

Hands on Virtualization with Ganeti

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<http://is.gd/osbganeti>
<http://is.gd/osbganetipdf>

About us

OSU Open Source Lab

Server hosting for Open Source Projects

Open Source development projects

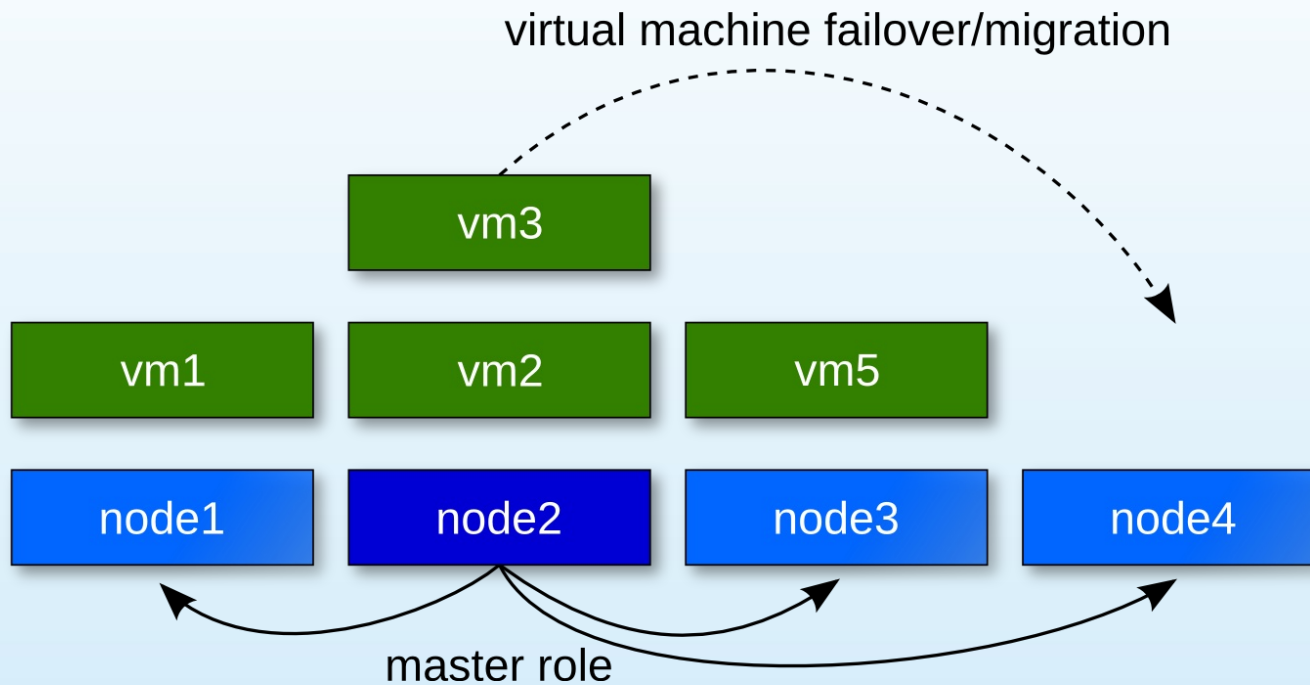
Lance / Lead Systems Administrator

Peter / Lead Software Engineer

Tutorial Overview

- Ganeti Architecture
- Installation
- Virtual machine deployment
- Cluster Management
- Dealing with failures
- Ganeti Web Manager

