

# Installare e gestire OpenStack con Fuel su storage Fibre Channel

Deploy controllato di OpenStack tramite la distribuzione Mirantis Fuel  
utilizzando Fibre Channel come storage backend

**Paolo Velati - GARR**

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# OpenStack Automation

- Perché automatizzare e come?



- Cosa è Fuel?  
Perché lo abbiamo scelto?



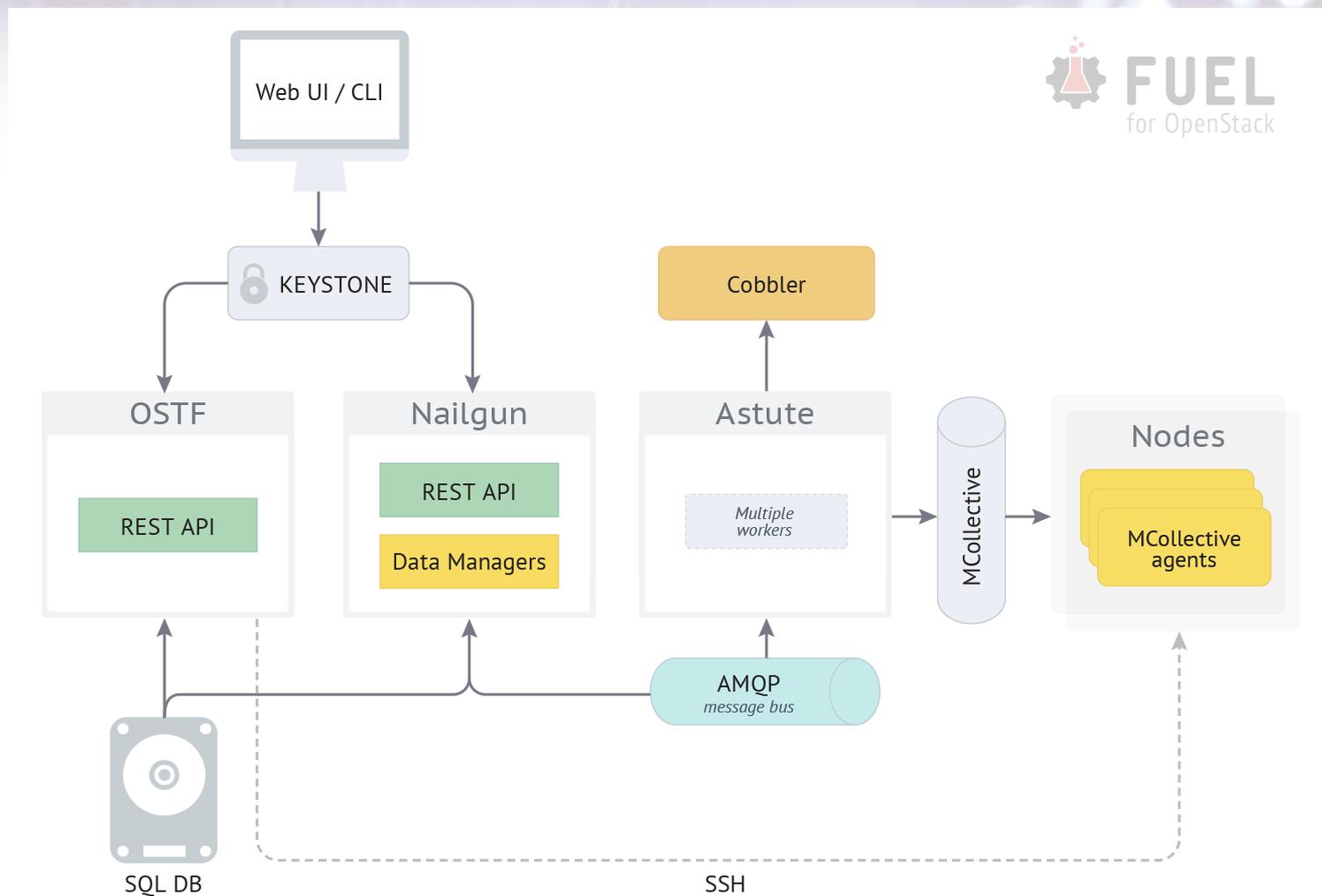
- Come funziona?

