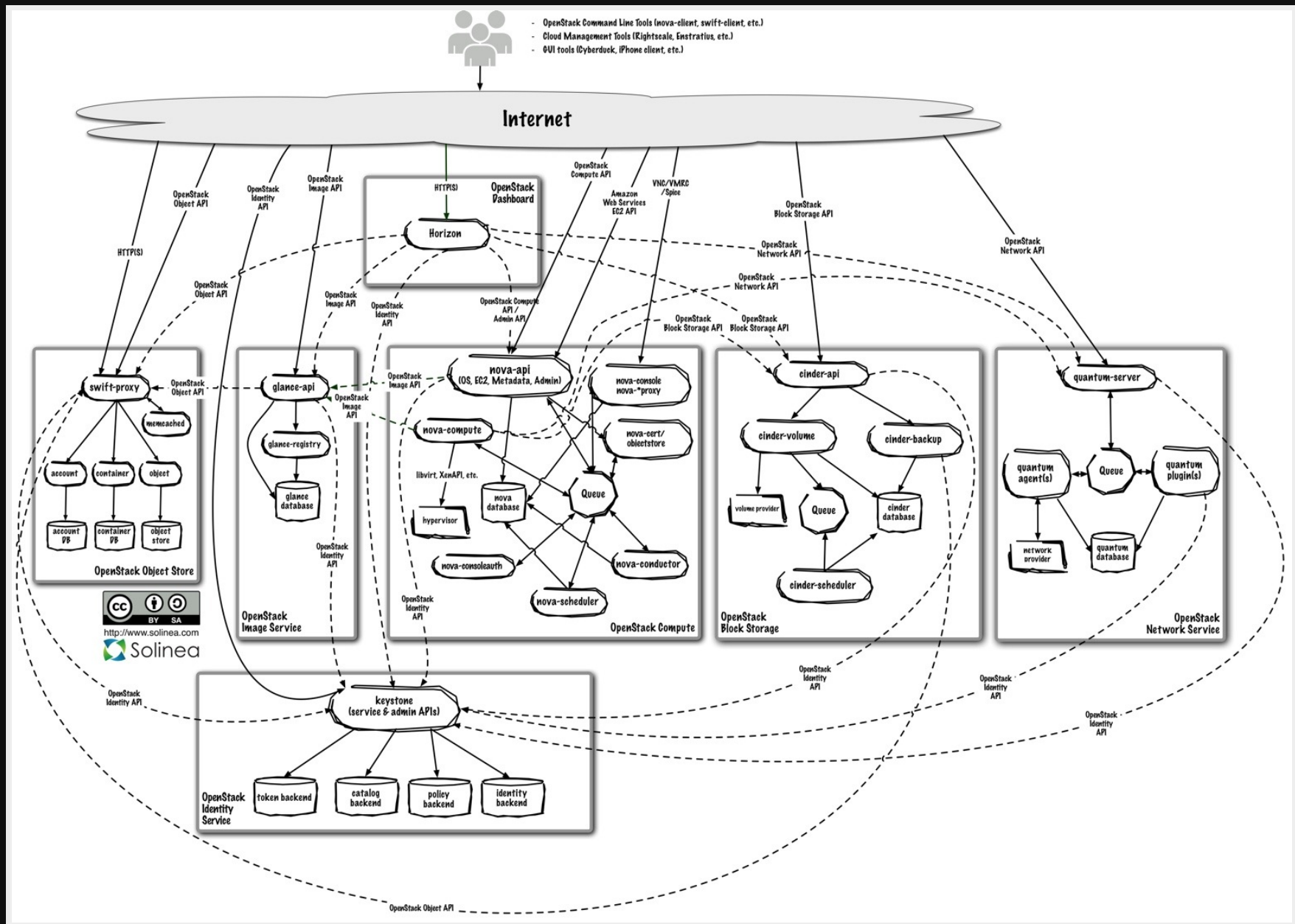
SDN Workshop (Group)

