



# Kubernetes on CloudStack

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Geneva, Switzerland

# Who am I ?

- Apache CloudStack and licloud committer + PMC member
- Looking at techs and how they work together
- Half dev, half community manager, + half event planner



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**60 Recipes for Apache CloudStack**  
Using the CloudStack Ecosystem  
By Sébastien Googuen  
Publisher: O'Reilly Media  
Final Release Date: October 2014  
Pages: 156

**★★★★★**  
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Planning to deploy and maintain a public, private, or hybrid cloud service? This cookbook's handy how-to recipes help you quickly learn and install Apache CloudStack, along with several API clients, API wrappers, data architectures, and configuration management technologies that work as part of CloudStack's ecosystem.

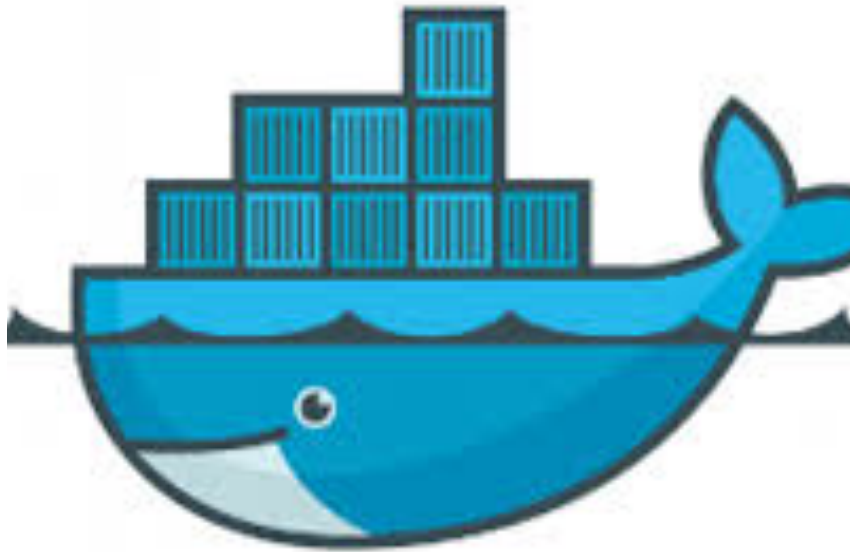
[Larger Cover](#) [Full description](#)



talk

Today's





- Linux container (LXC and more ...)
- Application deployment
- PaaS
- Portability
- Image sharing via DockerHub



- Linux distribution
- Rolling upgrades
- Minimal OS
- Docker support
- etcd and fleet tools to manage distributed applications based on containers.

## ***Kubernetes***

κυβερνήτης: *Greek for "pilot" or "helmsman of a ship"*  
the open source cluster manager from Google



- Docker application orchestration
- Google GCE, rackspace, Azure providers
- Deployable on CoreOS
- Container replication
- HA services



**exoscale**

- IaaS Public cloud
- Switzerland based
- Apache CloudStack
- Security groups, ssh key pairs
- Offers coreOS templates (+ Debian, ubuntu, CentOS and even Windows)



# Docker basics

```
$ sudo apt-get install docker.io
$ sudo ln -sf /usr/bin/docker.io /usr/local/bin/docker
$ sudo sed -i '$acomplete -F _docker docker' /etc/
bash_completion.d/docker.io
```