# Valore aggiunto con Fuel

- Servizi verticali: Murano, Sahara, HEAT, Ceilometer, ...
- Alta affidabilità e monitoring
- Espandibilità: astute, puppet,
- Estendibilità: Plugin per rete, monitoring, ...



# Distribuzione Mirantis Fuel



# Deploy con Fuel – Environment

## Definizione di una nuova installazione:

Create a new OpenStack environment

**Name and Release**

Name: Openstack-di-prova

OpenStack Release: Liberty on Ubuntu 14.04

By default, Fuel uploads the software packages for the Fuel Slave nodes from the external repositories. Please verify the Fuel Master node has the Internet connection. If the Fuel Master node does not have access to the Internet, you must create a local mirror with all required software packages and configure Fuel to use the mirror before you deploy an OpenStack environment.

This option will install the OpenStack Liberty packages using Ubuntu as a base operating system. With high availability features built in, you are getting a robust, enterprise-grade OpenStack deployment.

Cancel Prev Next

Create a new OpenStack environment

**Name and Release**

**Compute**

**Networking Setup**

Storage Backends

Additional Services

Finish

**Neutron with ML2 plugin** Framework that enables simultaneous utilization of the layer 2 networking technologies through drivers.

**Neutron with VLAN segmentation** Your network hardware must be configured for VLAN segmentation. This option supports up to 4095 networks.

**Neutron with tunneling segmentation** By default VXLAN tunnels will be used. This option supports millions of tenant data networks.

Cancel Prev Next

Create a new OpenStack environment

**Name and Release**

Compute

**Networking Setup**

**Storage Backends**

Additional Services

Finish

**Block Storage:**

**LVM** Use default storage providers

**Ceph** Use Ceph as backend for Cinder volumes

**Image Storage:**

**Ceph** Use Ceph as backend for Glance images

**Object Storage:**

**Ceph** Use Ceph as backend for Swift objects

**Ephemeral Storage:**

**Ceph** Use Ceph as backend for Nova

Cancel Prev Next

Create a new OpenStack environment

**Name and Release**

Compute

**Networking Setup**

Storage Backends

**Additional Services**

Finish

**Install Sahara** Sahara enables on demand provisioning of Hadoop clusters to be deployed on OpenStack utilizing a variety of vendor distributions.

**Install Murano** Murano is an application catalog, which allows application developers and cloud administrators to publish various cloud-ready applications in a browsable categorized catalog, which may be used by the cloud users (including the inexperienced ones) to pick-up the needed applications and services and composes the reliable environments out of them in a "push-the-button" manner.

