OpenStack tutorial

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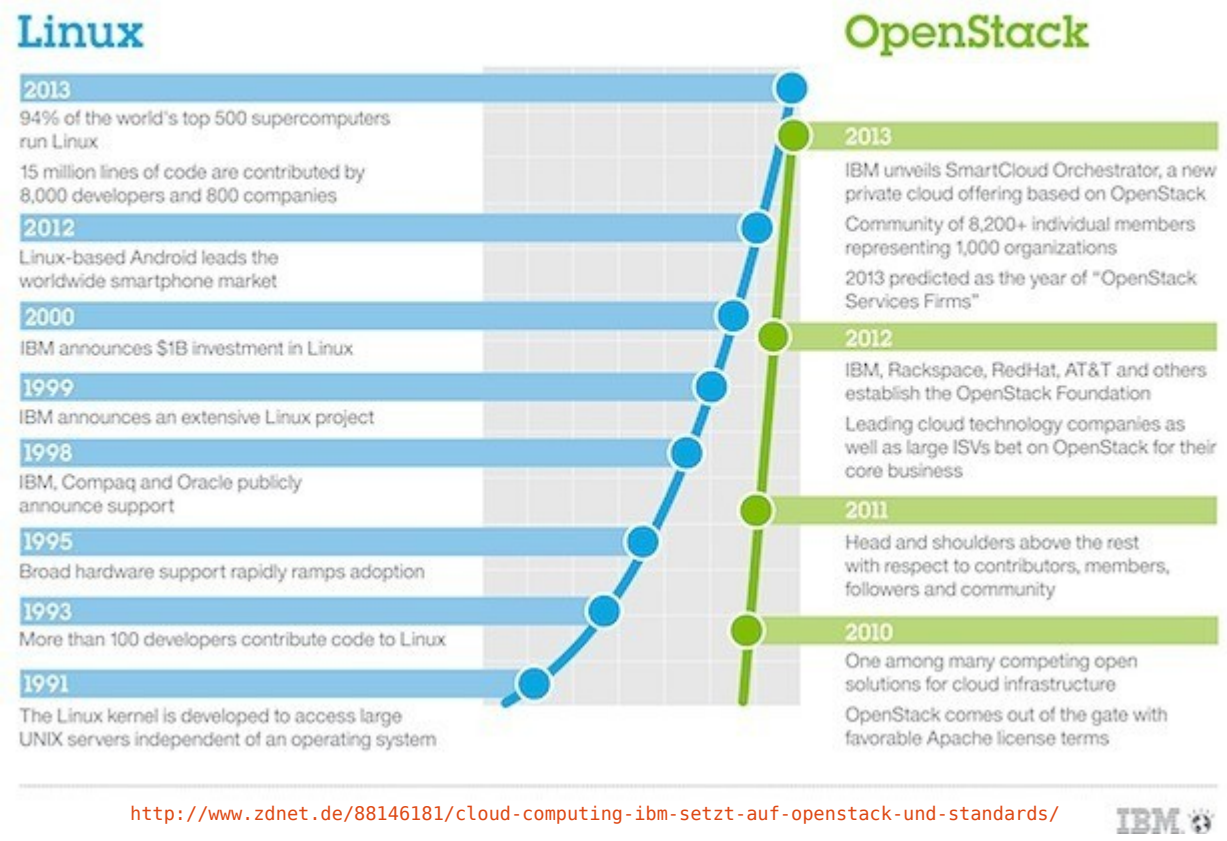
Rackspace International

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

“Linux of the cloud”