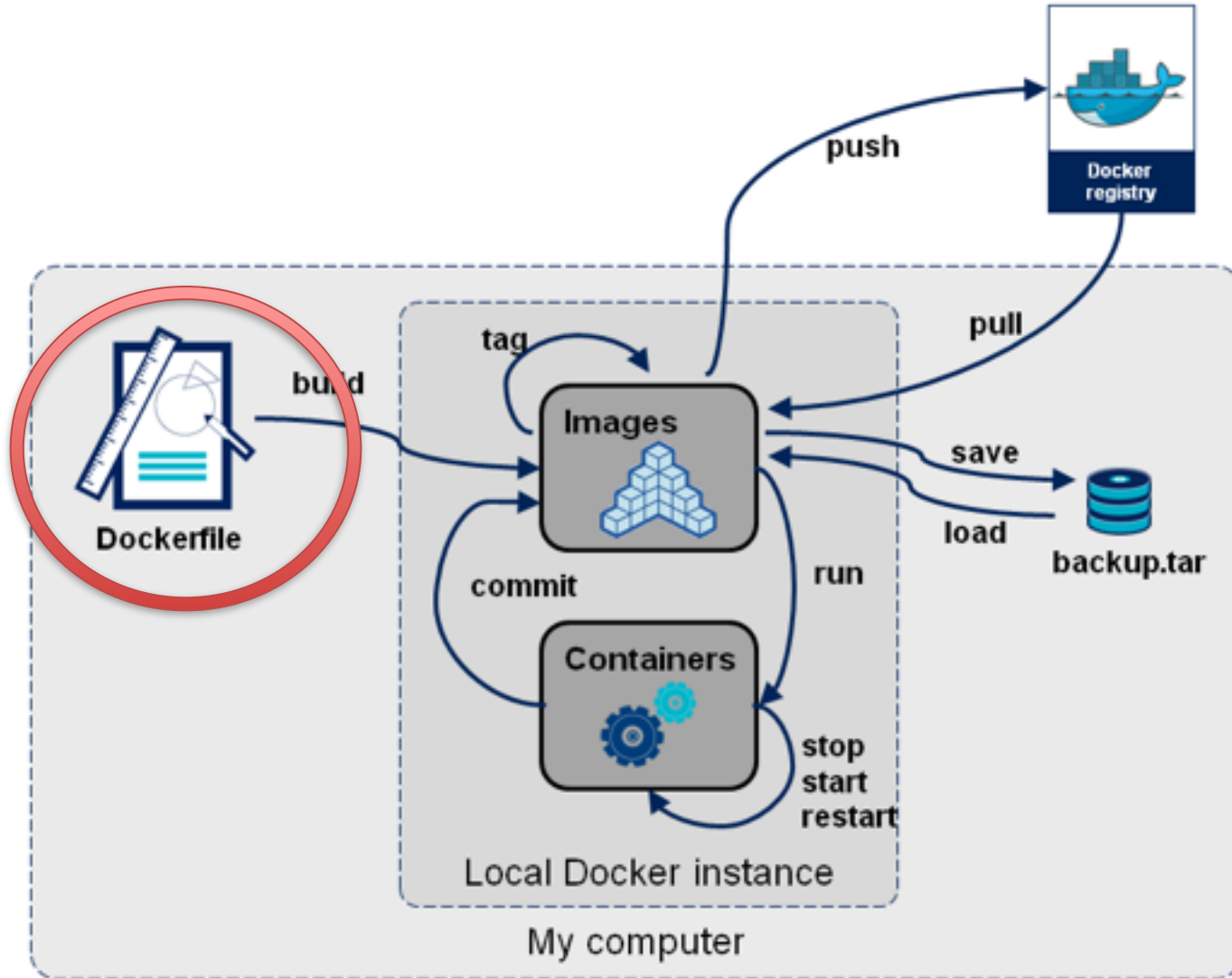
Easy to install, easy to start a container:

```
$ docker run -i -t ubuntu /bin/bash
```

Use existing container images from docker Hub, or build your own. Expose ports for services running in container, daemonize containers.



