





# Ganeti

Ganeti Core Team - Google  
LISA '13 - 5 Nov 2013



# Web Interfaces

Ganeti Web Manager and others

- Guido Trotter <ultrotter@google.com>
- Helga Velroyen <helgav@google.com>

# Latest version of these slides

Please find the latest version of these slides at:

<https://code.google.com/p/ganeti/wiki/LISA2013>

# Web Interfaces

- Ganeti web manager
  - Overview
  - Installation
  - Usage
- Synnefo and okeanos
  - Overview
  - Quick demo
- ganetimgr web manager
  - Overview

# Ganeti Web Manager Overview

- Web-based management system
- Easier management: no commands to remember
- Delegate authority: enables "self-service management" for users
- A project of OSU Open Source Lab
  - Written in Python using the Django web framework
  - GPLv2

# Users and Groups

- User/Group model (independent, not tied to LDAP, etc.)
- A user can be in any number of groups
- User/Groups have fine-grained settings on what they can/can't do
- Admin Permissions
  - Control what a user/group can do on each cluster and instance
- Quota System
  - Restrict resource usage by user or group

# Cluster Permissions

<b>admin</b>	<ul style="list-style-type: none"><li>• Grants full access to the cluster.</li><li>• Includes ability to set permissions and quotas, and full access to all virtual machines.</li></ul>
<b>create_vm</b>	Grants ability to create virtual machines on the cluster.
<b>tags</b>	Grants ability to set tags on the cluster.
<b>replace_disks</b>	Ability to replace disks of VMs on the cluster.
<b>migrate</b>	Can migrate a VM to another node
<b>export</b>	Can export a virtual machine

---



# Instance Permissions

<b>admin</b>	Full control
<b>modify</b>	Allows user to modify VM's settings, including reinstallation
<b>remove</b>	Permission to delete this VM
<b>power</b>	Permission to shutdown this VM
<b>tags</b>	Can set tags for this VM