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

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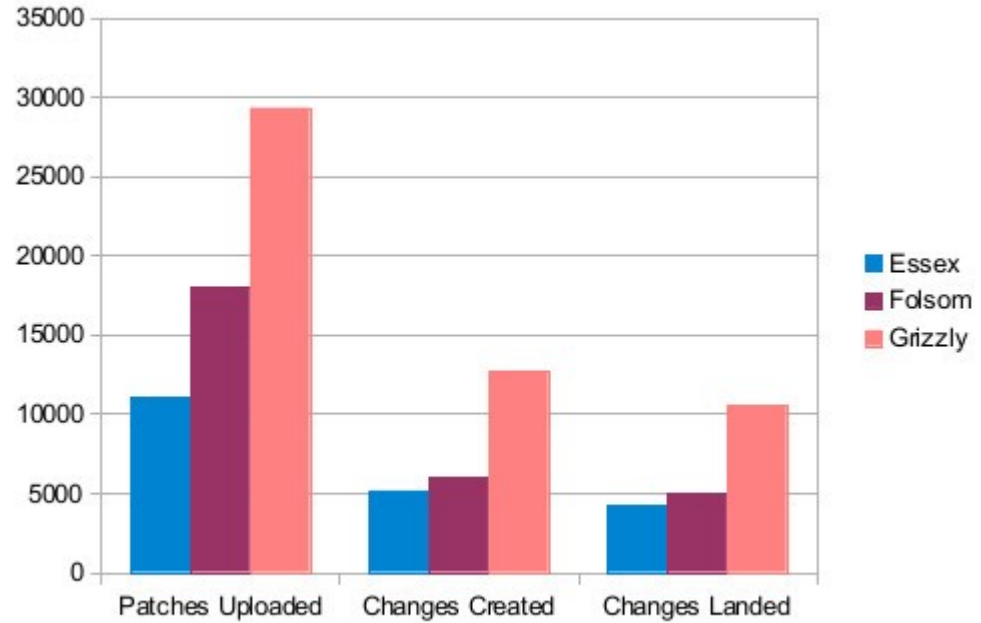
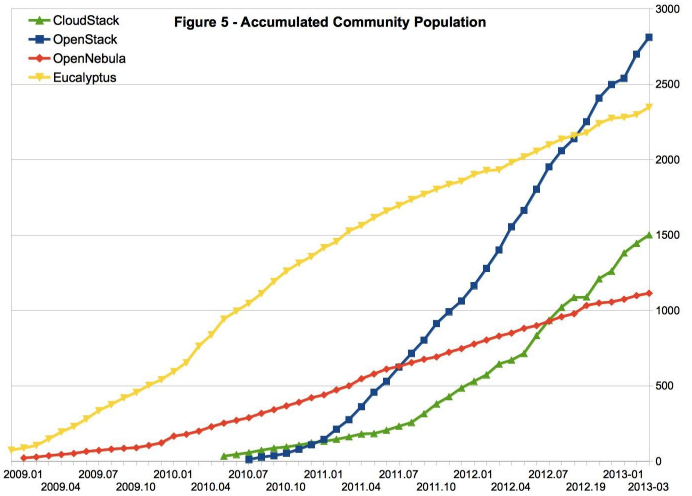
“last cycle .. 517 contributors”

