Ganeti Web Manager

Cluster Management Made Simple

Lance Albertson

Peter Krenesky

http://is.gd/oscongwm | http://is.gd/oscongwmpdf

About us

OSU Open Source Lab

Server hosting for Open Source Projects

Open Source development projects

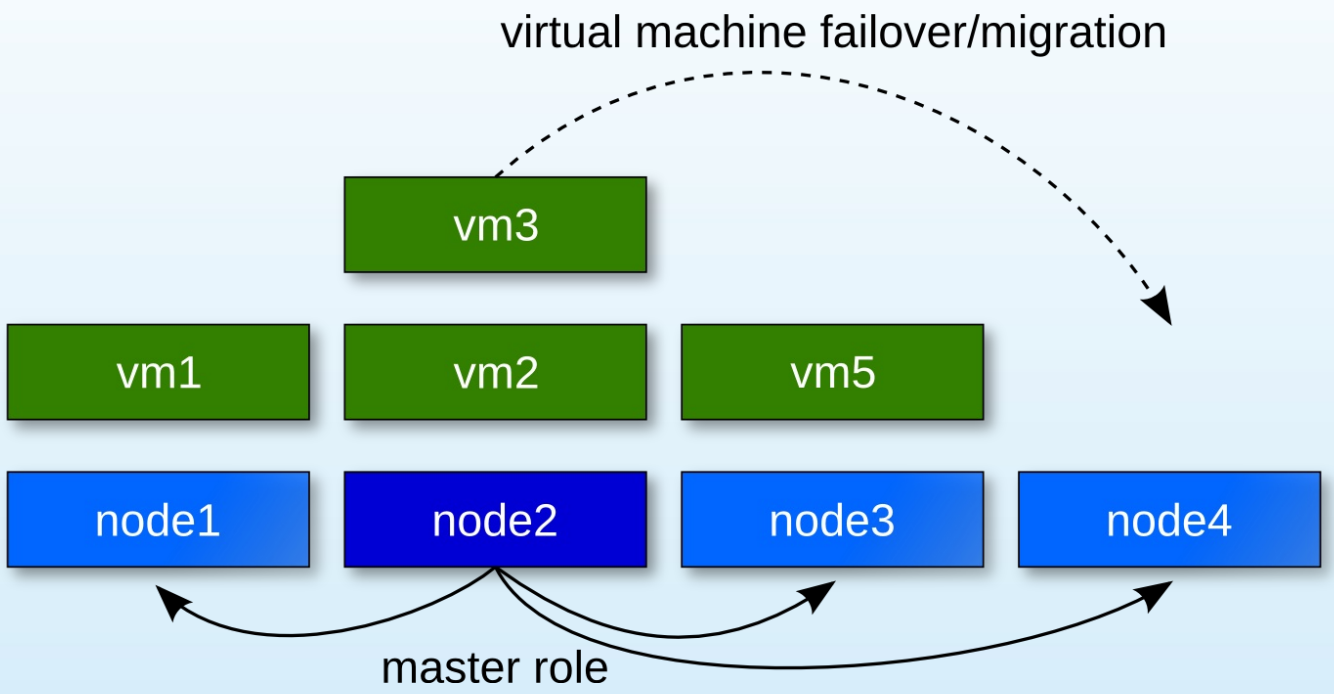
Lance / Lead Systems Administrator

Peter / Lead Software Engineer

Session Overview

- Ganeti Basics
- Ganeti Web Manager
- GWM Internals
- Using GWM

Ganeti Cluster



What is Ganeti?

- *Cluster* virtual server management software tool
- Built on top of *existing* OSS hypervisors
- Fast & simple *recovery* after physical failures
- Using *cheap* commodity hardware
- Private *IaaS*

Comparing Ganeti

- Utilizes *local* storage
- Built to deal with *hardware failures*
- *Mature* project
- Low package requirements
- Easily *pluggable* via hooks & RAPI

Project Background

- *Google* funded project
- Used in internal corporate env
- Open Sourced in 2007 *GPLv2*
- Team based in Google Switzerland
- Active mailing list & IRC channel
- Started internally before *libvirt*

