



Deltacloud

Cloud Computing

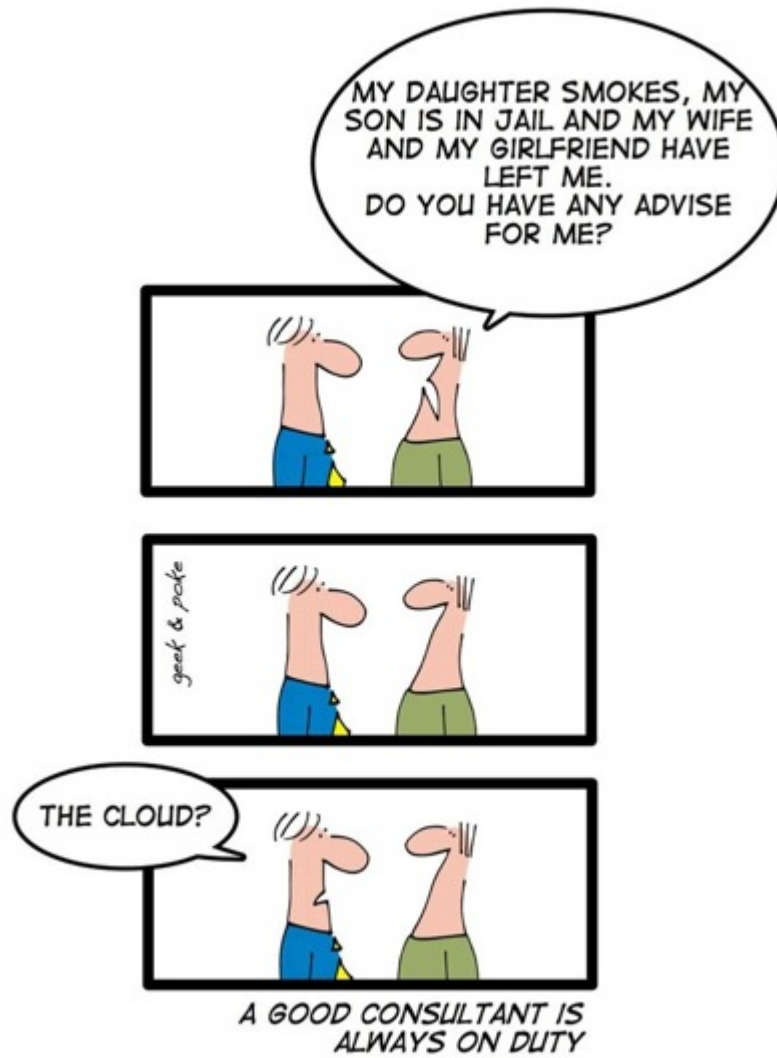
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Agenda

- Brief introduction to Cloud Computing
 - What is it ?
 - What is it good for ?
- Cloud providers API
- Deltacloud API





What is **Cloud Computing** ?



A “*buzzword*” ?



