Learn OpenStack Over Lunch

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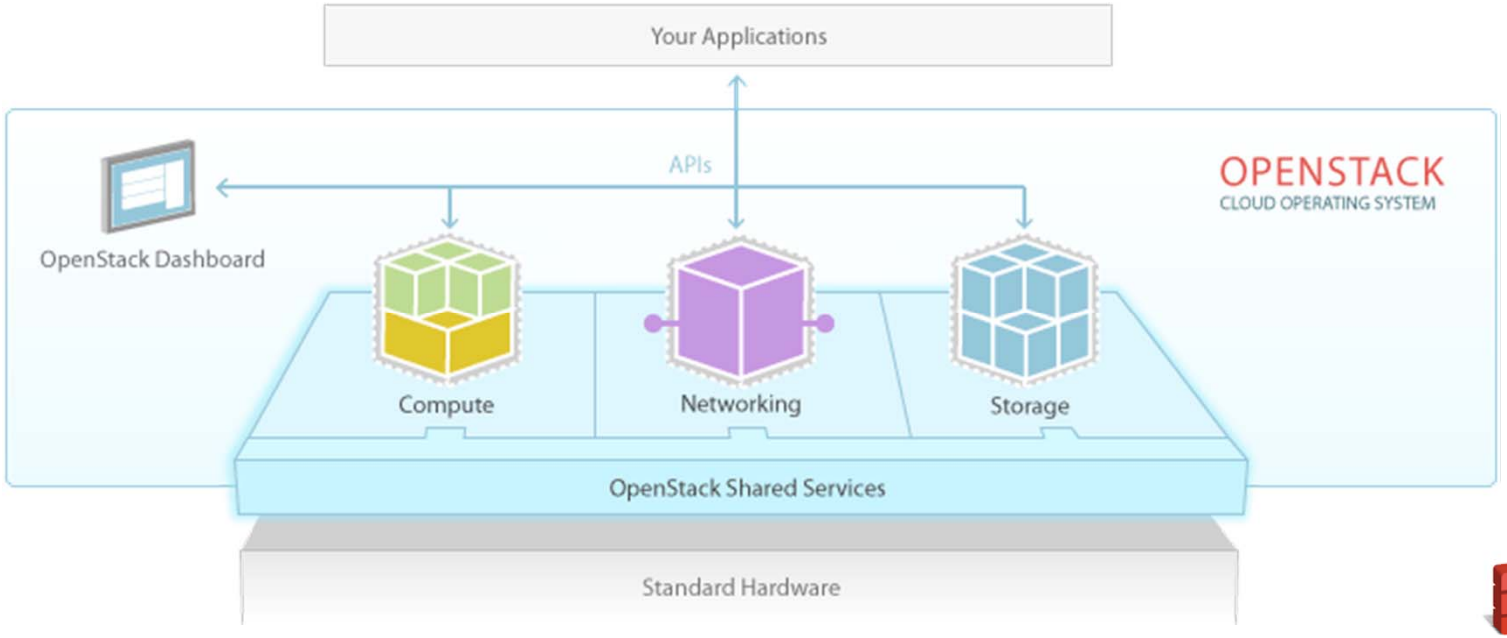
OpenStack provides access to compute, networking and storage



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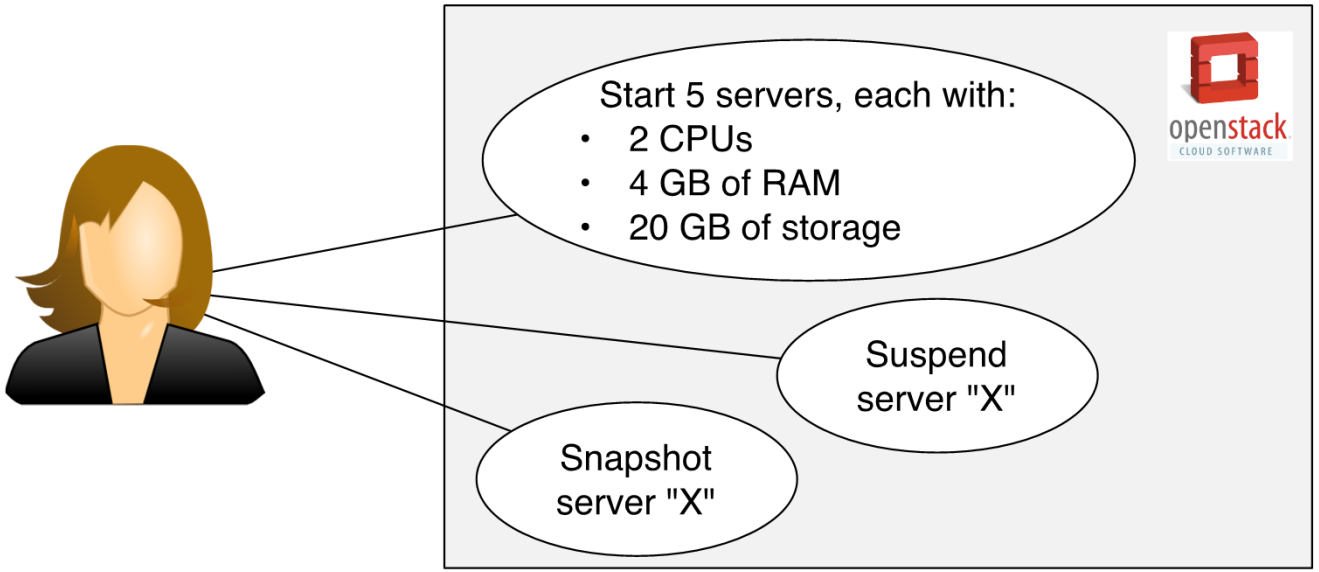
Access **compute** resources



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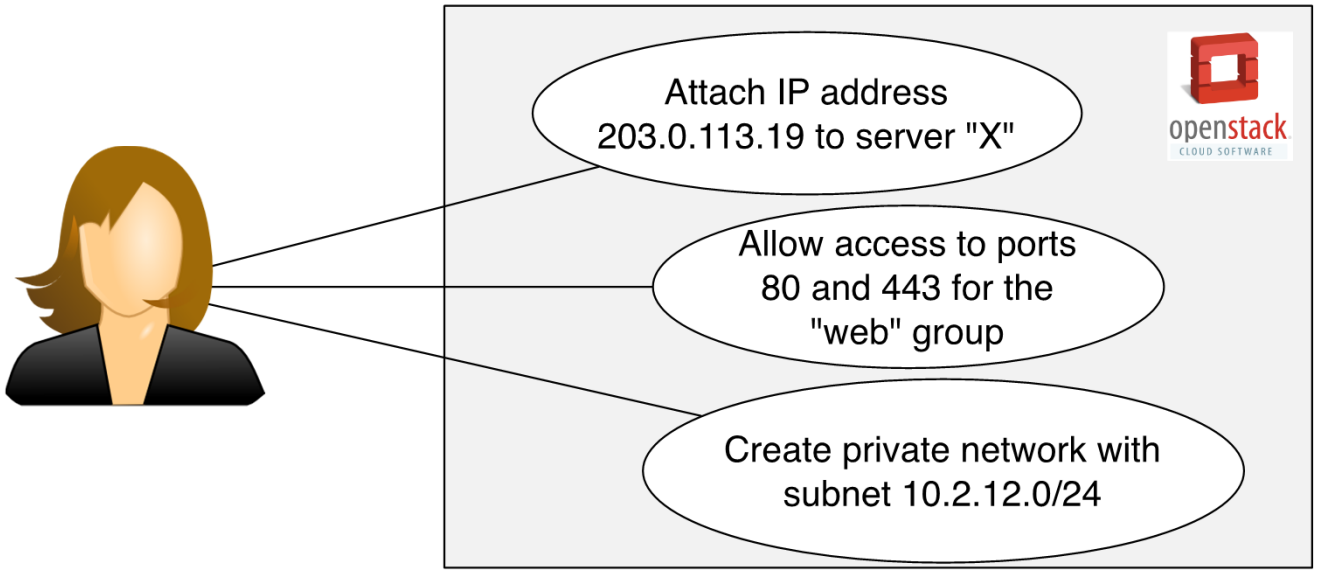
Access **networking** resources



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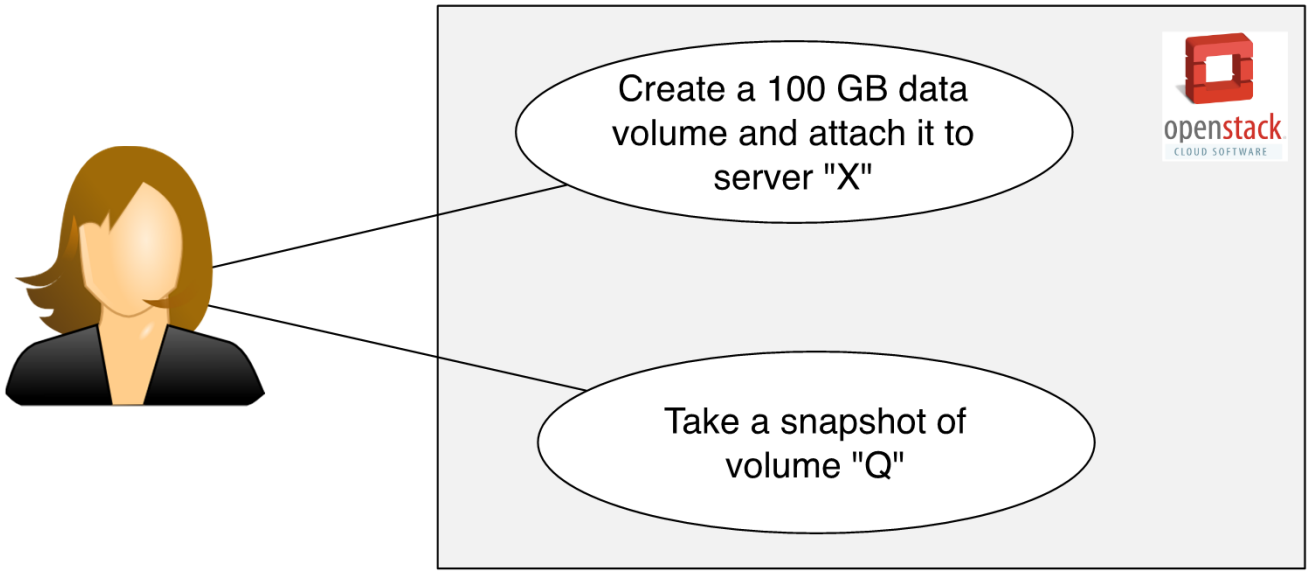
Access **block storage** resources, which attach to servers like disks



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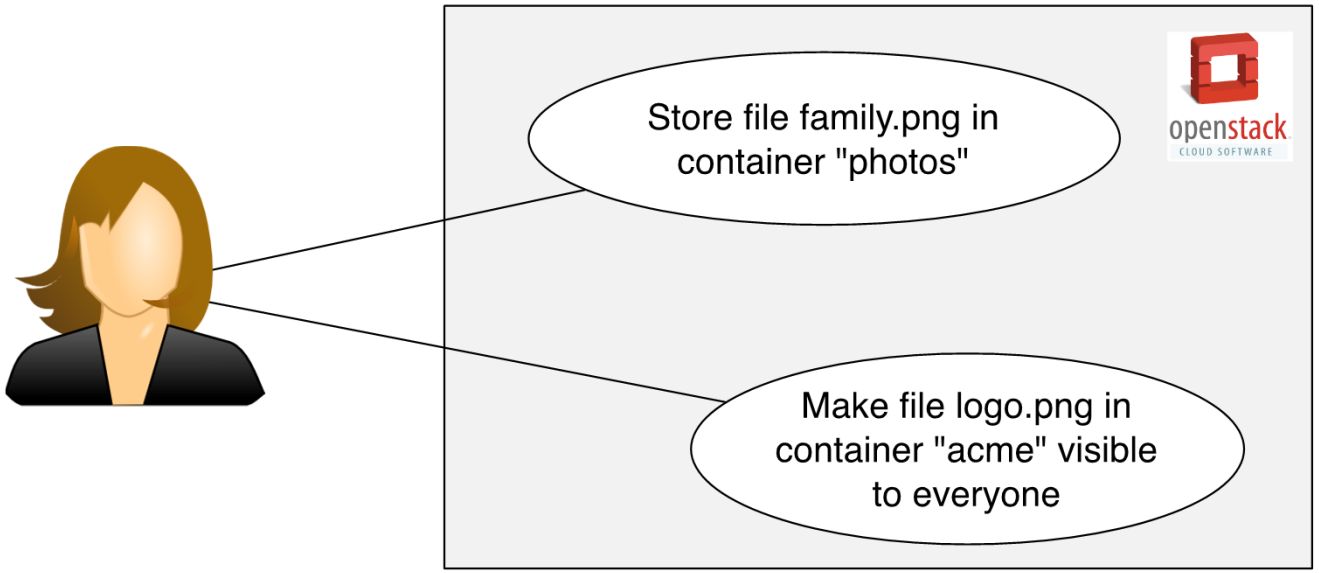
Access **object storage** resources, which are accessed over HTTP



