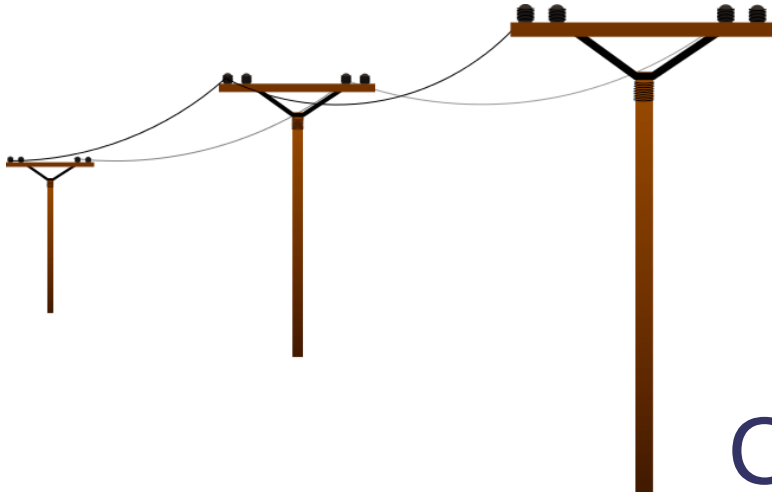
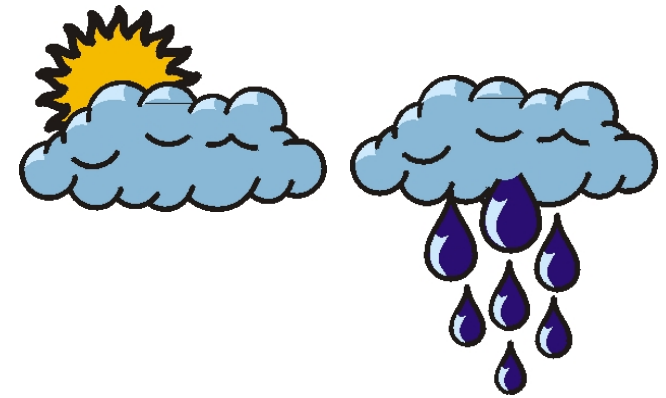


2011 OSG Summer School



Grids

Comparing
to



Clouds

by Igor Sfiligoi
University of California San Diego

Cloud computing

(as described this morning)

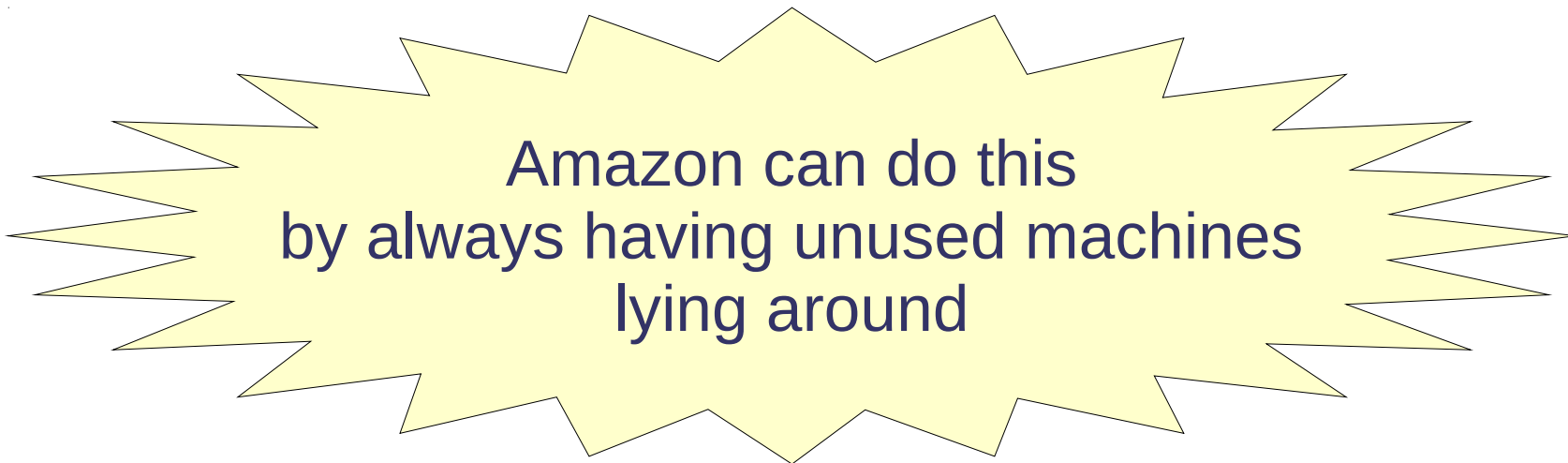
- A mix between hosted computing and Grids
- Job-based like a Grid
 - But “jobs” are Virtual Machines, not just processes
- You get your own machines like in hosted cmp.
 - They just happen to be VMs
 - You install whatever you want in them
 - There is an economic factor
(although there is a push for scientific clouds as well)