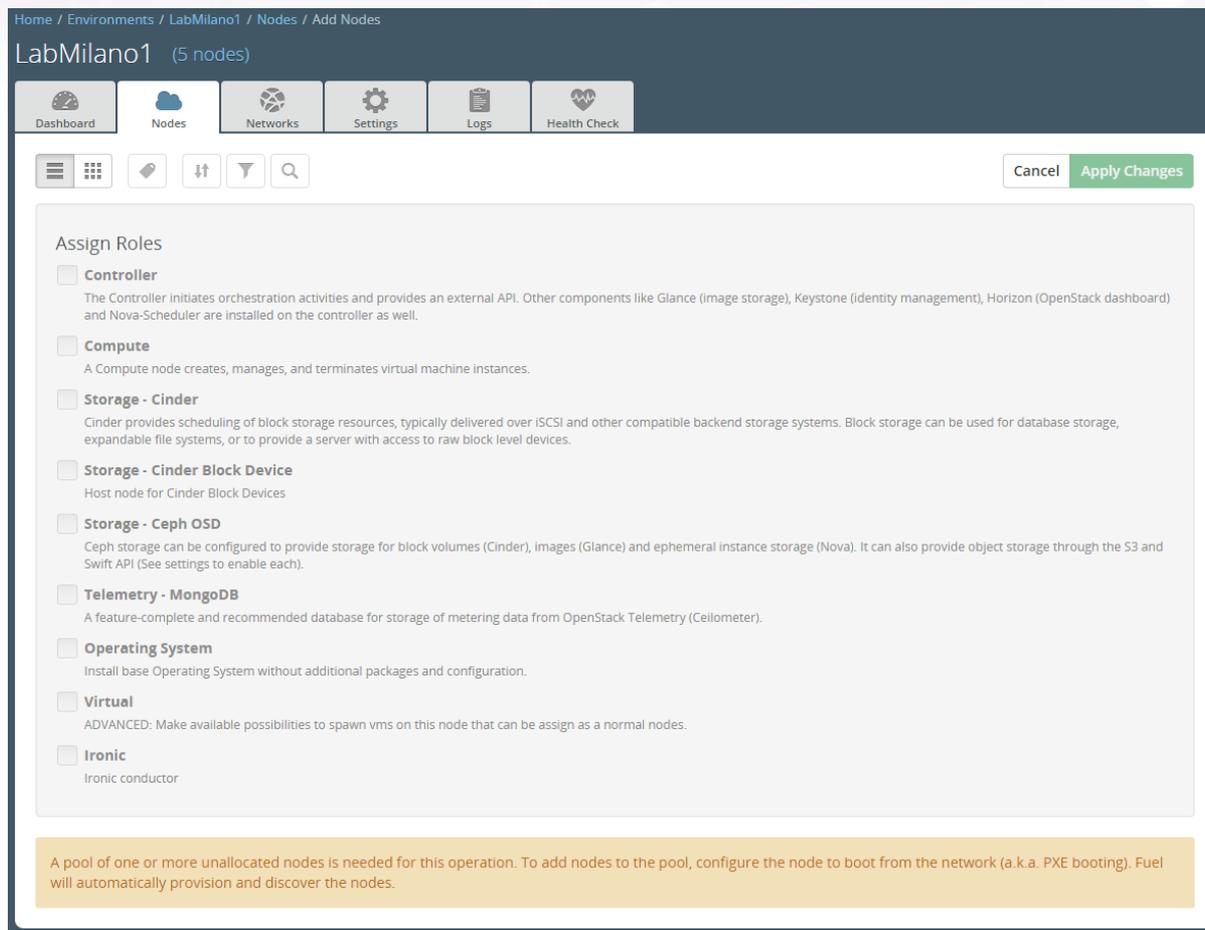
**Install Ceilometer (OpenStack Telemetry)** Ceilometer provides metering and monitoring of an OpenStack cloud.

**Install Ironic** Ironic enables baremetal provisioning.

Cancel Prev Next

# Deploy con Fuel – Ruoli

## Assegnazione ruoli:



The screenshot shows the Fuel web interface for a node pool named 'LabMilano1' (5 nodes). The breadcrumb trail is 'Home / Environments / LabMilano1 / Nodes / Add Nodes'. The main navigation bar includes 'Dashboard', 'Nodes', 'Networks', 'Settings', 'Logs', and 'Health Check'. Below the navigation bar, there are icons for a menu, a node, a refresh, a filter, and a search, along with 'Cancel' and 'Apply Changes' buttons.

**Assign Roles**

- Controller**  
The Controller initiates orchestration activities and provides an external API. Other components like Glance (image storage), Keystone (Identity management), Horizon (OpenStack dashboard) and Nova-Scheduler are installed on the controller as well.
- Compute**  
A Compute node creates, manages, and terminates virtual machine instances.
- Storage - Cinder**  
Cinder provides scheduling of block storage resources, typically delivered over iSCSI and other compatible backend storage systems. Block storage can be used for database storage, expandable file systems, or to provide a server with access to raw block level devices.
- Storage - Cinder Block Device**  
Host node for Cinder Block Devices
- Storage - Ceph OSD**  
Ceph storage can be configured to provide storage for block volumes (Cinder), images (Glance) and ephemeral instance storage (Nova). It can also provide object storage through the S3 and Swift API (See settings to enable each).
- Telemetry - MongoDB**  
A feature-complete and recommended database for storage of metering data from OpenStack Telemetry (Ceilometer).
- Operating System**  
Install base Operating System without additional packages and configuration.
- Virtual**  
ADVANCED: Make available possibilities to spawn vms on this node that can be assign as a normal nodes.
- Ironic**  
Ironic conductor

A pool of one or more unallocated nodes is needed for this operation. To add nodes to the pool, configure the node to boot from the network (a.k.a. PXE booting). Fuel will automatically provision and discover the nodes.