# Building docker images





+ config mgmt



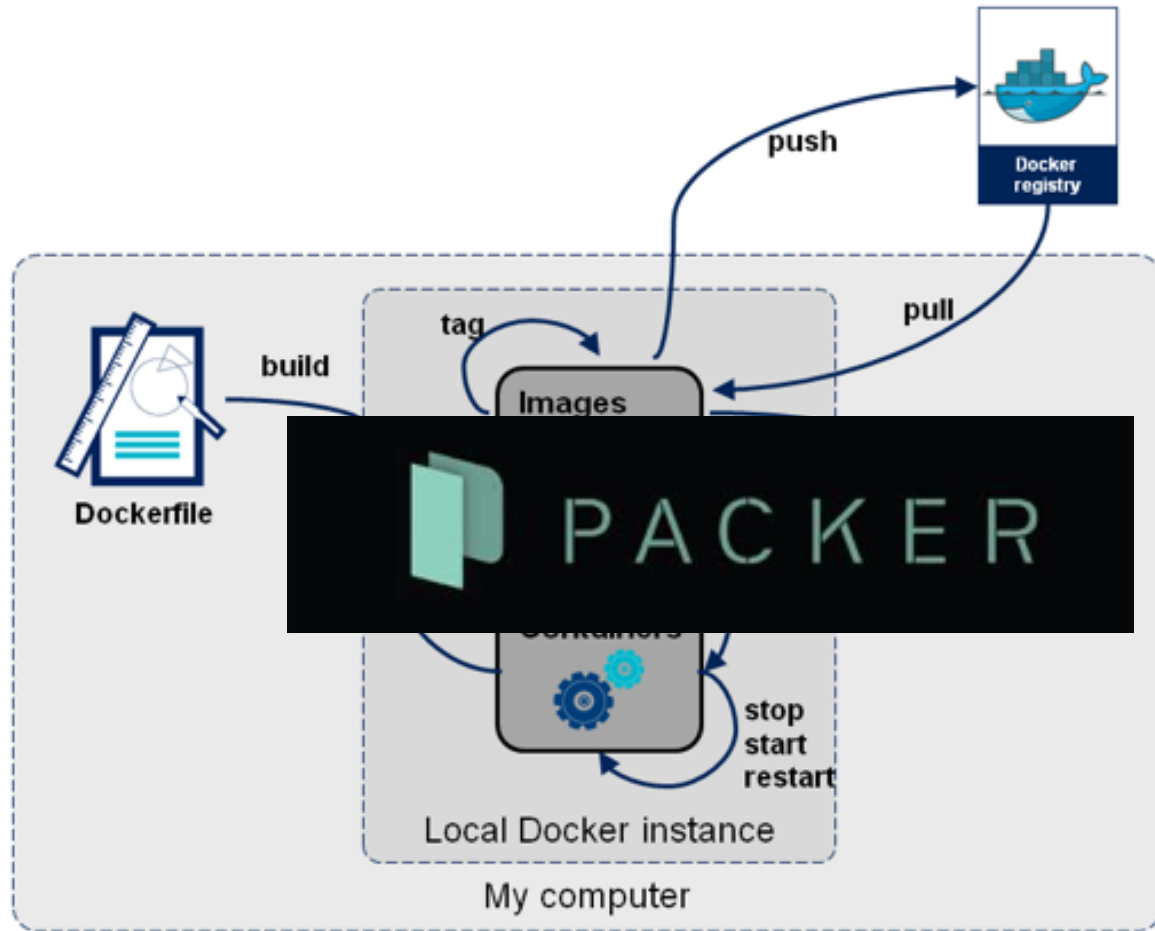
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# CoreOS



- Linux distribution
- Rolling upgrades
- Minimal OS
- Docker support
- etcd and fleet tools to manage distributed applications based on containers.
- Cloud-init support
- **Systemd units**

# CoreOS clustering

- `etcd` HA key value store
  - Raft election algorithm
  - Writes when majority in cluster has committed update
  - e.g 5 nodes, tolerates 3 node failure
- `fleet` distributed init system (schedules `systemd` units in a cluster)
  - Submits `systemd` units cluster wide
  - Affinity, anti-affinity, global “scheduling”



# Try it with

# Vagrant

```
git clone https://github.com/coreos/coreos-vagrant.git
```

```
vagrant up
```

```
vagrant ssh core-01 -- -A
```

```
fleetctl list-machines
```