---

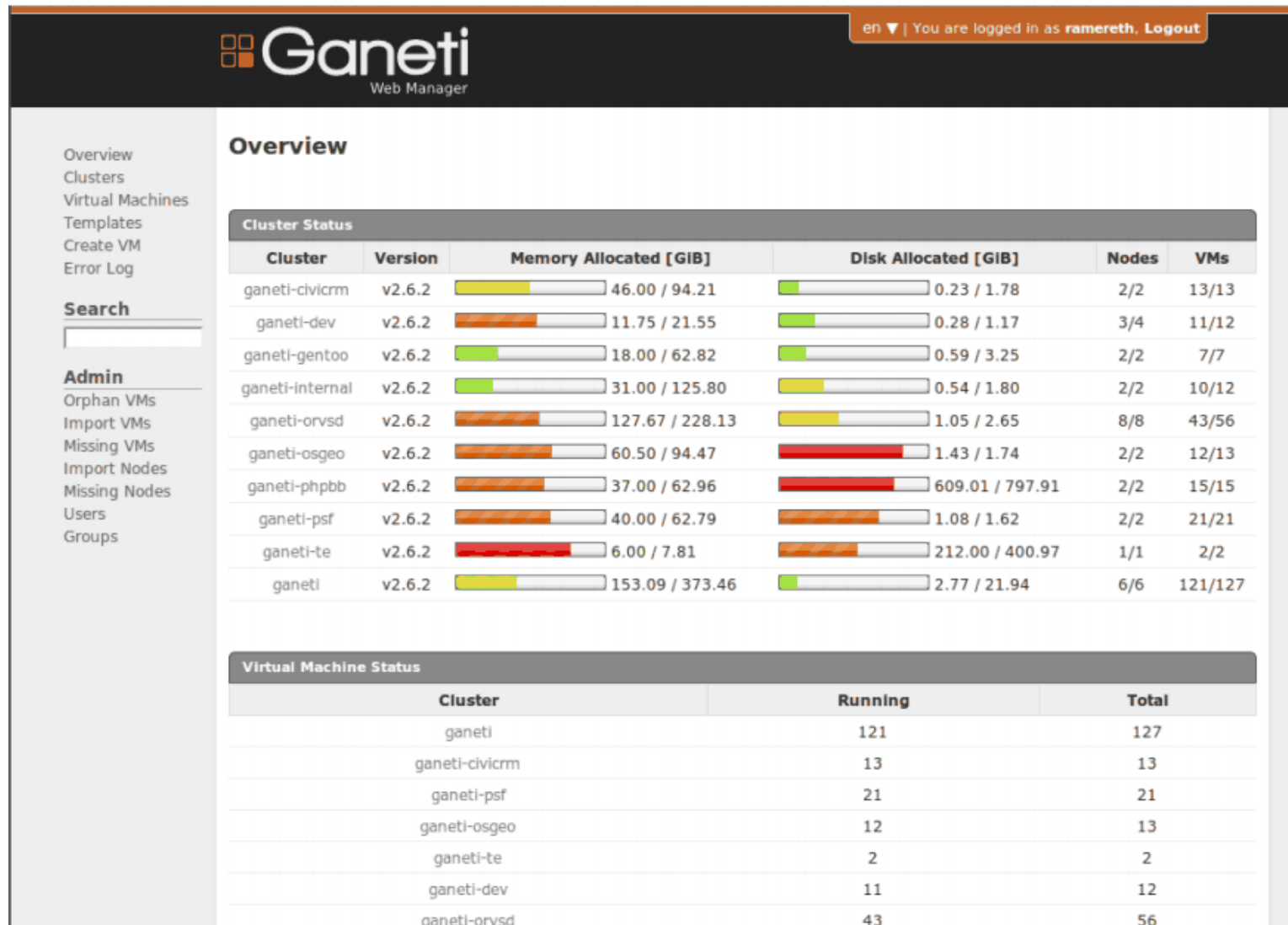
# Quotas

- Restricts resources used by users and groups
  - RAM
  - disk space
  - vCPUs
- Default quota for each cluster and user
- No quota == unlimited.


# RBAC in a nutshell

- Assigning individuals access is nice, but gets messy fast.
- Use "role-based access control" (RBAC)
- Clusters should be owned by a group.
- Add people to the groups they should be able to administer.
- Instances should be owned by groups or a single user
  - don't create a group if only one person will ever be in it

# Ganeti Web Manager Dashboard



# Cluster status

 **Ganeti**  
Web Manager

en ▼ | You are logged in as **ramereth**, [Logout](#)

Overview

Clusters

Virtual Machines

Templates

Create VM

Error Log

Search

Admin

Orphan VMs

Import VMs

Missing VMs

Import Nodes

Missing Nodes

Users

Groups

**Cluster : ganeti-supercell.osuosl.bak**

Overview

Virtual Machines

Nodes

Users

Log

Jobs

↕	Name ↕	Owner ↕	Node ↕	OS ↕	RAM ↕	Disk Space ↕	vCPUs ↕
✓	<a href="#">bigtop-centos.osuosl.test</a>	Apache Bigtop	supercell2	Centos ( <i>image</i> )	1.00 GiB	5.00 GiB	1
✓	<a href="#">bigtop-jenkins.osuosl.test</a>	Apache Bigtop	supercell2	Ubuntu Lucid ( <i>image</i> )	4.00 GiB	50.00 GiB	1
✓	<a href="#">bigtop-lucid.osuosl.test</a>	Apache Bigtop	supercell2	Ubuntu Lucid ( <i>image</i> )	1.00 GiB	5.00 GiB	1
✓	<a href="#">chance_sux100</a>	osuadmin	supercell1	Centos ( <i>image</i> )	512 MiB	4.00 GiB	2
✓	<a href="#">civdlient1.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid 32bit ( <i>image</i> )	1.34 GiB	8.58 GiB	1
✓	<a href="#">civdlient2.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid 32bit ( <i>image</i> )	1.34 GiB	8.58 GiB	1
✓	<a href="#">civdlient3.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid 32bit ( <i>image</i> )	1.34 GiB	8.58 GiB	1
✓	<a href="#">civdlient4.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid 32bit ( <i>image</i> )	1.34 GiB	8.58 GiB	1
✓	<a href="#">civdlient5.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid 32bit ( <i>image</i> )	1.34 GiB	8.58 GiB	1
✓	<a href="#">civdlient6.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid 32bit ( <i>image</i> )	1.27 GiB	8.50 GiB	1
✓	<a href="#">civihead.osuosl.test</a>	CiviCRM	supercell2	Ubuntu Lucid ( <i>image</i> )	2.00 GiB	12.00 GiB	2