Terminology

Components

Python

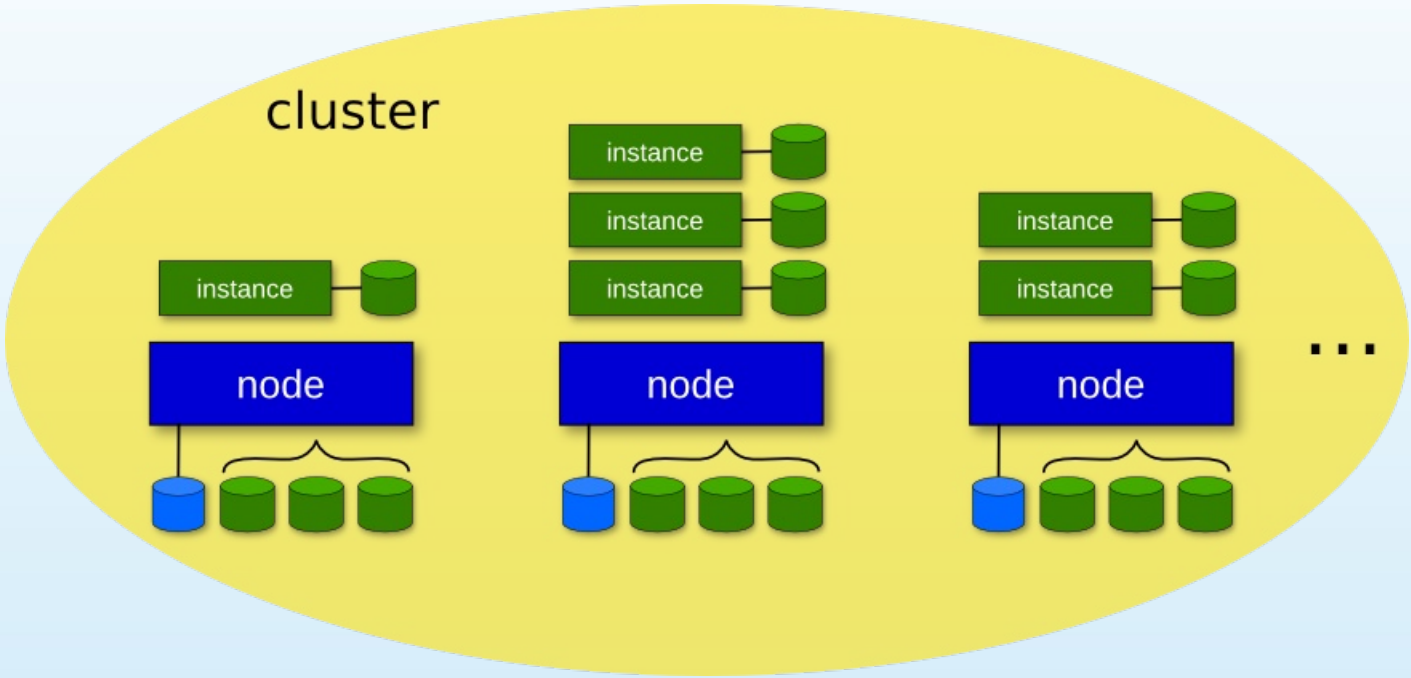
Haskell

DRBD

LVM

Hypervisor

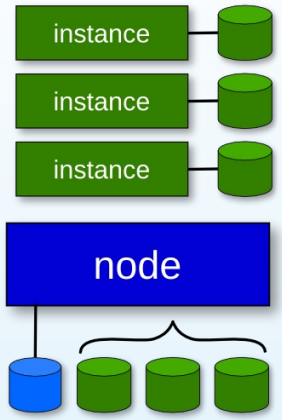
Architecture



Nodes

- *Physical* machine
- Fault tolerance not *required*
- Added/removed *at will* from cluster
- No *data loss* with loss of node

Instances



- Virtual machine that *runs* on the cluster
- *fault tolerant/HA* entity within cluster

Instance Parameters

- Hypervisor (called `hvparams`)
- General (called `beparams`)
- Networking (called `nicparams`)
- *Modified* via instance or cluster defaults

Disk template

- **drbd** : LVM + DRBD between 2 nodes
- **plain** : LVM w/ no redundancy
- **file** : Plain files, no redundancy
- **diskless** : Special purposes

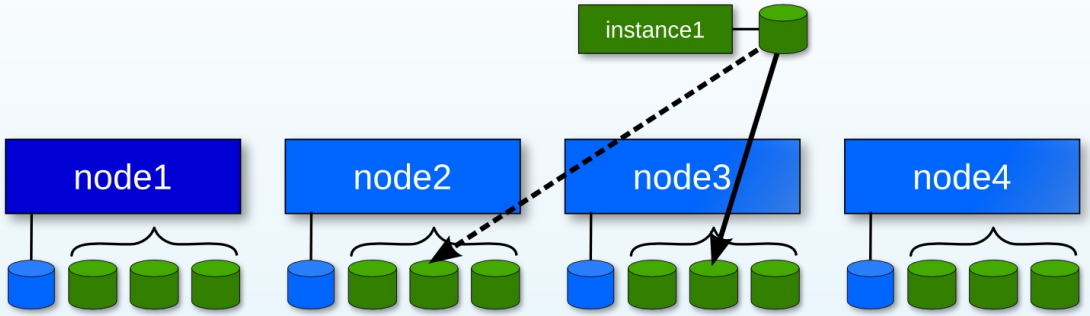
IAllocator

- Automatic placement of instances
- Eliminates manual node specification
- **htools**
- External scripts used to compute

Components

- Automatic allocation
- **hbal** : Cluster rebalancer
- **hail** : IAllocator script
- **hspace** : Cluster capacity estimator

Primary & *Secondary* concepts



- Instances always runs on *primary*
- Uses secondary node for *disk replication*
- Depends on *disk template* (i.e. drbd)

Remote API

Remote API

- *External* tools
- Retrieve cluster state
- *Execute* commands
- *JSON* over HTTP via *REST*