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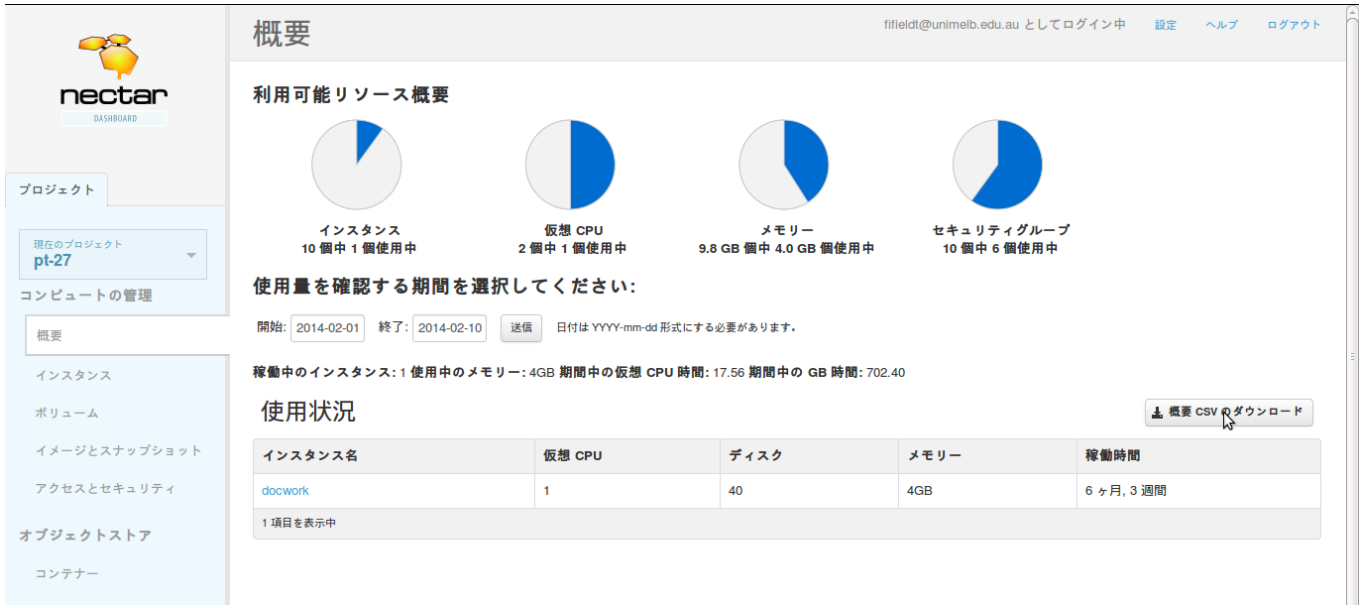
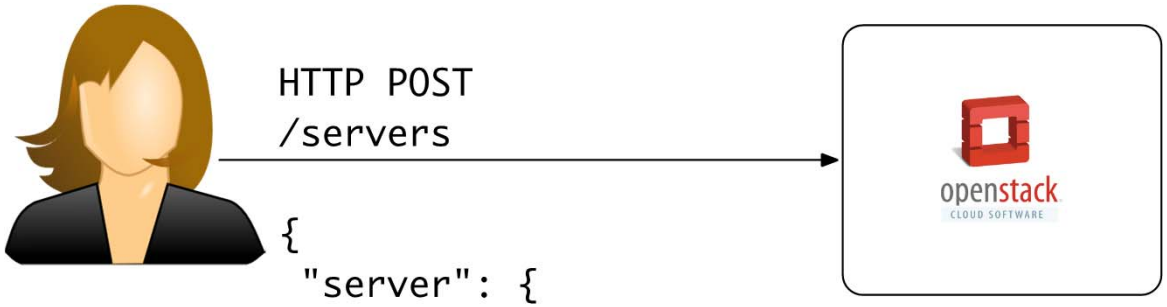
OpenStack includes a web-based Dashboard service



Make requests with command-line tools or REST API

```
$ nova boot --image precise --flavor m1.small myinstance
```




```
{
 "server": {
  "imageRef": ...
  "flavorRef": ...
  "name": "myinstance",
  }
}
```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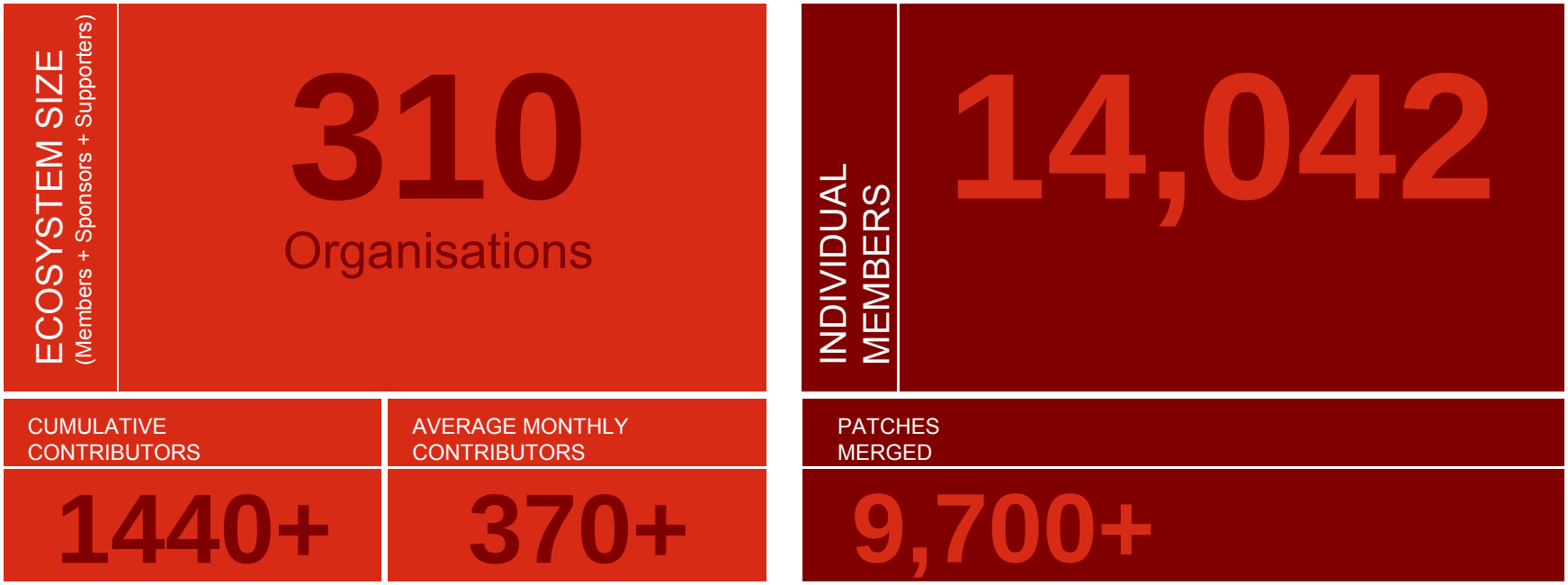
Also... Python bindings!

```
import novaclient.v1_1.client as nvclient
creds = ...
nova = nvclient.Client(**creds)

image = nova.images.find(name="precise")
flavor = nova.flavors.find(name="m1.small")

nova.servers.create(image=image,
                    flavor=flavor,
                    name="myinstance")
```

Project is very active with many contributors



Global Community

Countries with members

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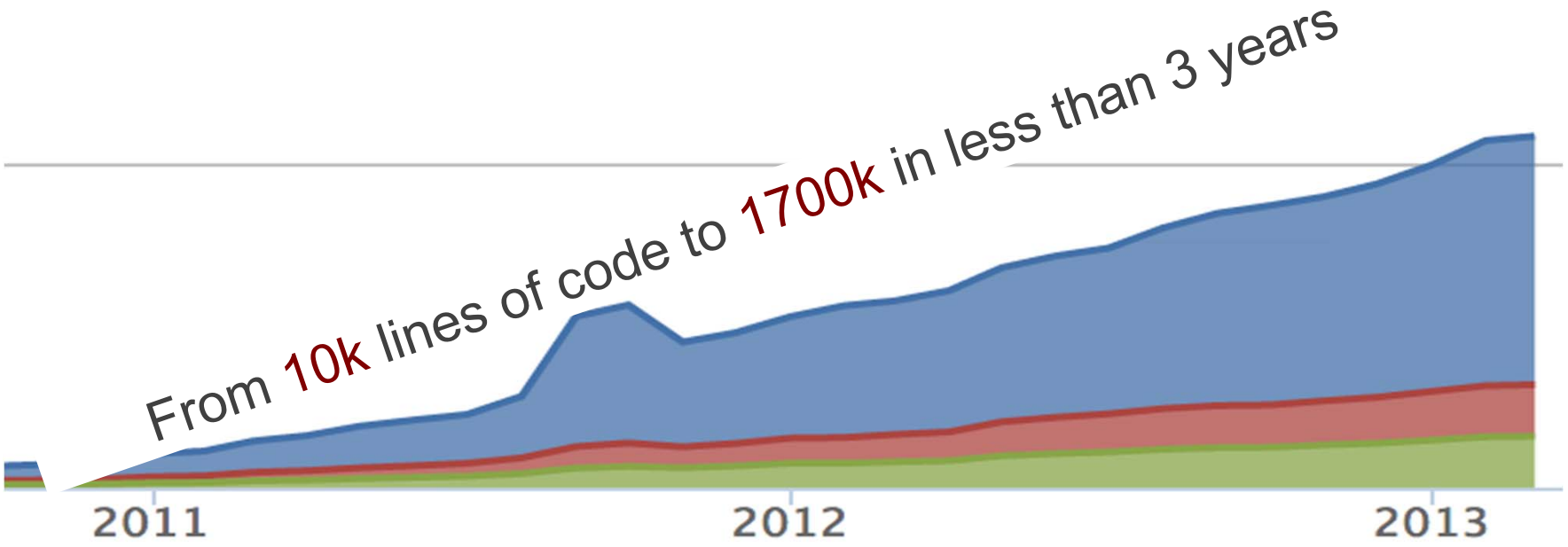
Rapid Innovation



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To Name Just a Few…

…and counting.

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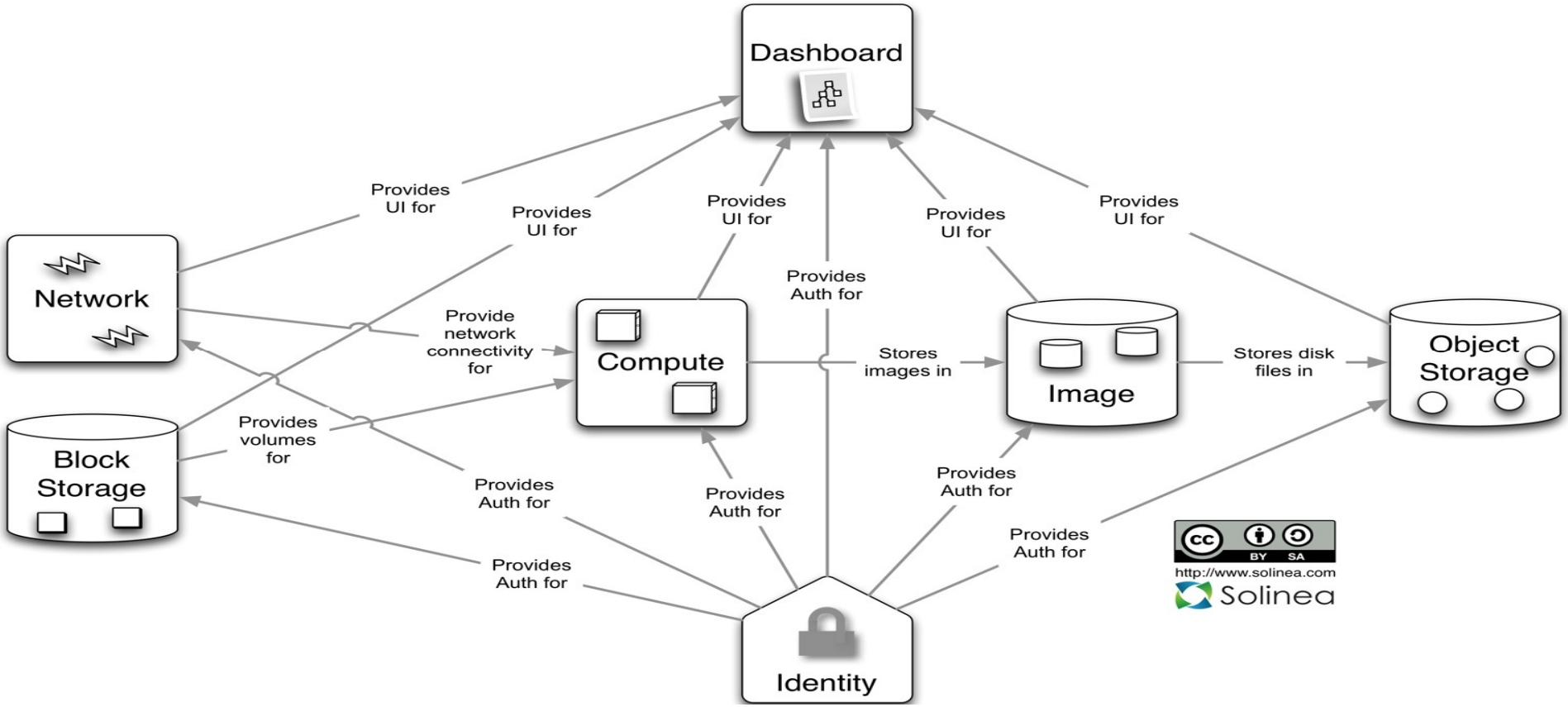
What does the architecture look like?