Philipp Aeschlimann - ICCLab Oct. 2013

What this talk is about



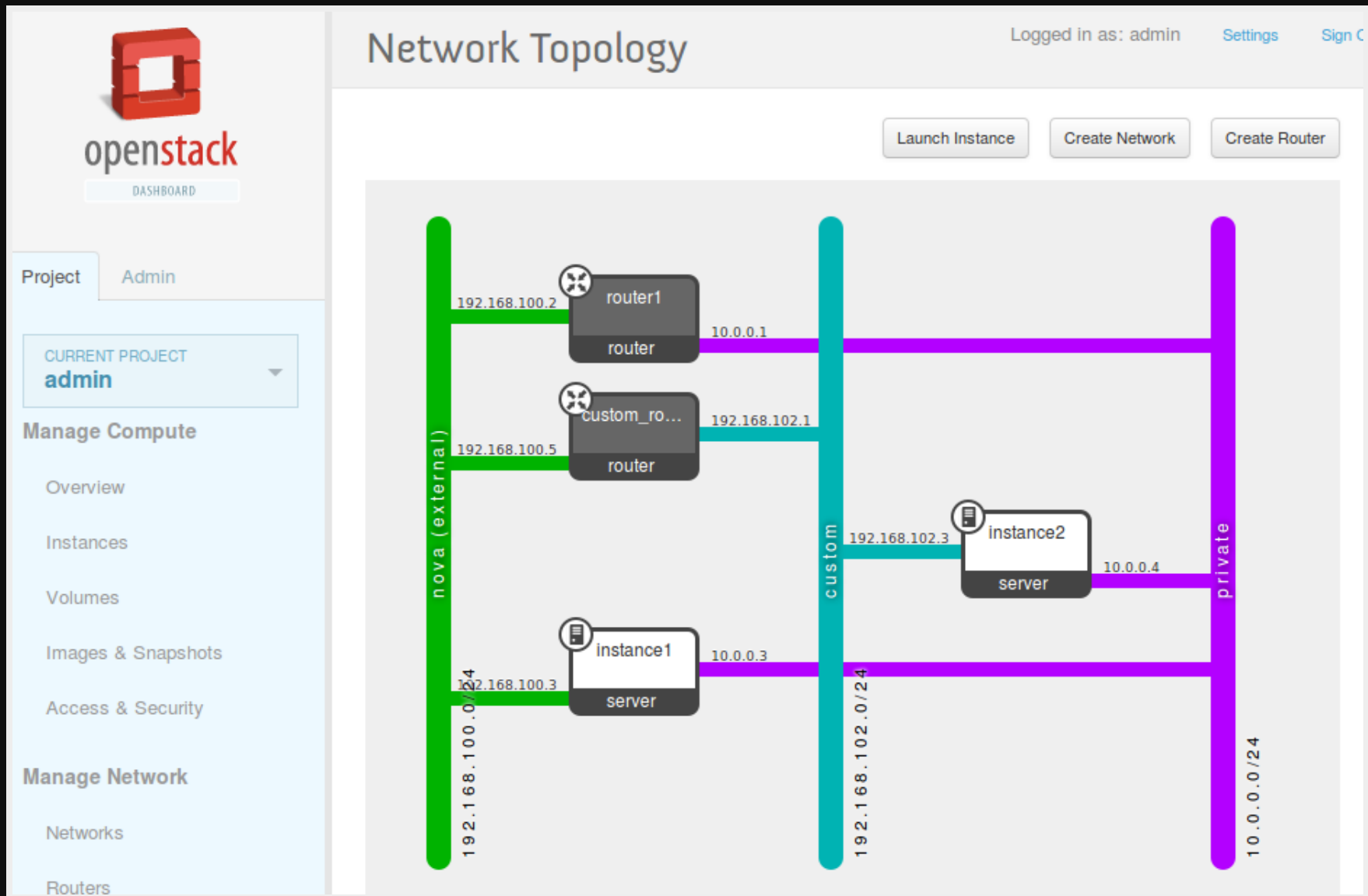
What this talk is about



Where OpenStack implements SDN

- OpenStack is the software used to provide cloud functionality
- The ultimate goal in OpenStack is isolation
 - isolate resources for every tenant
- SDN is used to offer NaaS to the tenant's
 - But it can also be an implementation based on Linux VLAN
- This "can" be done with the SDN paradigm
 - The enablement "can" be OpenFlow, but also e.g. Open vSwitch
- physical layer is not addressed