RAPI Security

- Users & Passwords
- RFC 2617 *HTTP Authentication*
- Read-only or Read-write

- Easy management of Ganeti
- *Client* facing service

Releases

- Project Founded - 9-10-2011
- Version 0.4 - 12-20-2010
- Version 0.5 - 02-03-2011
- Version 0.6 - 03-04-2011
- Version 0.7 - *06-17-2011*

Open Sourced Libraries

- Django Object Permissions
- Django Object Log
- Twisted VNC Auth Proxy

Ganeti Web Manager

Installation

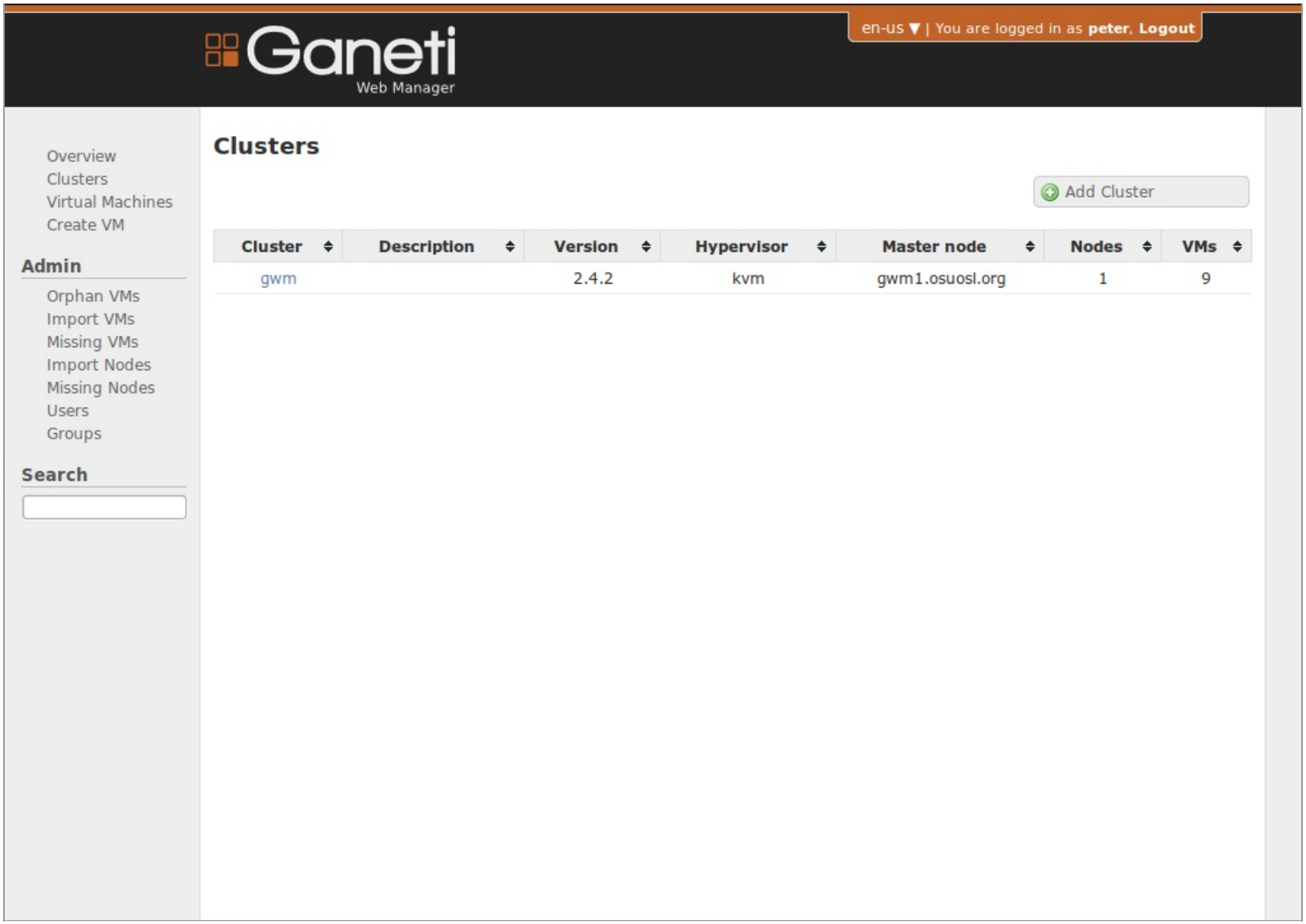
Dependencies

- *Python* >=2.5, 2.7 recommended
- *Pip* - Python package installer
- *Fabric* - Install scripts
- *VirtualEnv* - Python virtual environments
- *Git* - Distributed Source Control

Fabric Installer

```
$ fab dev deploy

$ fab prod deploy
```


Ganeti
Web Manager
en-us ▼ | You are logged in as peter, Logout
Overview
Clusters
Virtual Machines
Create VM
Admin
Orphan VMs
Import VMs
Missing VMs
Import Nodes
Missing Nodes
Users
Groups
Search
Clusters
Add Cluster
Cluster
Description
Version
Hypervisor
Master node
Nodes
VMs
gwm
2.4.2
kvm
gwm1.osuosl.org
1
9

