

CANONICAL



Welcome to Ubuntu Developer Day



CANONICAL

Developing Applications for the Cloud

Ubuntu Developer Day

February 2010

Presentation by
Nick Barcet
Cloud Solutions Lead
nick.barcet@canonical.com

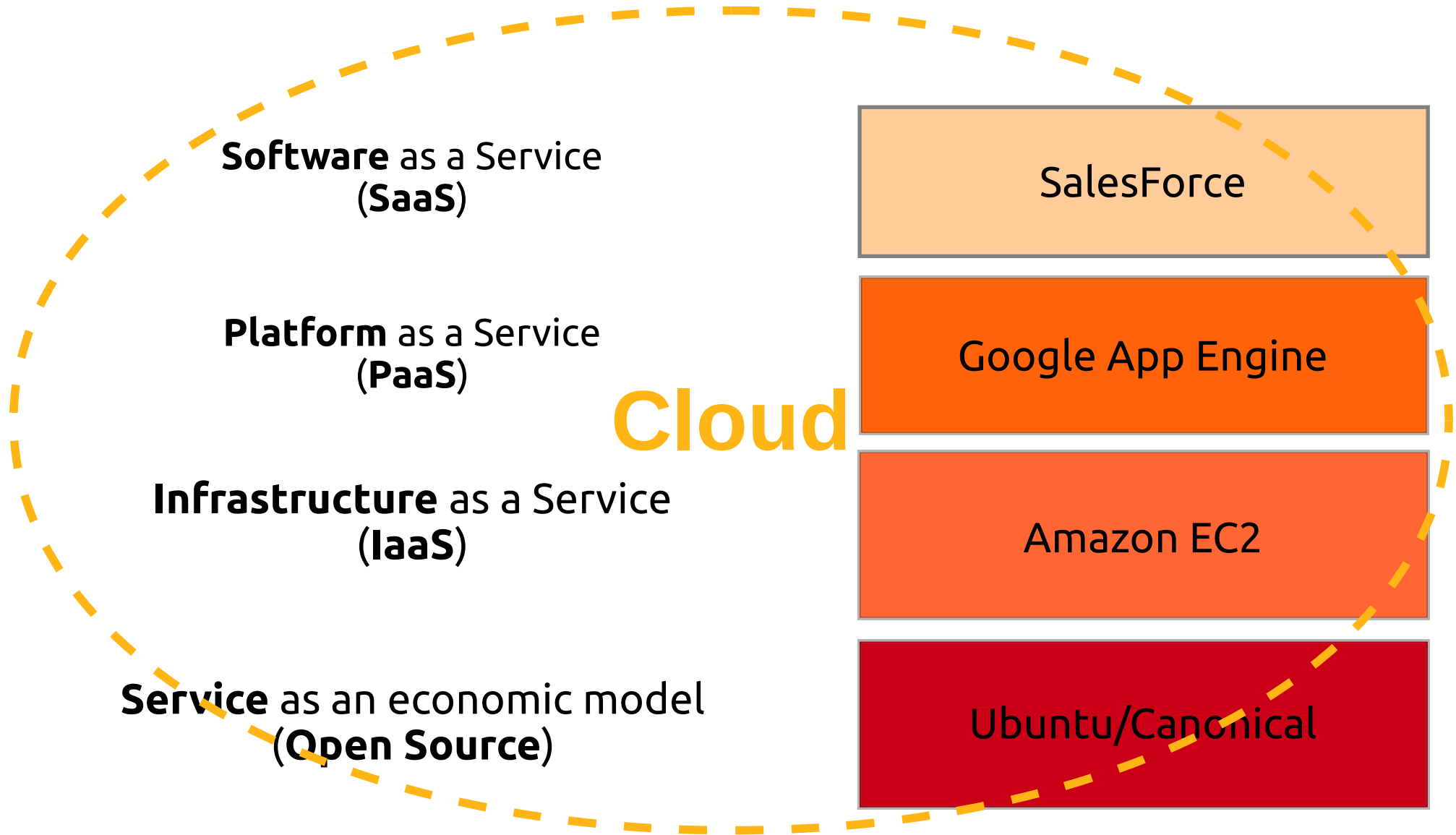


- Why develop in the cloud
- A fundamental change for developers
- Using Ubuntu IN the Cloud
- Using Ubuntu AS the Cloud

CANONICAL



Why develop in the cloud?





