

From Green Hosting to Cloud Computing

What Cloud Computing is, what is currently available,
how it can benefit you, and how it compares to
“normal” green hosting

About Kate & Memset

- Memset Dedicated Hosting
 - Web & IT hosting solutions provider
 - UK's first CarbonNeutral ISP
 - Voted UK's best Web host 06, 07, 08
 - Part of Deloitte UK technology fast 50
- Kate Craig-Wood Msc
 - Co-founder & MD of Memset
 - Main board member of Intellect
 - On energy & environment leadership group
 - On BCS Data Centre Specialist Group committee

What “Carbon Neutral” means

- Two steps to be carbon neutral accredited:
 - 1) Invest in and commit to energy efficiency
 - 2) Offset what you cannot avoid using
- Does not cost much - £10-14/tonne CO2
 - ~£1/month/server in our case
 - About £30/year/staff member
- See www.carbonneutral.com

EU Code of Conduct for Data Centres

- Released late last year
- Stipulates best practice for data centre operators
 - Resilience levels & provisioning
 - Equipment & software selection
 - Cooling
 - Power provision
 - Virtualisation
- Memset exceeds most minimum requirements

Compute resources

- **CPU time**
 - Cores & clock cycles per second
 - Floating point processing vs. integer processing
- **RAM (MBytes used)**
 - Access speed / latency time
- **Data storage (GBytes used)**
 - I/O throughput (MBytes per second)
 - Transactions (I/O operations per second)
 - Resilience (eg. RAID level)
- **Bandwidth (GBytes transferred)**
 - Latency & resilience

Grid

- **Grid computing** is a technical approach spanning an application across multiple computers within one administrative domain (one provider, not necessarily one location).
- **A compute grid** is a collection of computers within one administrative domain capable of hosting a distributed application.
- Grid is about infrastructure.

Utility

- **Utility computing** is a sales approach, treating computing resources as a utility in the way we treat the familiar utilities (water, gas, electricity etc.). A utility computing provider would sell resources on their own grid(s).
- *Utility is about business relationships.*

Cloud

- **Cloud computing** means an open market for computing resources; utility computing applied to multiple grids.
- **A compute cloud** is a grid spanning multiple administrative domains with applications able to move between domains in response to cost and SLA requirements.
- *Cloud is about scale and the computing resource market.*

Existing “clouds”

- Some regard “cloud computing” as **IT as a service**
 - Eg. Google's App Engine
 - Not really true cloud computing, but often what included in peoples' definition of “cloud”
- Amazon's Elastic Compute Cloud is the best example of an actual on-demand / utility / cloud computing facility

Benefits available from utility / cloud computing

- Scales from one to millions of users without the headache
- Pay only for what you need
- No up-front costs / capital expenditure
- In-built resilience
- Ultimate in “green” IT infrastructure
 - Little-no wasted hardware or available resource

Google's App Engine

- Run your Web applications on Google's infrastructure
- Technologies available:
 - Python
 - Django
 - Google's own “Datastore” storage database
- Need to write applications specifically for App Engine
- Resources are automatically scaled
- Allows rapid development & deployment of online applications

Amazon Elastic Compute Cloud

- Run virtual machine instances on Amazon's infrastructure
 - One “unit” is roughly a 1.7GHz 2006 Xeon
- Billed per-hour for each instance (CPU/RAM)
- Storage provided by “Simple Storage Service”
 - \$0.18 / GB-month stored
 - \$0.17 / GB transfer
- Additional instances must be requested via API
- Choice of operating systems available

Alternative: Dedicated Hosting

- Advantages:
 - Dedicated server resources (not shared / contended)
 - Complete flexibility
 - Performance
 - Ease of migration
- Disadvantages:
 - Resilience costs extra
 - Scaling takes hours, not minutes
 - Minimum term is 1 month, not 1 hour

Cost comparison

- One Amazon EC2 compute unit is approx a 2006 1.7GHz single-core Xeon
 - \$0.11/hour = £0.08/hour = £56.20/month
- One Memset Miniserver VM, approx a 2.4 GHz single-core Xeon (less RAM & storage included)
 - £59.95/month
- Amazon S3
 - \$0.18/GB-month = £0.13 /GB-month
- Memset storage array
 - 22TBytes = £499/mo = £0.02 /GB-month

So which to use?

- Depends on the application!
- Cloud Computing:
 - Web applications with highly-variable usage pattern
 - Small amounts of variable online storage
 - SaaS hosting (cost control & planning)
- Green Dedicated Hosting:
 - Large storage requirements
 - Migration of single-server applications
 - Migration of legacy applications
 - High-security requirements

Thank you!

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