Import Tools

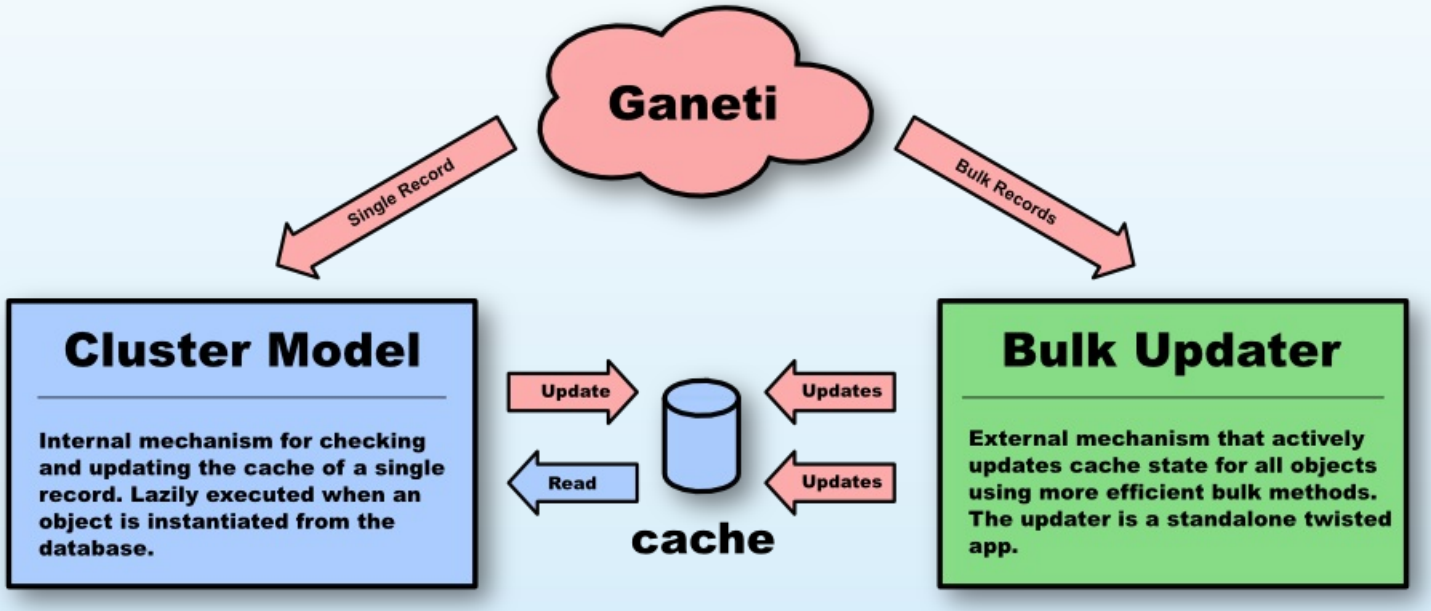
- Find Orphaned Instances
- Import New Nodes & Instances
- Remove Deleted Nodes & Instances