- Cloud reduces development friction and costs
- Cloud adoption is being driven by developers
- Opportunity
 - Access to latest technologies needed for competitive advantage rather than cost saving
 - Reduces time to market and therefore increases

Speed of innovation

Second Wave of OSS Adoption



- First wave in 2000 focused on Linux and LAMP
 - Winners were RedHat, MySQL
- Cloud represents Second Wave
 - OSS innovating rather than imitating
 - OSS is dominant in the cloud
- Opportunity
 - Scalability of cloud requires free bits



CANONICAL

A fundamental change for developers



- Infrastructure as a Service (IaaS) is not Virtualisation
- Not just porting existing Applications
- Applications have control on the infrastructure
- Instances specialize themselves
- Develop on a cloud

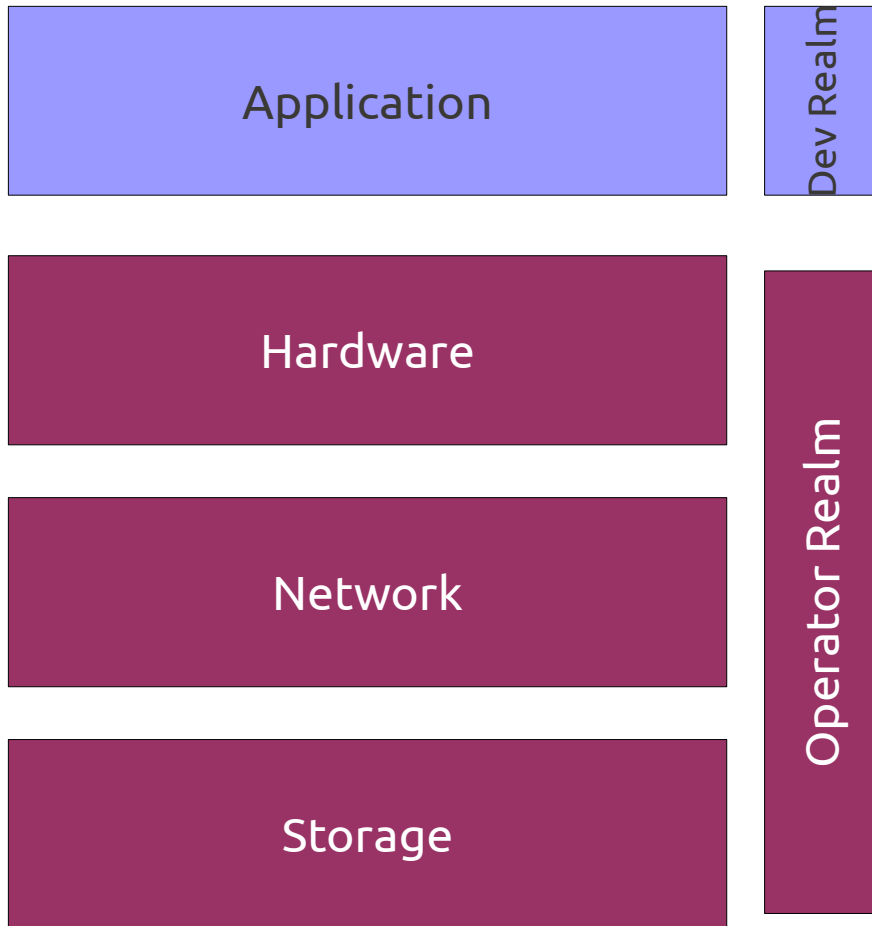


- Virtualisation:
 - Is not controllable by the application
 - Each Instance require a specific disk image
 - the term “virtual machine” regroups the notion of disk image and execution instance.
 - Assumes old separation of work model between developer and operators



