



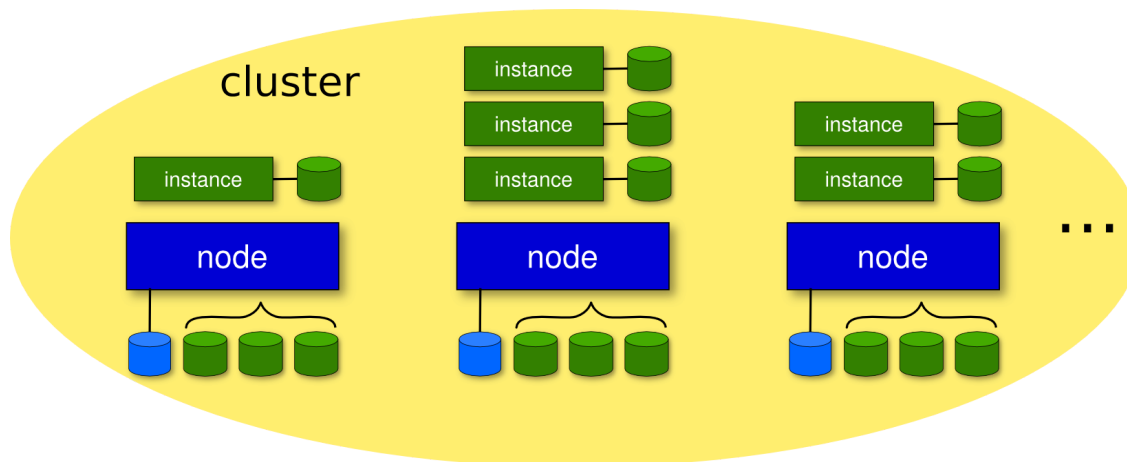
# Ganeti

Private Cloud as Google does it

- Helga Velroyen <helgav@google.com>
- Linuxtag Berlin, May 9th, 2014

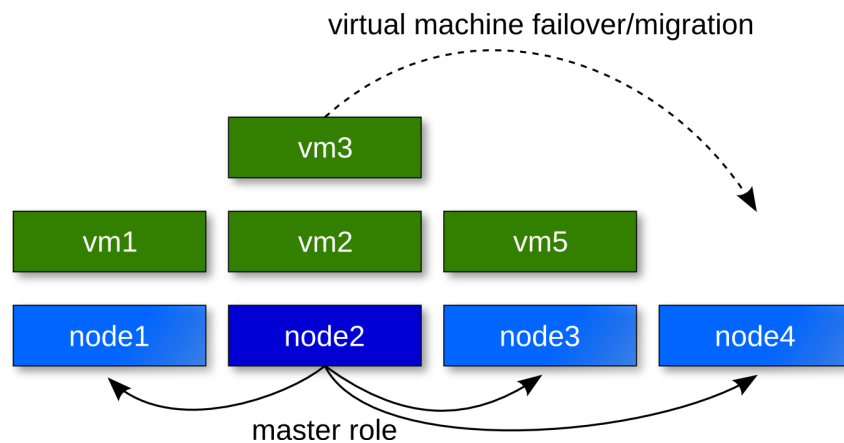
# A Ganeti Cluster

- Instance: a virtualization guest
- Node: a virtualization host
- Nodegroup: a homogeneous set of nodes
- Cluster: a set of nodes, managed as a collective, partitioned by nodegroups



# What can it do?

- Manage clusters of physical machines
- Deploy virtual machines on them
  - Resiliency to failure (distributed storage)
  - Live migration
  - Ease of repairs and hardware swaps
  - Cluster balancing



# Ideas

- Interact with the cluster as an entity, instead of the individual machines.
- Making the virtualization entry level as low as possible
  - Easy to install/manage
  - Lightweight (no "expensive" dependencies)
  - No specialized hardware needed (eg. SANs)
  - Start small, grow big
- Scale to enterprise ecosystems
  - Manage simultaneously from 1 to ~200 host machines
  - Access to advanced features (distributed storage, live migration, cluster balancing)