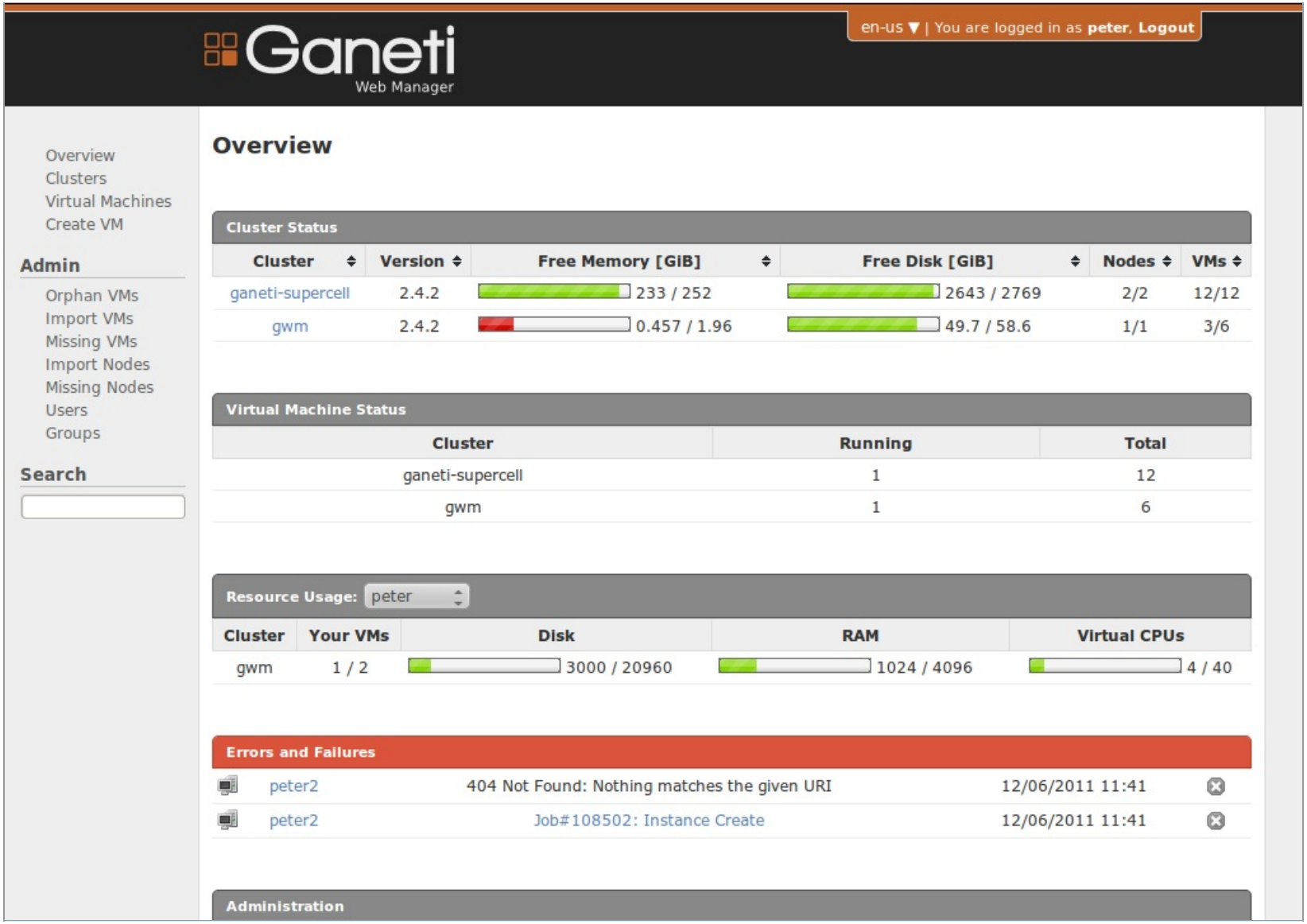
Cache Updater

Imports Nodes and Virtual Machines too

```
$ twistd --pidfile=cache.pid gwm_cache
```