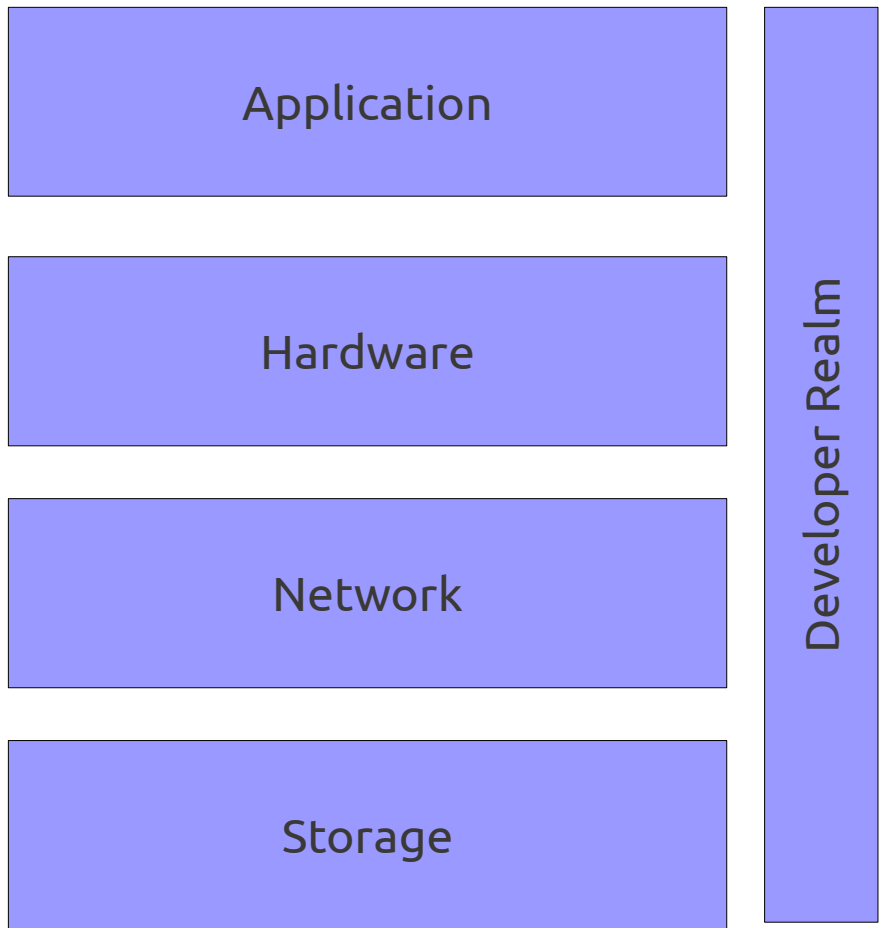
- Current applications do not need to be ported
 - anything that will run on a server can run in the cloud
- Application need to take advantage of the cloud
 - Dynamic scaling
 - Introspection
 - Storage

Old Habits



- Assume that the infra is resilient
- Assume that the hardware scales vertically
- Assume that SQL is the only DB method, and that it will grow with the app
- SPOF and scalability are a data center issue

New Habits



- Applications can scale horizontally
- Application can spawns additional instances based on needs
- Any instance can fail, but you can always launch another one
- Data can scale horizontally too if you use NoSQL DBs for critical elements
- Applications can run across data centers (availability zones)
- Application control their storage



- Amazon's API to control AWS leads the way to control
 - The infrastructure (EC2)
 - Elemental/Object storage (S3)
 - Block storage (EBS)
 - Instances have access to meta-data and user-data
 - Can query about environment
 - Can learn about self
- Developers are now operators of the data center: **DevOps**



- Instances are very similar to Object instances in programming
- A single Image can have multiple instances
- Can initialize themselves based on user-data passed to it
- Specialization of the instance is not linked to the image
- Storage is not linked to the image



1. Instance is created from a generic OS image with user data:
 - Type: web front end
 - Load balancer: lb.somewhere.com
 - EBS: use disk “web”
2. Instance boots, receives and parse user data
3. Installs apache and configures itself
4. Attaches to ebs disk “web”
5. Informs load balancer that it is ready to receive requests



- Requires to develop ON a cloud infrastructure
- Requires an instance OS that is compatible with the cloud



CANONICAL

Using Ubuntu IN the cloud

Ubuntu is free, maintained AND supported



- No additional fee to run your instance in public cloud
- Images are maintained, updates are public
- Mirrors are maintained within the environment
- Support is available as an option



- Small, efficient base image (build on the su
- Provides Amazon's API for most languages
- Same image can be ran on multiple cloud
 - Amazon
 - Ubuntu Enterprise Cloud
 - Rackspace*
 - Flexiant*
 - KVM virtualisation environment
- Has cloud-init built in