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*

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



various python modules



Haskell



DRBD

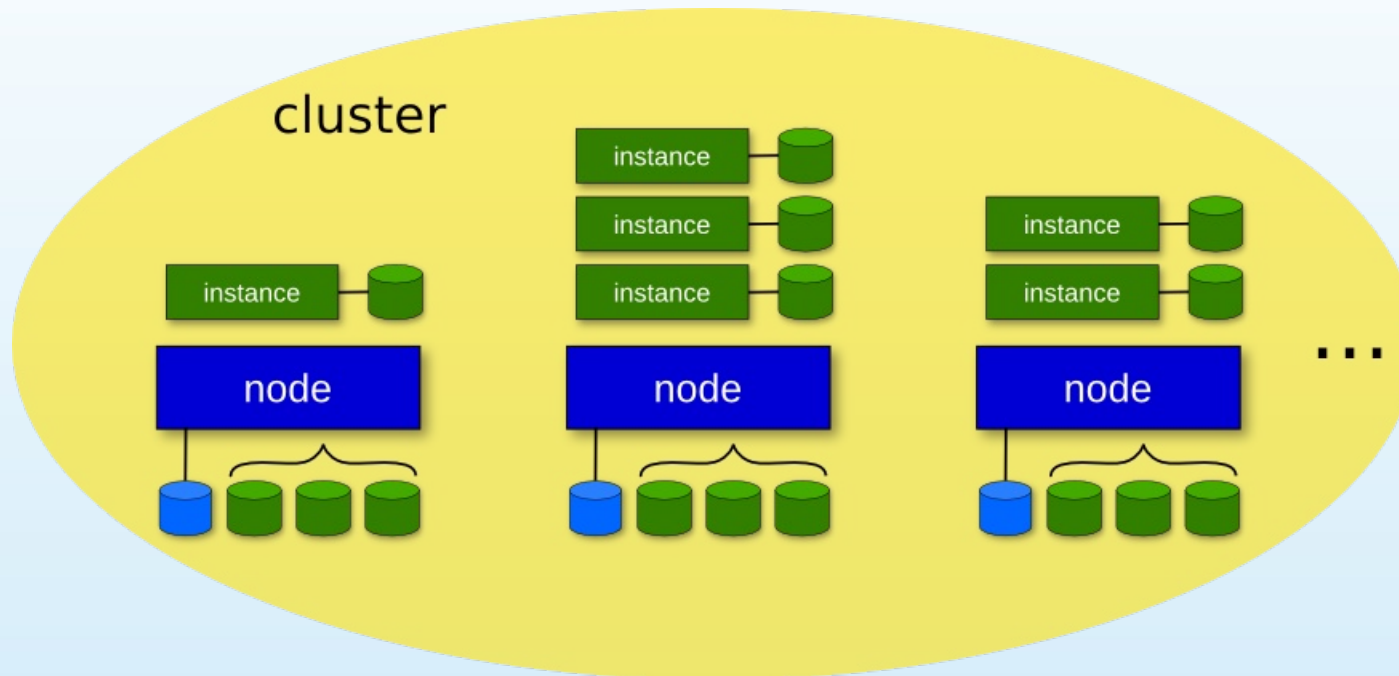


LVM



Hypervisor

Architecture



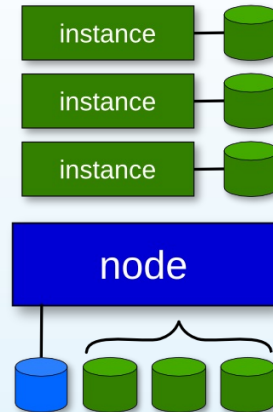
Nodes

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

Node Daemons

ganeti-noded	control hardware resources, runs on all
ganeti-confd	only functional on master, runs on all
ganeti-rapi	offers HTTP-based API for cluster, runs on master
ganeti-masterd	allows control of cluster, runs on master

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

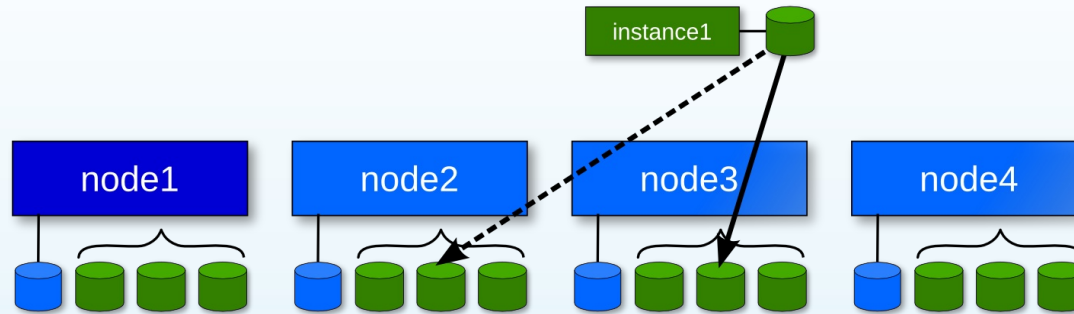
Disk template

- **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

Primary & Secondary concepts



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

Planning your cluster

Hardware Planning

Disks

Types: SAS vs SATA

Speed: Faster = better

Number: More = better

Hardware Planning

CPU

Cores: More = better

Speed: Depends on your uses

Brand: AMD vs Intel = use case

Hardware Planning

RAM

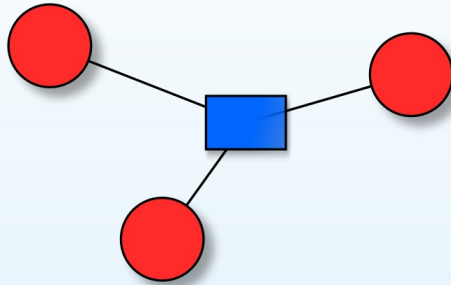
Amount: More = better

Use case: Types of services

Operating System Planning

- **Debian** - most supported upstream
- **Gentoo** - great support
- **Ubuntu** - should work great
- CentOS - works but a few setup issues

