Using the cloud for e-Learning.

Interoute: Jonathan Graham
UniMarconi: Alessandro Giorgio
Education from the cloud
Agenda

• Intro
  • Jonathan.graham@interoute.com
    • Cloud solution consultant/business dev
  • Alessandro Giorgio Togna a.togna@unimarconi.it
    • System, Network and Infrastructure Architect

• Uni Marconi
  • The Service
  • The challenge
  • The plan
  • Requirements

• Interoute
  • The solution
  • Virtual Data Centre
  • The cloud
  • The network
University Gugliemo Marconi Case Study

- UniMarconi is a Telematic University
  - E-Learning/virtual campus
  - Accredited educational distance programs
- Includes 30 different degree courses, 70 Masters, PhDs.
  - Economics, Law, Arts, Politics, Science
- UniMarconi has 16,000 students
- From 83 countries
- Virtual C@mpus, our e-learning platform, has more than 1,000 concurrent students
- From 25 countries
- Delivering 10,500 degrees since 2004
Virtual C@mpus

- Learning Management System
- E-learning platform to offer distance learning
- Any time any place
- Synchronous & Asynchronous content
- Course programmes, calendar, exercises, audio/video lessons, Didactic content, simulations, multimedia simulations and self assessment tests, collaboration
Virtual C@mpus video

http://www.youtube.com/watch?v=X6C3o2Auw-I
Virtual C@mpus

- **Needs**
  - High Availability and fast Disaster Recovery
  - High performance Network
  - Possible use of Content Delivery Network
  - Rapid deployment of new services
  - Rapid deployment of new resources to accommodate spikes in student usage
  - Adherence to Italian and European Union laws
How?
The challenge

- E-learning platform
  - Colocation costs
  - 3rd party Management costs
  - EOL hardware
  - €’s
The plan
Outsource, but only if.....
Outsource, but only if…..

- Control
- Costs
- Migration
- Performance
Outsource, but only if......

- Retain control
- Location of data
- Root Access to servers
- Connectivity (LAN, WAN & Internet)
Outsource, but only if.....

Costs

- Colocation and 3\textsuperscript{rd} party management was expensive but at least predictable.
- The CFO at least liked this.
Outsource, but only if.....

- 5TB of didactic data
- Videos
- Learning content
- All needs to be migrated to the new solution
- Migration must be simple and quick
Outsource, but only if.....

- Quality End user experience is paramount
- Network and Compute performance essential
And what about the cloud?

- IaaS
- Ever growing data
- Pay As You Go
- Elastic
- DR & Backup to the cloud
Who are we?
What have we got?
What have we done with it?
For whom?
Interoute’s Global Reach
"The company is moving at a faster pace than rivals into positioning itself as a cloud-based provider of ICT services.....The carrier’s cloud drive is supported by best-value high bandwidths, as well as a densely connected pan European network.”
Interoute: from the ground to the cloud

10 Data Centers

The network – 60 000 km fiber across 30 countries

PROFESSIONAL SERVICES

YOUR AMBASSADORS:
- Project Manager
- Service Manager

CloudStore
Interoute as a Service

Connectivity
Communications
Computing
Professional Services
Security
Web
Business Apps
Network

- Compute & Storage
- Operating System
- Security
- Web
- Business Apps
- Network

- Video as a Service
- Hosted Lync/Exchange
- Audio/Web Conferencing
- Voice/SIP
- Transit/Internet Access
- Ethernet
- Dark Fibre

COMPUTING

- Apps Management
- Virtual & Dedicated Servers
- Virtual Data Centre
- Storage, Backup & DR

- Wan Optimisation
- MPLS-VPN
- SDH Wavelength

SECURITY

- Intrusion Prevention System
- Ddos Mitigation
- Secure Access
- 2Factor Authentication
- NextGen Firewall

SÉCURITY

10 Data Centers

The network – 60 000 km fiber across 30 countries

INTERROUTE

from the ground to the cloud

- Interoute
- NextGen Firewall
- 2Factor Authentication
- Secure Access
- MPLS-VPN
- Wan Optimisation
- Storage, Backup & DR
- Virtual Data Centre
- Virtual & Dedicated Servers
- Apps Management
- Voice/SIP
- Audio/Web Conferencing
- Hosted Lync/Exchange
- Video as a Service
- Compute & Storage
- Operating System
- Security
- Web
- Business Apps
- Network
# Our customers