# Technologies

- Linux and standard utils (iproute2, bridge-utils, ssh)
- Hypervisors:
  - Xen, KVM, LXC
- Storage:
  - DRBD, LVM, file, distributed storage, Ceph/Gluster
- Programming languages:
  - Python, Haskell



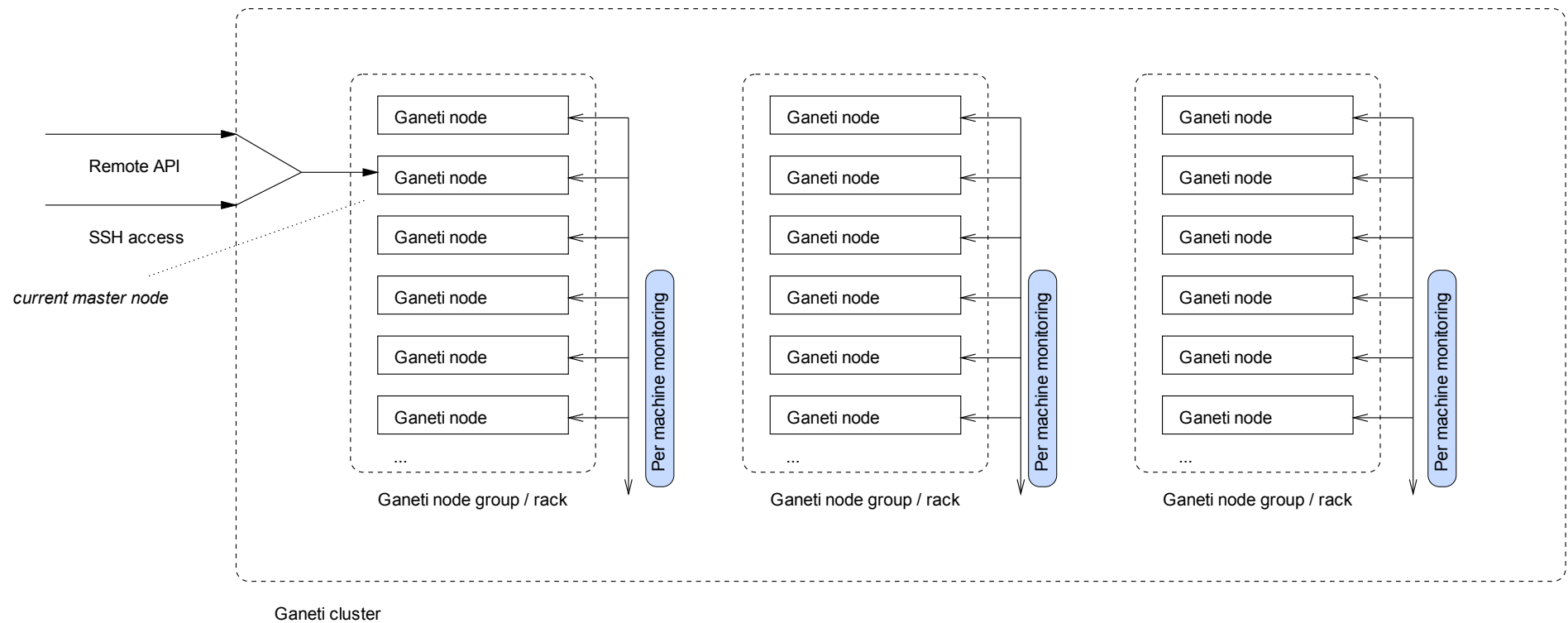
# Controlling Ganeti

- Command line (\*)
- RAPI (Rest-full http interface) (\*)
- Webinterfaces:
  - [Ganeti Web manager](#), aiming for admins, but includes "self-service management" for users
  - [ganetimgr web manager](#), simplified multicluster web manager for end users
  - [Synnefo](#), complete cloud service solution, OpenStack API compatible