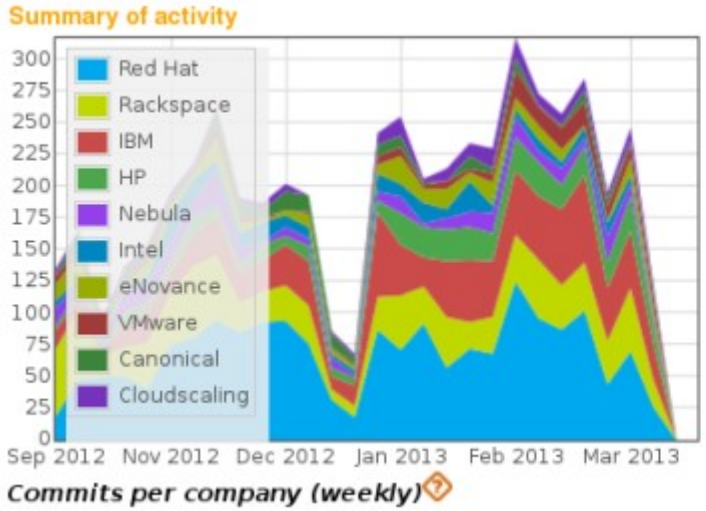


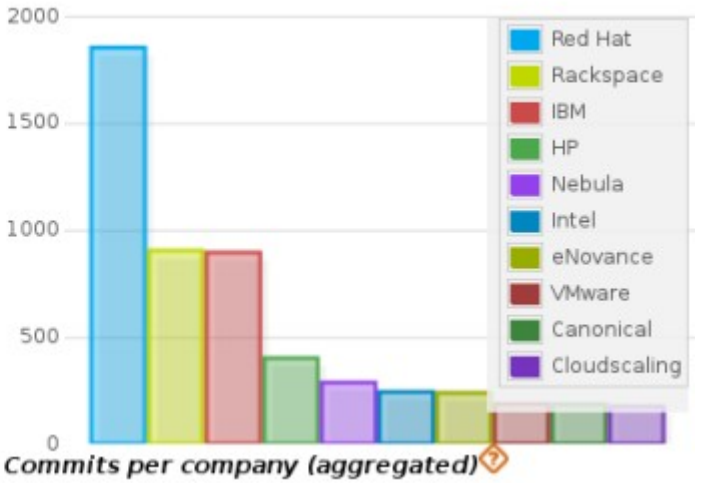
Source: http://lists.openstack.org/pipermail/openstack-dev/2013-April/007189.html



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

Where are these devs coming from?





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

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

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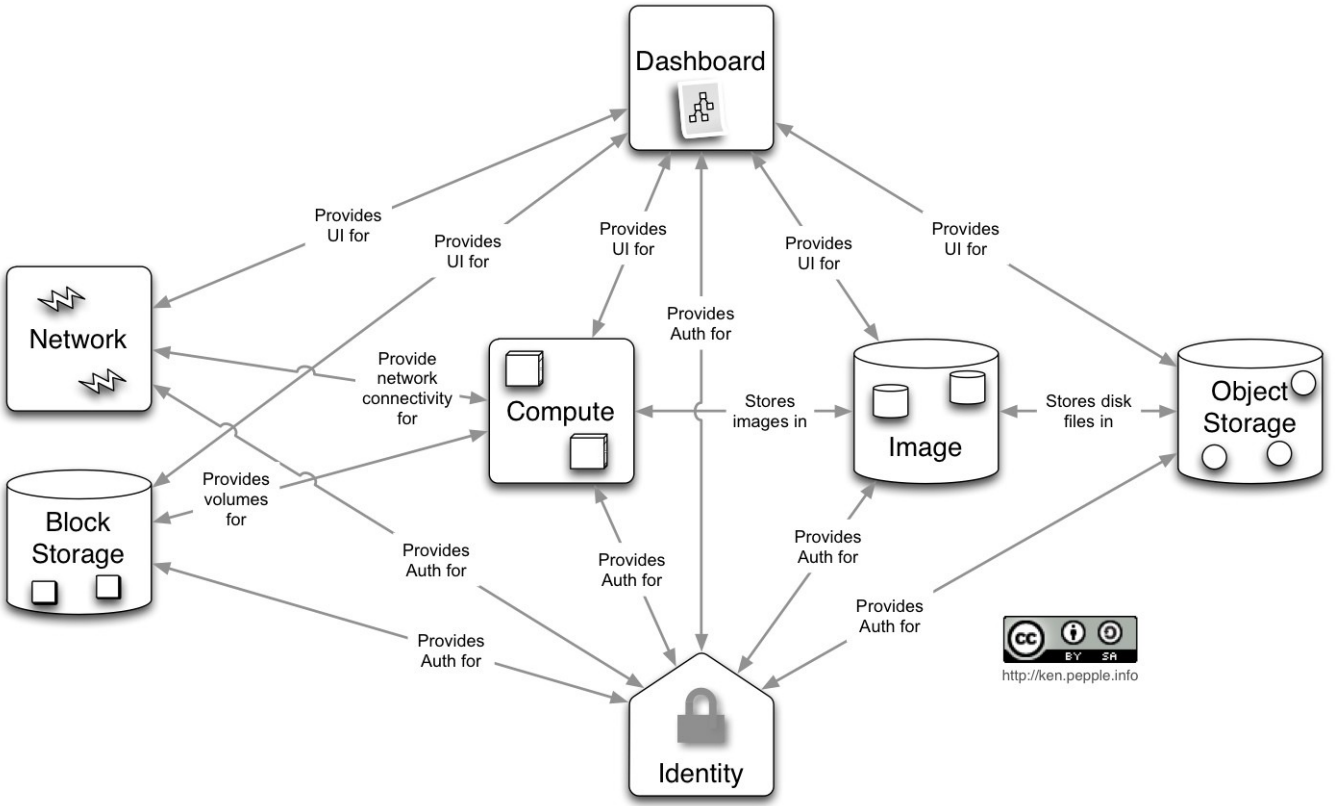
332,387 lines of python code