# Deploy con Fuel – Storage / Eth

Modifiche alla configurazione delle interfacce di rete e dello storage:

OpenStack-1 Cosenza (15 nodes)

Disks configuration of 3 nodes

sda (disk/by-path/pci-0000:02:00.0-0:0:0) Total Space : 0.3 TB

Base System	Logs	Mysql Database
60.5 GB	95.7 GB	121.9 GB

Back To Node List

OpenStack-1 Cosenza (15 nodes)

Disks configuration of 9 nodes

sda (disk/by-path/pci-0000:02:00.0-0:0:0) Total Space : 0.3 TB

Base System	Ceph	Virtual Storage
58.6 GB	156.2 GB	63.5 GB

Back To Node List

OpenStack-1 Cosenza (15 nodes)

Disks configuration of 3 nodes

sda (disk/by-path/pci-0000:00:10.0-0:0:0) Total Space : 127.4 GB

Base System	MongoDB
33.7 GB	73.7 GB

sdb (disk/by-path/pci-0000:00:10.0-0:0:1) Total Space : 0.3 TB

MongoDB
0.3 TB

sdc (disk/by-path/pci-0000:00:10.0-0:0:2) Total Space : 0.3 TB

MongoDB
0.3 TB

Back To Node List

OpenStack-1 Cosenza (15 nodes)

Interfaces configuration of 3 nodes

bond0 LACP Rate: Fast Xmit Hash Policy: layer3-4 Mode: 802.3ad(LACP)

eth1 Speed: 10.0 Gbps Public VLAN ID: 401 Storage VLAN ID: 201 Management VLAN ID: 203 Private VLAN ID: 202

eth2 Speed: 10.0 Gbps

eth3 Speed: 10.0 Gbps

Offloading Modes: Default MTU: 9000

eth0 Speed: 10.0 Gbps Admin (PXE)

Offloading Modes: Default MTU: Default

Back To Node List

OpenStack-1 Cosenza (15 nodes)

Interfaces configuration of 3 nodes

eth0 Speed: N/A Admin (PXE)

Offloading Modes: Default MTU: Default

eth1 Speed: N/A Storage VLAN ID: 201

Offloading Modes: Default MTU: Default

eth2 Speed: N/A Private VLAN ID: 202

Offloading Modes: Default MTU: Default

eth3 Speed: N/A Management VLAN ID: 203

Offloading Modes: Default MTU: Default

eth4 Speed: N/A Public VLAN ID: 401

Offloading Modes: Default MTU: Default

Back To Node List



# Deploy con Fuel – Conf Rete

## Definizione delle configurazioni di rete:

Network Settings (Neutron with tunneling segmentation) Add New Node Network Group

**Node Network Groups**

default  
This node network group uses a shared admin network and cannot be deleted

**Public**

This public network allows inbound connections to VMs (Controllers and Tenant VMs) from external networks (e.g., the Internet) as well as outbound connections from VMs to the external networks.

**Settings**

Neutron L2

Neutron L3

Other

**Network Verification**

Connectivity Check

Use VLAN tagging  171

**Storage**

The Storage network is used to provide storage services such as replication traffic from Ceph. The Management network is used for Ceph Public traffic.

Use VLAN tagging

Network Settings (Neutron with tunneling segmentation) Add New Node Network Group

**Node Network Groups**

default

**Settings**

Neutron L2

Neutron L3

Other

**Network Verification**

Connectivity Check

**Neutron L2 Configuration**

Neutron supports different types of network segmentation such as VLAN, GRE, VXLAN etc. This section is specific to a tunneling segmentation related parameters such as Tunnel ID ranges for tenant separation and the Base MAC address.