System is a collection of RESTful web services



Compute service manages VMs on compute nodes

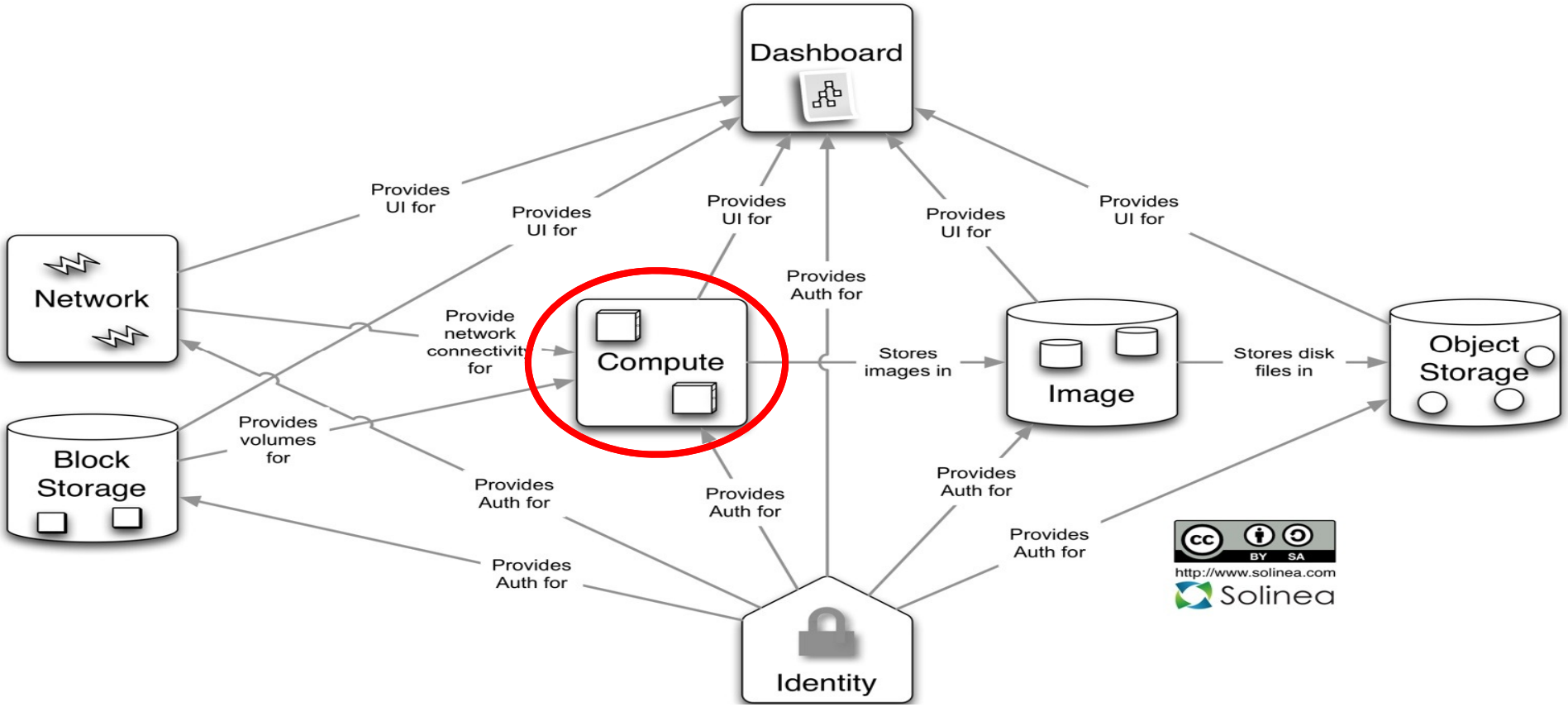
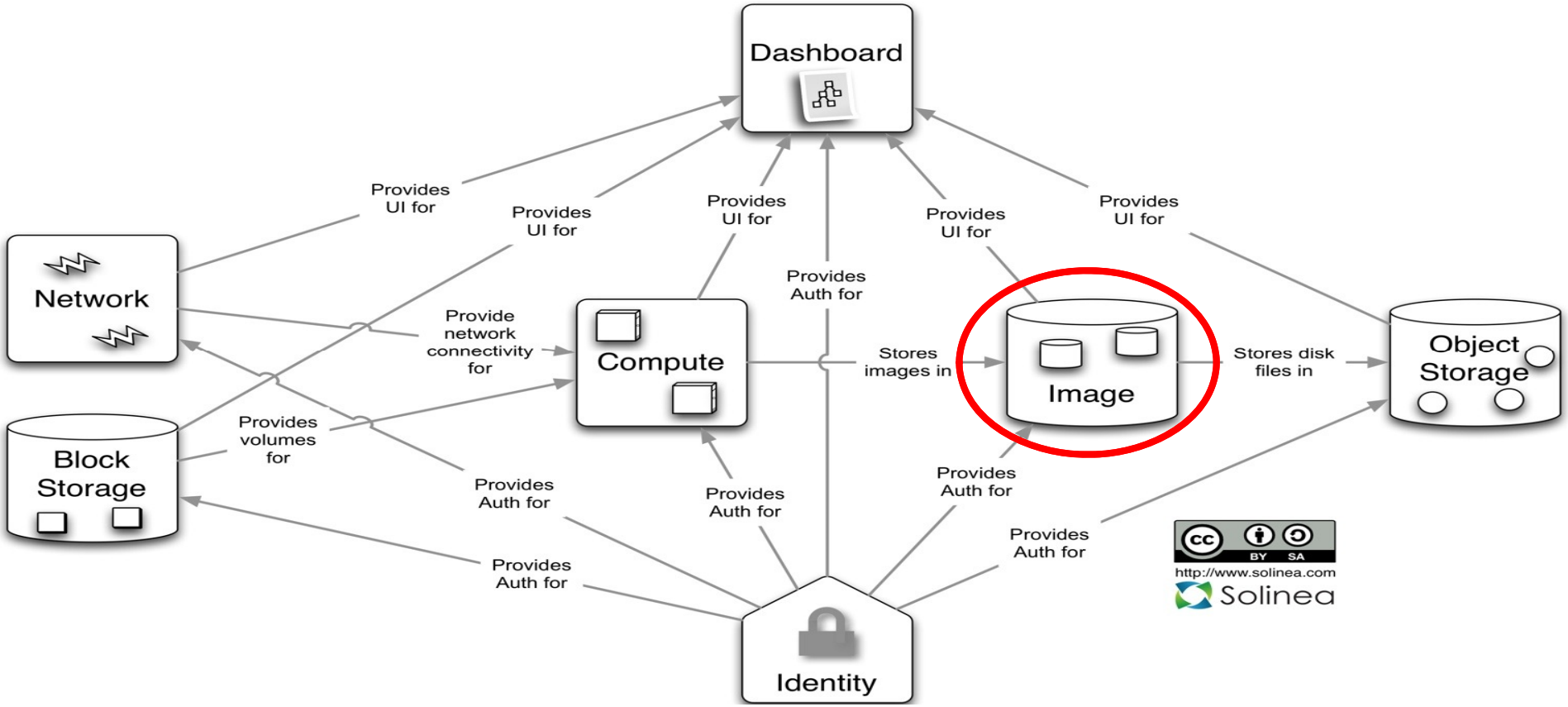
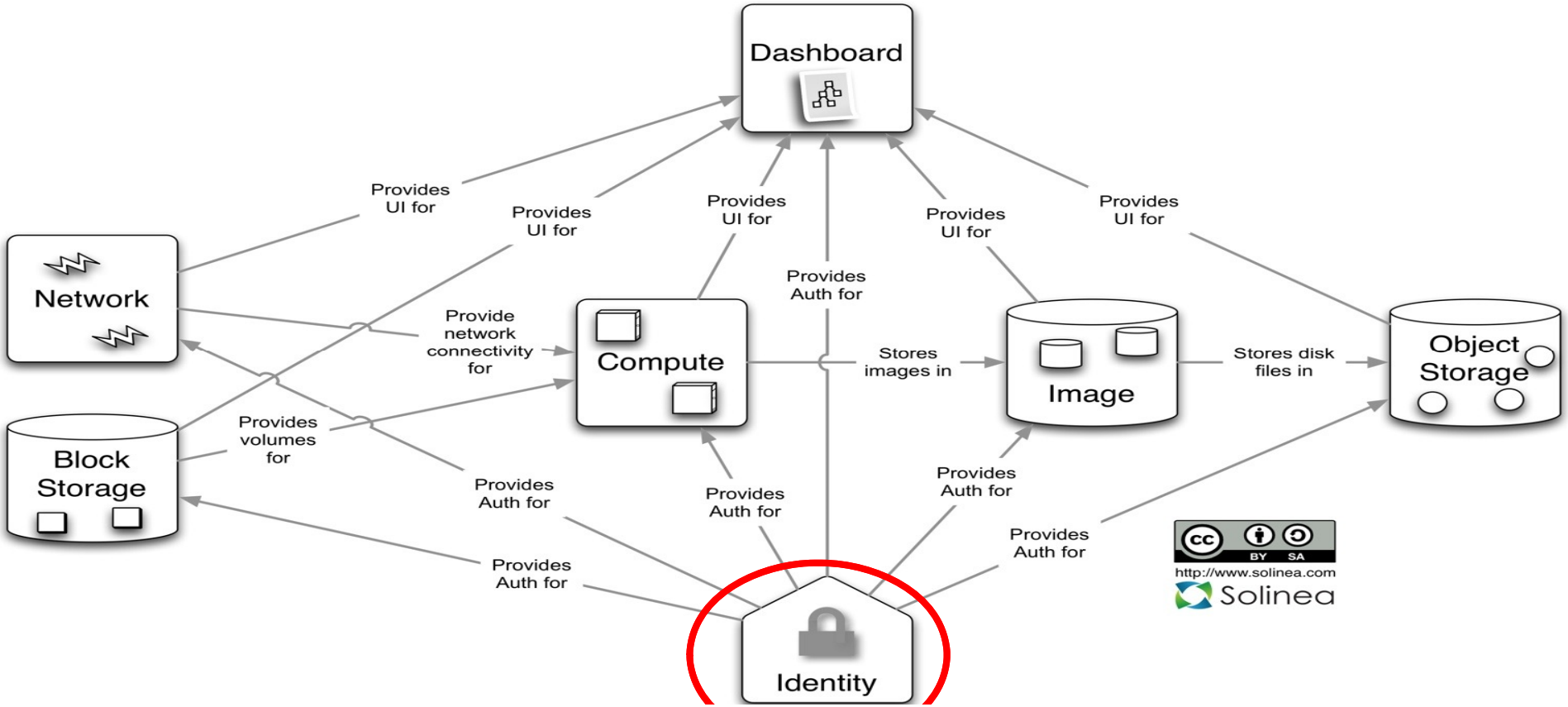


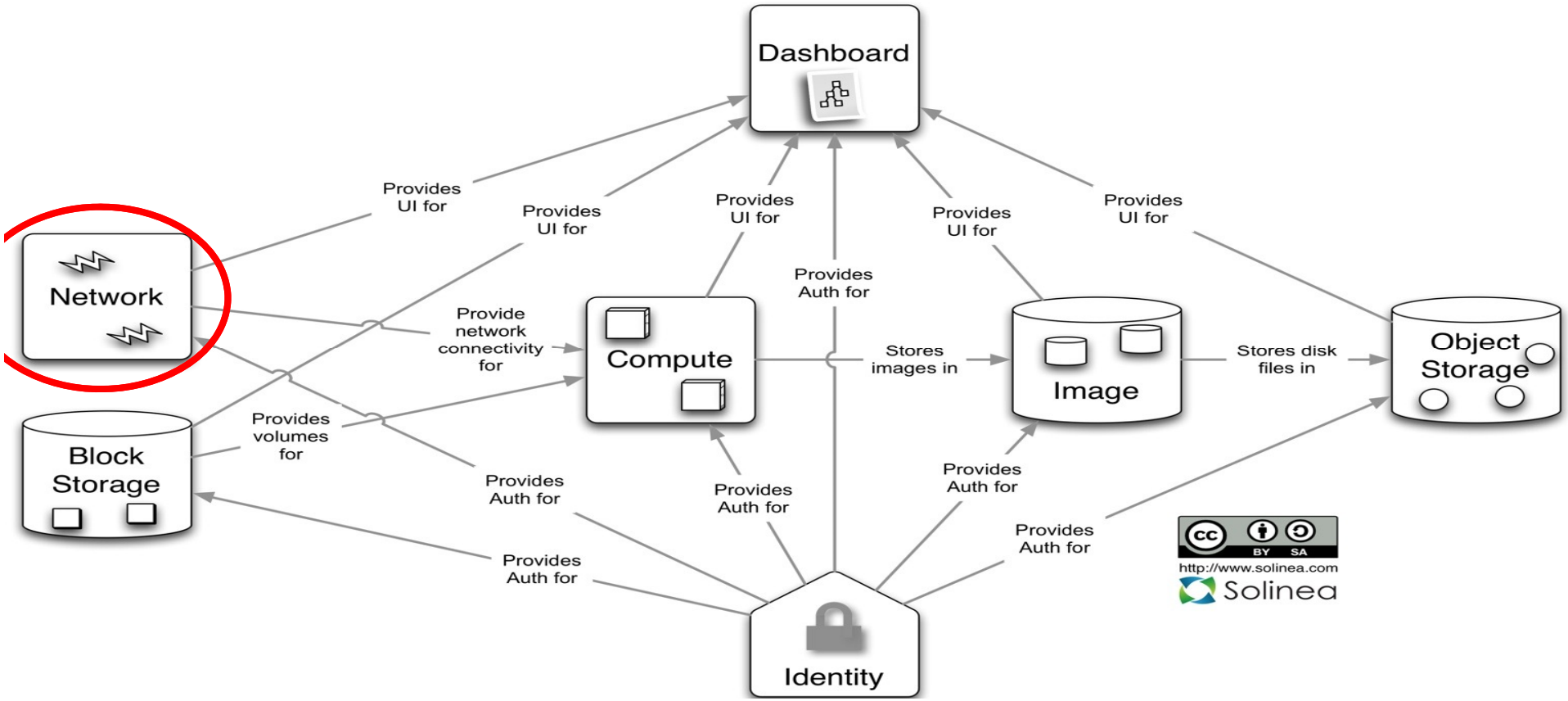
Image provides a catalog of virtual machine images