Cache System

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Virtual Machines
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Orphan VMs
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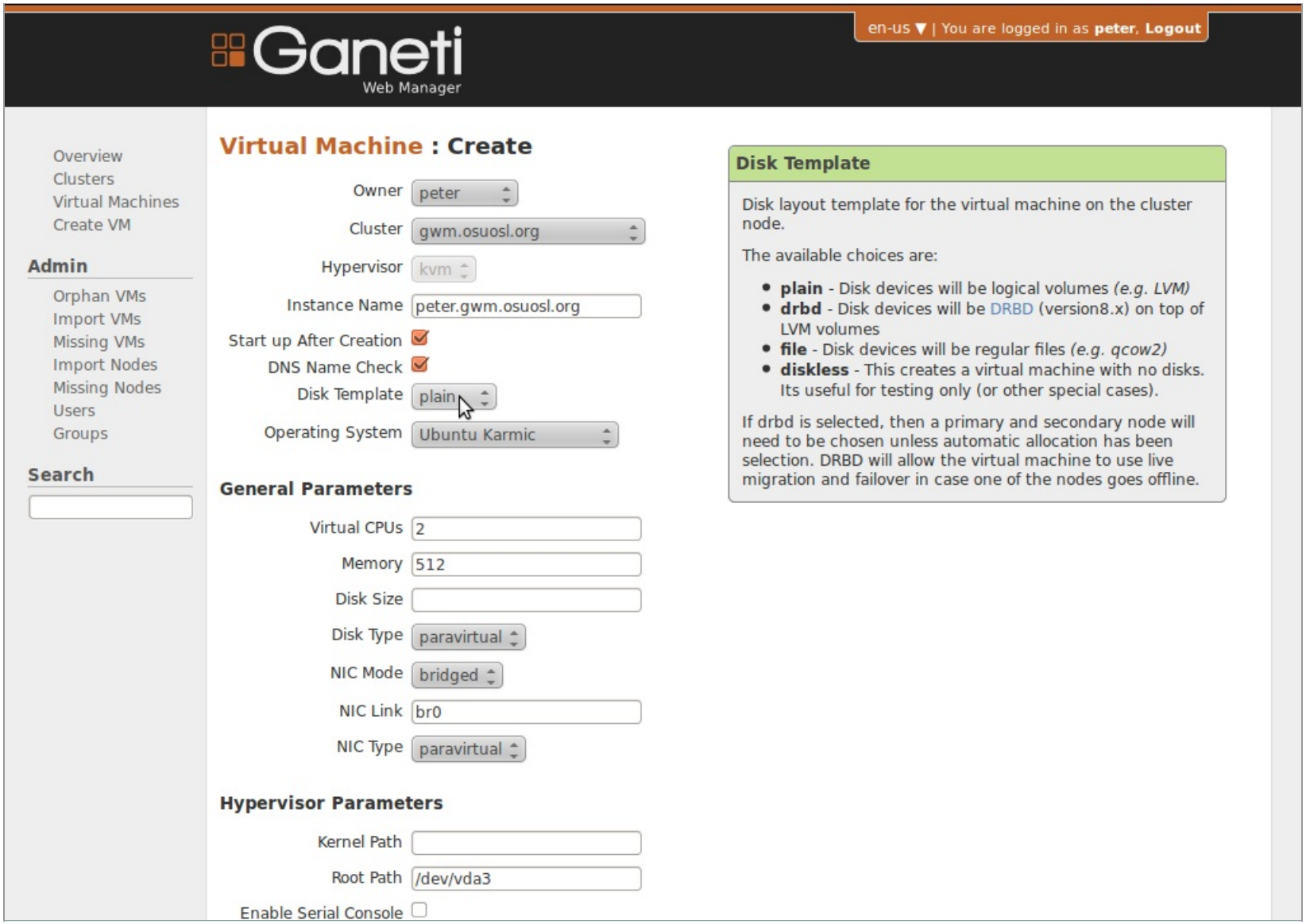
Missing VMs
Import Nodes
Missing Nodes
Users
Groups
Search
Overview
Cluster Status
Cluster
Version
Free Memory [GiB]
Free Disk [GiB]
Nodes
VMs
ganeti-supercell
2.4.2
233 / 252
2643 / 2769
2/2
12/12
gwm
2.4.2
0.457 / 1.96
49.7 / 58.6
1/1
3/6
Virtual Machine Status
Cluster
Running
Total
ganeti-supercell
1
12
gwm
1
6
Resource Usage:
peter
Cluster
Your VMs
Disk
RAM
Virtual CPUs
gwm
1 / 2
3000 / 20960
1024 / 4096
4 / 40
Errors and Failures
peter2
404 Not Found: Nothing matches the given URI
12/06/2011 11:41
peter2
Job#108502: Instance Create
12/06/2011 11:41
Administration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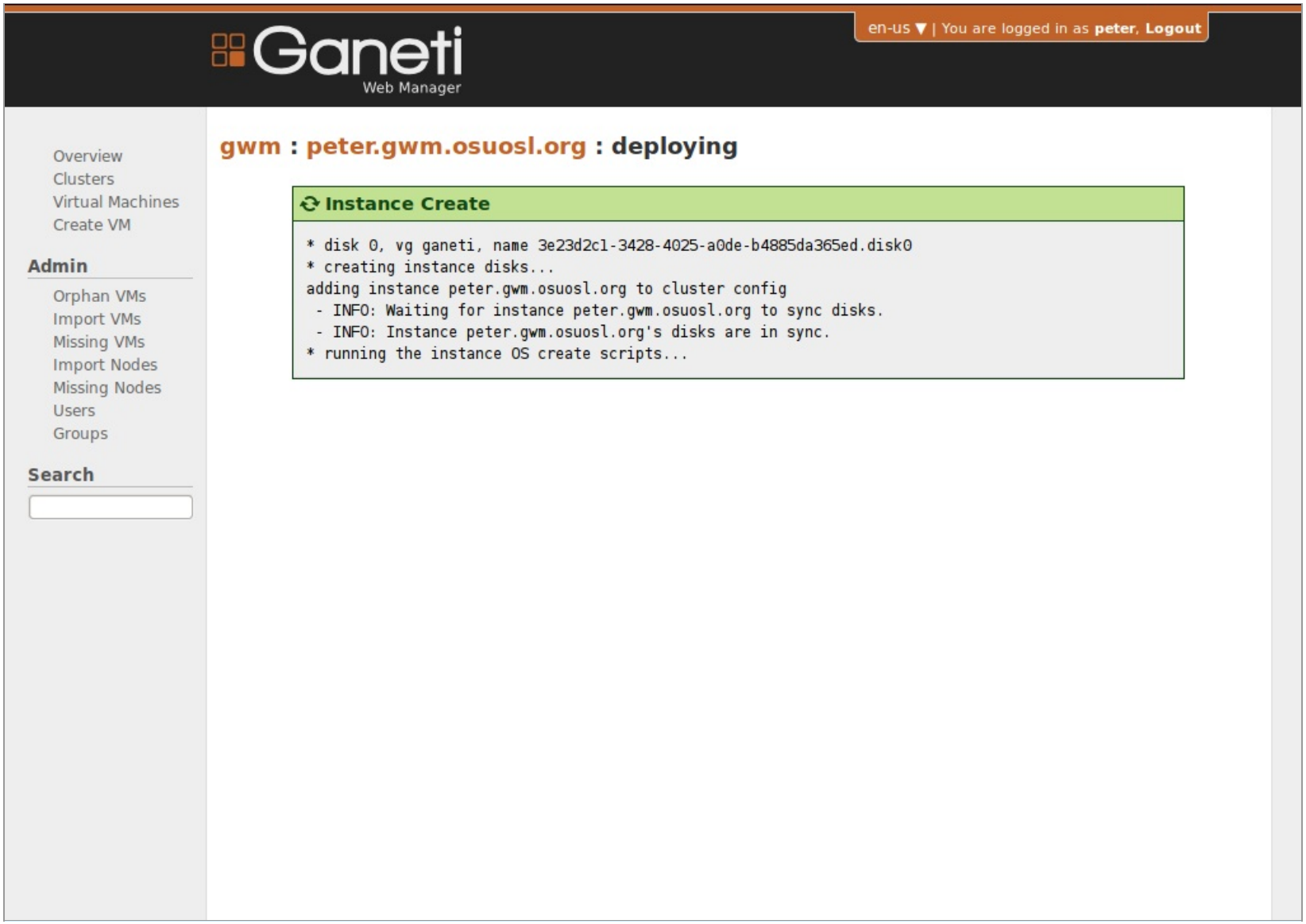
Missing Nodes
Users
Groups
Search
Virtual Machine : Create
Owner peter
Cluster gwm.osuosl.org
Hypervisor kvm
Instance Name peter.gwm.osuosl.org
Start up After Creation
DNS Name Check
Disk Template plain
Operating System Ubuntu Karmic
General Parameters
Virtual CPUs 2
Memory 512
Disk Size
Disk Type paravirtual
NIC Mode bridged
NIC Link br0
NIC Type paravirtual
Hypervisor Parameters
Kernel Path
Root Path /dev/vda3
Enable Serial Console
Disk Template
Disk layout template for the virtual machine on the cluster node.
The available choices are:
plain - Disk devices will be logical volumes (e.g. LVM)
drbd - Disk devices will be DRBD (version8.x) on top of LVM volumes
file - Disk devices will be regular files (e.g. qcow2)
diskless - This creates a virtual machine with no disks. Its useful for testing only (or other special cases).
If drbd is selected, then a primary and secondary node will need to be chosen unless automatic allocation has been selection. DRBD will allow the virtual machine to use live migration and failover in case one of the nodes goes offline.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Missing Nodes
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Groups
Search
gwm : peter.gwm.osuosl.org : deploying
Instance Create
* disk 0, vg ganeti, name 3e23d2c1-3428-4025-a0de-b4885da365ed.disk0
* creating instance disks...
adding instance peter.gwm.osuosl.org to cluster config
- INFO: Waiting for instance peter.gwm.osuosl.org to sync disks.
- INFO: Instance peter.gwm.osuosl.org's disks are in sync.
* running the instance OS create scripts...


