

Quantum in Action !

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whoami

- ♦ EmilienM on IRC
- ♦ 25 old
- ♦ Student in Master Degree (Part time)
- ♦ **OpenStack Operator** at eNovance :
 - ♦ Maintain and manage eNoCloud (Public Cloud using OpenStack)
 - ♦ Building CloudWatt Cloud
 - ♦ OpenStack contributor (HA stuffs + doc)

whoami

- ♦ nijaba on IRC
- ♦ 44 old
- ♦ Part of the Ubuntu Cloud team since 2007
- ♦ Involved in **OpenStack** since its inception
 - ♦ Metering was missing from OpenStack
 - ♦ Proposed Ceilometer at Folsom summit
 - ♦ Ceilometer project lead since
 - ♦ Ceilometer is now an incubated project

Quantum in the IaaS*

IaaS Components

Compute

Storage

Networking

OpenStack Projects

Nova
(Virtual Machines)

Swift
(Object Storage)

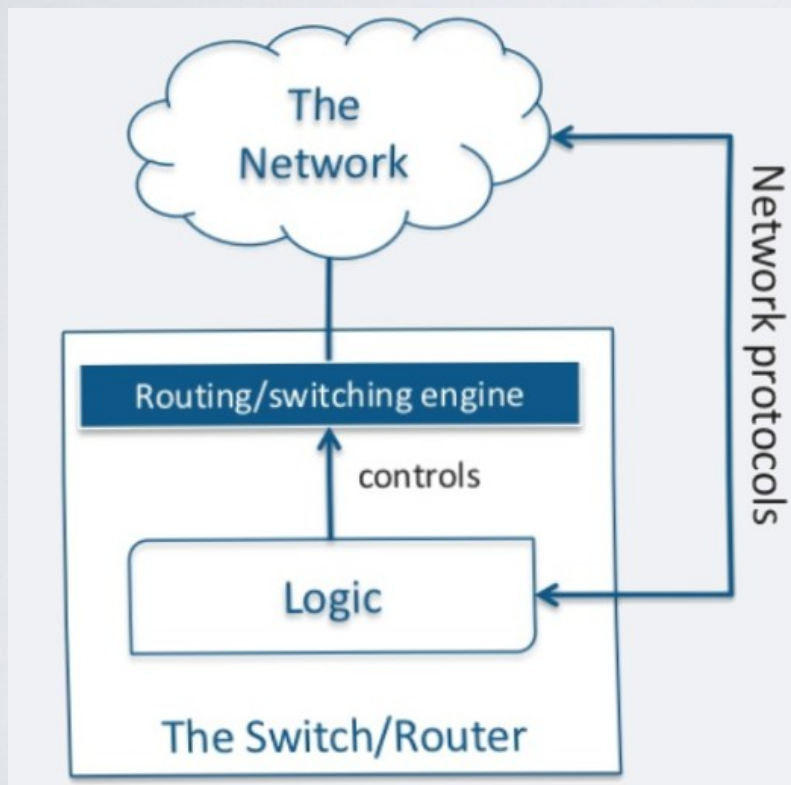
Cinder
(Block Storage)

Quantum
(Virtual Networking)

