

OpenStack tutorial

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<https://github.com/al-maisan/p/blob/master/japan-os-tutorial.pdf>

“Linux of the cloud”

Linux

2013

94% of the world's top 500 supercomputers run Linux

15 million lines of code are contributed by 8,000 developers and 800 companies

2012

Linux-based Android leads the worldwide smartphone market

2000

IBM announces \$1B investment in Linux

1999

IBM announces an extensive Linux project

1998

IBM, Compaq and Oracle publicly announce support

1995

Broad hardware support rapidly ramps adoption

1993

More than 100 developers contribute code to Linux

1991

The Linux kernel is developed to access large UNIX servers independent of an operating system

OpenStack

2013

IBM unveils SmartCloud Orchestrator, a new private cloud offering based on OpenStack
Community of 8,200+ individual members representing 1,000 organizations
2013 predicted as the year of “OpenStack Services Firms”

2012

IBM, Rackspace, RedHat, AT&T and others establish the OpenStack Foundation
Leading cloud technology companies as well as large ISVs bet on OpenStack for their core business

2011

Head and shoulders above the rest with respect to contributors, members, followers and community

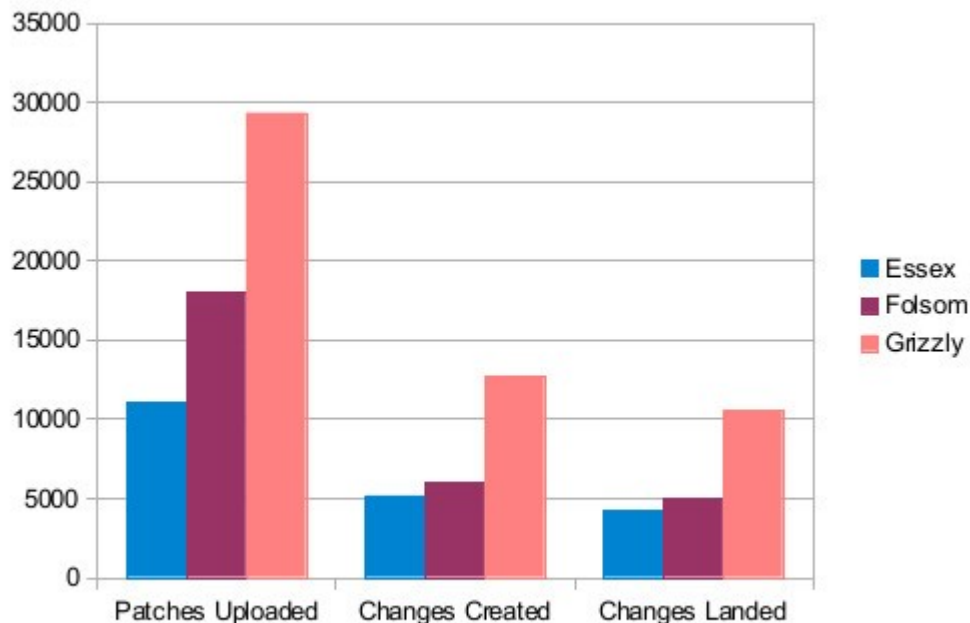
2010

One among many competing open solutions for cloud infrastructure
OpenStack comes out of the gate with favorable Apache license terms

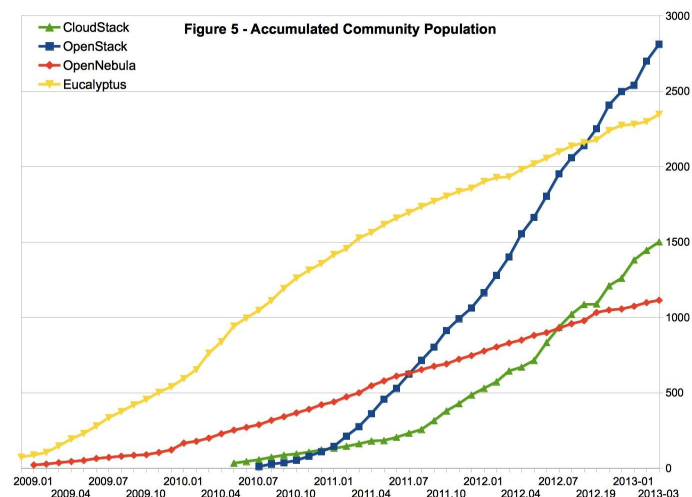
<http://www.zdnet.de/88146181/cloud-computing-ibm-setzt-auf-openstack-und-standards/>



“last cycle .. 517 contributors”



Source: <http://lists.openstack.org/pipermail/openstack-dev/2013-April/007189.html>