http://ken.pepple.info/openstack/2012/09/25/openstack-folsom-architecture/

Wait! There's more

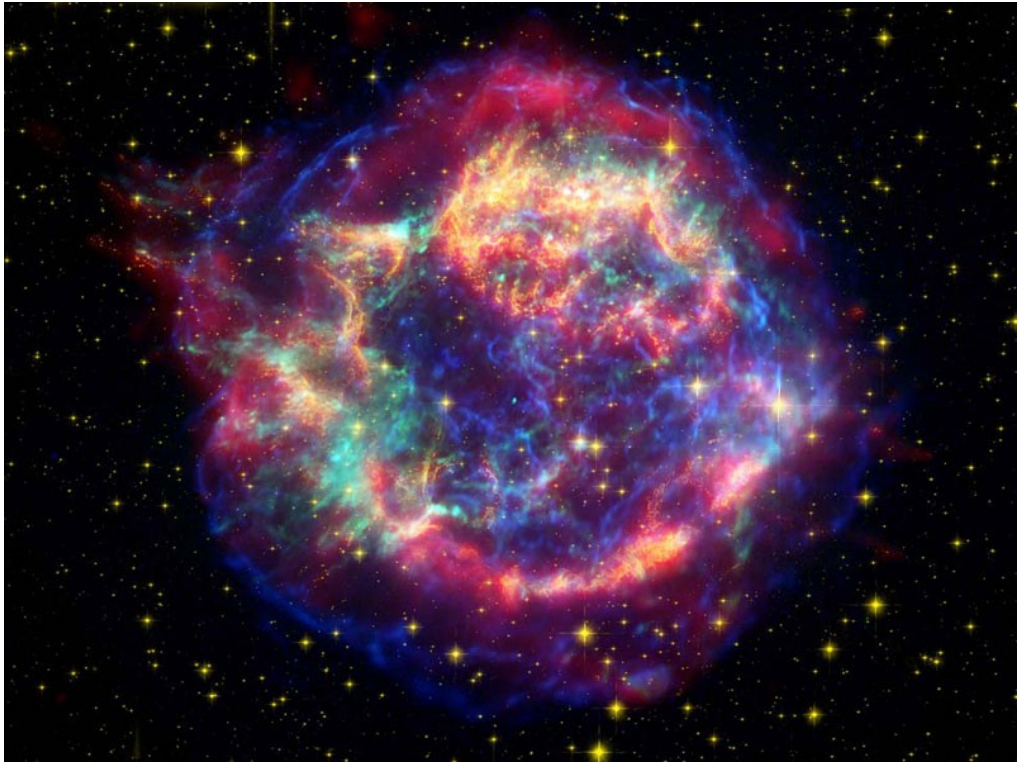
- heat - orchestration
- ceilometer - metering & monitoring
- Marconi - queuing as a service
- reddwarf - database as a service
- moniker - dns as a service

Open => operational choice

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

!! <u>experiment and play</u> !!

nova



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

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:~$
```

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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         | [{u'name': u'default'}]                                      |
| status                  | BUILD                                                        |
| tenant_id               | 8638d357ec6f42cdb4ab44584a2172ea                             |
| updated                 | 2013-05-29T16:29:29Z                                         |
| user_id                 | ac6cea30da394de7978fb67737d3052b                             |
+-------------------------+--------------------------------------------------------------+
tete@osc:~$
```

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/TqznOhzG-tI/AAAAAAAAAKk/xm-bx0svRbc/s1600/funny_accident.jpg