Cloud computing vs Grids

- Jobs are **whole system images**
 - You configure your own virtual machine
 - Grid nodes come with site-installed OS
- You **pay in \$\$** to use them
 - In Grids (and local HTC) systems you typically pay just in priority
- Instantaneous access
 - You get the resource within minutes of asking
 - In Grids you may wait a long time

Pay to use

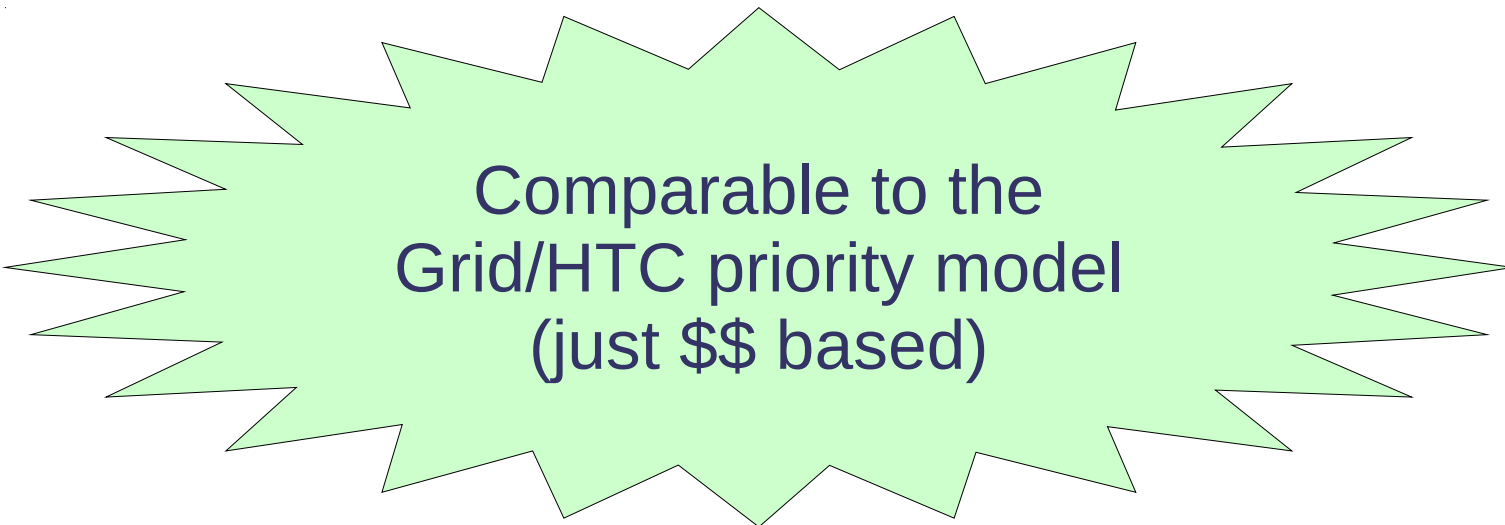
- Amazon EC2 made Cloud computing popular by defining a price in \$\$/hour
- A major selling point is also the fact that you will get the resources the moment you ask



Amazon can do this
by always having unused machines
lying around

Even clouds have priorities

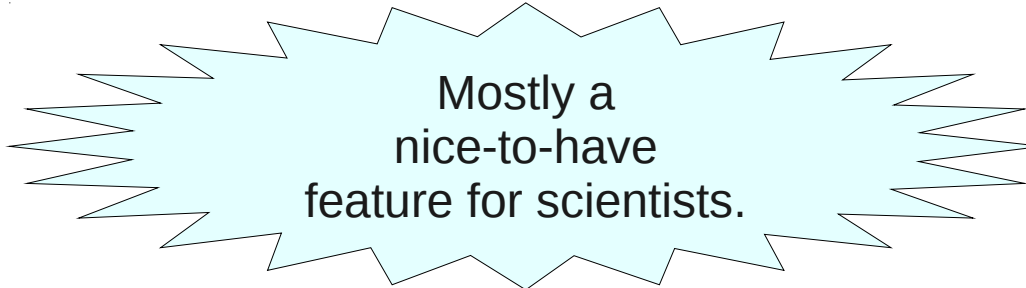
- Amazon EC2 now has “spot pricing”
- You bid for “unused resources”
 - If a higher bid comes in, you loose your machine