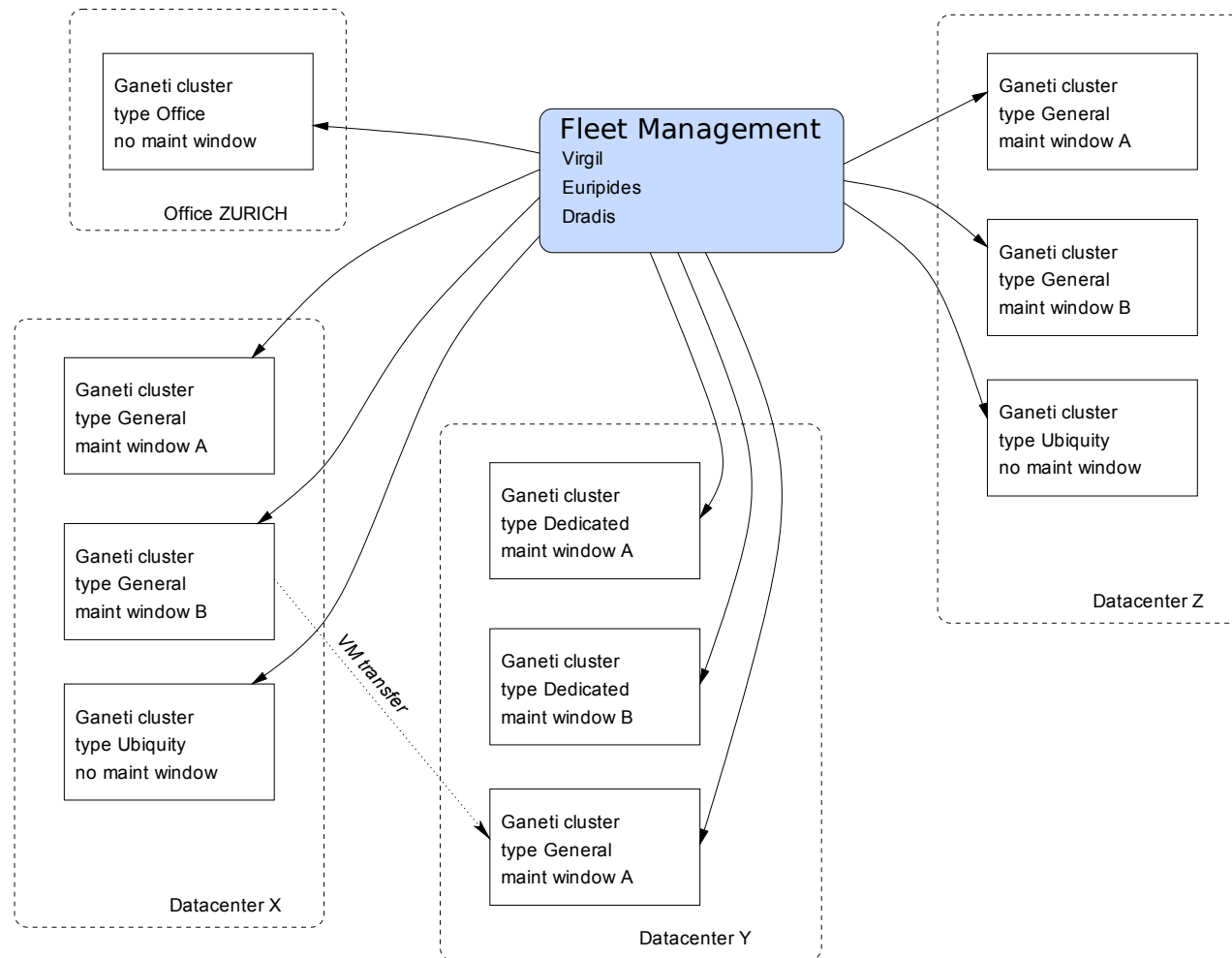
(\*) Programmable interfaces

# Production cluster

As we use it in a Google Datacentre

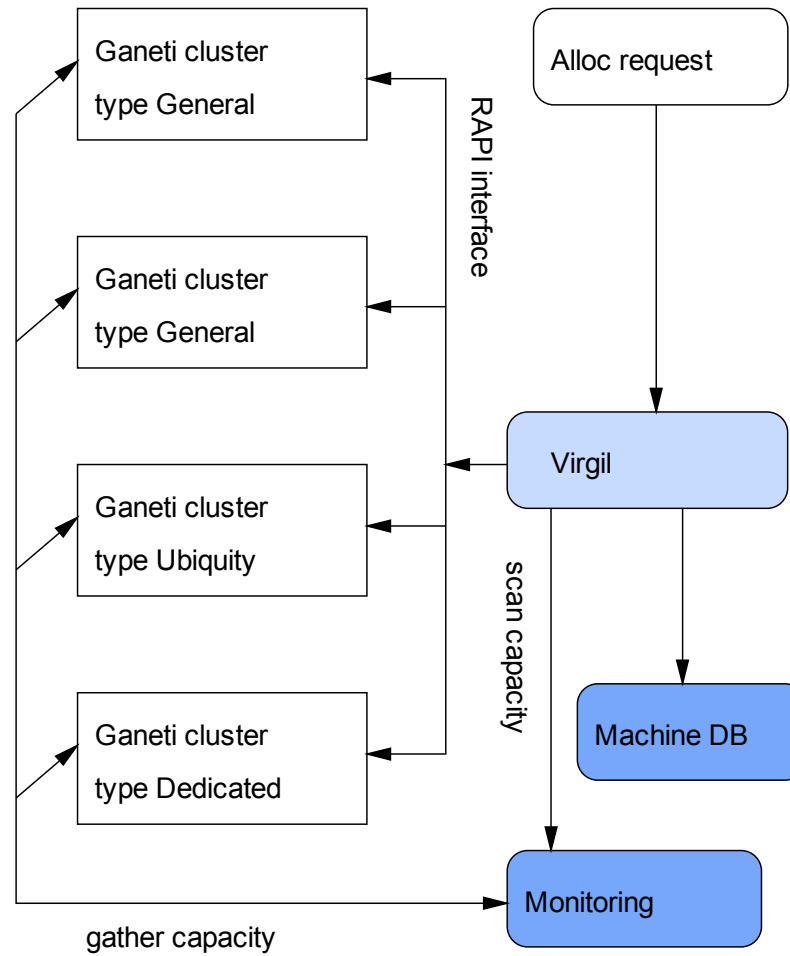


# Fleet at Google

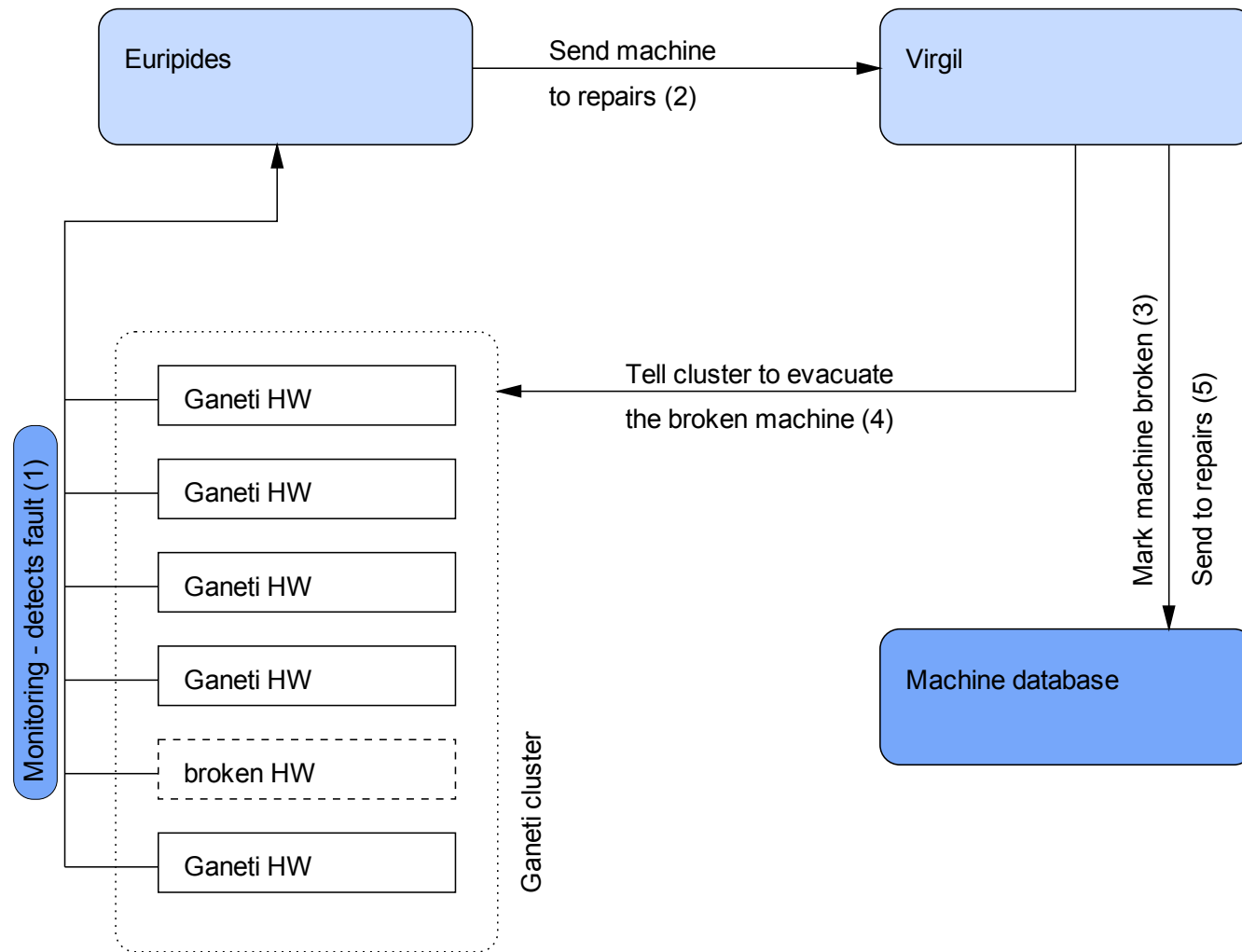




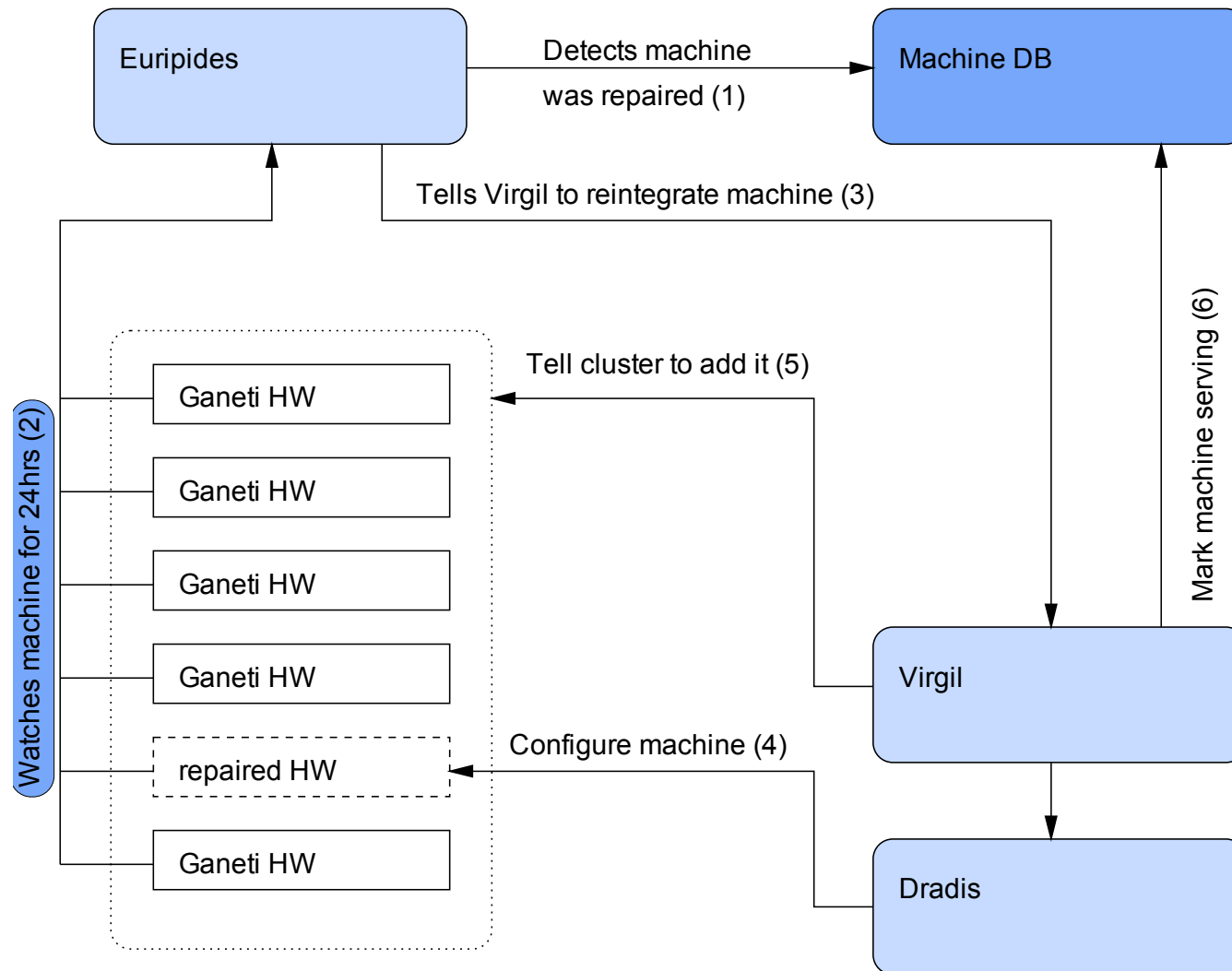
# Instance provisioning at Google



# Auto node repair at Google



# Auto node readd at Google



# Ganeti 2.8, 2.9

## 2.8.4

- Downgrading
- Autorepair tool
- Hroller
- Improvements on storage, monitoring

## 2.9.6

- DRBD 8.4 support
- Continued work on monitoring, storage, hroller

# Ganeti 2.10

2.10.3, available in debian wheezy backports, debian jessi