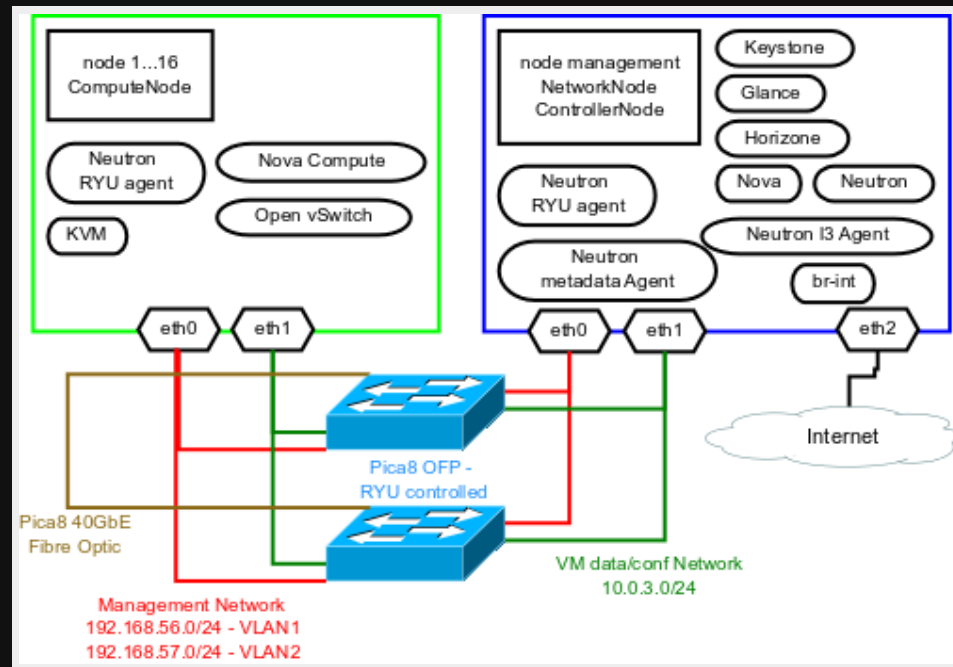
What is it - NaaS



Why do we want to control the physical network

- There will be new opportunities
 - Live migration of virtual machines
 - Monitoring tasks
 - Simplify the management of network devices
 - Change the network dynamically as alternative to live migration
 - Federated SDN or bring pieces of different data-centers together

Network Layout at the ICCLab



Virtual big-switch

- Making multiple switches looking as one has several advantages
- We don't care anymore, where a cable is connected
- We can exchange devices directly
- It makes monitoring more simple

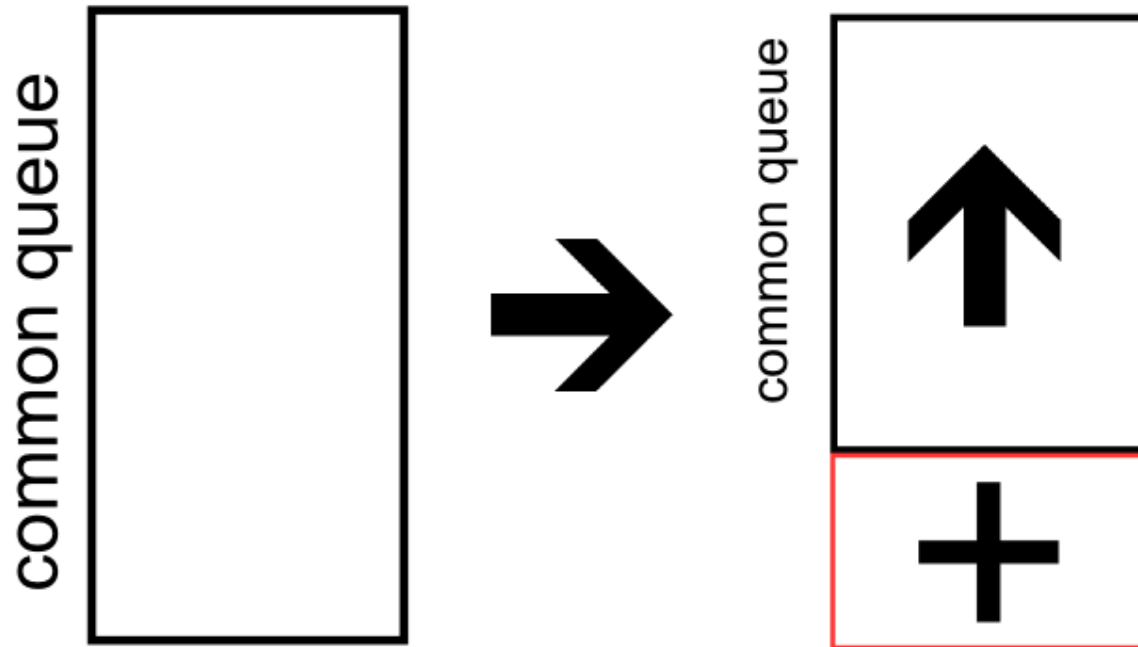
controlling the bandwidth

- QoS is always divided in two main goals:
 - service differentiation
 - how to identify traffic from youtube and a video call
 - performance assurance
 - how to actually assure the needed performance
- This brings us to SDN and OpenFlow as the enablement
 - service differentiation with OFP-match
 - performance assurance with OFP-meter-bands