**Start** **End**

Tunnel ID range: 2 65535

Base MAC address: fa:16:3e:00:00:00

Network Settings (Neutron with tunneling segmentation) Add New Node Network Group

**Node Network Groups**

default

**Settings**

Neutron L2

Neutron L3

Other

**Network Verification**

Connectivity Check

**Public network assignment**

Assign public network to all nodes  
When disabled, public network will be assigned to controllers only

**Neutron Advanced Configuration**

Neutron L2 population  
Enable L2 population mechanism in Neutron

Neutron DVR  
Enable Distributed Virtual Routers in Neutron

Neutron L3 HA  
Enable High Availability features for Virtual Routers in Neutron  
Requires at least 2 Controller nodes to function properly

Network Settings (Neutron with tunneling segmentation) Add New Node Network Group

**Node Network Groups**

default

**Settings**

Neutron L2

Neutron L3

Other

**Network Verification**

Connectivity Check

**Floating Network Parameters**

This network is used to assign Floating IPs to tenant VMs.

**Start** **End**

Floating IP range: 90 90

Floating network name: admin\_floating\_net

**Internal Network Parameters**

The Internal network connects all OpenStack nodes in the environment. All components of an OpenStack environment communicate with each other using this network.

Internal network CIDR: 192.168.111.0/24

Internal network gateway: 192.168.111.1

Internal network name: admin\_internal\_net

**Guest OS DNS Servers**

This setting is used to specify the upstream name servers for the environment. These servers will be used to forward DNS queries for external DNS names to DNS servers outside the environment.

Guest OS DNS Servers: 90, 193, 193

# Deploy con Fuel – Conclusioni

- Verifica configurazione di rete prima del deploy

Network Settings (Neutron with tunneling segmentation) Add New Node Network Group

Node Network Groups

- default

Settings

- Neutron L2
- Neutron L3
- Other

Network Verification

- Connectivity Check**



**Connectivity Check**

Network verification checks the following:

1. L2 connectivity checks between nodes in the environment.
2. DHCP discover check on all nodes.
3. Repository connectivity check from the Fuel Master node.
4. Repository connectivity check from the Fuel Slave nodes through the public & admin (PXE) networks.

Verify Networks

- Avvio del deploy
- Health check funzionale
  - Verifica di ogni componente
  - Test HA

Home / Environments / LabMilano1 / Health Check

LabMilano1 (5 nodes)

Dashboard Nodes Networks Settings Logs Health Check

### OpenStack Health Check

Select All Provide credentials Run Tests

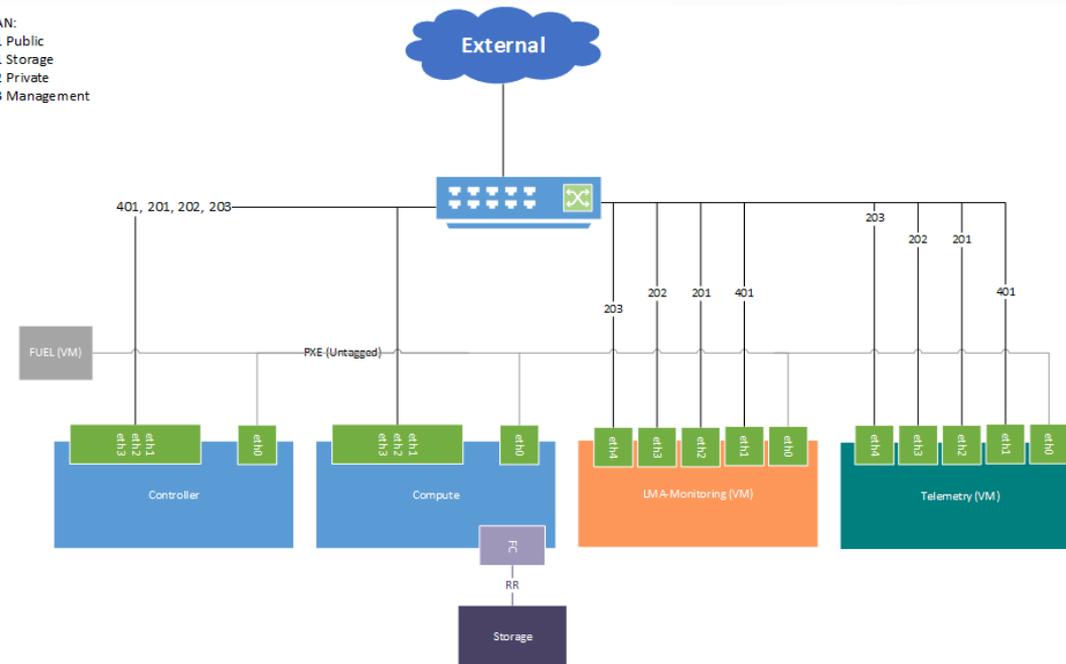
	Expected Duration	Actual Duration	Status
<input type="checkbox"/> <b>Sanity tests. Duration 30 sec - 2 min</b>			
<input type="checkbox"/> Cellometer test to list meters, alarms, resources and events	180 s.	1.5	✓
<input type="checkbox"/> Request flavor list	20 s.	0.2	✓
<input type="checkbox"/> Request image list using Nova	20 s.	0.3	✓
<input type="checkbox"/> Request instance list	20 s.	0.1	✓
<input type="checkbox"/> Request absolute limits list	20 s.	0.0	✓
<input type="checkbox"/> Request snapshot list	20 s.	0.7	✓
<input type="checkbox"/> Request volume list	20 s.	0.1	✓
<input type="checkbox"/> Request image list using Glance v1	10 s.	0.0	✓
<input type="checkbox"/> Request image list using Glance v2	10 s.	0.0	✓
<input type="checkbox"/> Request stack list	20 s.	0.0	✓
<input type="checkbox"/> Request active services list	20 s.	0.2	✓
<input type="checkbox"/> Request user list	20 s.	0.1	✓