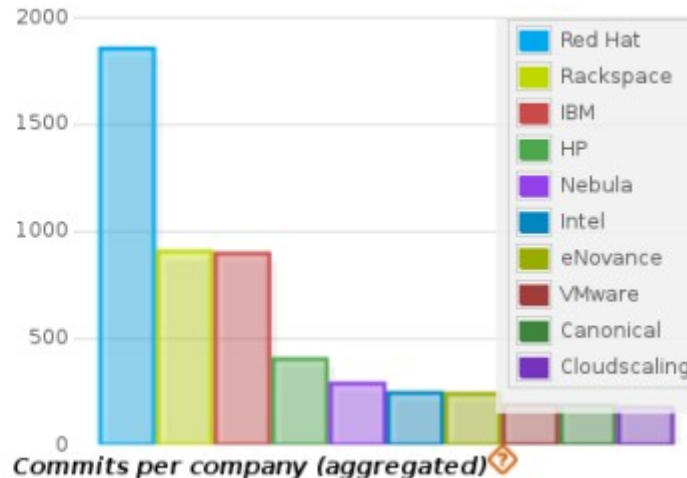
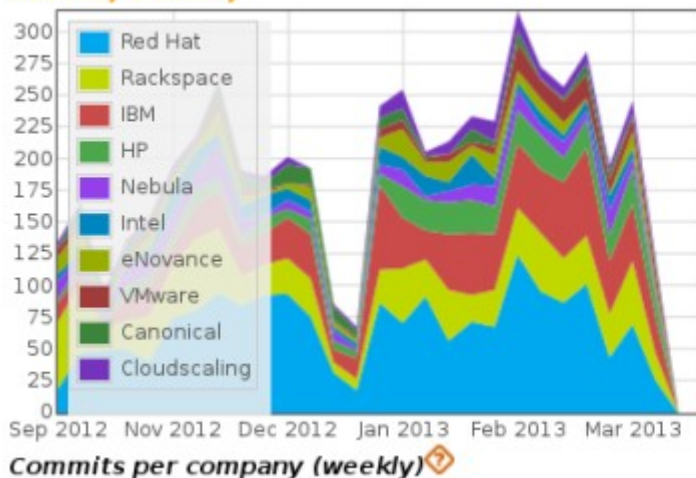


<http://www.qyjohn.net/?p=3120>



Where are these devs coming from?

Summary of activity



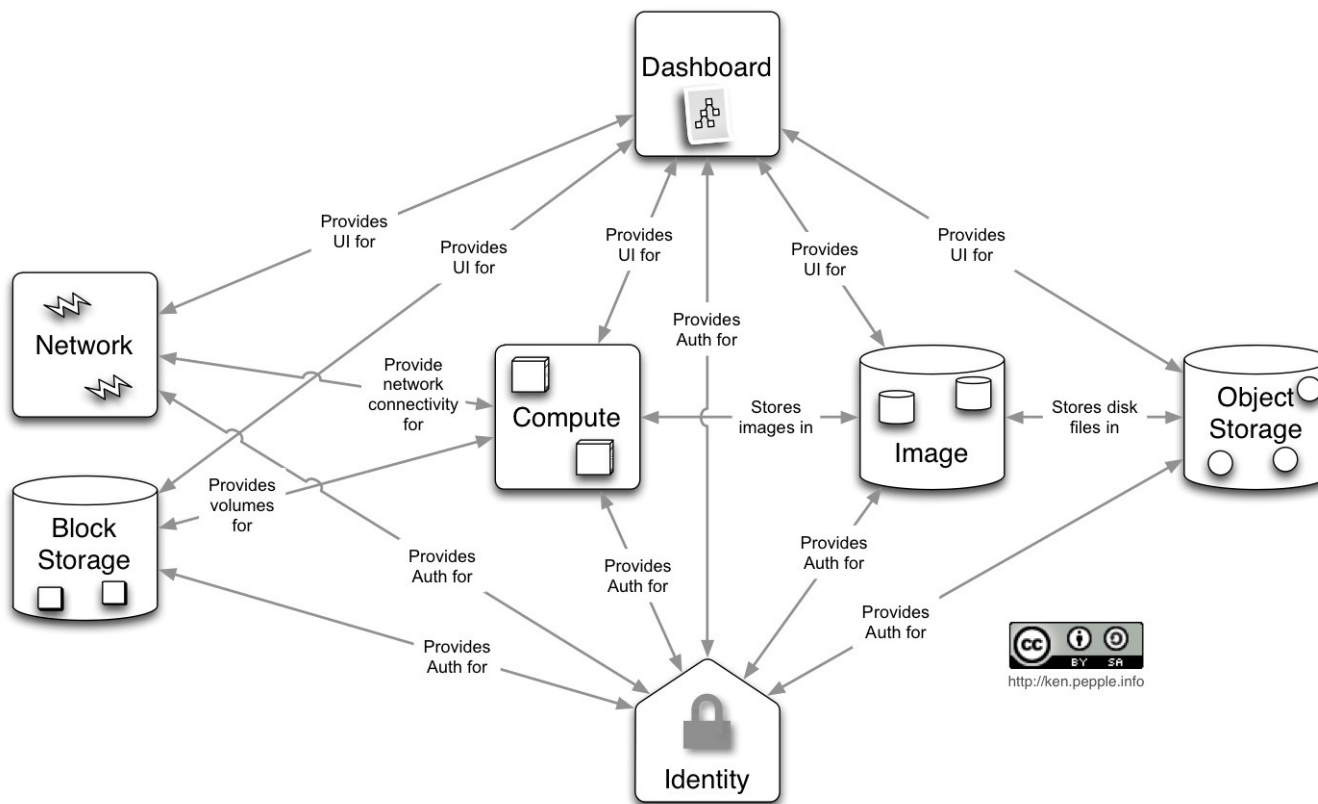
<http://blog.bitergia.com/2013/04/04/companies-contributing-to-openstack-grizzly-analysis/>