Network Planning



Bridging is most supported

Routed networking also supported

Nodes on *private NAT*

Pre-Installation Steps

Operating System Setup

- Clean ,minimal system install
- Minimum *20GB* system volume
- *Single* LVM Volume Group for instances
- 64bit is preferred
- *Similar* hardware/software configuration across nodes

Partition Setup

typical layout

/dev/sda1	/boot	200M
/dev/sda2	/	10-20G
/dev/sda3	LVM	rest, named ganeti

Hostname Issues

- Requires *hostname* to be the **FQDN**
- i.e. *node1.example.com* instead of *node1*
- *hostname* - - *fqdn* requires resolver library
- Reduce dependency on DNS and *guessing*

Installing the Hypervisor

Hypervisor requirements

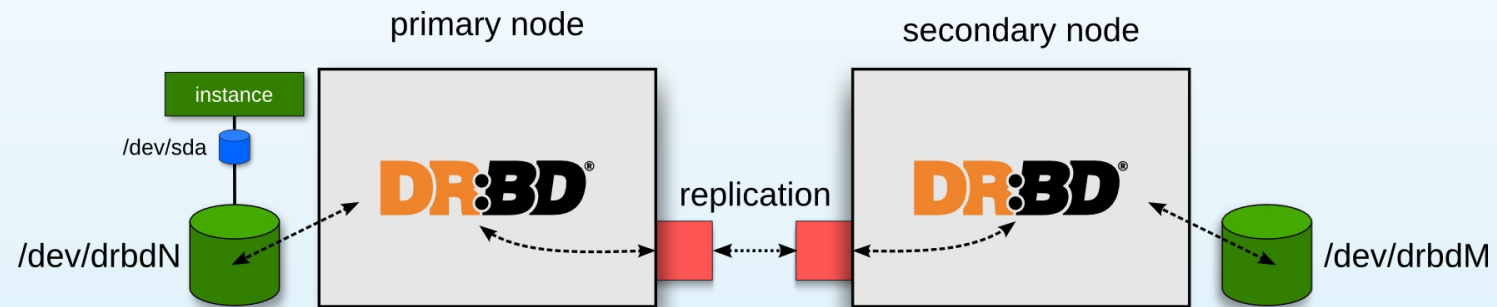
Mandatory on all nodes

Xen 3.0 and above

KVM 0.11 and above

Install via your distro

DRBD Architecture



RAID1 over the network

Installing DRBD

- Required for *high availability*
- Can *upgrade* non-HA to DRBD later
- Need at least *>=drbd-8.0.12*
- Depends on distro Support
- Included in *mainline*

DRBD Setup

Installation

```
$ apt-get install drbd8-utils
```

Via modules

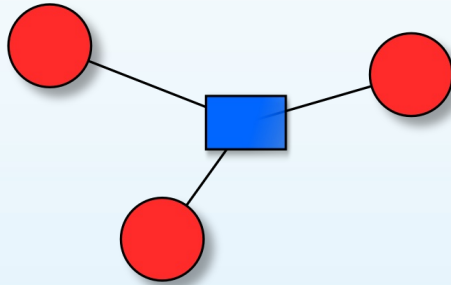
```
$ echo drbd minor_count=255 usermode_helper=/bin/true >> /etc/modules  
$ depmod -a  
$ modprobe drbd minor_count=255 usermode_helper=/bin/true
```

Via Grub

```
# Kernel Commands  
drbd.minor_count=255 drbd.usermode_helper=/bin/true
```

Network Setup

Interface Layout



eth0 - trunked VLANs

eth1 - private DRBD network

VLAN setup

for Debian/Ubuntu

```
allow-hotplug eth0
allow-hotplug eth1
allow-hotplug vlan100
allow-hotplug vlan42

auto vlan100
iface vlan100 inet manual
    vlan_raw_device eth0

auto vlan42
iface vlan42 inet manual
    vlan_raw_device eth0
```

Bridge setup

for Debian/Ubuntu

```
allow-hotplug br42
allow-hotplug br10

auto br42
iface br42 inet static
    address 10.1.0.140
    netmask 255.255.254.0
    network 10.1.0.0
    broadcast 10.1.1.255
    gateway 10.1.0.1
    dns-nameservers 10.1.0.130
    dns-search example.org
    bridge_ports vlan42
    bridge_stp off
    bridge_fd 0

auto br100
iface br100 inet manual
    bridge_ports vlan100
    bridge_stp off
    bridge_fd 0
```