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Missing Nodes
Users
Groups
Search
gwm : peter.gwm.osuosl.org
Overview
Users
Log
Console
Owner
Created on 16/05/2011 14:32
Last modified 10/06/2011 19:38
Status Running
Primary node gwm1.osuosl.org
Secondary node
Operating System Ubuntu Natty 32bit (image)
Autostart
VNC gwm1.osuosl.org::11116
Edit
Rename
Change Owner
Delete
Reinstall
Shutdown
Reboot
Hardware
VCPUs 2
Memory 1.00 GiB
NIC type paravirtual
Disks
Disk Type Size
disk/0 paravirtual 1.46 GiB
Network Devices
Nic Mac IP Mode Link


Ganeti
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Overview
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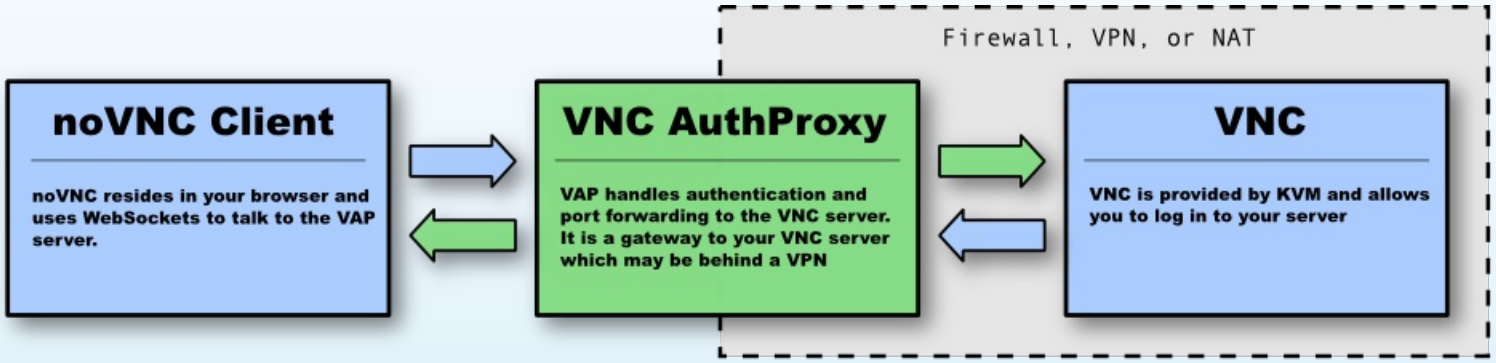
Users
Groups
ganeti-test : gimager.osuosl.bak
Overview
Users
Console
Encrypt
Disconnect
Shutdown
Reboot
Ctrl-Alt-Delete
Connected (unencrypted) to: QEMU (gimager.osuosl.bak)
Applications
Places
System
Wed Feb 2, 11:44 PM
ubuntu
Examples
Install Ubuntu 10.10