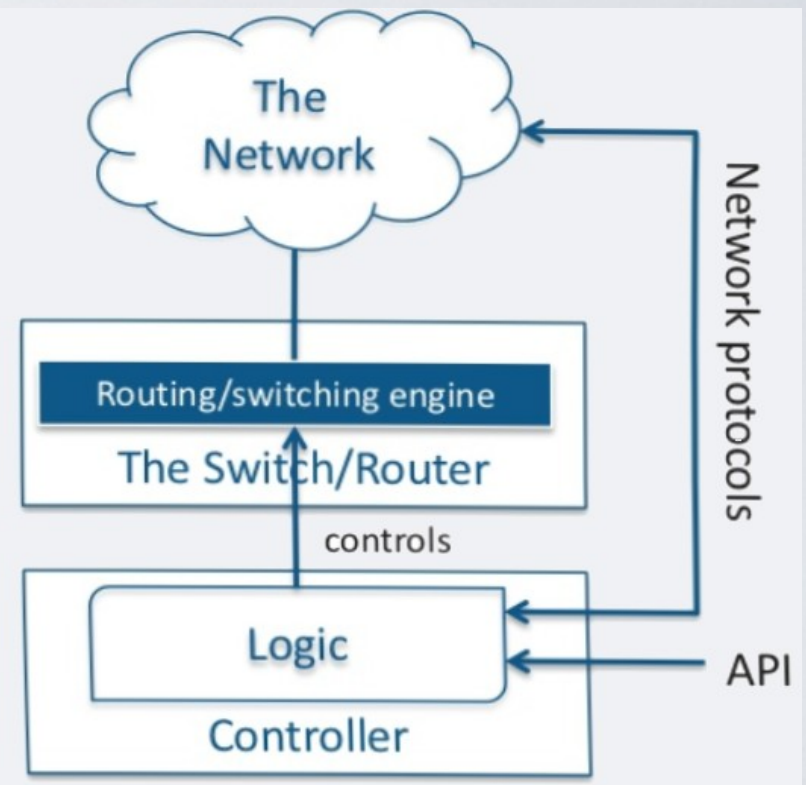
* Infrastructure as a Service

Hum. What is SDN* ?

Traditional Networking



SDN



* Software Defined Networking

Quantum & SDN

- ♦ Quantum is an API for building and managing networks with a plugin.
- ♦ Quantum **is NOT SDN** but transforms your Cloud in SDN with the right plugin.

What does Quantum provide ?

- ♦ API for Networking in OpenStack
- ♦ Nova Integration
- ♦ OSI Network Layers L2 + L3
- ♦ Decouples Logical / Tenant view of the network from Physical / Provider

Quantum Plugins*

Networking Solution	Company / Organization	License	Essex Reasy	Folsom ready
Floodlight	BigSwitch + Community	Apache 2.0	Yes	Not yet
BigSwitch Controller	BigSwitch	Commercial	Yes	Not yet
Midonet	Midokura	Commercial	Yes	Not yet
NVP	Nicira / VMware	Commercial	Yes	Yes
Open-vSwitch	Community	Apache 2.0	Yes	Yes
Cisco Nexus, UCS	Cisco	Commercial	Yes	Yes
Linux Bridge	Community	GPL	Yes	Yes
Trema with Sliceable Switch (OpenFlow)	NEC	Apache 2.0	Yes	Yes
Ryu OS	OSRG	Apache 2.0	Yes	Yes