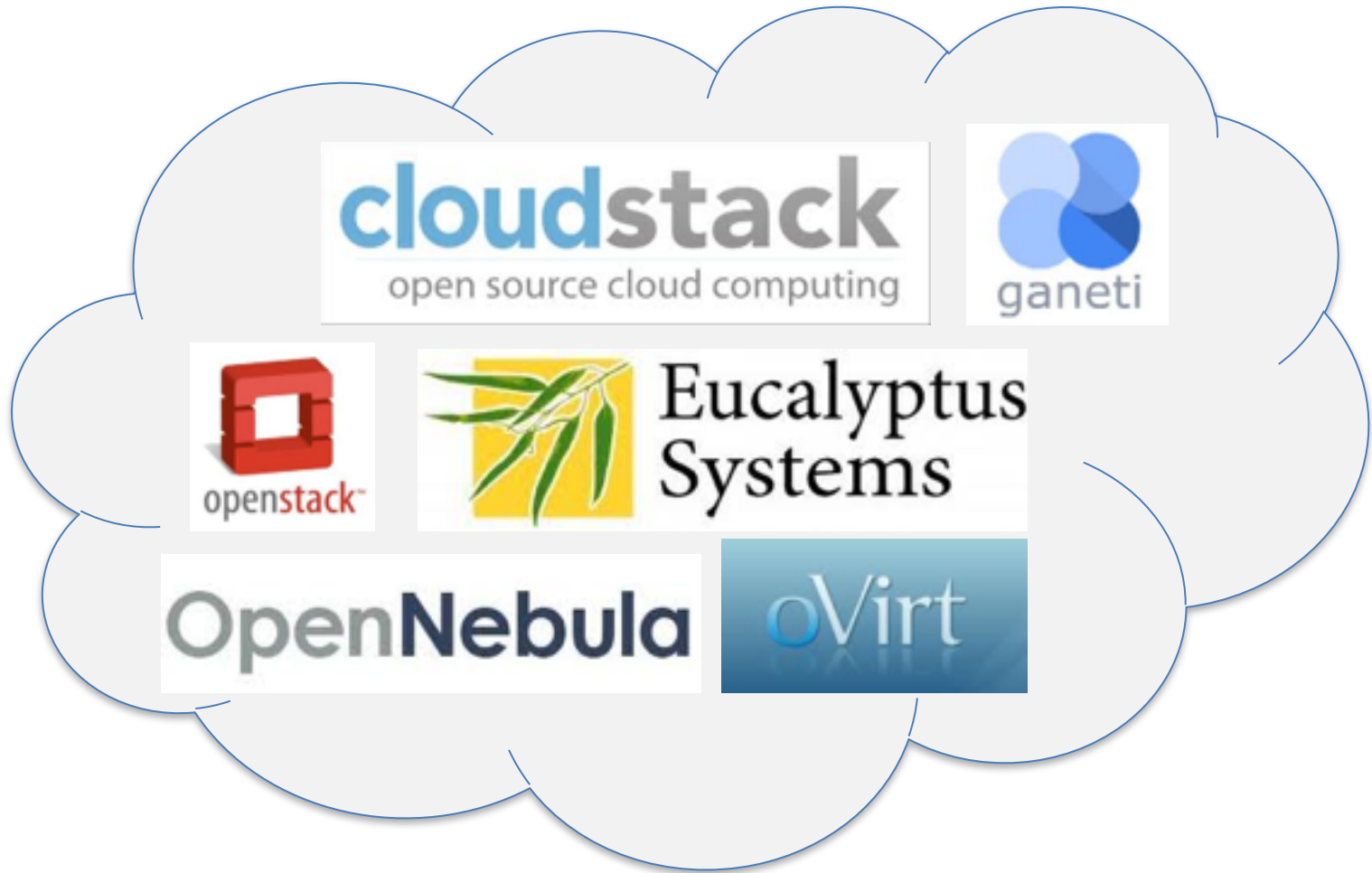
```
fleetctl list-units
```

```
fleetctl start es.service
```

```
fleetctl destroy es.service
```