# Create an instance

Overview

Clusters

Virtual Machines

Create VM

Admin


Orphan VMs

Import VMs

Missing VMs

Users

Groups

 **Ganeti**  
Web Manager

You are logged in as **peter**. [Logout](#)

### New Virtual Machine

Owner peter ▾

Cluster gwm.osuosl.org ▾

Instance Name peter.gwm.osuosl.org

Start up after creation ☒

DNS Name Check ☐

Disk Template plain ▾

Primary Node gwm1.osuosl.org

Operating System Ubuntu Maverick ▾

#### 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 ☐

Boot Device Hard Disk ▾

CD-ROM Image Path

Create

#### 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 (version 8.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.

A Project by the [Oregon State University Open Source Lab](#).

# Instance being created

Overview

Clusters

Virtual Machines

Create VM

Admin

Orphan VMs

Import VMs

Missing VMs

Users

Groups

Ganeti

Web Manager

You are logged in as **peter**, [Logout](#)

**gwm : peter.gwm.osuosl.org**

↻ Instance Create

```
* 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...
```

Overview

Users

Console

Owner	peter
Status	Stopped
Autostart	
UUID	
Primary node	
Failover node	
Created on	
Last modified	
NIC type	
Disk type	

Delete

Reinstall

Start


A Project by the Oregon State University Open Source Lab.

# Connect to console

The screenshot displays the Ganeti Web Manager interface. At the top, the Ganeti logo and 'Web Manager' text are on the left, and a login status 'You are logged in as peter, Logout' is on the right. A left sidebar contains navigation links: Overview, Clusters, Virtual Machines, Create VM, Admin, Orphan VMs, Import VMs, Missing VMs, Users, and Groups. The main content area is titled 'ganeti-test : gimager.osuosl.bak' and has tabs for Overview, Users, and Console. Below the tabs are buttons for Encrypt, Disconnect, Shutdown, Reboot, and Ctrl-Alt-Delete. The console window shows a connection to a QEMU virtual machine. The desktop environment is Ubuntu 10.10, featuring a purple background with icons for 'Examples' and 'Install Ubuntu 10.10'. The top of the desktop window displays 'Applications Places System' and the system clock shows 'Wed Feb 2, 11:44 PM' for the 'ubuntu' user. The footer of the interface states 'A Project by the Oregon State University Open Source Lab.'



# Ganeti Jobs



en ▼ | You are logged in as **ramereth**. [Logout](#)

Overview

Clusters

Virtual Machines

Templates

Create VM

Error Log

Search

Admin

Orphan VMs

Import VMs

Missing VMs

Import Nodes

Missing Nodes

Users

Groups

Cluster : ganeti-internal.osuosl.bak

OverviewVirtual MachinesNodesUsersLogJobs

Job Id	Object	Operation	Status	Finished
40	chef	Instance Create	success	04/02/2013 10:40 p.m.
42	chef	Instance Startup	success	04/02/2013 10:46 p.m.
43	chef	Instance Shutdown	success	04/03/2013 12:20 a.m.
45	chef	Instance Reinstall	success	04/03/2013 12:21 a.m.
46	chef	Instance Startup	success	04/03/2013 8:08 a.m.
47	chef	Instance Shutdown	success	04/03/2013 11:17 a.m.
49	chef	Instance Reinstall	success	04/03/2013 11:18 a.m.
50	chef	Instance Startup	success	04/03/2013 11:18 a.m.
57	logs	Instance Create	success	04/04/2013 12:34 p.m.
61	logs	Instance Reboot	success	04/04/2013 3 p.m.
63	logs	Instance Shutdown	success	04/04/2013 3:06 p.m.
65	logs	Instance Startup	success	04/04/2013 3:17 p.m.
68	logs	Instance Reboot	success	04/04/2013 11:47 p.m.
71	mon1	Instance Create	success	04/05/2013 12:06 p.m.
74	mon1	Instance Startup	success	04/05/2013 12:34 p.m.
75	mon1	Instance Shutdown	success	04/05/2013 3:02 p.m.
78	mon1	Instance Reinstall	success	04/05/2013 3:03 p.m.