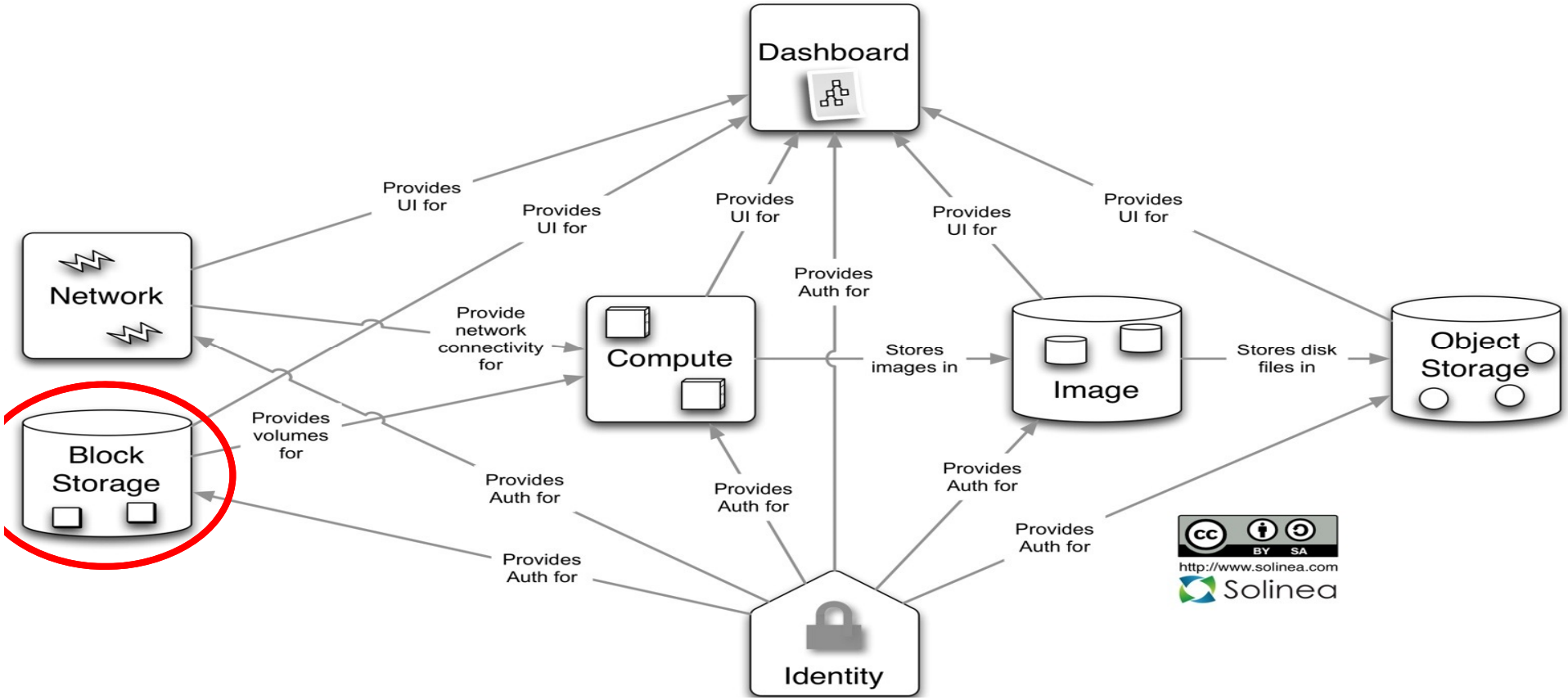
Identity handles authentication and service catalog



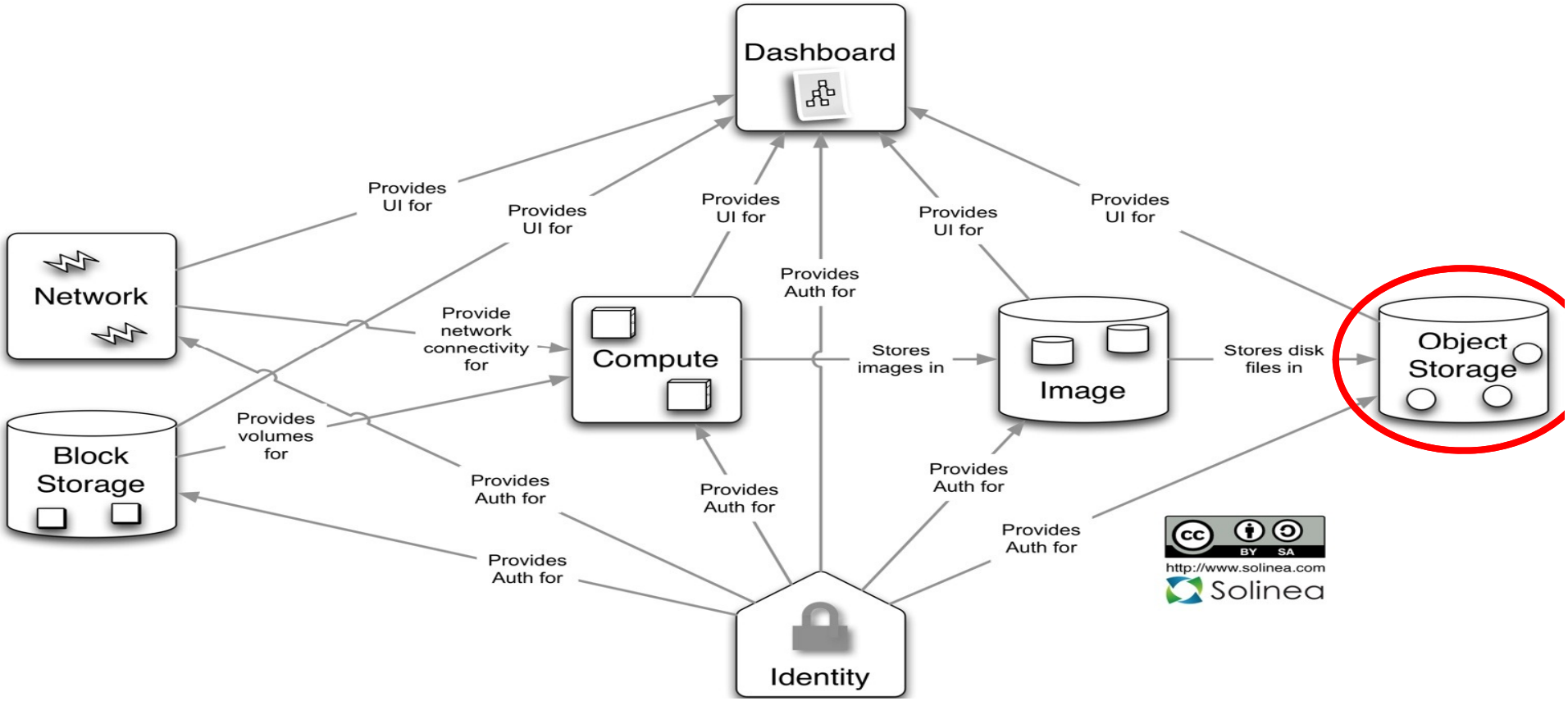
Network service manages connectivity for VMs



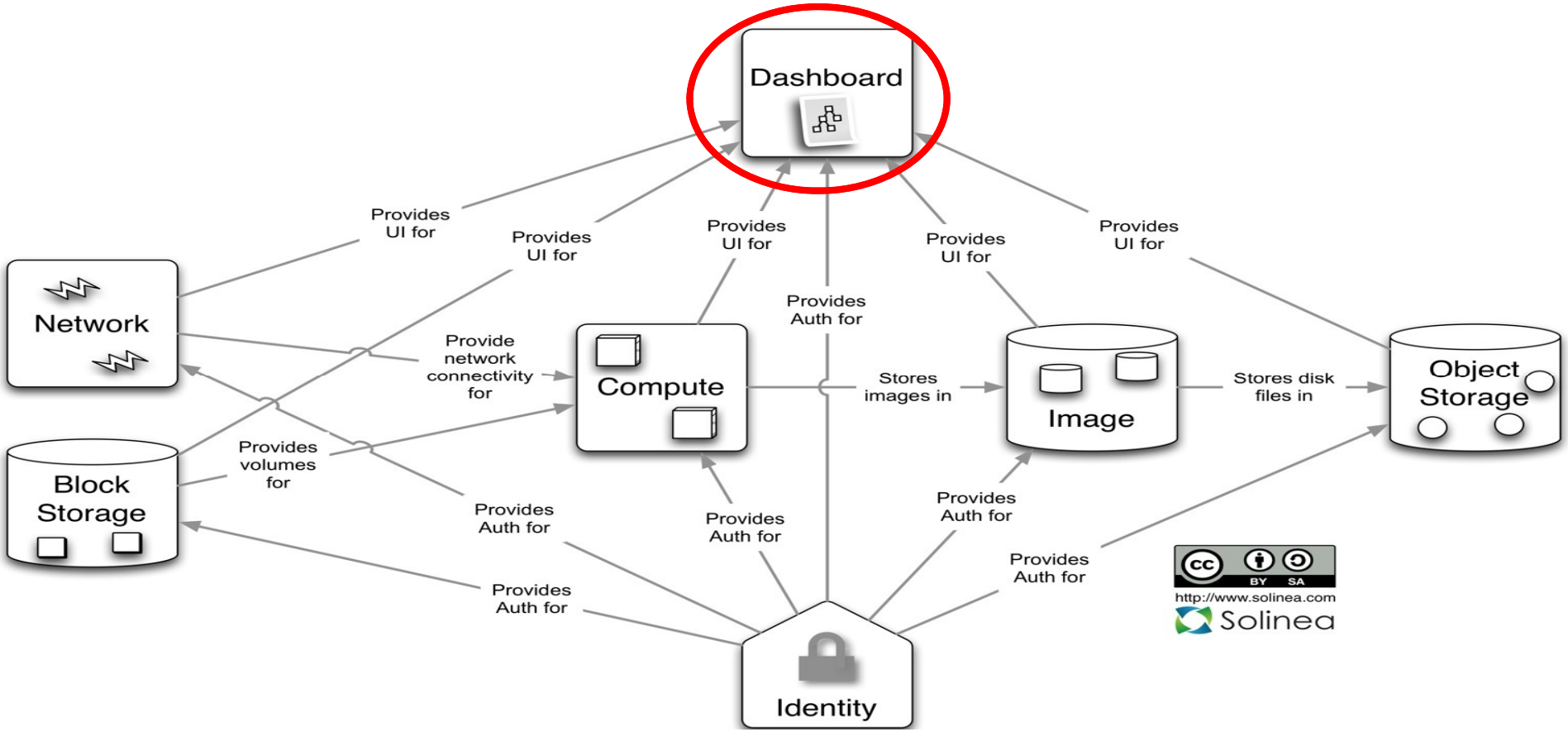
Block storage manages block devices that attach to VMs



Object storage manages binary objects accessed via HTTP

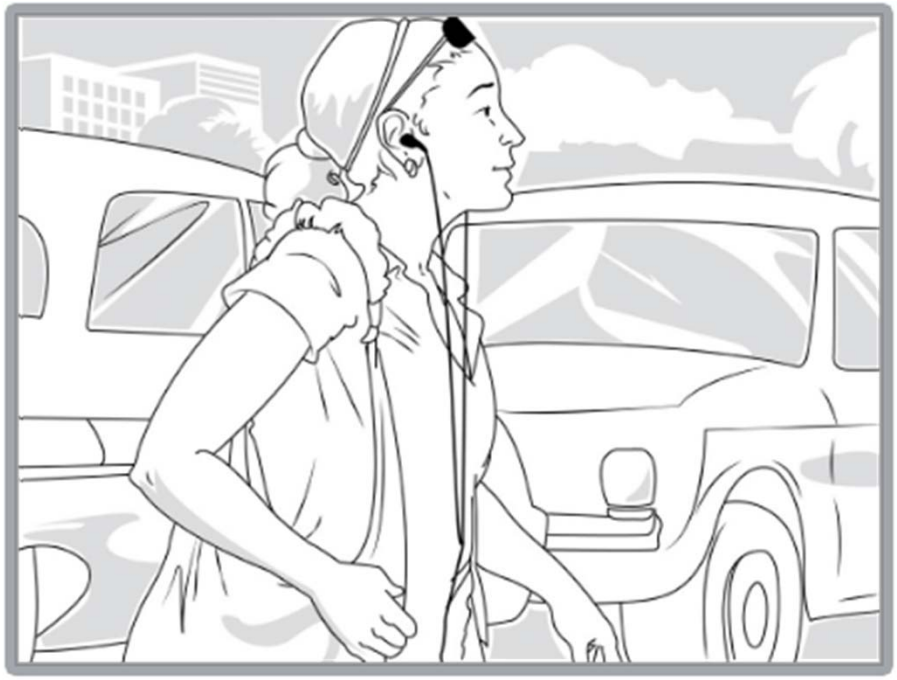


Dashboard service provides web interface



Let’s look at an example.