controlling the bandwidth

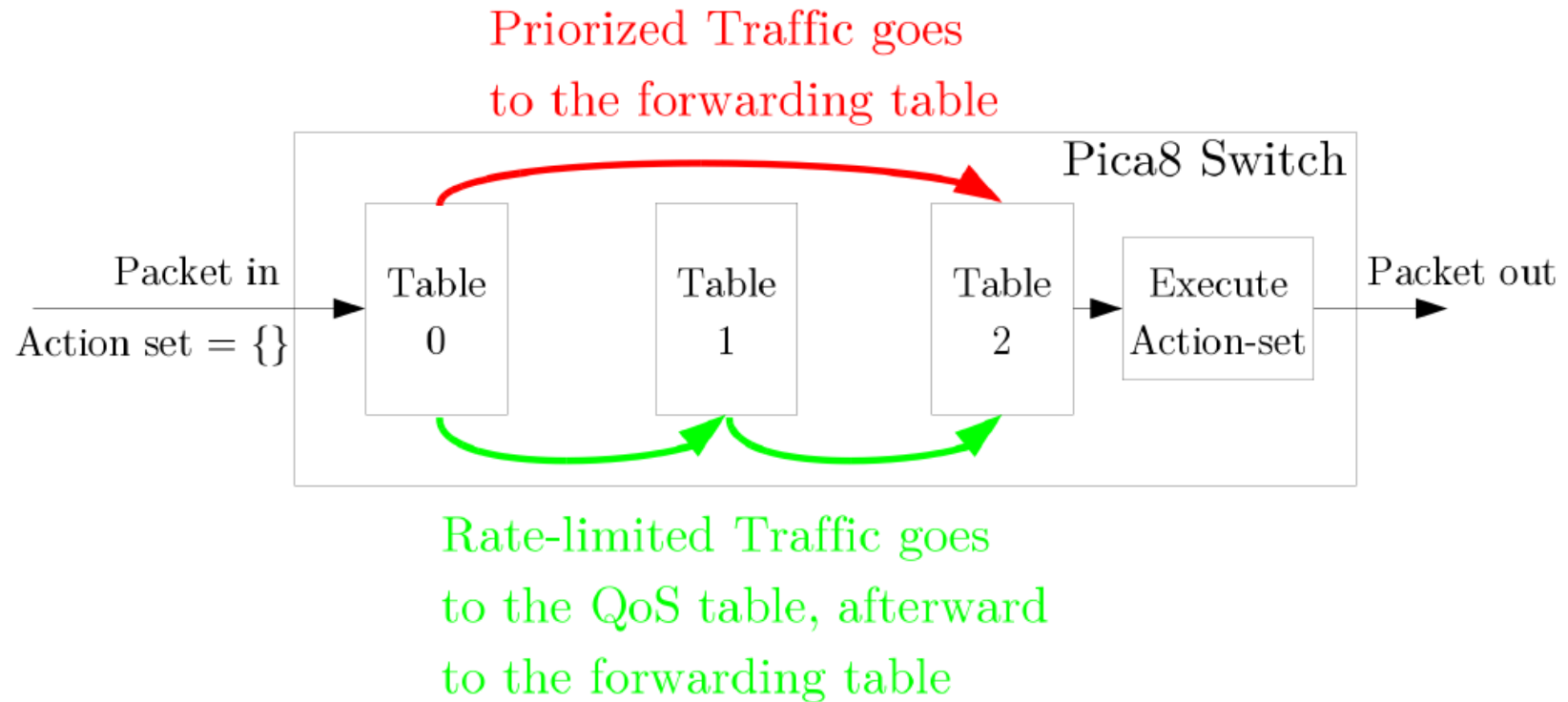
- Is made by percentage values
 - e.g. Reserve 5% of the total Bandwidth for my traffic
- Arranged in queues but not the OFP-queues!
 - OFP-queues are too static for use
 - General idea is based on rate-limiters
 - easy to use and simple mechanism
 - rate-limit all traffic and burst to the back-plane size if more bandwidth is available
 - the common-queue is always installed and rate-limits traffic to the backplane

controlling the bandwidth



resize the common queue and
add the new one

controlling the bandwidth



Future work

- Automatic resetting the backplane-size by monitoring value
- Automatic initial backplane-size by SNMP
- Experiments with different parameters in the cloud
- Using the REST-API from the QoS application by OpenStack monitoring
- Connecting RYU to the automated Framework

Questions/Discussion



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