# IaaS Landscape



**cloudstack**  
open source cloud computing



 **Eucalyptus  
Systems**

**OpenNebula**

**oVirt**



# CloudStack clouds



greencloud



exoscale

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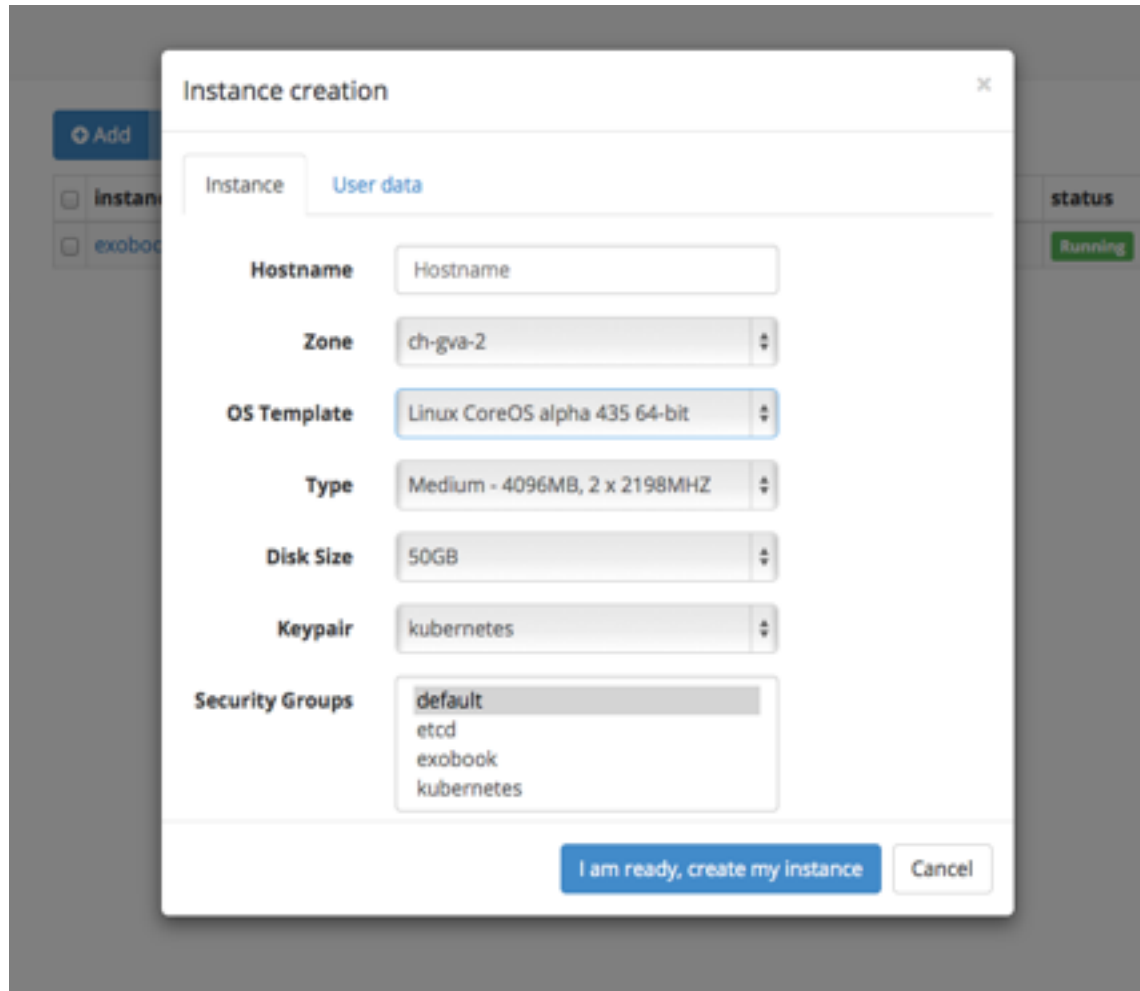


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# CoreOS on exoscale



The screenshot shows the 'Instance creation' dialog box in CloudStack. The 'User data' tab is selected. The configuration is as follows:

Field	Value
Hostname	Hostname
Zone	ch-gva-2
OS Template	Linux CoreOS alpha 435 64-bit
Type	Medium - 4096MB, 2 x 2198MHZ
Disk Size	50GB
Keypair	kubernetes
Security Groups	default, etcd, exobook, kubernetes

At the bottom of the dialog, there are two buttons: 'I am ready, create my instance' (highlighted in blue) and 'Cancel'.

# Starting containers

```
#cloud-config
```

```
coreos:
```

```
  units:
```

```
    - name: docker.service
```

```
      command: start
```

```
    - name: es.service
```

```
      command: start
```

```
      content: |
```

```
[Unit]
```

```
After=docker.service
```

```
Requires=docker.service
```

```
Description=starts Elasticsearch container
```

```
[Service]
```

```
TimeoutStartSec=0
```

```
ExecStartPre=/usr/bin/docker pull dockerfile/elasticsearch
```

```
ExecStart=/usr/bin/docker run -d -p 9200:9200 -p 9300:9300
```

```
dockerfile/elasticsearch
```

# Kubernetes

## *Kubernetes*

κυβερνήτης: *Greek for "pilot" or "helmsman of a ship"*  
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# Kubernetes

## on CloudStack

- Find a CloudStack cloud that supports CoreOS
- Then use:

<https://github.com/runseb/kubernetes-exoscale>

- Libcloud to start nodes with coreOS template
- User data to pass cloud-configs
- Then start Kube\* Service units with fleet



**DEMO ?**



# Questions and Thanks

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