Aliceis a web developer who needs an Ubuntu server to deploy her app for testing



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Start a server using the 'ubuntu12.04' image and attach it to network 'mynet'

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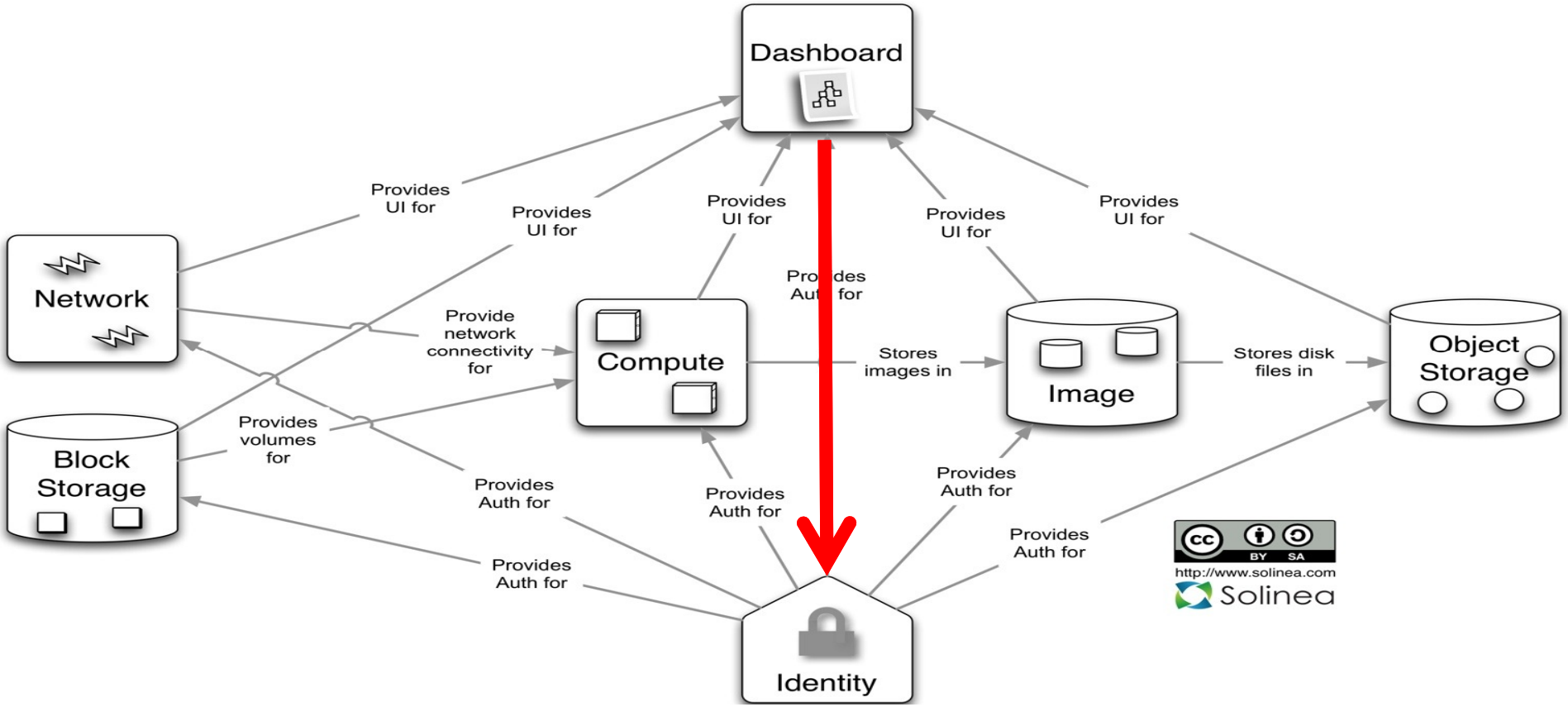
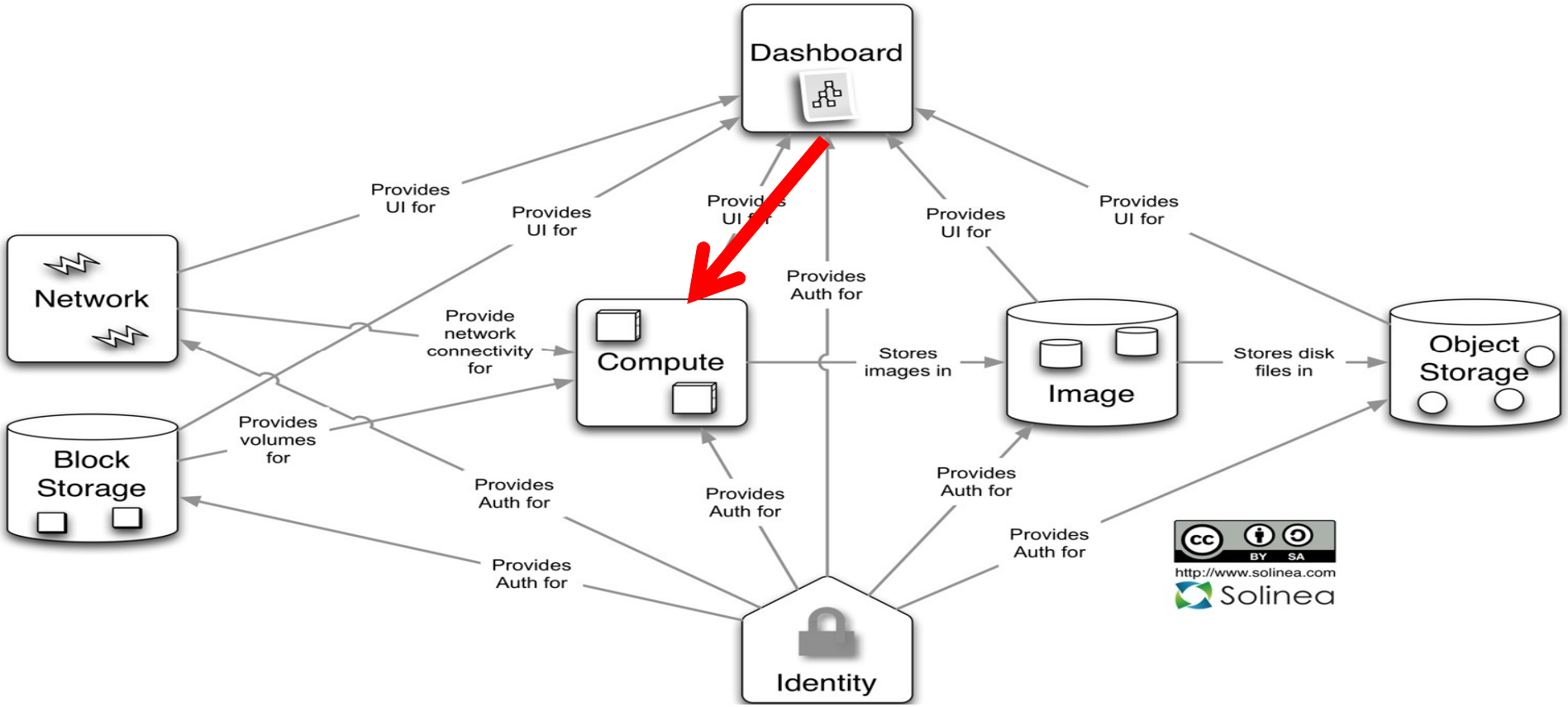
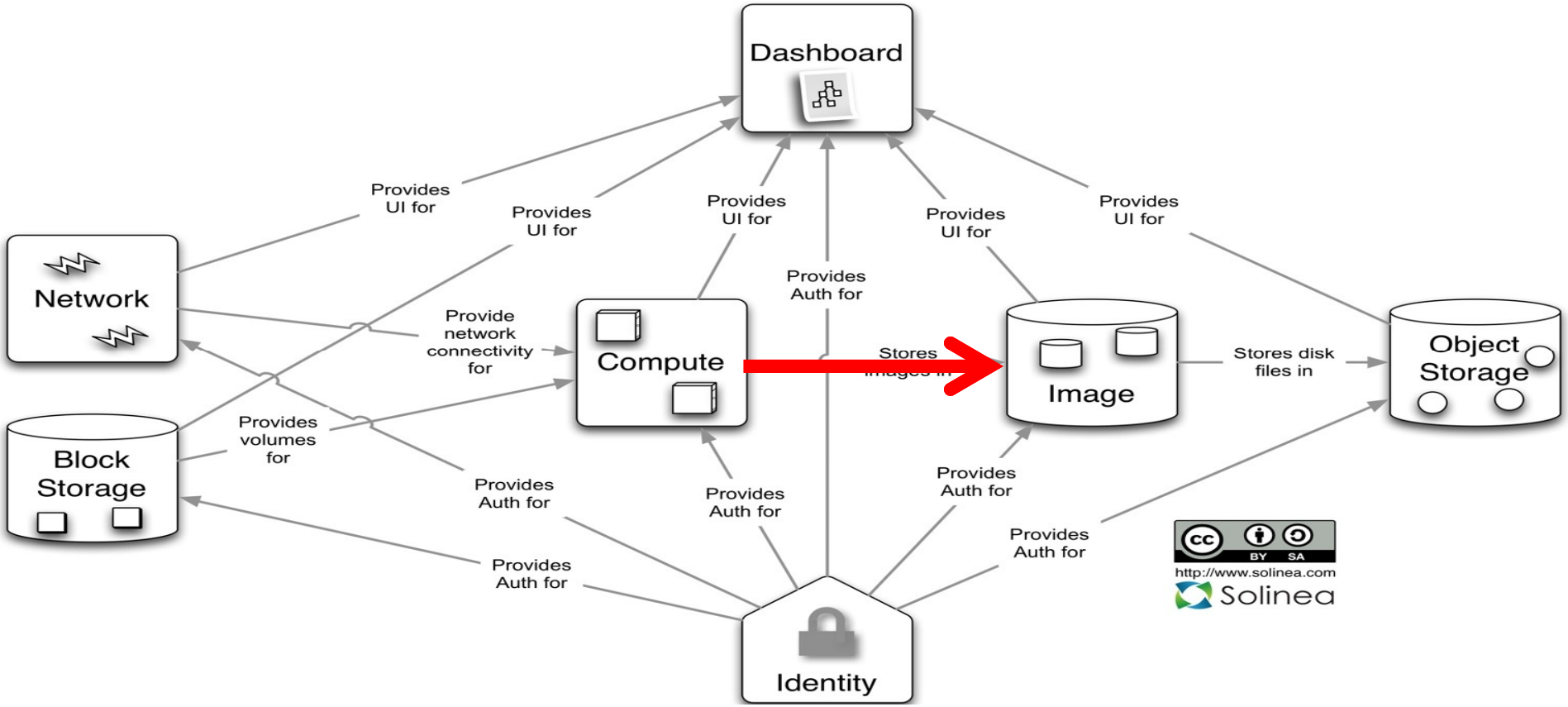
1. Get the compute endpoint and an auth token