<table>
<thead>
<tr>
<th>Government &amp; Government Channels</th>
<th>ESA, Space for Europe, Belgium, Germany, Italy, Spain, Europe, United States</th>
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</thead>
<tbody>
<tr>
<td>Financial Services</td>
<td>BNP Paribas, ING, Genérale, Deutsche Bank, Morgan Stanley</td>
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<tr>
<td>Service Industry</td>
<td>Hilton, UEFA, Deutsche Post, Air Berlin, Rentokil, United Kingdom</td>
</tr>
<tr>
<td>Retailers</td>
<td>Rossmann, Chopard, Brabantia, ASICS, Coca-Cola</td>
</tr>
<tr>
<td>Industrials</td>
<td>Ford, Volvo, GE, Siemens, Ingram Micro, Ferrari</td>
</tr>
<tr>
<td>Service Providers</td>
<td>Sprint, NTT Communications, BT, Telefónica, Deutsche Telekom, China Telecom</td>
</tr>
</tbody>
</table>
VDC = Public cloud simplicity with private cloud security

True* IaaS cloud service:
- On demand (Hub)
- Networked (WAN, LAN & Internet)
- Multi tenant
- Elastic
- Measured
*As per NIST definitions

PLUS:
- Pan European IaaS
- Location sensitive
- Network integration
- Public + Private + Hybrid....
- No lock in: open + import and export
- Network Control not emulation
- Secure and compliant
VDC Online: Order, Create & Deploy

1) Hub: Order the Virtual Data Centre Service online.

2) Hub: Choose the VDC package and city location (zone(s)).

3) Hub: Launch the VDC Control Centre.

4) VDC: Create Virtual Appliance, Storage and Network elements.

5) Upload your own or use Interoute supplied templates to create one or more Virtual Machines.

6) Specify the CPU, RAM, Storage and Network configuration of each Virtual Machine.

7) Deploy your Virtual Machines.

8) Manage your machines using the web Console, RDP or SSH.

9) Create your ICT service using your VDC environment and access it over integrated IPVPN or Internet connection.
The cloud is great, but a VDC is better

**Connectivity**
- Automated MPLS integration
- LAN, WAN, Internet control
- *Integrated with Interoute core*
- Public & Private

**Cost**
- *PAYG & Commit* (with burst)
- No network costs
- Define VM sizes

**Security & Compliance**
- European
- *Chose country*
- VLAN segregated, DMZ enabled
- Network control (not emulation)
- Interoute owned

**Manageability**
- Import & Export
- Hypervisor Agnostic
- 99.99% SLA
- API
- Elastic
- CloudStore
- *Root Access*
Virtual Campus using VDC
1) VPN extended to include VDC in London and Amsterdam

2) Primary VDC site London
   1) IaaS resources (CPU, RAM, Storage & Network)
   2) Hosts Virtual Campus

3) Secondary VDC site Amsterdam
   1) IaaS resources (CPU, RAM, Storage & Network)
   2) Backup of London
The Solution (Zoom in)

All within VDC:
1. DMZ
2. Internet Access
3. VLAN Segregation
4. NAS: Shared Storage NFS
5. Load Balancer & Firewall Appliances
Success...

- Outsourced infrastructure and management
- CAPEX removed
- Cost savings >€15k / 23% per month
- Future proof infrastructure
  - No support agreements
  - No upgrade concerns
- End to end SLA.
  - Always on and always available.
- Cloud Roadmap
  - To grow the service, further increase savings
UniMarconi Cloud roadmap

Now

ISS

HK/U S

Auto Scale

PAYG

2015

Backup on premise NetApp to Cloud vFiler

Expand service to US and Asia Pac

Auto scale dependant on quantity and location of demand

Pay As You Go Business Model
Interoute’s VDC Roadmap

- USA + Hong Kong VDC
- Object storage
- Instant(s)/Web Scale Solutions
  - Moodle: Course Management System/Learning Management System/Virtual Learning Platform
  - Joomla: Content management
  - WordPress: Blogging
  - MediaWiki: crowd sourced encyclopedia
  - Drupal: Content management
VDC Instant: Web Scale Course/Content management
Thank you!

- [www.interoute.com/vdc](www.interoute.com/vdc)
  - Free trial
- [Jonathan.graham@interoute.com](mailto:Jonathan.graham@interoute.com)
  - Beta trial of Moodle/Joomla