VNC Auth Proxy



- allows proxying through firewall / VPN
- no need for passwords

Permissions

Personas

Users can act on behalf of groups

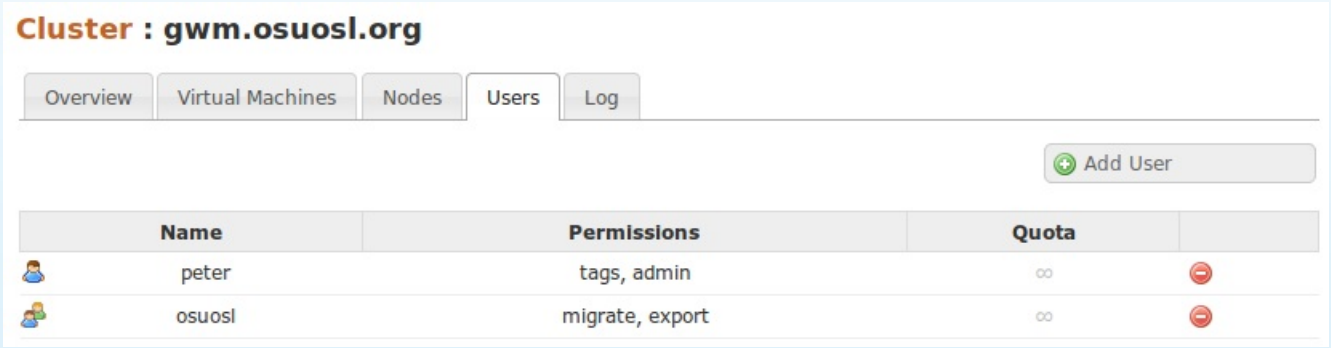
Ownership

vs.

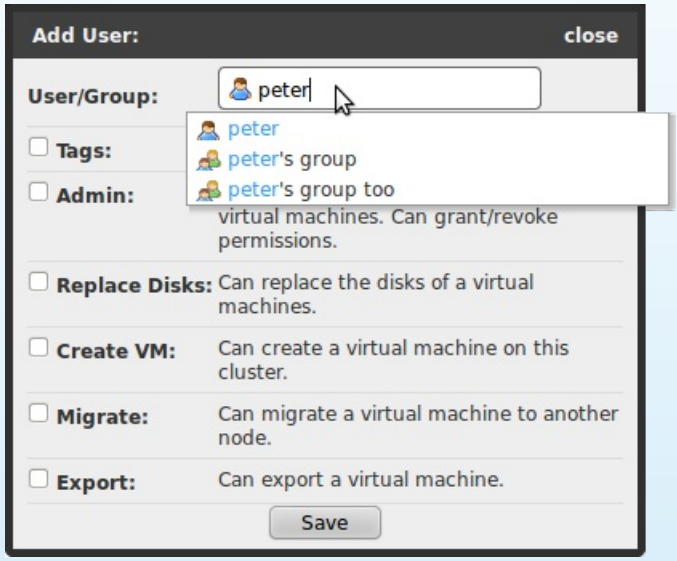
Permissions

- Ownership is for book keeping
- Permissions let you do things

Users Tab


Cluster : gwm.osuosl.org
Overview
Virtual Machines
Nodes
Users
Log
Add User
Name
Permissions
Quota
peter
tags, admin
∞
osuosl
migrate, export
∞

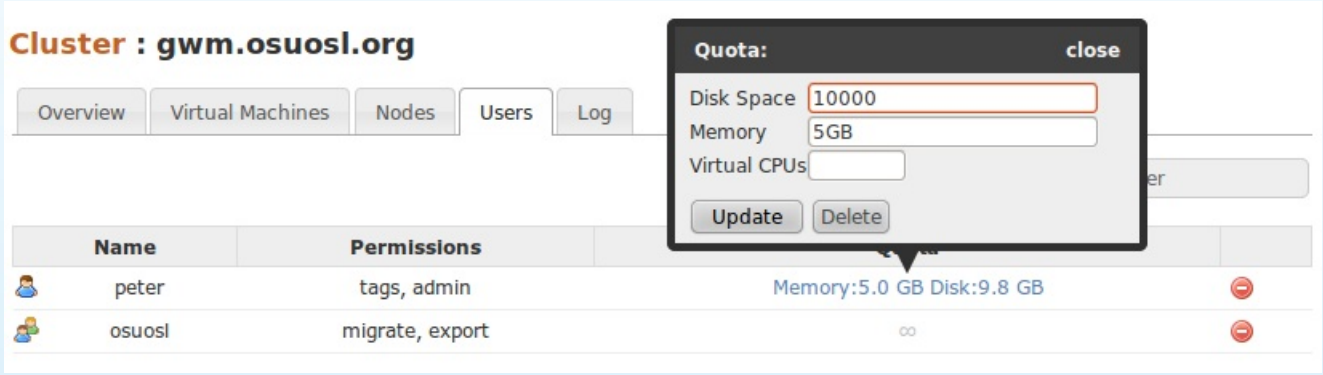
Editing Users



Quotas

Per Persona, Per Cluster

Overriding Default Quota



Future Features

- Instance Template
- Instance Defaults
- API
- And much more!

Conclusion

Questions?

Lance Albertson	Peter Krenesky
lance@osuosl.org	peter@osuosl.org
@ramereth	@kreneskyp
http://www.lancealbertson.com	http://blogs.osuosl.org/kreneskyp/

http://code.google.com/p/ganeti/

http://code.osuosl.org/projects/ganeti-webmgr

Presentation made with ***showoff***
http://github.com/ramereth/presentation-ganeti-tutorial
http://is.gd/oscongwm | http://is.gd/oscongwmpdf