<http://www.bauder.co.uk/media-centre/hot-project>

332,387 lines of python code



Wait! There's more

- **heat** - orchestration
- **ceilometer** - metering & monitoring
- **Marconi** - queuing as a service
- **reddwarf** - database as a service
- **moniker** - dns as a service



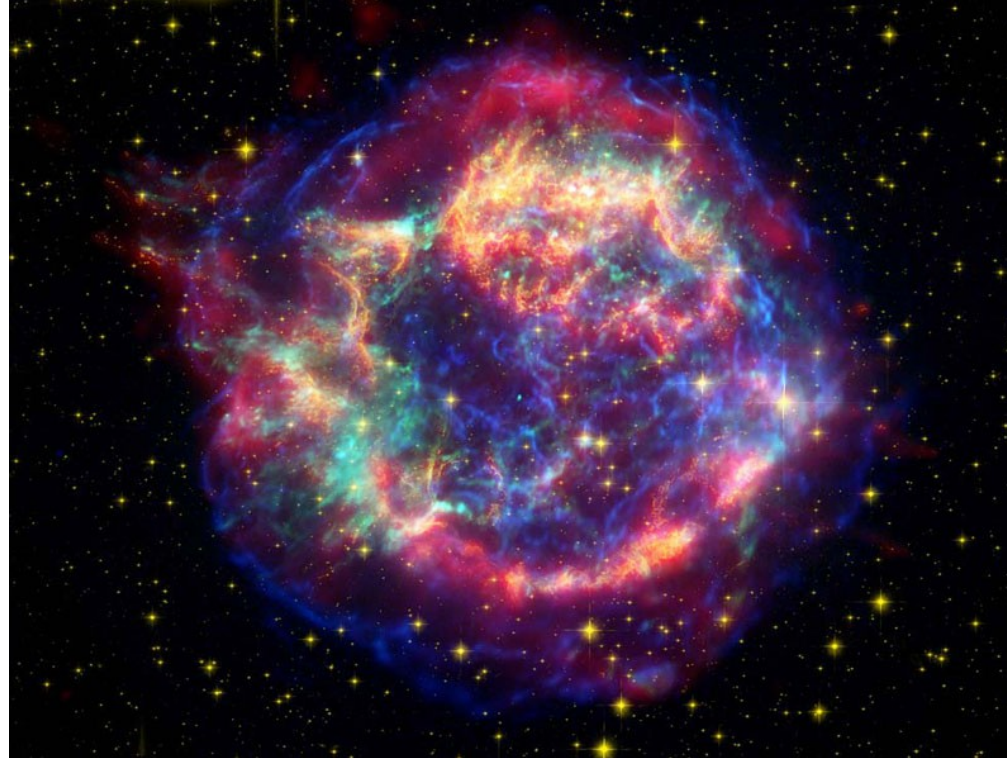
Open => operational choice

- Public cloud (Rackspace, HP etc.)
- Your own cloud (data centre, laptop, vm)
 - Distro
 - Rackspace private cloud
 - RDO
 - devstack

!! experiment and play !!



nova



<http://www.williamsclass.com/EighthScienceWork/ImagesEighth/SuperNovaReminant.jpg>