Definition

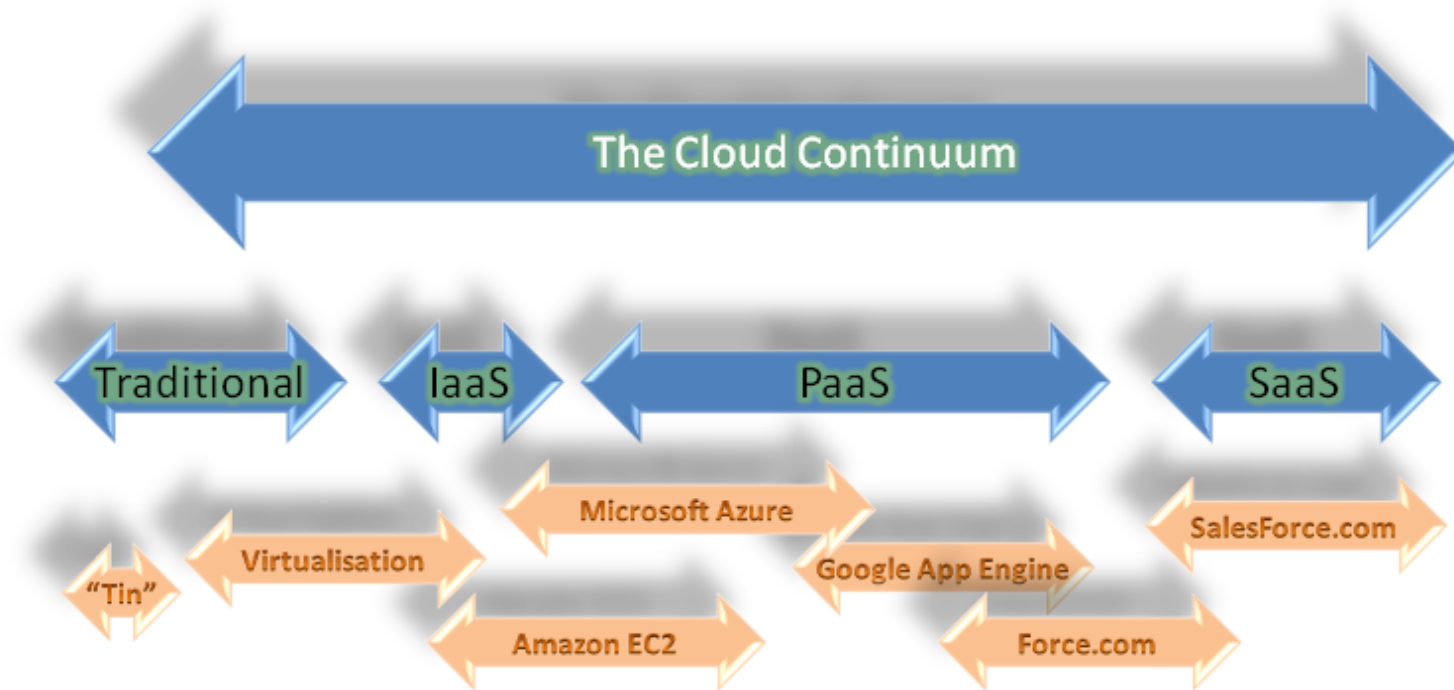
- **Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources.**

- www.nist.gov

- On-demand self-service
- Broadband network access
- Rapid elasticity
- Pay-as-you-Go models
- Extreme usage of Virtualization



Cloud Computing Ecosystem



What is it good for ?
What can I do in cloud ?



Working with Clouds

- Providers Web UI
 - ... or even better API!
 - ... but wait... which API?
- **Many API's => Many problems:**
 - No way to leave!
 - Let's change something today!
 - Backward compatibility?
 - Why bother with documenting a change?
 - Want to develop something? Pay!



So, what about one API ?

- Why ?
 - Abstracts the differences between clouds
 - Independent on cloud provider
 - One way to access many providers in the same time
 - Migration from one provider to another
 - Hurray! A backward compatibility
 - Faster development



The Problem:

So many cloud API's, so little time....



Deltacloud - Project Overview

- **Deltacloud Core:**

- Cross-cloud API abstraction
- One API for Amazon EC2, RackSpace, RimuHosting, GoGrid, OpenNebula, RHEV-M...
- Open Source project - Incubated in Apache
- Written using the power of Ruby DSL

- **Deltacloud Aggregator:**

- Manage many clouds in one place
- Cross-cloud remix



How ?

RESTful Web Service



Deltacloud Core: Basics

- **REST** based and thus language agnostic
- Programming Language: **Ruby** (Sinatra, Rails)
- Core concept
 - Hardware profiles
 - Realms
 - Images
 - Instances
 - Instance states
 - *Storage, networking...*



Deltacloud Core: Basics

- Entry point model
- Feature advertising
 - Instance Authentication
 - Firewalls
- Included Ruby client library (deltacloud-client)
- Simple build-in web UI for testing and documentation
- Command-line testing tool



Why Ruby ?





Because Ruby rocks! :-)



Deltacloud Core: Drivers

- What is “driver” ?