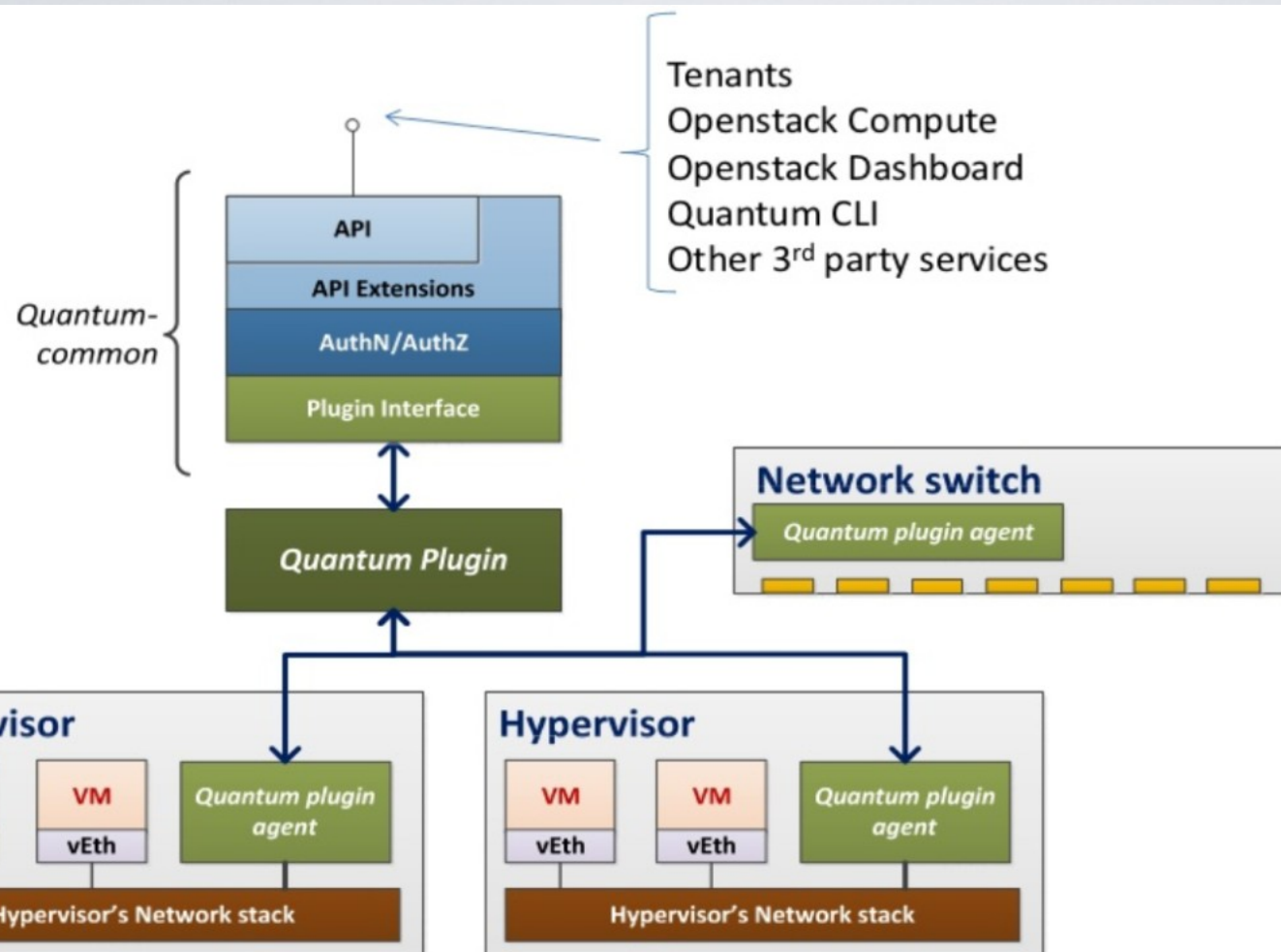
* co-written with Sebastien Han

Networking Features*

Networking Solution	L2 Isolation	L3 Features	HA	Firewall	QoS	IDS / IPS
Floodlight	OpenFlow	No	No	No	No	No
BigSwitch Controller	OpenFlow	No	Yes	Yes	No	No
Midonet	OVS Kernel	Yes	Yes	Yes	Yes	Yes
NVP	STT	Yes	Yes	Yes	Yes	Yes
Open-vSwitch	VLAN / GRE	Limited	No	Limited	Limited	No
Cisco Nexus, UCS	VXLAN	Yes	Yes	Yes	Yes	Yes
Linux Bridge	VLAN	No	No	No	No	No
Trema with Sliceable Switch (OpenFlow)	OpenFlow	No	Limited	Yes	Limited	No
Ryu OS	OpenFlow	No	No	No	No	No