# Openstack Fuel @ Progress CS

The screenshot shows the Openstack Fuel dashboard with the following sections:

- Controller (3):** Three controller nodes (Slot02, Slot04, Slot03) are listed as READY with 2 CPUs, 1 HDD, 0.3 TB RAM, and 384.0 GB.
- Compute, Storage - Ceph OSD (9):** Nine compute nodes (Slot08, Slot13, Slot06, Slot12, Slot05, Slot07, Slot10, Slot09, Slot11) are listed as READY with 2 CPUs, 1 HDD, 0.3 TB RAM, and 384.0 GB.
- Telemetry - MongoDB (3):** Three VM nodes (VM - Telemetry02, VM - Telemetry01, VM - Telemetry03) are listed as READY with 1 CPU, 1 HDD, 0.8 TB RAM, and 32.0 GB.

VLAN:  
401 Public  
201 Storage  
202 Private  
203 Management

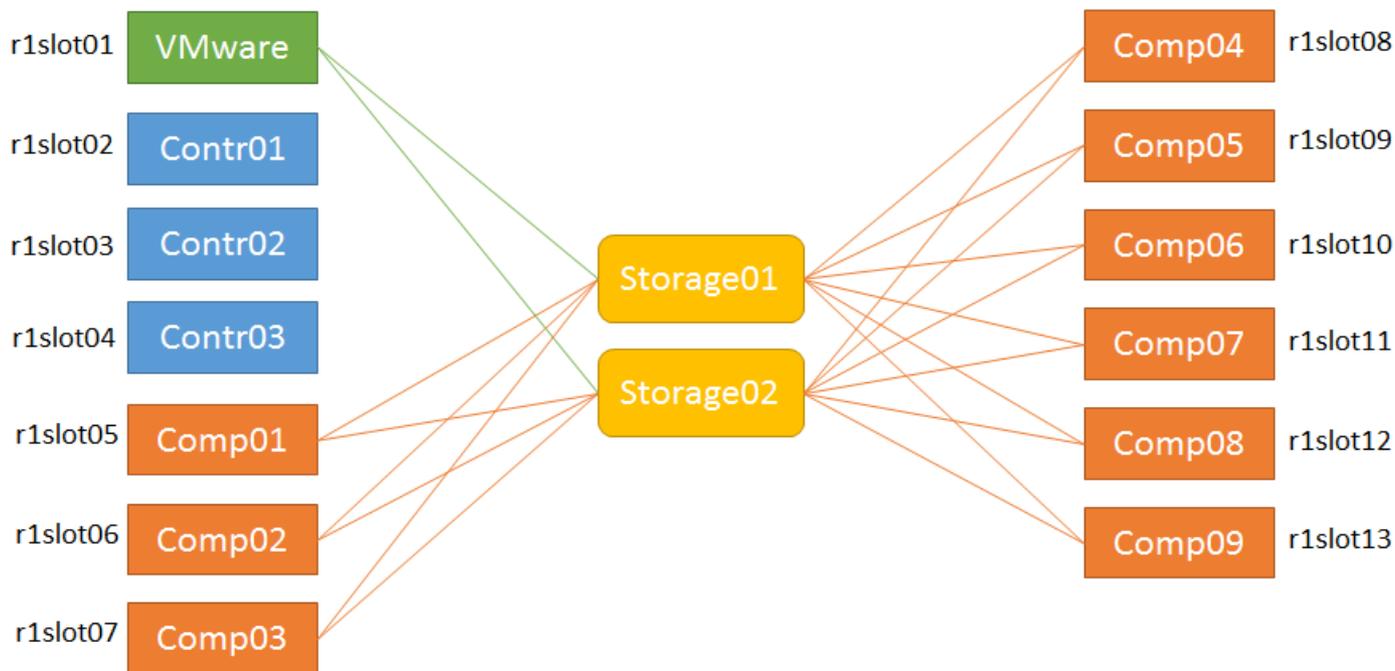


# Fibre Channel + OpenStack

- Oltre piccoli problemi di configurazione