# Behind the scenes

- Permissions are recorded by setting Ganeti tags on clusters and instances.
- Tags are cached in a local database for speed

Format:

`GANETI_WEB_MANAGER:<permission>:[G|U]:<user_id>`

Examples:

Admin permission for User with id 2:

`GANETI_WEB_MANAGER:admin:U:2`

Start permission for Group with id 4:

`GANETI_WEB_MANAGER:start:G:4`

# Synnefo

- Open Source project to use Ganeti to build a complete private cloud solution
- Relatively new project with a lot of horsepower behind it.
- Project home:
  - <http://www.synnefo.org/>
  - <https://code.grnet.gr/projects/synnefo>
- Documentation:
  - <http://docs.dev.grnet.gr/synnefo/latest/>
- Public cloud based on it:
  - <https://www.okeanos.io>

# Synnefo Components

- Identity Management (codename: astakos)
- Object Storage Service (codename: pithos+)
- Compute Service (codename: cyclades)
- Network Service (part of Cyclades)
- Image Registry (codename: plankton)
- Billing Service (codename: aquarium)
- Volume Storage Service (codename: archipelago)


# Machines view



The screenshot displays the 'machines' view in the OpenStack 'alpha' environment. The interface includes a top navigation bar with the 'openstack alpha' logo and 'options | en' links. Below this is a sub-header with a monitor icon and the word 'machines'. An orange button labeled 'New Machine +' is positioned on the left. On the right, there are view toggle buttons: 'icon' (selected), 'list', and 'single'. The main content area lists two machines:

Machine Name	IPv4 Address	IPv6 Address	Status
tix001	83.212.96.45	...a80c:eaff:fe0d:2ef3	Running
tix002	83.212.96.70	...a80c:eaff:fe1d:b2fd	Running


Each machine entry also features a monitor icon and an 'info' button.

# Networks view

 alpha options | en

  networks

New Network +




Internet

machines (2)

Public network

■ ■ ■ ■



tixback

machines (2)

Private network

■ ■ ■ ■

# Quick okeanos demo

Time to see it work!

# ganetimgr web manager

- Simplified multicluster web manager geared at end users
- Original code of the Ganeti web manager, then evolved independently
- See <http://ganetimgr.readthedocs.org/en/latest/>
- Code at <https://code.grnet.gr/projects/ganetimgr>

The screenshot shows the ganetimgr web manager interface in a browser window. The page title is "My instances" and it displays a list of virtual instances. The interface includes a sidebar with navigation links: Home, Send Mail, Nodes, Statistics, Applications, Instance Owners, Idle Accounts, My Profile, and Admin. The main content area shows a table of instances with columns: Name, Cluster, Memory, CPUs, Status, Network, Owner, and Options. The table lists 10 instances, all with a status of "Running". The first four instances are associated with the "gnt7" cluster and have a memory of 512.0 MB. The remaining six instances are also associated with the "gnt7" cluster but have a memory of 128.0 MB. The network column shows the public IP address for the first four instances and a small orange icon for the others. The Options column contains a gear icon and a dropdown menu for each instance.

Name	Cluster	Memory	CPUs	Status	Network	Owner	Options
diktio.vm.grnet.gr	gnt7	512.0 MB	1	Running	192.168.1.100@public_98		Options
diktio2.vm.grnet.gr	gnt7	512.0 MB	1	Running	192.168.1.101@public_98		Options
gnt7-test1.vm.grnet.gr	gnt7	512.0 MB	1	Running	192.168.1.102@public_98		Options
testing.vm.grnet.gr	gnt7	512.0 MB	1	Running	192.168.1.103@public_98		Options
testing1.vm.grnet.gr	gnt7	128.0 MB	1	Running			Options
testing2.vm.grnet.gr	gnt7	128.0 MB	1	Running			Options
testing3.vm.grnet.gr	gnt7	128.0 MB	1	Running			Options
testing4.vm.grnet.gr	gnt7	128.0 MB	1	Running			Options
testing5.vm.grnet.gr	gnt7	128.0 MB	1	Running			Options



# Thank You!

Questions?

Survey at <https://www.usenix.org/lisa13/training/survey>



- © 2010 - 2013 Google
- Use under GPLv2+ or CC-by-SA
- Some images borrowed / modified from Lance Albertson and Iustin Pop
- Some slides were borrowed / modified from Tom Limoncelli