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Muharem Hrnjadovic | RACKSPACE.COM

features

List images, flavors and instances

ID	Name	Memory_MB	Disk	Ephemeral	Swap	VCPUs	RXTX_Factor	Is_Public	extra_specs
1	m1.tiny	512	0	0		1	1.0	True	{}
2	m1.small	2048	10	20		1	1.0	True	{}
3	m1.medium	4096	10	40		2	1.0	True	{}
4	m1.large	8192	10	80		4	1.0	True	{}
5	m1.xlarge	16384	10	160		8	1.0	True	{}
100	m1.midi	1024	5	0		1	1.0	True	{}
101	m1.mmax	1024	0	0		1	1.0	True	{}

```
tete@osc:~$ nova image-list
```

ID	Name	Status	Server
2d906358-bee3-4ed7-b4b5-d9db4eb1e1e8	ubuntu.12.04.server	ACTIVE	

```
tete@osc:~$ nova list
```

ID	Name	Status	Networks
924928a8-2dff-46fa-96e7-5ae473c7e842	ui2	ACTIVE	novanetwork=10.1.0.2

```
tete@osc:~$ █
```

features

Launch, suspend, resume, terminate instances

```
tete@osc:~$ nova boot --flavor 1 --image ubuntu.12.04.server --key-name guest instance1
```

Property	Value
OS-DCF:diskConfig	MANUAL
OS-EXT-STS:power_state	0
OS-EXT-STS:task_state	scheduling
OS-EXT-STS:vm_state	building
accessIPv4	
accessIPv6	
adminPass	HBy3mbwKieAT
config_drive	
created	2013-05-29T16:29:29Z
flavor	m1.tiny
hostId	231ad1f4c4e954fb7814dfcbfb2adc250f300f0c87bfddf445adaa43
id	e76a3033-cb0c-497c-9d66-db0770f31e06
image	ubuntu.12.04.server
key_name	guest
metadata	{}
name	instance1
progress	0
security_groups	[[{'name': 'u'default'}]]
status	BUILD
tenant_id	8638d357ec6f42cdb4ab44584a2172ea
updated	2013-05-29T16:29:29Z
user_id	ac6cea30da394de7978fb67737d3052b

features

Launch, suspend, resume, terminate instances

```
tete@osc:~$ nova suspend instance1
tete@osc:~$ nova list
```

ID	Name	Status	Networks
d1eb5ef8-e5ff-4f65-8fef-8c69f970768c	instance1	SUSPENDED	novanetwork=10.1.0.4
924928a8-2dff-46fa-96e7-5ae473c7e842	ui2	ACTIVE	novanetwork=10.1.0.2

```
tete@osc:~$ nova resume instance1
tete@osc:~$ nova list
```

ID	Name	Status	Networks
d1eb5ef8-e5ff-4f65-8fef-8c69f970768c	instance1	ACTIVE	novanetwork=10.1.0.4
924928a8-2dff-46fa-96e7-5ae473c7e842	ui2	ACTIVE	novanetwork=10.1.0.2

```
tete@osc:~$ nova delete instance1
tete@osc:~$ nova list
```

ID	Name	Status	Networks
924928a8-2dff-46fa-96e7-5ae473c7e842	ui2	ACTIVE	novanetwork=10.1.0.2

```
tete@osc:~$ █
```