- FC perfetto per la virtualizzazione
  - cloud != virtualizzazione
- FC verticale vs storage backend orizzontale
  - (SAN vs CEPH)

# Fibre Channel + OpenStack

Come abbiamo coniugato efficienza FC  
con flessibilità dello storage cloud?



# Fibre Channel + Fuel

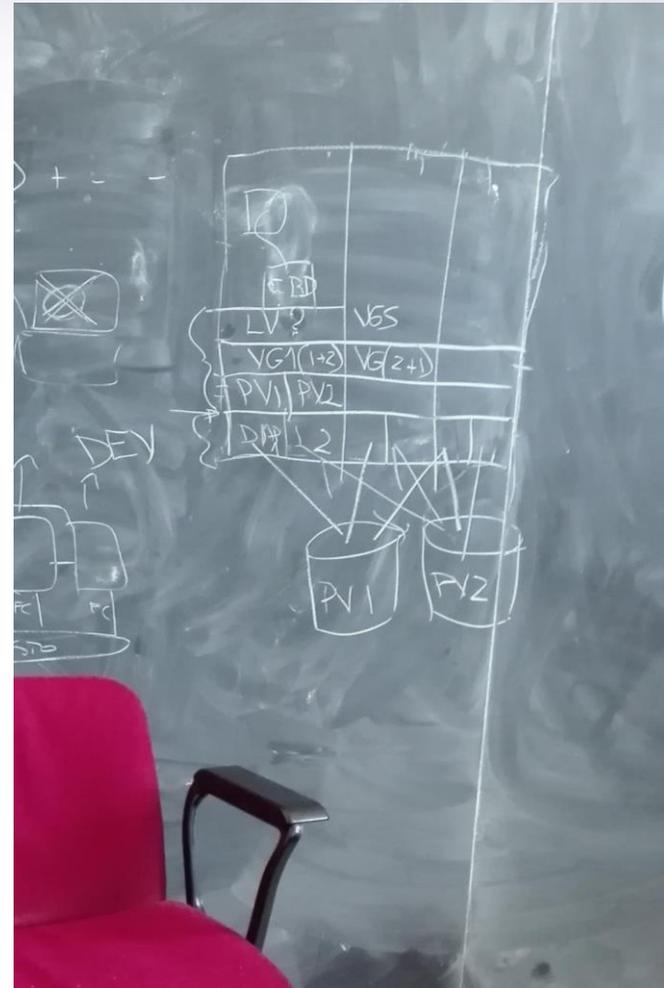
Come evolveremo:

OpenStack Fuel @ NA

FC condivisa direttamente senza  
mediazione da parte di Ceph

Come Fuel evolverà:

- Supporto nativo di FC con multipath
- Maggiore modularità per servizi verticali
- Supporto ufficiale da parte dei vendor



# Keyword di riferimento

- [Fuel](#)
- [Fuel plugin](#)
- [Script per deploy Fuel 8.0 locale su VirtualBox](#)
- [Docs Fuel e Demo](#)
- [Sviluppo di Plugin per Fuel](#)
- [Fix per FC e multipath](#)