DRBD Network setup

for Debian/Ubuntu

```
iface eth1 inet static
    address 192.168.16.140
    netmask 255.255.255.0
    network 192.168.16.0
    broadcast 192.168.16.255
```

Configuring LVM

```
$ pvcreate /dev/sda3  
$ vgcreate ganeti /dev/sda3
```

lvm.conf changes

Ignore drbd devices

```
filter = ["r|/dev/cdrom|", "r|/dev/drbd[0-9]+|" ]
```

Installing Ganeti

Installation Options

Via package manager

Via source

Installing Ganeti Dependencies

via source

```
$ apt-get install lvm2 ssh bridge-utils \  
    iproute iputils-arping ndisc6 python \  
    python-pyopenssl openssl \  
    python-pyparsing python-simplejson \  
    python-pyinotify python-pycurl socat
```

Htools Dependencies

provides IAllocator *hail*

```
$ apt-get install ghc6 libghc6-json-dev \  
libghc6-network-dev \  
libghc6-parallel-dev libghc6-curl-dev
```

Install Ganeti

```
$ ./configure --localstatedir=/var \  
    --sysconfdir=/etc \  
    --enable-htools  
$ make  
$ make install
```

Startup Scripts

Installed into `/usr/local/`

```
$ cp doc/examples/ganeti.initd /etc/init.d/ganeti  
$ update-rc.d ganeti defaults 20 80
```

ganeti-watcher

```
$ cp doc/examples/ganeti.cron /etc/cron.d/ganeti
```

- *Automatically* restarts failed instances
- Restarts *failed* secondary storage

What gets installed

- Python libraries under the *ganeti* namespace
- Set of programs under `/usr/local/sbin` or `/usr/sbin`
- Set of tools under `lib/ganeti/tools` directory
- IAllocator scripts under `lib/ganeti/tools` directory
- *Cron job* needed for cluster maintenance
- *Init script* for Ganeti daemons

Install OS Definition

Instance creation scripts

also known as OS Definitions

- Requires Operating System installation script
- Provide scripts to deploy various operating systems
- *Ganeti Instance Debootstrap* - upstream supported
- *Ganeti Instance Image* - written by me

OS Variants

- *Variants* of the OS Definition
- Used for *defining* guest operating system
- Types of deployment settings:
 - Filesystem
 - Image directory
 - Image Name

Install Instance Image Dependencies

```
$ apt-get install dump qemu-kvm kpartx
```

Install Instance Image

```
$ ./configure --prefix=/usr \  
  --localstatedir=/var \  
  --sysconfdir=/etc \  
  --with-os-dir=/srv/ganeti/os  
$ make  
$ make install
```

Creating images

Manually install/setup guest

Shutdown guest

Create filesystem *dump* or *tarball*

Place in `IMAGE_DIR`

Initialize Ganeti

Cluster name

Mandatory once per cluster, on the first node.

- Cluster hostname *resolvable* by all nodes
- IP reserved **exclusively** for the cluster
- Used by *master* node
- i.e.: `ganeti-prod.example.org`

Initialization

KVM example

```
$ gnt-cluster init \  
  --master-netdev=br42 \  
  --vg-name ganeti \  
  --secondary-ip 192.168.16.140 \  
  --enabled-hypervisors=kvm \  
  --nic-parameters link=br100 \  
  --backend-parameters \  
    vcpus=2,memory=512M \  
  --hypervisor-parameters \  
    kvm:kernel_path=/boot/guest/vmlinuz \  
    vnc_bind_address=0.0.0.0 \  
ganeti-prod.example.org
```

Cluster init args

Master Network Device

```
--master-netdev=br42
```

Volume Group Name

```
--vg-name ganeti
```

DRBD Interface

```
--secondary-ip 192.168.16.140
```

Enabled Hypervisors

```
--enabled-hypervisors=kvm
```


Cluster init args

Default NIC

```
--nic-parameters link=br100
```

Default Backend parameters

```
--backend-parameters vcpus=2,memory=512M
```

Default Hypervisor Parameters

```
--hypervisor-parameters \  
    kvm:kernel_path=/boot/guest/vmlinuz-guest, \  
    vnc_bind_address=0.0.0.0 \  
    \
```

Cluster hostname

```
ganeti-prod.example.org
```

Post-install Steps

Testing/Viewing the nodes

```
$ gnt-node list
```

Node	DTotal	DFree	MTotal	MNode	MFree	Pinst	Sinst
node1.example.org	223.4G	223.4G	7.8G	300M	7.5G	0	0
node2.example.org	223.4G	223.4G	7.8G	300M	7.5G	0	0

- Ganeti daemons can talk to each other
- Ganeti can examine storage on the nodes (*DTotal/DFree*)
- Ganeti can talk to the selected hypervisor (*MTotal/MNode/MFree*)

Cluster burnin testing

```
$ /usr/lib/ganeti/tools/burnin -o image -p instance{1..5}
```

- Does the *hardware* work?
- Can the *Hypervisor* create instances?
- Does each *operation* work properly?