* Coming soon



- Generic way to initialize your instance
 - Works identically on multiple clouds
- Supports:
 - Mounting EBS volumes
 - Configuration management tools (ie Puppet)
 - Modular and external scripting
 - Package installation and configuration

Ubuntu Images – The #1 Public Cloud OS



- Amazon Web Services
 - Images available since 2007
 - Believed to be the most widely deployed OS
 - <https://help.ubuntu.com/community/EC2StartersGuide>



- Rackspace Cloud
 - Images available since 2008
 - Confirmed as most widely deployed OS
 - http://cloudservers.rackspacecloud.com/index.php/Ubuntu_-_Setup





CANONICAL

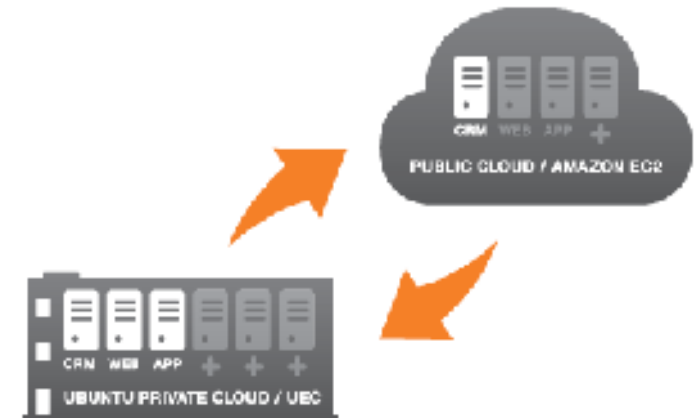
Using Ubuntu AS the cloud



Ubuntu Enterprise Cloud

Compatible Technology

Ability to use the same Ubuntu machine images and management tools across both private and public systems, minimising costly re-training or application change when moving from private to public and vice versa.



Ubuntu Enterprise Cloud

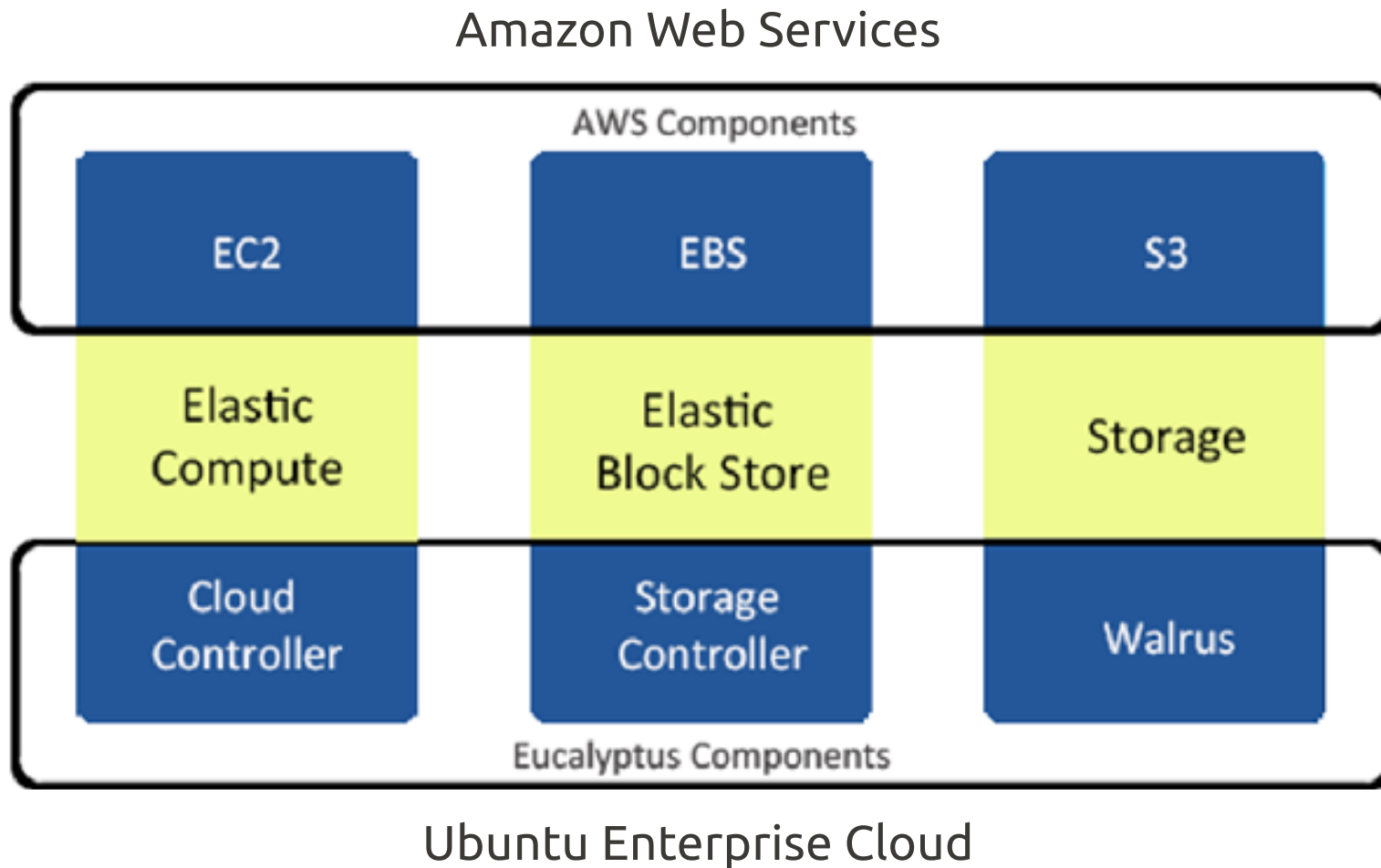
- Rapid deployment
- Optimize resources & immediacy (self service IT)
- Best of breed (KVM, Eucalyptus)
- Compatible technology (matches EC2/S3)
- Supports multiple guest O/S
- Secure, trusted & open source