“Set of methods implementing a basic abstraction for communication with a 'backend cloud'.”

- Drivers are **simple**, easy implementable **Ruby** classes



Deltacloud Core: Driver methods

- def realms()
- def images()
- def instances()
- def create_instance()
- def start_instance()
- def reboot_instance()
- def destroy_instance()
- define_hardware_profile
- define_instance_states



Deltacloud Core: Included drivers

	Create new instances	Start stopped instances	Stop running instances	Reboot running instances	Destroy instances	List all/get details about hardware profiles	List all/get details about realms	List all/get details about images	List all/get details about instances
Amazon EC2	yes	no	yes	yes	yes	yes	yes	yes	yes
GoGrid	yes	no	yes	yes	yes	yes	yes	yes	yes
OpenNebula	yes	yes	yes	no	yes	yes	yes	yes	yes
Rackspace	yes	no	yes	yes	yes	yes	yes	yes	yes
RHEV-M	yes	yes	yes	yes	yes	yes	yes	yes	yes
RimuHosting	yes	yes	yes	yes	yes	yes	yes	yes	yes
Terremark <i>coming soon</i>	yes	yes	yes	yes	yes	yes	yes	yes	yes
vCloud <i>coming soon</i>	yes	yes	yes	yes	yes	yes	yes	yes	yes



Deltacloud Core: Hardware Profiles

- Deployment platform
 - Architecture
 - CPU type
 - RAM size
 - Storage

```
define_hardware_profile 'm1-xlarge' do
  cpu 4
  memory      (12*1024 .. 32*1024)
  storage     [ 1024, 2048, 4096 ]
  architecture 'x86_64'
end
```



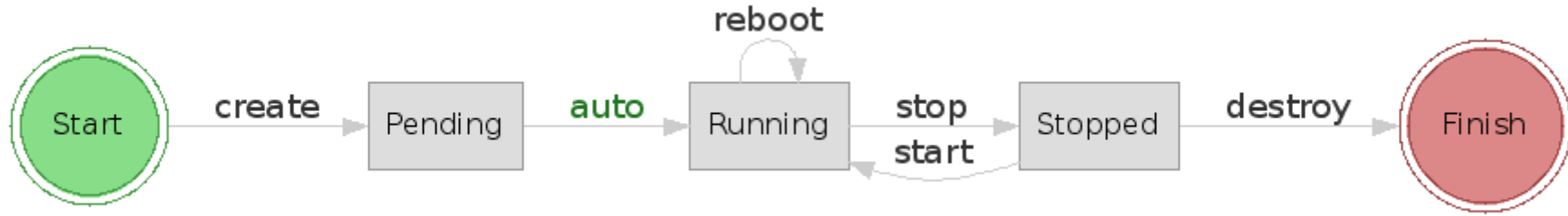
Deltacloud Core: Instances

- Basic capabilities
- Links to possible actions
- Optional capabilities
 - Authentication
 - Data injection
 - Networking
 - <your feature here>

```
feature :instances, :user_data  
feature :instances, :authentication_key
```



Deltacloud Core: Instance states



```
define_instance_states do
  start.to( :pending )      .on( :create )
  pending.to( :running )   .automatically
  running.to( :running )   .on( :reboot )
  running.to( :stopped )   .on( :stop )
  stopped.to( :running )   .on( :start )
  stopped.to( :finish )    .on( :destroy )
end
```



Deltacloud Core: Getting started

- Available as Fedora RPM
- Available as a standard Ruby gem
 - gemcutter.org/deltacloud-core
 - gemcutter.org/deltacloud-client
- Or from GIT repository
 - git.fedorahosted.org/deltacloud/deltacloud-core.git



Deltacloud Core: Clients

CLI * Ruby * Java * C * Python

... add your language here.



Deltacloud – Future (?)

- Aggregator
- Billing API
- Instance monitoring (EC2 CloudWatch)
- Storage management
- Network management
- Firewalls
- Integration of Image Builder



δ.CLOUD | Many clouds. One API. No problem.

<http://deltacloud.org>

Subscribe to mailling list:
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