Instance Management

Adding an instance

Requires at least 5 params

- OS for the instance (`gnt-os list`)
- Disk template
- Disk count & size
- Node or iallocator
- Instance name (*resolvable*)

Add Command

```
$ gnt-instance add \  
  -n TARGET_NODE:SECONDARY_NODE \  
  -o OS_TYPE \  
  -t DISK_TEMPLATE -s DISK_SIZE \  
  INSTANCE_NAME
```

Other options

among others

- Memory size (-B memory=1GB)
- Number of virtual CPUs (-B vcpus=4)
- NIC settings (--nic 0:link=br100)
- batch-create
- See gnt-instance manpage for others

Instance Removal

```
$ gnt-instance remove INSTANCE_NAME
```

Startup/Shutdown

```
$ gnt-instance startup INSTANCE_NAME  
$ gnt-instance shutdown INSTANCE_NAME
```

Started automatically

Do not use hypervisor directly

Querying Instances

- **Two methods:**
 - listing instances
 - detailed instance information
- One useful for grep
- Other has more details, slower

Listing instances

```
$ gnt-instance list
```

Instance	Hypervisor	OS	Primary_node	Status	Memory
instance1.example.org	kvm	image+gentoo-hardened	node1.example.org	ERROR_down	-
instance2.example.org	kvm	image+centos	node2.example.org	running	512M
instance3.example.org	kvm	image+debian-squeeze	node1.example.org	running	512M
instance4.example.org	kvm	image+ubuntu-lucid	node2.example.org	running	512M

Detailed Instance Info

```
$ gnt-instance info instance2
Instance name: instance2.example.org
UUID: 5b5b1c35-23de-45bf-b125-a9a001b2bebb
Serial number: 22
Creation time: 2011-05-24 23:05:44
Modification time: 2011-06-15 21:39:12
State: configured to be up, actual state is up
  Nodes:
    - primary: node2.example.org
    - secondaries:
Operating system: image+centos
Allocated network port: 11013
Hypervisor: kvm
  - console connection: vnc to node2.example.org:11013 (display 5113)
  - acpi: True
  ...
Hardware:
  - VCPUs: 2
  - memory: 512MiB
  - NICs:
    - nic/0: MAC: aa:00:00:39:4b:b5, IP: None, mode: bridged, link: br113
Disk template: plain
Disks:
  - disk/0: lvm, size 9.8G
    access mode: rw
    logical_id: ganeti/0c3f6913-cc3d-4132-bbbf-af9766a7cde3.disk0
    on primary: /dev/ganeti/0c3f6913-cc3d-4132-bbbf-af9766a7cde3.disk0 (252:3)
```

Export/Import

```
$ gnt-backup export -n TARGET_NODE INSTANCE_NAME
```

Create *snapshot* of disk & configuration

Backup, or import into another cluster

One snapshot for an instance

Importing an instance

```
$ gnt-backup import \  
  -n TARGET_NODE \  
  --src-node=NODE \  
  --src-dir=DIR INSTANCE_NAME
```

Import of foreign instances

```
$ gnt-instance add -t plain -n HOME_NODE ... \  
  --disk 0:adopt=lv_name[,vg=vg_name] \  
  INSTANCE_NAME
```

- Already stored as LVM volumes
- Ensure non-managed instance is stopped
- Take over given logical volumes
- Better transition

Instance Console

```
$ gnt-instance console INSTANCE_NAME
```

Type `^]` when done, to exit.

Instance HA Features

Changing the Primary node

Failing over an instance

```
$ gnt-instance failover INSTANCE_NAME
```

Live migrating an instance

```
$ gnt-instance migrate INSTANCE_NAME
```

Restoring redundancy for DRBD-based instances

- *Primary* node storage failed
 - Re-create disks on it
- *Secondary* node storage failed
 - Re-create disks on secondary node
 - Change secondary

Replacing disks

```
$ # re-create disks on the primary node
gnt-instance replace-disks -p INSTANCE_NAME

$ # re-create disks on the current secondary
gnt-instance replace-disks -s INSTANCE_NAME

$ # change the secondary node, via manual
$ # specification
gnt-instance replace-disks -n NODE INSTANCE_NAME

$ # change the secondary node, via an iallocator
$ # script
gnt-instance replace-disks -I SCRIPT INSTANCE_NAME

$ # automatically fix the primary or secondary node
gnt-instance replace-disks -a INSTANCE_NAME
```

