Interlude A

Cloud Computing

Cloud Computing

• Overview
• Risks
Cloud Computing: What is it?

• Over-used/overrated term?
• Marketing hype?
• Anything and everything?

Cloud Computing: What is it?

• Is cloud computing really new?
• Is it not the same as yesterday’s:
  – hosted services?
  – application service providers (ASPs)?
  – distributed computing?
  – grid computing?
  – All of the above?
Cloud Computing Benefits

• What is different with today’s cloud computing?
  – Development of the software behind the cloud has advanced tremendously
  – Cloud providers have worked hard to make cloud computing simple
  – More users have seen the value that cloud computing can offer them

Core expectations of most cloud services

• Self monitoring & self-healing
• Automation “galore”
• Self service
• Pay only for what you use
• Greater reliability & availability than what older technologies can provide
  – (self-healing)
The philosophy behind the cloud

• Able to do things better than you can do with your own hardware
• At a lower overall cost (hopefully!)
• Mostly allows an organisation to do what they do best – which probably isn’t IT!

Different cloud models

• Deployment models
  – Private clouds
  – Public clouds
  – Hybrid
  – Community
Different cloud models

• Delivery models
  – Private clouds
    • ITaaS
    • Example: Nimbula
  – Public clouds
    • IaaS
    • PaaS
    • SaaS

• IaaS (Infrastructure as a Service)
  – virtual hosted servers/machines
  – to end users
  – on a “pay as you go” basis
  – with features like
    • self-service
    • high availability
    • virtual machine upload/download
    • self-healing
  – Example: Amazon Web Services
Different cloud models

• PaaS (Platform as a Service)
  – For developers
  – Can build new apps without having to purchase development, testing, or production infrastructure
  – Examples: Google’s App Engine, and Microsoft’s Azure

Different cloud models

• SaaS (Software as a Service)
  – Most of us use SaaS everyday, without even thinking about it
  – Examples:
    • Almost all Google stuff (Gmail, Drive etc.)
    • Office365
    • Dropbox
    • Logmein
    • Office Live
    • Skydrive
**Different cloud models**

- **Other**
  - Storage as a service (STaaS)
  - Security as a service (SECaaS)
  - Data as a service (DaaS)
  - Business process as a service (BPaaS)
  - Test environment as a service (TEaaS)
  - Desktop as a service (DaaS)
  - API as a service (APIaaS)

**Cloud Characteristics**

**Summary**

- **On-demand self-service**
  - computing resources (such as server time and network storage) automatically as you need them

- **Broad network access**
  - access with a variety of technologies, such as mobile phones, laptops, desktops, mainframes.

- **Resource pooling**
- **Rapid elasticity**
- **Measured service – pay as you use**
Risks

• Concerns about data confidentiality
• Governments: citizens’ personal information
  – Privacy issues
  – Legal issues (jurisdictions)
• Clients rented it to conduct mal activities
• Expiration of software licences
• Suspension of service due to non/late payment

Risks

• Technical risks
  – Resource depletion (exhaustion)
  – Isolation of data – difficult
  – Performance issues due to e.g. encryption
  – Malware
  – Using clouds to break encryption