What is the Cloud?
The Landscape

- IaaS - Amazon EC2, Rackspace Cloud
- PaaS - Force.com, CloudFoundry, OpenShift, Heroku
- SaaS: SalesForce, Zoho, Google Apps, Zendesk
Why Cloud?
Elastic
Multi-tenancy
Pay As You Go
Pace of Innovation
Speed of Provisioning
An Opportunity

Cap-Ex

Op-Ex
<table>
<thead>
<tr>
<th>Feature</th>
<th>Cloud</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Minutes</td>
<td>Days</td>
</tr>
<tr>
<td>Capex</td>
<td>Pay As You Go</td>
<td>Fixed, Upfront Cost</td>
</tr>
<tr>
<td>Economies of Scale</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Geography</td>
<td>Distributed</td>
<td>Local/Offsite</td>
</tr>
<tr>
<td>Multi-tenant</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Scalability</td>
<td>Elastic</td>
<td>Manual</td>
</tr>
<tr>
<td>Virtualized</td>
<td>Yes</td>
<td>Both</td>
</tr>
</tbody>
</table>
Hosted IAAS Options

OPEN

CLOSED

- openstack
- nimbus i/o
- cloud.com
- Eucalyptus
- Joyent
- VMware
PAAS Generations

GEN 1

force.com
Google App Engine

GEN 2

Engine Yard
heroku

GEN 3

OPENSHIFT
Cloud Foundry
The Future is Open

- GEN 1: Closed Runtimes
- GEN 2: Open Runtimes
- GEN 3: Multiple Open Runtimes
Ubuntu Cloud
Ubuntu Cloud Map

**PaaS**
- PaaS Frameworks: Cloud Foundry et al
- Juju Services Orchestration

**IaaS**
- Private Cloud Infrastructure: OpenStack, KVM
- Public Cloud: Amazon, Rackspace, HP

**Host**
- Ubuntu on X86 and ARM in Private and Public Clouds
Ubuntu is #1 OS for Cloud Computing

Leader in private cloud infrastructure

- Ubuntu 9.04 – first to ship Amazon EC2 compatible private cloud infrastructure with Eucalyptus
- Ubuntu 11.04 – first to ship OpenStack
- Ubuntu 11.10 – OpenStack default in Ubuntu Cloud Infrastructure

Built for innovation

- Release cycle provides today's technology, and long term support
- Free, with commercial services from Canonical
- Developers' preferred platform

Built for the cloud

- IaaS built in
- Perfect guest - #1 on AWS and RackSpace Public Clouds
- PaaS OS of choice – VMWare CloudFoundry and many more
- BigData solutions on tap – Hadoop, NoSQL and the rest
Cloud Innovation starts with Ubuntu

First to embrace and deliver critical technologies

- KVM for virtualisation
- LXC for containers
- OpenStack
- CloudInit
- AWS updates and integration

Continual innovation

- ARM for hyperscale data centers
  (HP Moonshot and beyond)
- Juju service orchestration

Canonical services

- Support and legal assurance
- Turnkey solutions
- Consulting, design and engineering
IaaS: HP selects Ubuntu

Ubuntu selected by HP Cloud Services as its lead host and guest platform

- Currently in private beta

Canonical and HP

- Recognize that open, interoperable cloud infrastructure and services are critical for next generation cloud-based services
- Share a commitment to open source and embrace the OpenStack community
PaaS: VMWare selects Ubuntu

Ubuntu selected by VMWare Cloud Foundry as its standard guest platform

- On CloudFoundry.com, on AWS/Rackspace and in private cloud deployments
- Supports multiple PaaS languages and frameworks

Canonical and VMWare

- Want the widest variety of PaaS options available to developers regardless of IaaS
- Deliver CloudFoundry on Ubuntu, to Amazon AWS, Rackspace, Private Clouds and direct to developer workstation
Why Ubuntu Cloud?
Hybrid cloud is the goal:

Move workloads between your private cloud and major public cloud infrastructures
Friction-free deployment

Provisioning and deployment friction destroy your agility and efficiency
Power density is critical:

ARM processors coming to the data centre change the way workloads are deployed
The next problem
(and a solution)
Managing services in the cloud, not machines

In the cloud, machines are ephemeral and unreliable

- Machines no longer the appropriate unit
- Current configuration tools are clumsy as they still focus on machines

Services, not machines

Services change during their lifetime

- Number of instances, which machines, dependencies
- Horizontal scaling of services brings internal complexity
- Pipeline from development, through staging, test and production
<table>
<thead>
<tr>
<th>Configuration management</th>
<th>Service orchestration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Machine-centric</td>
<td>• Service-centric</td>
</tr>
<tr>
<td>• Decoupled from provisioning</td>
<td>• Coupled with provisioning</td>
</tr>
<tr>
<td>• Inefficient re-use of knowledge</td>
<td>• Efficient knowledge sharing</td>
</tr>
<tr>
<td>• Analog: ./configure &amp;&amp; make &amp;&amp; sudo make install</td>
<td>• Complementary to config management</td>
</tr>
<tr>
<td></td>
<td>• Analog: apt-get install</td>
</tr>
</tbody>
</table>
Service orchestration

Juju models relationships between services, not machines

- Dependency model allows loosely coupled but highly cohesive services
- Maintains service relationships through scaling

Encapsulates deployment intelligence for re-use

- Hides complexity of horizontal scalability in “charms”
- Reusable, codified best practice from devops
Juju is...

DevOps Distilled

- Expertise encapsulated in charms
- Frictionless dev-ops handovers

Scalable by design

- Re-usable service units, well-defined interfaces
- Encapsulation

A community of expertise

- Public charms, open source
- Governance of charmers

Service orchestration

- Focus on services, not machines or instances

Easy

- No need to learn a new language
- No need for packaging
- Codify existing practice first

Universal

- Same charms locally, bare metal, EC2, OpenStack
Ubuntu Cloud
Canonical Services
Ubuntu Advantage Cloud

Ubuntu Advantage Cloud Infrastructure
Support, Management and Legal protection for Ubuntu Cloud Infrastructure

Ubuntu Advantage Cloud Guest
(released)
Fixed price, up to 100 guests

Ubuntu Cloud Guest OnDemand
(To be announced)
Utility based pricing

Professional Services
Canonical can help you implement a cloud-computing environment with the management tools you need to grow your cloud and prepare for the future.

You can involve us at every stages:
• Planning
• Proof of concept
• Deployment
• Optimisation
Ubuntu Cloud Jumpstart

Your own cloud in 1 week for $9000

Request your Jumpstart: https://pages.ubuntu.com/ubuntu-cloud-jumpstart

Ubuntu Cloud Jumpstart includes:

- One Canonical Services Engineer for five days
- A planning framework that enables you to make essential, core architecture decisions based on your specific needs and the rapidly evolving state of the various components that provide those services
- A seed Ubuntu Cloud Infrastructure deployment on up to 20 x86 servers
- Limited opportunistic integration of this cloud infrastructure with existing related systems on your premises
- Training on key tools and processes to support your cloud
Thank you.

Questions?

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https://pages.ubuntu.com/ubuntu-cloud-jumpstart
www.ubuntu.com/business/cloud/overview
juju.ubuntu.com
@ubuntucloud on Twitter