Conversion of an instance's disk type

```
$ # start with a non-redundant instance  
gnt-instance add -t plain ... INSTANCE
```

```
$ # later convert it to redundant  
gnt-instance stop INSTANCE  
gnt-instance modify -t drbd \  
    -n NEW_SECONDARY INSTANCE  
gnt-instance start INSTANCE
```

```
$ # and convert it back  
gnt-instance stop INSTANCE  
gnt-instance modify -t plain INSTANCE  
gnt-instance start INSTANCE
```

Node Operations

Add/Re-add

```
$ gnt-node add NEW_NODE
```

May need to pass **-s REPLICATION_IP** parameter

```
$ gnt-node add --readd EXISTING_NODE
```

-s parameter *not* required

Master fail-over

```
$ gnt-cluster master-failover
```

On a non-master, master-capable node

Evacuating nodes

- Moving the *primary* instances
- Moving *secondary* instances

Primary Instance conversion

```
$ gnt-node migrate NODE  
$ gnt-node evacuate NODE
```

Node Removal

```
$ gnt-node remove NODE_NAME
```

Deconfigure node

Stop ganeti daemons

Node in *clean* state

Job Operations

Listing Jobs

```
$ gnt-job list  
17771 success INSTANCE_QUERY_DATA  
17773 success CLUSTER_VERIFY_DISKS  
17775 success CLUSTER_REPAIR_DISK_SIZES  
17776 error    CLUSTER_RENAME(cluster.example.com)  
17780 success CLUSTER_REDIST_CONF  
17792 success INSTANCE_REBOOT(instance1.example.com)
```

Detailed Info

```
$ gnt-job info 17776
Job ID: 17776
Status: error
Received:          2009-10-25 23:18:02.180569
Processing start: 2009-10-25 23:18:02.200335 (delta 0.019766s)
Processing end:    2009-10-25 23:18:02.279743 (delta 0.079408s)
Total processing time: 0.099174 seconds
Opcodes:
  OP_CLUSTER_RENAME
    Status: error
    Processing start: 2009-10-25 23:18:02.200335
    Processing end:    2009-10-25 23:18:02.252282
    Input fields:
      name: cluster.example.com
    Result:
      OpPrereqError
      [Neither the name nor the IP address of the cluster has changed]
    Execution log:
```

Watching a job

```
$ gnt-instance add --submit ... instance1
JobID: 17818
$ gnt-job watch 17818
Output from job 17818 follows
-----
Mon Oct 26 2009 - INFO: Selected nodes for instance instance1 via iallocator dumb: node1, node2
Mon Oct 26 2009 * creating instance disks...
Mon Oct 26 2009 adding instance instance1 to cluster config
Mon Oct 26 2009 - INFO: Waiting for instance instance1 to sync disks.
...
Mon Oct 26 2009 creating os for instance instance1 on node node1
Mon Oct 26 2009 * running the instance OS create scripts...
Mon Oct 26 2009 * starting instance...
```


htools

Components

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

hbal

```
$ hbal -m ganeti.example.org
Loaded 4 nodes, 63 instances
Initial check done: 0 bad nodes, 0 bad instances.
Initial score: 0.53388595
Trying to minimize the CV...
  1. bonsai          g1:g2 => g2:g1 0.53220090 a=f
  2. connectopenso g3:g1 => g1:g3 0.53114943 a=f
  3. amahi           g2:g3 => g3:g2 0.53088116 a=f
  4. mertan          g1:g2 => g2:g1 0.53031862 a=f
  5. dspace          g3:g1 => g1:g3 0.52958328 a=f
Cluster score improved from 0.53388595 to 0.52958328
Solution length=5
```

Useful for cluster re-balancing

hbal

```
$ hbal -C -m ganeti.example.org
Loaded 4 nodes, 71 instances
Initial check done: 0 bad nodes, 0 bad instances.
Initial score: 2.10591985
Trying to minimize the CV...
  1. linuxfund          g4:g3 => g4:g2 2.09981699 a=r:g2
Cluster score improved from 2.10591985 to 2.09981699
Solution length=1

Commands to run to reach the above solution:

  echo jobset 1, 1 jobs
  echo job 1/1
  gnt-instance replace-disks -n g2 linuxfund
```

hspace

Cluster planning

```
$ hspace --memory 512 --disk 10240 \  
$      -m ganeti.example.org  
HTS_INI_INST_CNT=63  
  
HTS_FIN_INST_CNT=101  
  
HTS_ALLOC_INSTANCES=38  
HTS_ALLOC_FAIL_REASON=FAILDISK
```