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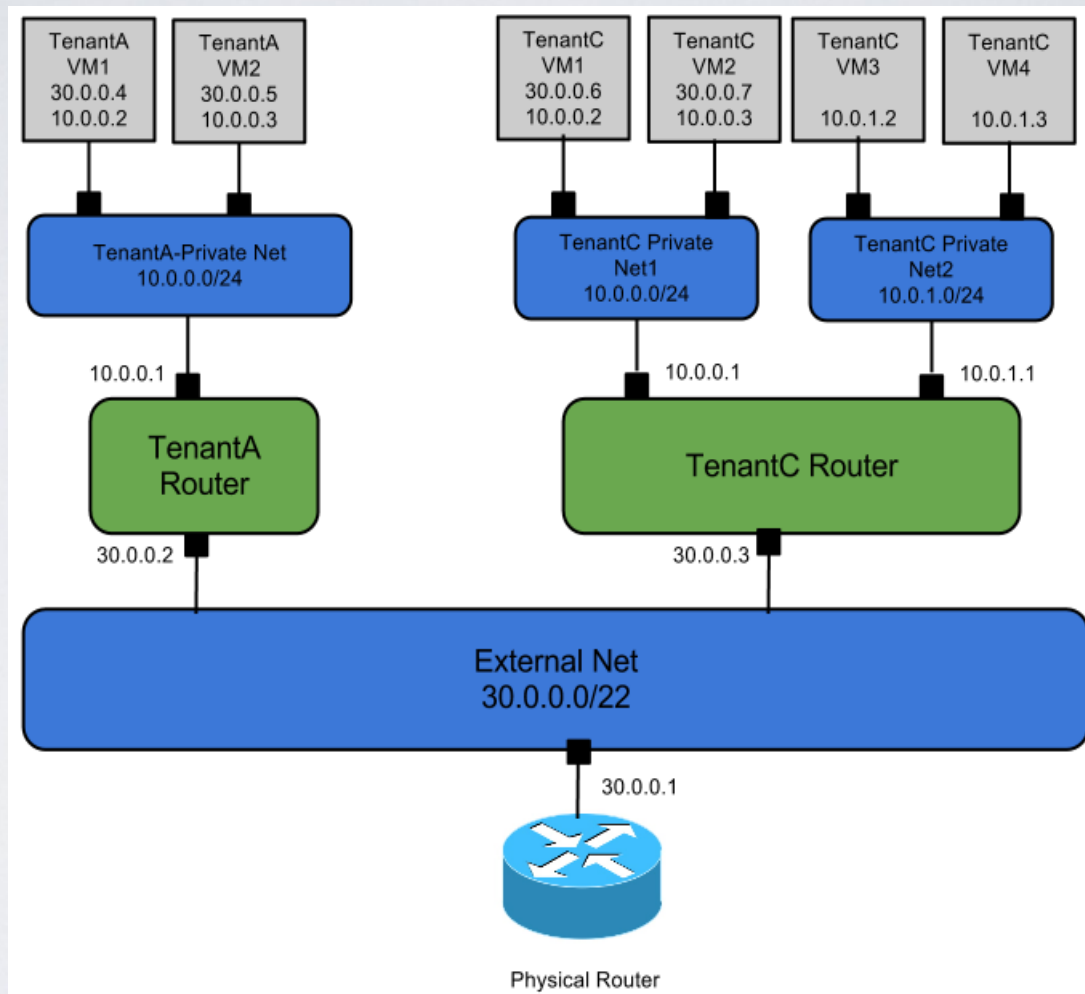
Quantum Architecture*



- ♦ API
- ♦ Extensions
- ♦ Plugin
- ♦ Plugin Agent
- ♦ L3 Agent
- ♦ DHCP Agent

* Designed by
Salvador Orlando

Use case : Per Tenant Routers



Limitations in Folsom

- Overlapping IPs don't work with Security Groups or Metadata Server
- No Multi-Host (→ so we have a SPOF)
- No IPV6 support for L3 Agent
- L3 agent supports limited scale for Quantum routers (MySQL issues)
- ZeroMQ and MetaPlugin support are experimental
- Horizon can't manage L3 (routers + floating IP)

What can we expect in Grizzly ?

- ♦ Load-Balancing as a Service API
- ♦ RPC for L3 Agent
- ♦ VIF Plugging Improvements
- ♦ More IPV6 features
- ♦ Metadata with Overlapping IPs
- ♦ Multiple queues support (with RabbitMQ)
- ♦ Multi-Host
- ♦ More Plugins (Hyper-V, Brocade, ...)

Quantum in Production !

- ♦ Public Clouds : RackSpace, Dreamhost
- ♦ Private Clouds : eBay
- ♦ eNovance : Soon.

For success you should :

- ♦ Choose the right plugin
- ♦ Use a Networking Controller
- ♦ Don't hack Quantum, just use Quantum API
- ♦ Be ready for SDN !

Future of Quantum

- We expect to have more and more features with plugins, and extend the API with **L4 → L7**.
- **New plugins** from **more constructors** : Brocade, Juniper... who's the next one ?
- More deployments in production

OpenStack WorkShop - Paris

- ♦ 20th December 2012
- ♦ Install Party (Keystone, Glance, Nova, Cinder, Quantum)
- ♦ Subscribe here : **<http://bit.ly/Stoo8E>**
- ♦ Led by eNovance

Questions ?

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