Comparable to the
Grid/HTC priority model
(just \$\$ based)

The VM business

- Amazon EC2 success arguably lies in the fact that they allow customers to provide **their own system image**
 - Most customers are not running compute jobs
 - They want to install a Web server and a database!
- This is less important for scientific users
 - Most scientific jobs don't need root/admin access!
 - Although it can make life easier (more homogeneous)



Mostly a nice-to-have feature for scientists.

Using Cloud resources

- The problem is similar to using Grid resources
 - Find a client and submit the job
- If your job is not a system image, you need someone to create the OS image for you
 - You, if you submit directly
 - The pilot will do it automatically, if you use an overlay system

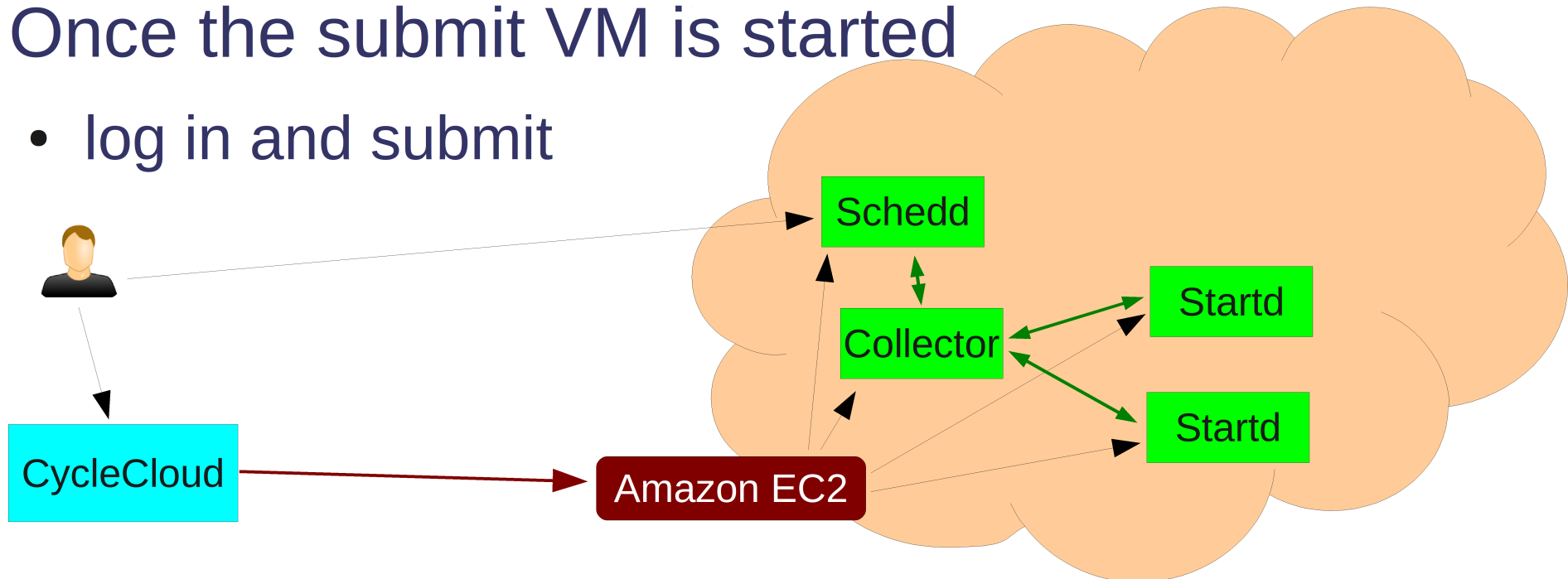


Cloud clients

- Direct submission
 - Cloud provider clients (EC2, Eucalyptus, OpenStack, ...)
 - Condor-G
- Overlay systems
 - glideinWMS (in prototype stage for now)
 - CycleCloud

CycleCloud

- Starts a whole Condor cluster on Amazon EC2
 - A service run by Cycle Computing
 - Just give them the money
- Once the submit VM is started
 - log in and submit



Get your hands dirty

- This is all the theory you need to know for now
- Demo/Exercise time
- Feel free to ask questions