hail

```
$ gnt-instance add -t drbd -I hail \  
$ -s 10G -o image+ubuntu-maverick \  
$ --net 0:link=br42 instance1.example.org \  
- INFO: Selected nodes for instance instance1.example.org  
      via iallocator hail: node1.example.org, node2.example.org  
* creating instance disks...  
adding instance instance1.example.org to cluster config  
- INFO: Waiting for instance instance1.example.org to sync disks.  
- INFO: - device disk/0:  3.60% done, 1149 estimated seconds remaining  
- INFO: - device disk/0: 29.70% done, 144 estimated seconds remaining  
- INFO: - device disk/0: 55.50% done, 88 estimated seconds remaining  
- INFO: - device disk/0: 81.10% done, 47 estimated seconds remaining  
- INFO: Instance instance1.example.org's disks are in sync.  
* running the instance OS create scripts...  
* starting instance...
```

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

RAPI Example use-cases

- Web-based GUI (see *Ganeti Web Manager*)
- Automate cluster tasks via scripts
- Custom reporting tools

Project Roadmap

Project Details

- <http://code.google.com/p/ganeti/>
- License: *GPL v2*
- Ganeti 1.2.0 - December 2007
- Ganeti 2.0.0 - May 2009
- Ganeti 2.4.0 - Mar 2011 / *2.4.2* current
- Ganeti 2.5.0 - *July 2011?*

Upcoming features

- Merge htools
- CPU Pinning
- Replacing internal HTTP server
- Import/export version 2
- Moving instance across node groups
- Network management
- Shared storage support