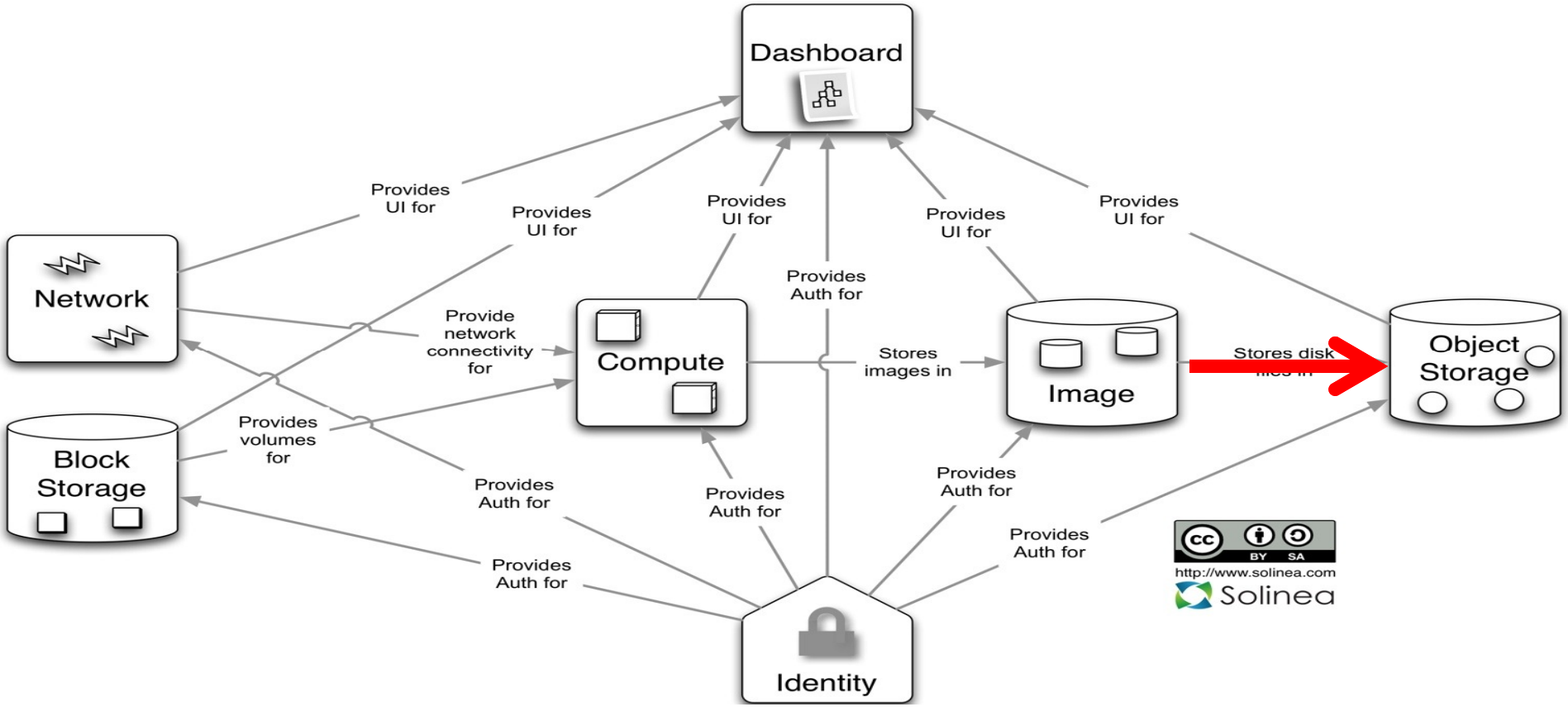
2. Start a new compute server



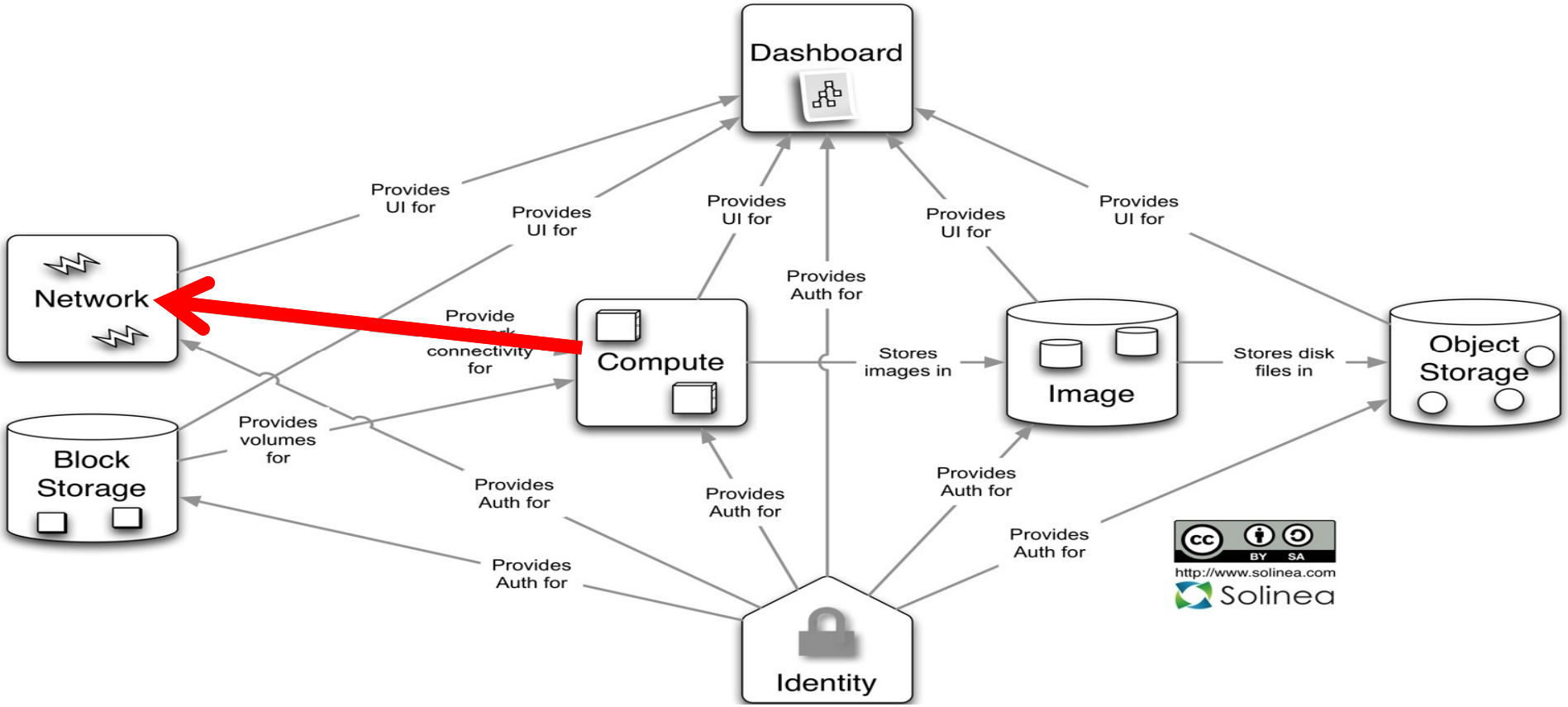
3. Download the ubuntu12.04 image



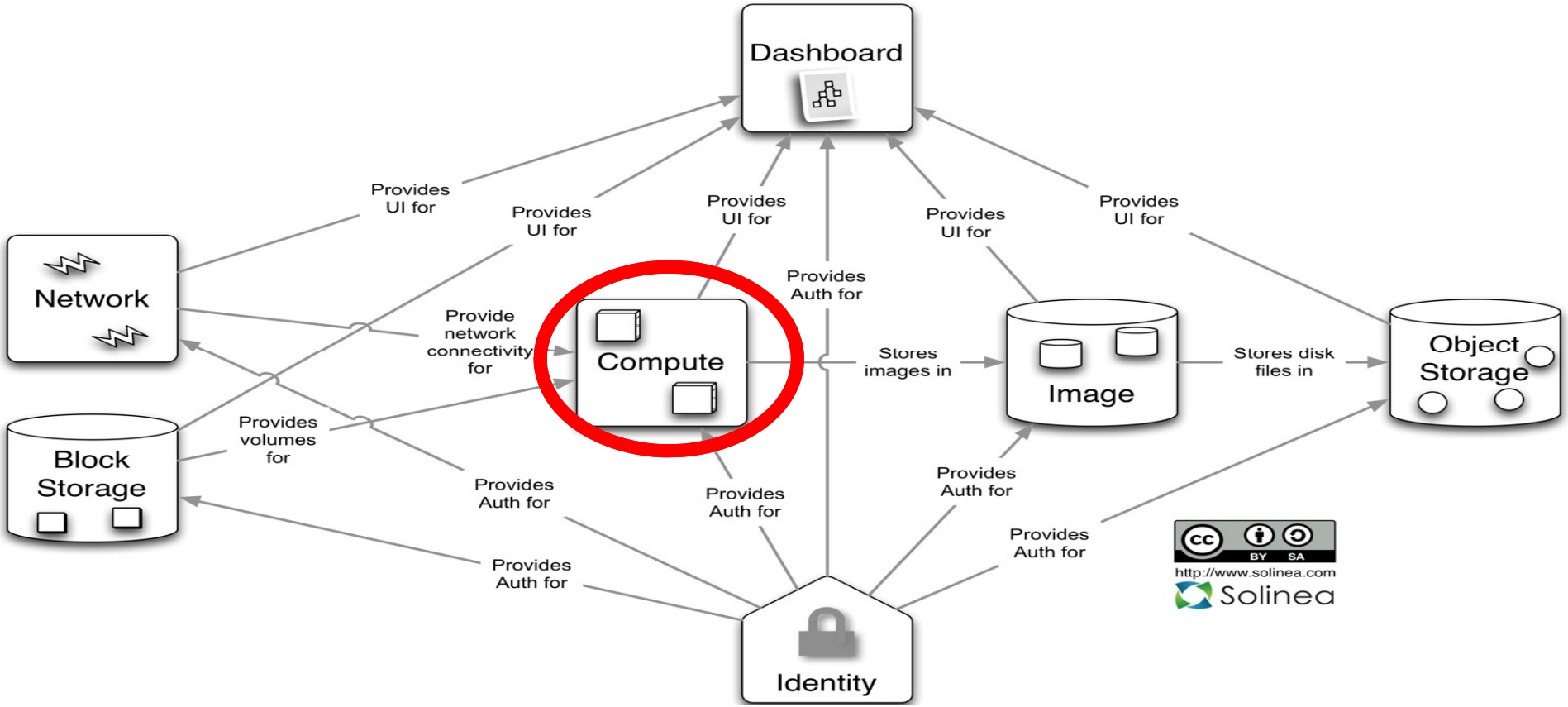
4. Retrieve the image from the object store



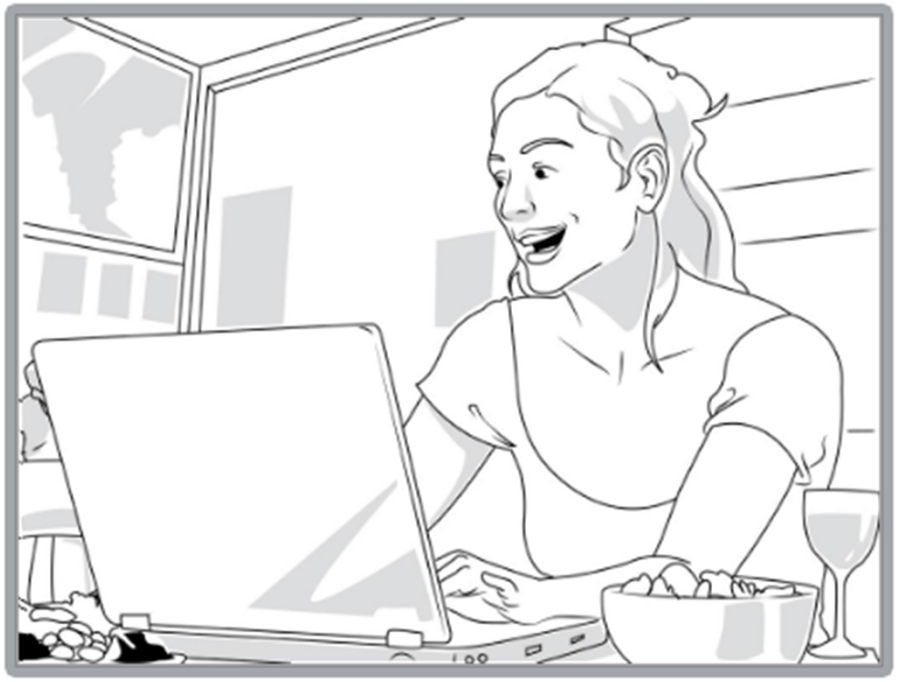
5. Determine how to connect the VM to ‘mynet’



6. Start the virtual machine



Alice sees that her server is now running and connects to it via ssh.



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Alice's OpenStack Picture

Compute	Web servers
Networking	Load balancers, private network to database
Block Storage	Code and configuration
Object Storage	Application assets, user uploaded files
Database	State storage

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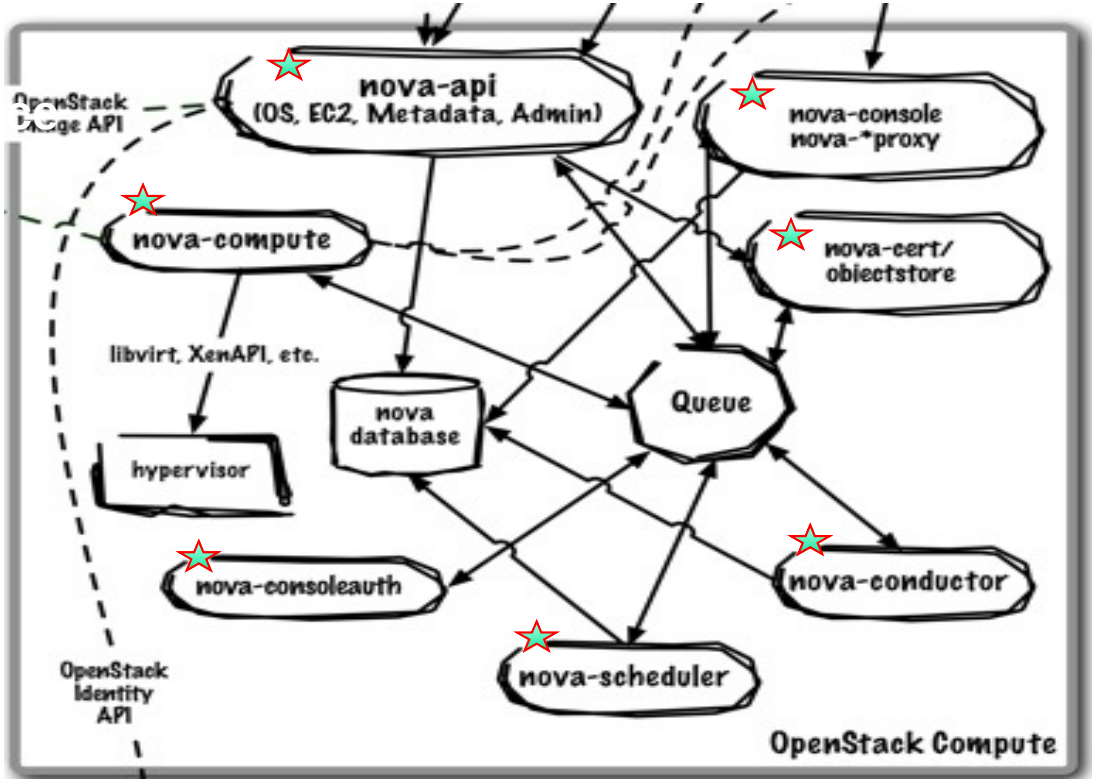
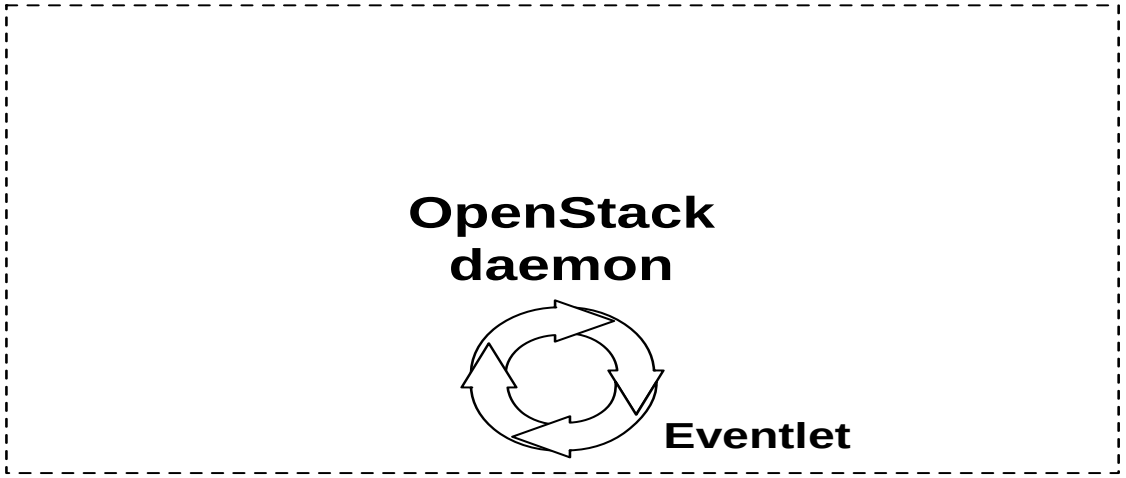
… but how does that work?