Hybrid Focus

- Ubuntu on EC2 (public)
- Ubuntu Enterprise Cloud (private)
- Maximise benefits whilst minimising risks
- Elasticity
- Simplifies bursting
- Common Standards
- Common Ubuntu machine image



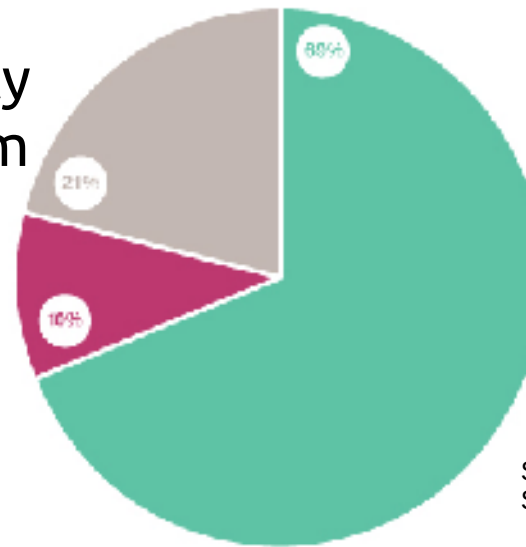
UEC/Amazon API Compatibility





UEC Adoption

- Users convinced of the validity of Ubuntu & UEC as a platform for cloud.
- 7% have built a private cloud with UEC, 17% are expecting to in the next 12 months.



Do you consider Ubuntu a viable platform for "cloud" based deployments?

| Answer | Count | Percentage |
|----------------|-------|------------|
| Yes (71) | 420 | 56% |
| No (17) | 22 | 10% |
| No answer (29) | 129 | 21% |

- Yes (420)
- No (22)
- No answer (29)

Source: Ubuntu Server Edition User Survey by Canonical

- Currently tracking over 20,000 deployments of UEC

Countries (Top 10) - by 1st

| Countries | Pages | Hits | Bandwidth |
|---------------|-------|------|-----------|
| United States | 1034 | 1035 | 130.05 GB |
| Great Britain | 1026 | 1026 | 20.92 GB |
| Germany | 1309 | 1021 | 21.00 GB |
| Spain | 1127 | 1127 | 15.23 GB |
| China | 1000 | 1000 | 5.19 GB |
| India | 1024 | 1024 | 8.05 GB |
| Canada | 901 | 901 | 12.90 GB |
| Netherlands | 977 | 977 | 12.57 GB |
| France | 779 | 792 | 12.57 GB |
| Japan | 771 | 771 | 8.21 GB |
| Others | 0100 | 0270 | 97.91 GB |



Ubuntu Enterprise Cloud

Five Characteristics:

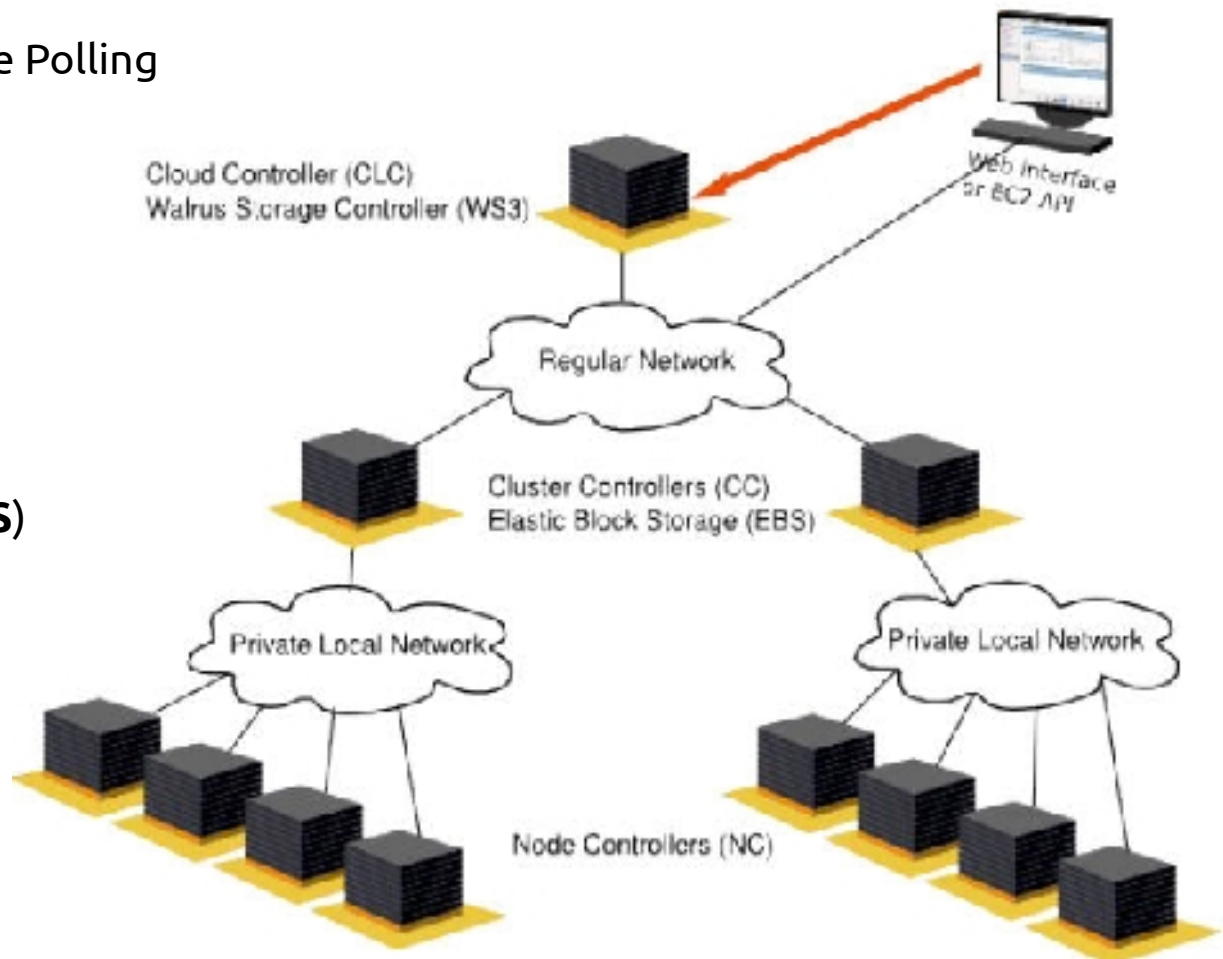
- On Demand Service
- Ubiquitous Network Access
- Location Independent Resource Polling
- Rapid Elasticity
- Measured Service

Delivery Models

- Software as a Service (**SaaS**)
- Platform as a Service (**PaaS**)
- Infrastructure as a Service (**IaaS**)

Deployment Models

- Private Cloud
- Public Cloud
- Hybrid Cloud





CANONICAL

Thank You

<nick.barcet@canonical.com>