- 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
```


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Admin

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[Import VMs](#)
[Missing VMs](#)
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Search

Clusters

 [Add Cluster](#)

Cluster ▾	Description ▾	Version ▾	Hypervisor ▾	Master node ▾	Nodes ▾	VMs ▾
gwm		2.4.2	kvm	gwm1.osuosl.org	1	9

Import Tools

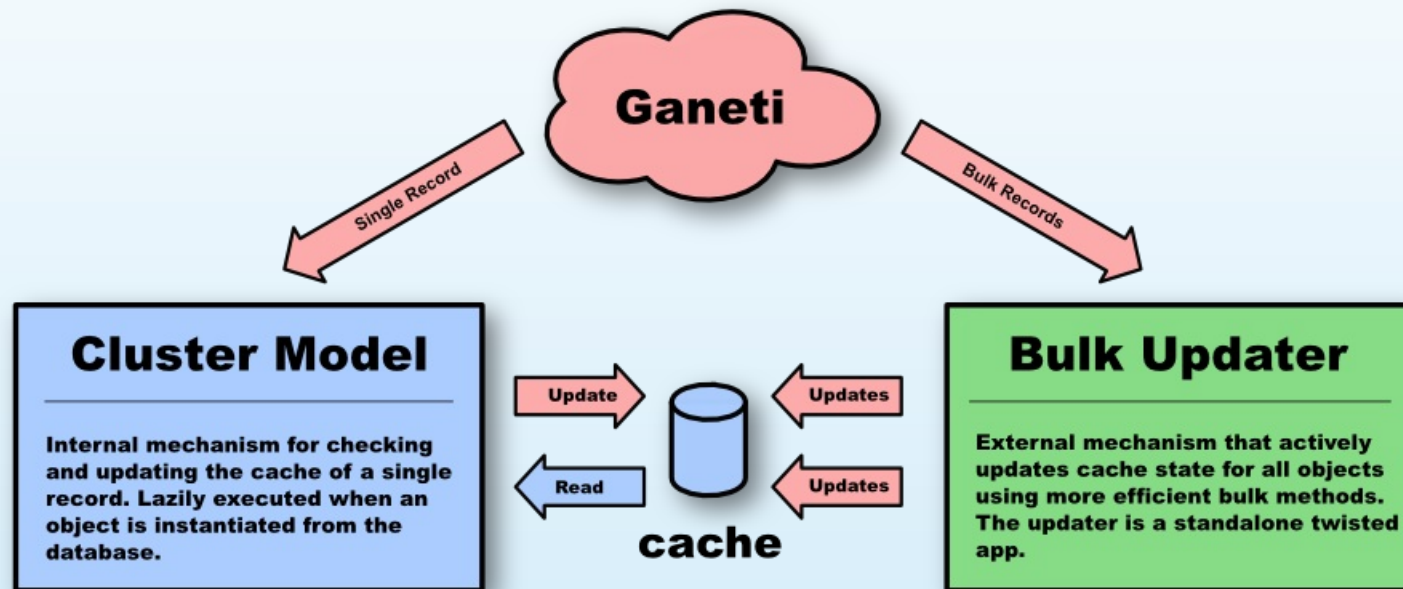
- Find Orphaned Instances
- Import New Nodes & Instances
- Remove Deleted Nodes & Instances

Cache Updater

Imports Nodes and Virtual Machines too

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

Cache System



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Overview

Cluster Status

Cluster	Version	Free Memory [GiB]	Free Disk [GiB]	Nodes	VMs
ganeti-supercell	2.4.2	<div><div></div></div> 233 / 252	<div><div></div></div> 2643 / 2769	2/2	12/12
gwm	2.4.2	<div><div></div></div> 0.457 / 1.96	<div><div></div></div> 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	<div><div></div></div> 3000 / 20960	<div><div></div></div> 1024 / 4096	<div><div></div></div> 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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Search**Virtual Machine : Create**

Owner

Cluster

Hypervisor

Instance Name

Start up After Creation ☒

DNS Name Check ☒

Disk Template

Operating System

General Parameters

Virtual CPUs

Memory

Disk Size

Disk Type

NIC Mode

NIC Link

NIC Type

Hypervisor Parameters

Kernel Path

Root Path

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

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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 (<i>image</i>)
Autostart	✓
VNC	gwm1.osuosl.org::11116

-  [Edit](#)
-  [Rename](#)
-  [Change Owner](#)
-  [Delete](#)
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-  [Shutdown](#)
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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
-----	-----	----	------	------


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ganeti-test : gimager.osuosl.bak

Overview Users Console

 Encrypt










 Disconnect

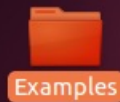
 Shutdown

 Reboot

 Ctrl-Alt-Delete

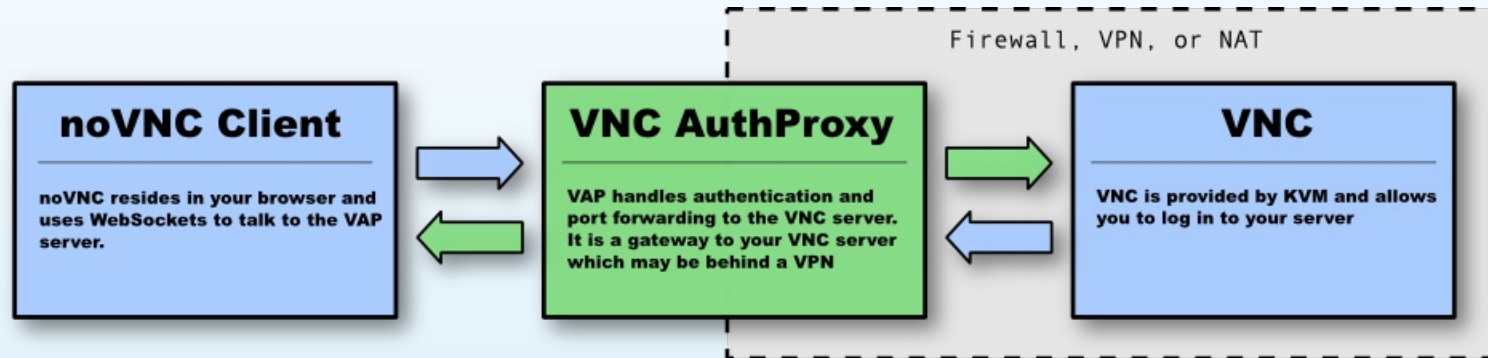
Connected (unencrypted) to: QEMU (gimager.osuosl.bak)

 Applications  Places  System     Wed Feb 2, 11:44 PM  ubuntu 



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


Add User: close

User/Group:

 peter

 peter

 peter's group

 peter's group too

☐ **Tags:**

☐ **Admin:**

☐ **Replace Disks:** Can replace the disks of a virtual machines.

☐ **Create VM:** Can create a virtual machine on this cluster.

☐ **Migrate:** Can migrate a virtual machine to another node.

☐ **Export:** Can export a virtual machine.

Save

Quotas

Per Persona, Per Cluster

Overriding Default Quota

Cluster : gwm.osuosl.org





Overview Virtual Machines Nodes **Users** Log

Quota: close

Disk Space

Memory

Virtual CPUs

Name	Permissions		
 peter	tags, admin	Memory:5.0 GB Disk:9.8 GB	
 osuosl	migrate, export	∞	

Future Features

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

Conclusion

Questions?

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



Presentation made with *showoff*
<http://github.com/ramereth/presentation-ganeti-tutorial>
<http://is.gd/osbganeti> | <http://is.gd/osbganetipdf>