- Cross-cluster instance moves:
  - automatic node allocation on destination cluster
  - convert disk templates on the fly
- Cluster balancing based on CPU load
- KVM: Hotplug support, direct access to RBD storage
- Ganeti upgrades!

# Updates

In the past, updating Ganeti was a pain:

```
/etc/init.d/ganeti stop // on all nodes
apt-get install ganeti2=2.7.1-1 ganeti-htools=2.7.1-1 // on all nodes
/usr/lib/ganeti/tools/cfgupgrade // on master
/etc/init.d/ganeti start // on all nodes
gnt-cluster redist-conf // on master
... // lots of other steps, depending on the version
// If something goes wrong, fix the mess manually.
```

From 2.10 on, Ganeti comes with a built-in upgrade mechanism:

```
apt-get install ganeti-2.11 // on all nodes
gnt-cluster upgrade --to 2.11 // on master
gnt-cluster upgrade --to 2.10 // to roll back
```

Note that you still have to install the new and deinstall the old packages manually.

# Ganeti 2.11

Current stable release, 2.11.0.

- RPC security: individual node certificates
- Compression for instance moves / backups / imports
- Configurable SSH ports per node group
- Gluster support (experimental)

# Current and Future development

No guarantees!

- Network improvements (IPv6, more flexibility)
- Storage: more work on shared storage
- Heterogeneous clusters
- Improvements on cross-cluster instances moves

Google Summer of Code:

- Make LXC support production-ready
- Conversion between arbitrary disk templates



# Open Source Events

Confirmed:

- Linuxcon Japan, Tokyo, May 20th 2014
- Ganeticon, Portland, Oregon, September

Not confirmed yet:

- Linuxcon North America, Chicago, August
- FrOSCon, St. Augustin, Germany, August
- LISA '14, Seattle, November

# Thank You!

Questions?



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- Some images borrowed / modified from Lance Albertson, Justin Pop, and Guido Trotter
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