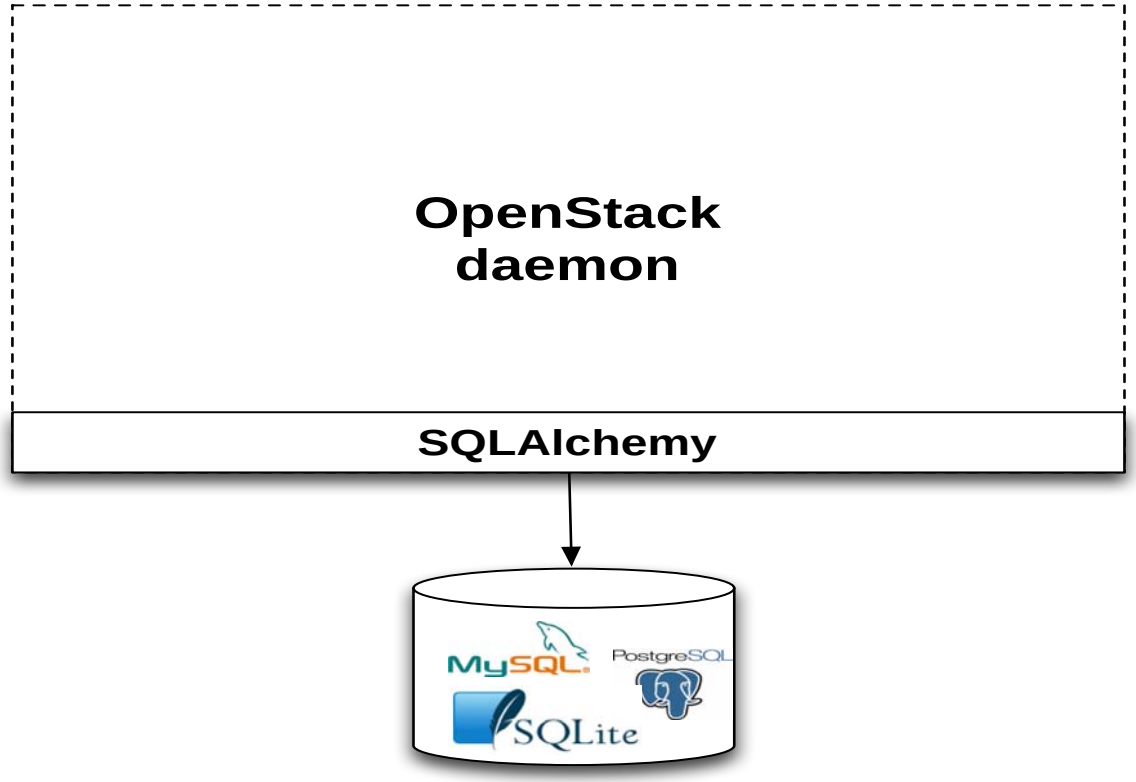
Each OpenStack service is implemented as Linux daemons



Daemons use non-blocking I/O with *eventlet* to handle multiple requests



Daemons maintain persistent state using an SQL database via SQLAlchemy



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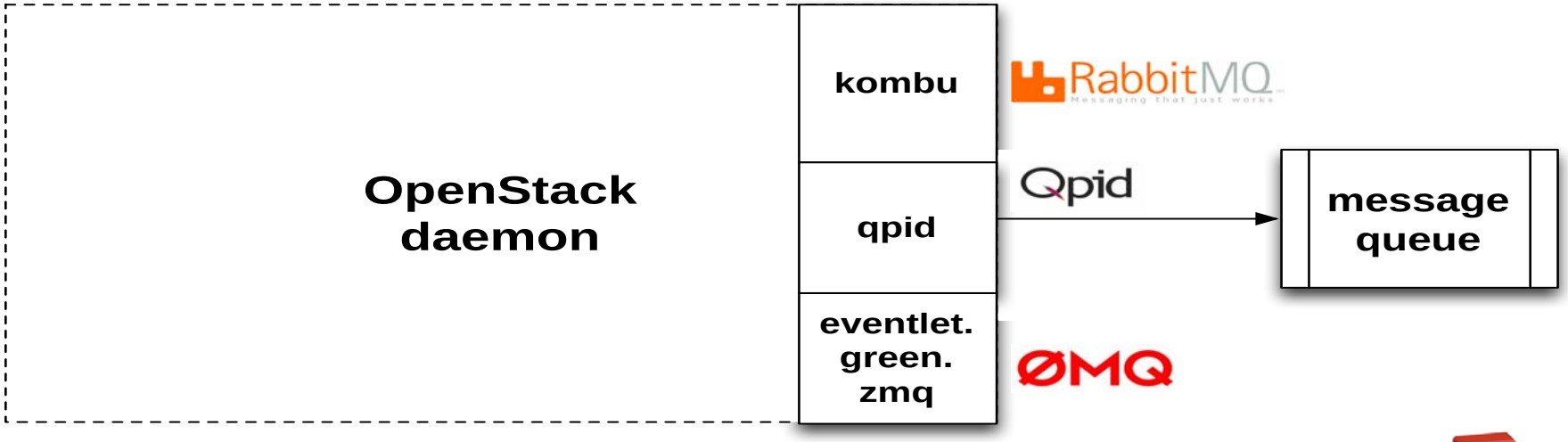
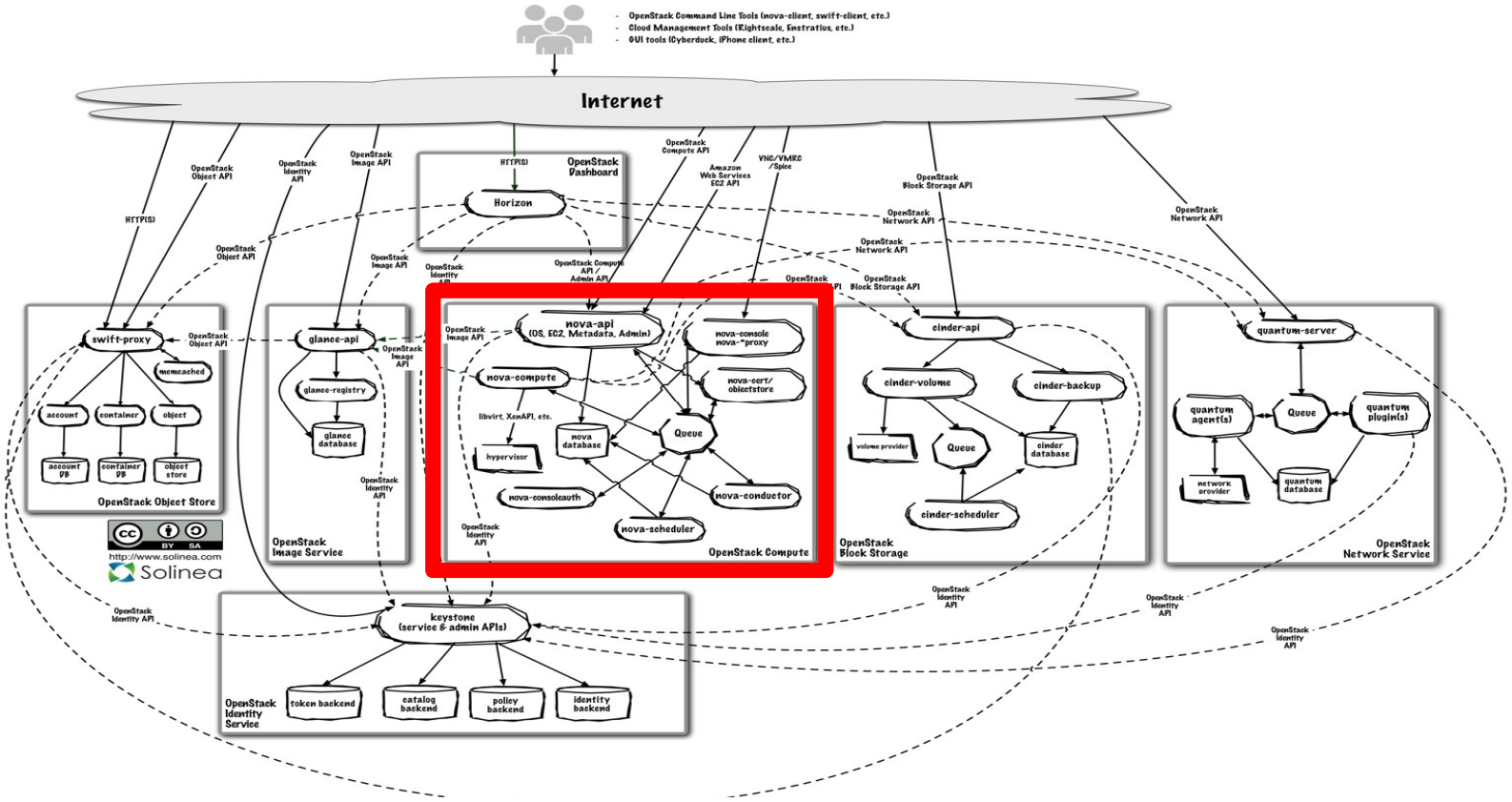
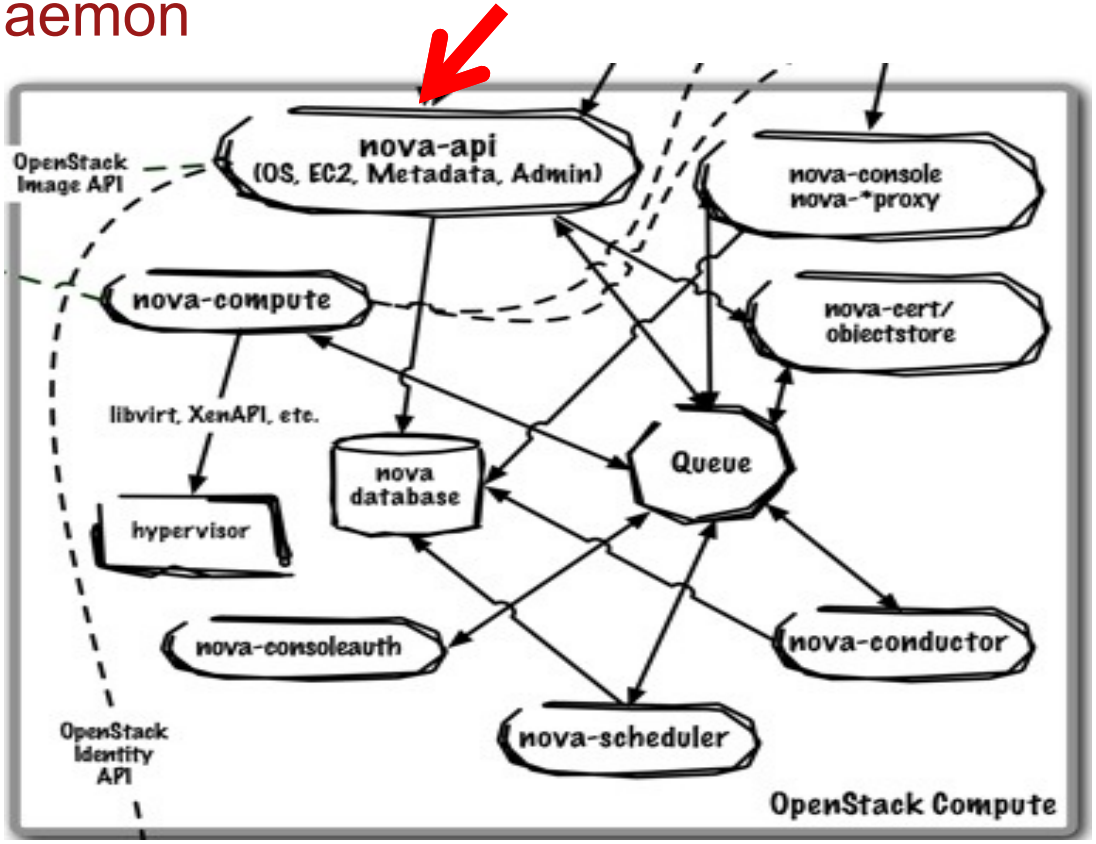
Daemons communicate using remote procedure call over message queue



Let’s go back to the earlier example



“Start a new compute server” request comes in to the *nova-api* daemon



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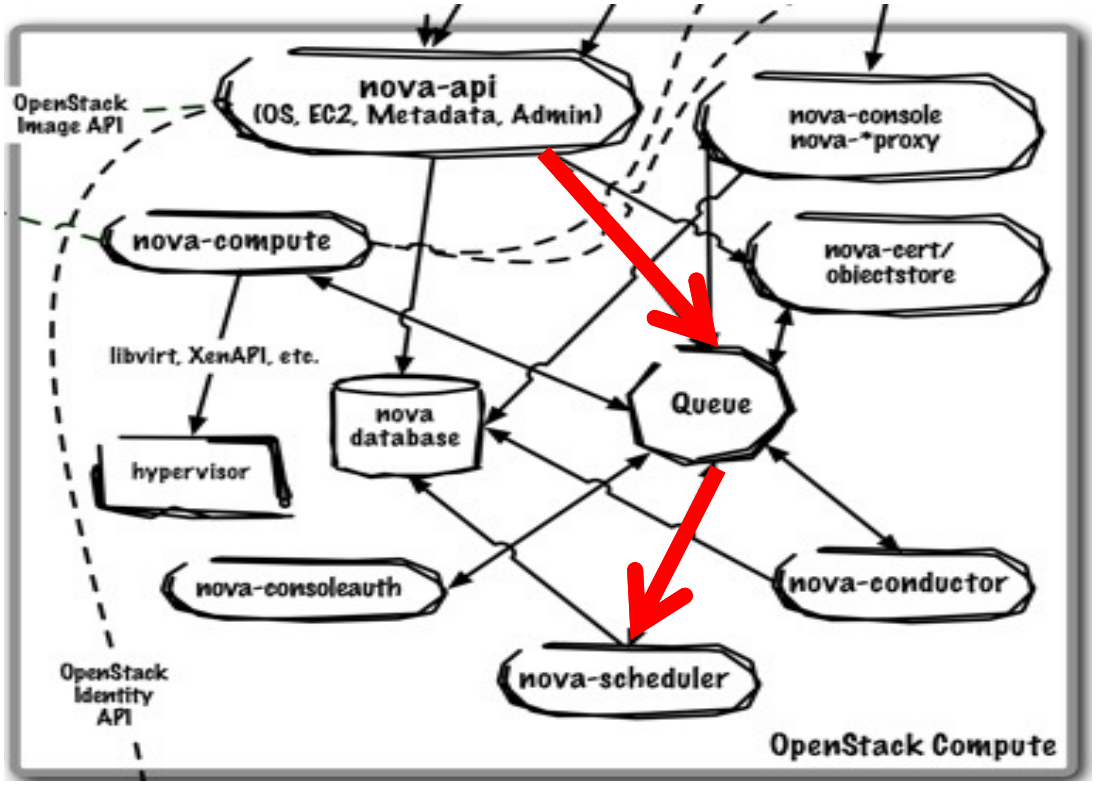
Ask *nova-scheduler* to find a compute node that can fulfill the request