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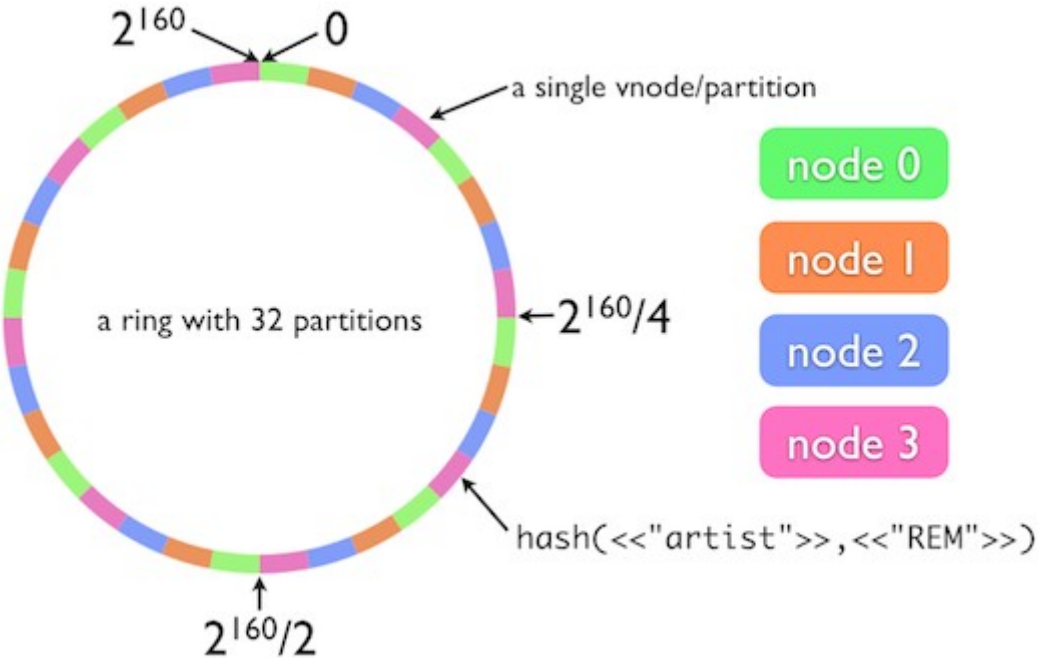
swift



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

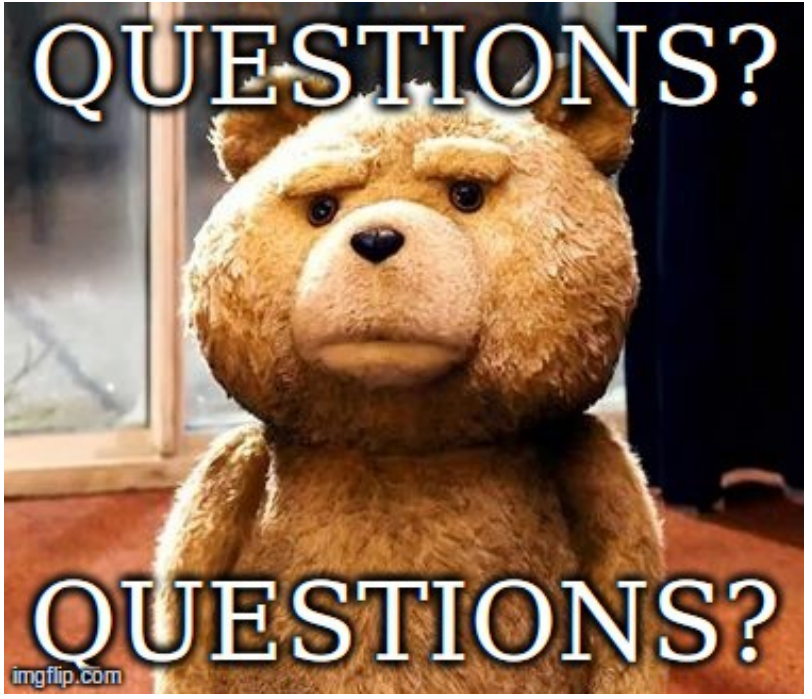
Swift facts

- 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



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Where's IT headed?

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

Perspective

Automated Elasticity + Scalability

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 :-)