Advanced features

- Evacuate servers
- Manage bare metal nodes

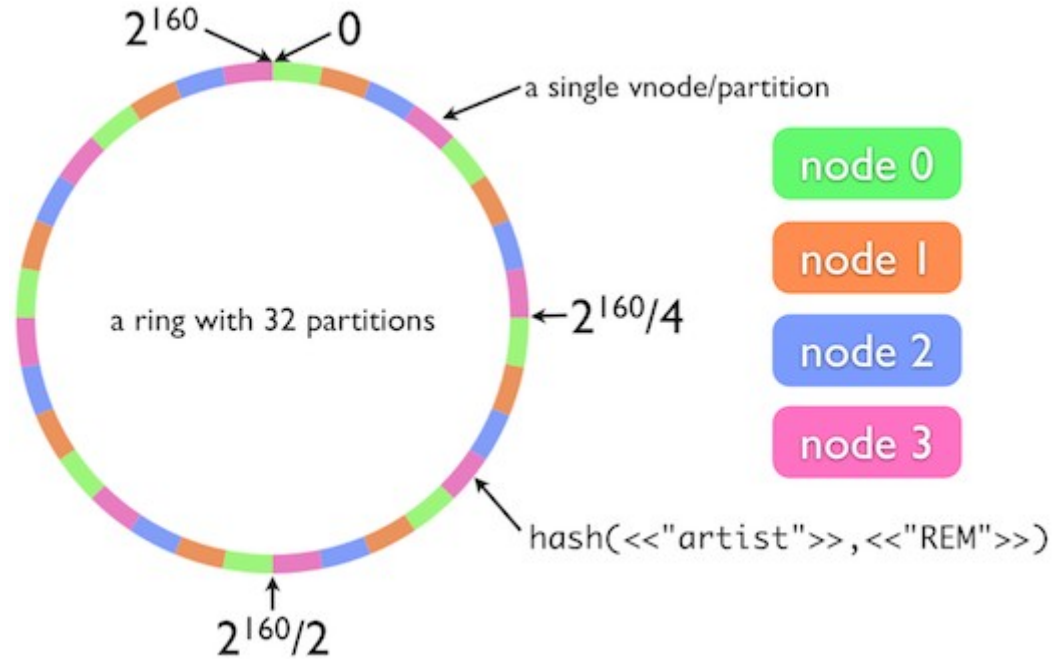


Nova demo (CloudInit)



http://2.bp.blogspot.com/-hNhZtLtNVvs/Tqzn0hzG-tI/AAAAAAAAAKk/xm-bx0svRbc/s1600/funny_accident.jpg

swift



<http://paperplanes-assets.s3.amazonaws.com/consistent-hashing.png>

Swift facts

- highly available, distributed
- eventually consistent
- 3 replicas by default
- Supports **rate limiting**, container level **ACLs**
- **client config**

**stat, list, upload, post, download,
delete**



Swift demo



<http://funkydowntown.com/incredible-but-funny-accident-photos>

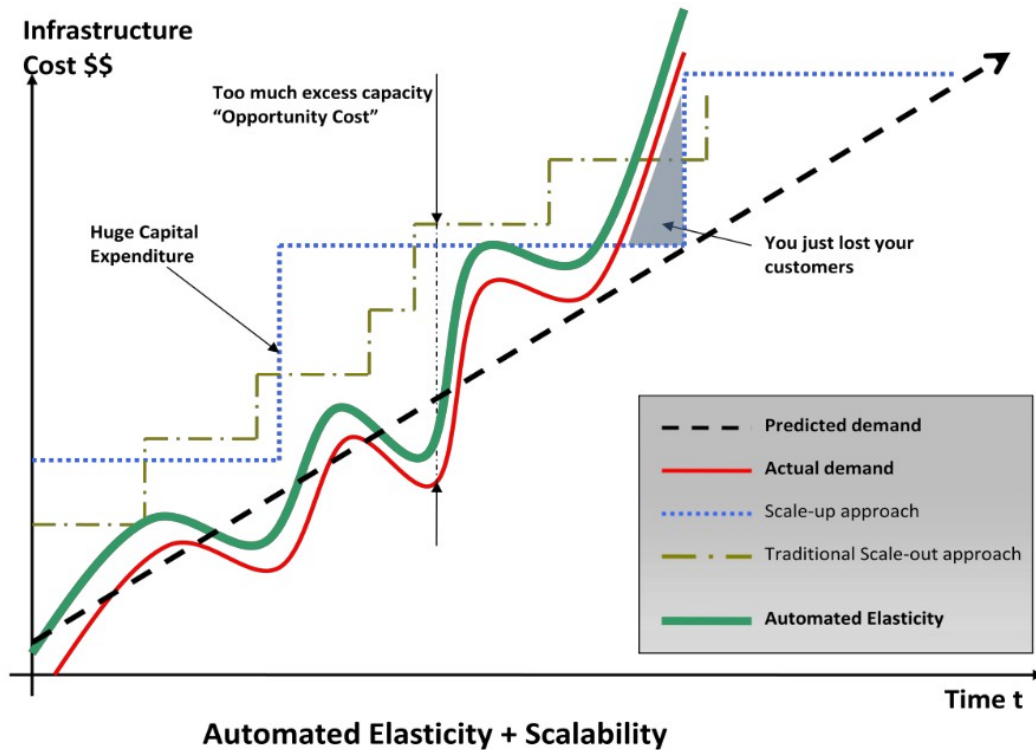


Where's IT headed?



<http://www.photosfan.com/images/view-upside-down-from-inside-an-airplane1.jpg>

Perspective



http://media.amazonwebservices.com/AWS_Cloud_Best_Practices.pdf

cloud drivers

- “infinite” scale
- Pay as you go (capex → opex)
- Minimal time to resource (business agility)
- Elasticity
- Automation

Data centre with an API



Why is it cool?

- Python!
- Open source
- Great community
- Distributed
- All kinds of cool technologies :-)