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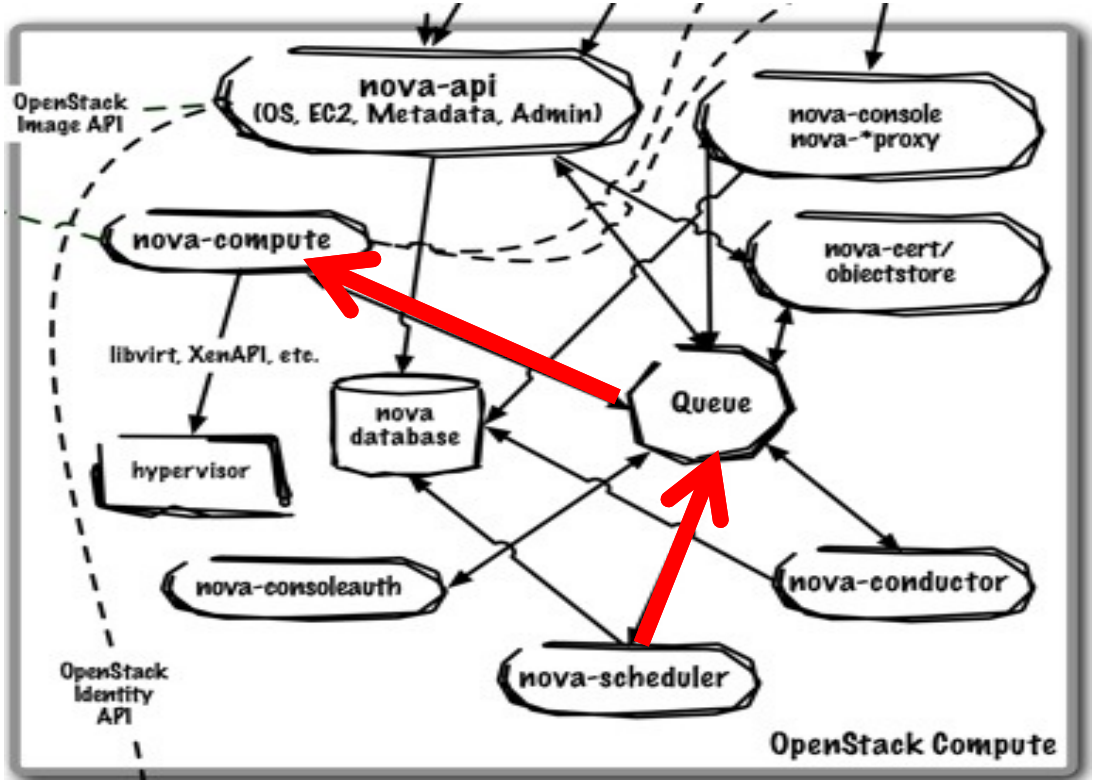
Dispatch the request to *nova-compute* on a node that has enough resources



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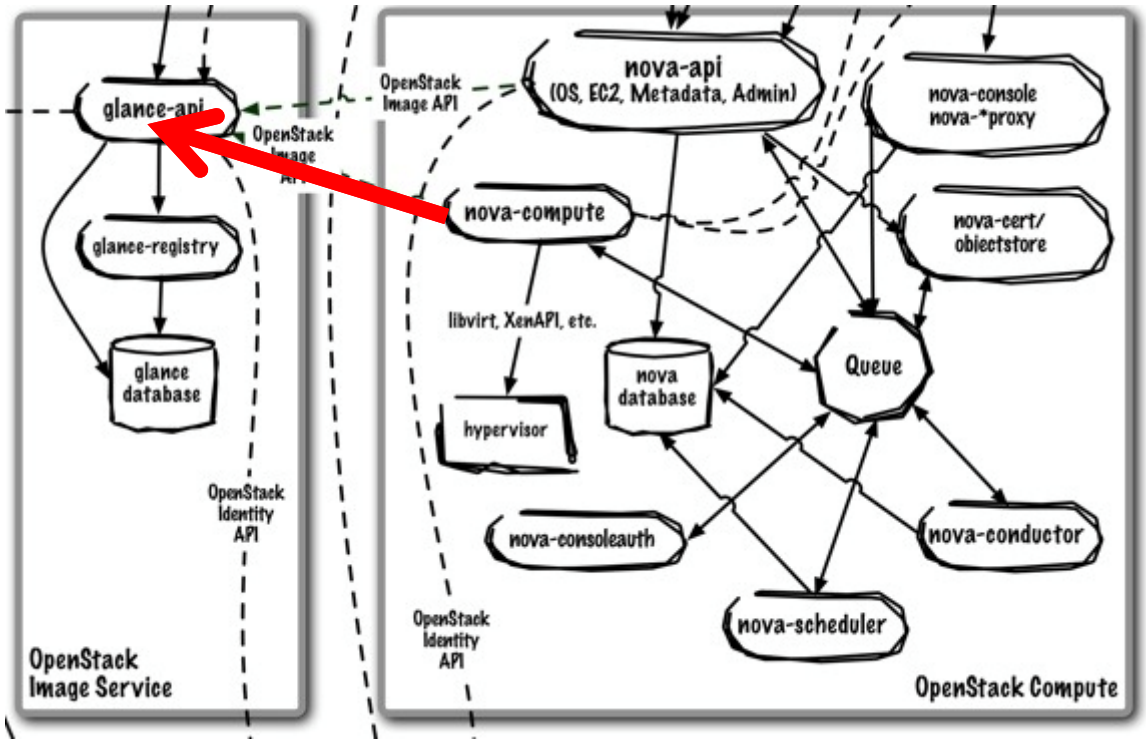
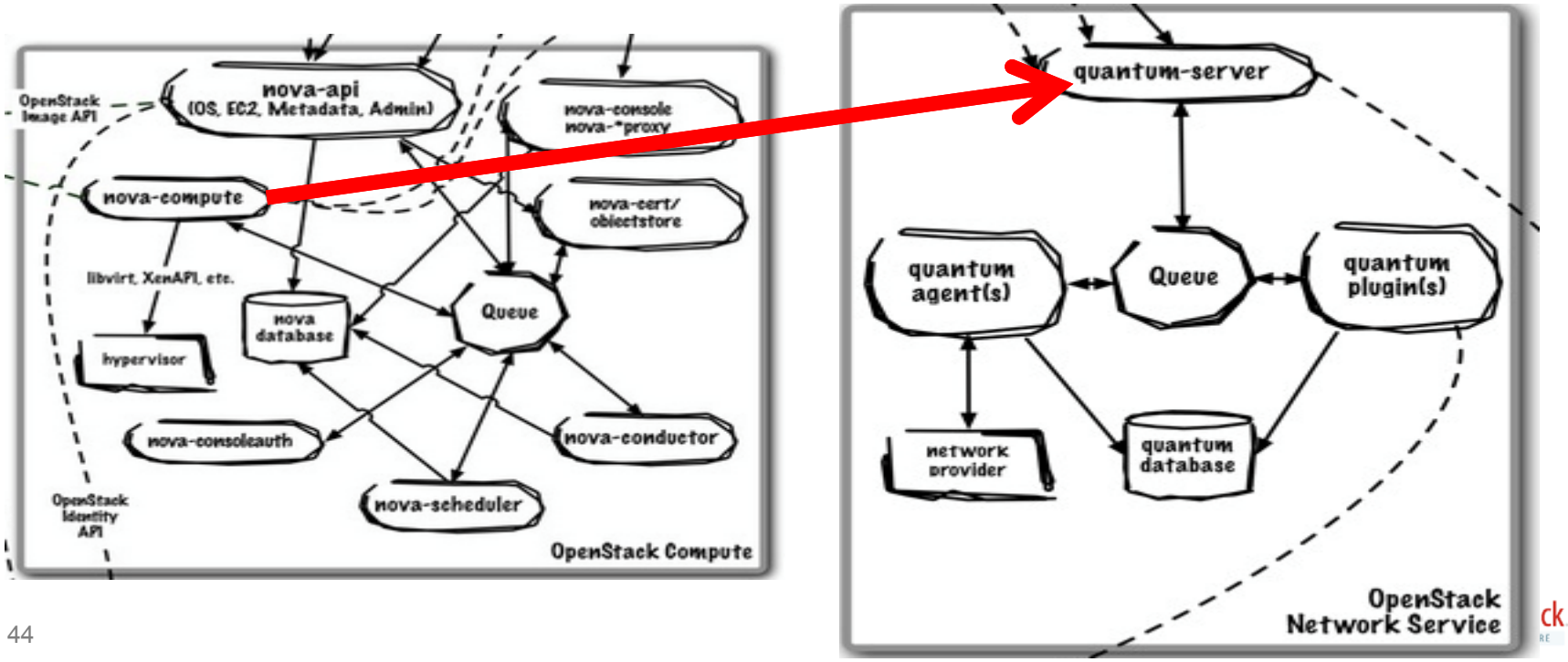
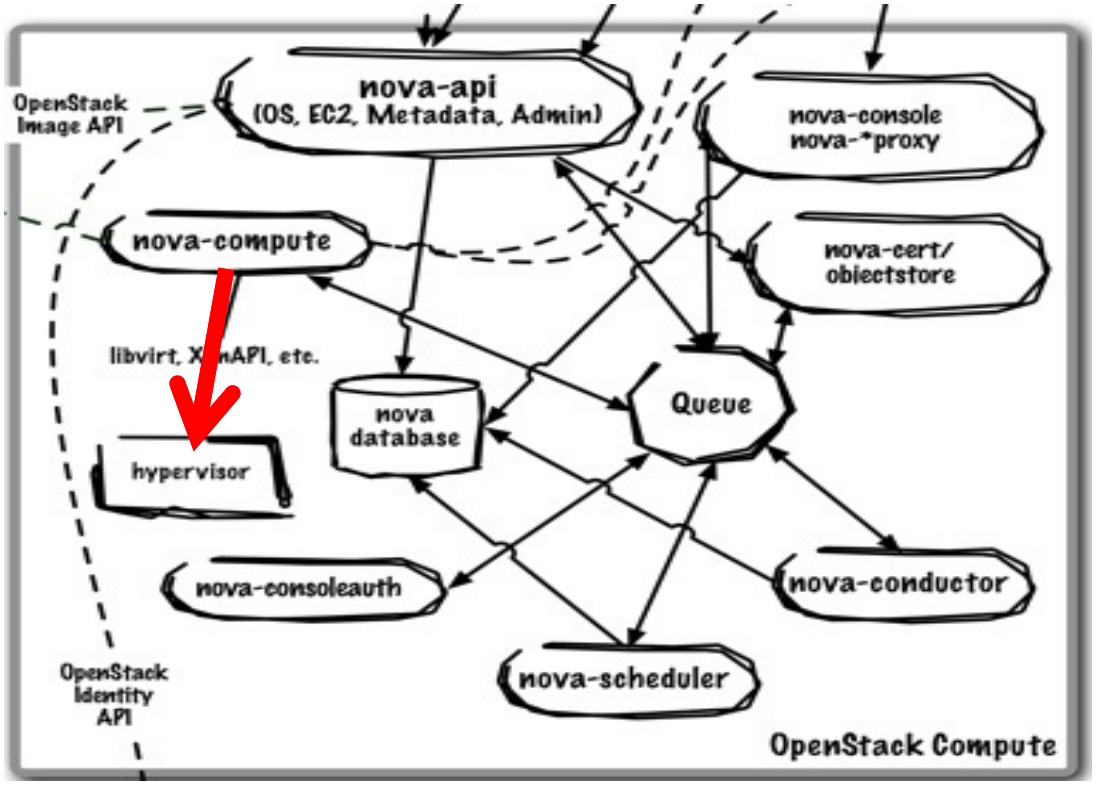
Download the image from the Image service



Get network connection info from Networking service



Ask the hypervisor to start the virtual machine



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So, what is OpenStack?

OpenStack Mission

To produce the

ubiquitous open source cloud computing platform

that will meet the needs of public and private clouds regardless of size, by being simple to implement and massively scalable.

The OpenStack Foundation

Protecting, **Empowering**, and **Promoting** OpenStack software and the community around it, including users, developers and the entire ecosystem.

- Over 14,400 Individual Members, up from 5,600 at launch
- The leading Global IT companies as Gold & Platinum Members
- Board of Directors that sets strategic direction
- Project Technical Leads and a Technical Committee that are elected from among the contributors
- User Committee to ensure your voice is heard

Interacting with the Community

- All development is open
  - Etherpad → Blueprint → Coded → Reviewed → Released
- Collaboratively design features
- Competitors working together
- Every line of code reviewed by at least two people
- An extensive continuous integration and testing infrastructure

Documentation, Translation, Infrastructure is all Collaborative

You are welcome to join!

Customisation

- OpenStack doesn’t quite do what you need?
  - Add it, but contribute back if possible
- Many things are pluggable
  - Eg Object Storage Middleware Pipeline
  - Eg Compute Scheduler
  - Eg Dashboard
- Get a DevStack running and play!

Interacting with the Community

- Ask OpenStack! (http://ask.openstack.org/)
- https://wiki.openstack.org/wiki/MailingLists
- https://wiki.openstack.org/IRC
- Your local user group
- The comments section on that almost-related blog
- The OpenStack User Survey

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ATLANTA, USA

May 12-16 – Atlanta, USA

Design Sessions: not a classic track with speakers and presentations - generally an open brainstorming discussion on a given feature

Conference Sessions: Keynotes, Case Studies, Ecosystem, Operations, Strategy, Workshops

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Thank you for supporting OpenStack

Ask Questions at ask.openstack.org

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@Tom Fifield