It Starts with Architecture

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1. What is the requirement of virtualization platforms in implementing cloud?

- Cloud operating system
- Manage the Service level policies
- Virtualization keeps the user level and the backend level

What are the advantages of cloud architecture?

- Simple APIs to provide easy accessible services to the user through the internet.
- Scale on demand.
- Transparency between machines.

What is the business benefits involved in cloud architecture?

- Zero infrastructure investment.
- Just-in-time infrastructure.
- More efficient resource utilization.

What are the different roles defined by cloud architecture?

- Cloud service consumer.
- Cloud service provider.
- Cloud service creator. (create the services and provide the infrastructure to the user)

What are the examples of cloud architectures on which application can run?

1. Processing Pipelines: convert documents of any form into raw searchable text.
    - Image processing (create thumbnails or low resolution image)
    - Video transcoding
    - Indexing: create an index of web crawl data
    - Data mining
2. Batch Processing Systems: uses log management or generate reports.
    - Automated Unit Testing and Deployment Testing
3. Websites

4 phases in cloud architecture

- Launch phase
- Monitor phase
- Shutdown phase
- Cleanup phase

What is Hypervisor in cloud computing and their types?

- Hypervisor is a Virtual Machine Monitor which manages resources for virtual machines.
    - guest VM runs directly over the host hardware (Xen, VmWARE ESXI)
    - guest VM runs over hardware through a host OS KVM, Oracle virtualbox)

Assignment 1

1. 建置雲端要有哪些必要的虛擬化平台？
2. 雲端架構的優勢？
3. 企業採用雲端架構的效益？
4. 舉 2 個可在雲端執行的 app
5. 雲端架構的 4 個階段
6. Hypervisor 是什麼？

5 Categories for Considering Cloud Computing

- Technical
- Financial
- Strategic
- Organization
- Risk

1. Technical

the developer can focus on business requirements

- Performance, scalability: critical for deciding between Paas and IaaS service models

- Both IaaS and PaaS solutions offer Database as a Service (DBaaS, database replication, autoscaling, monitoring, backups…) (off line issue)

- security, regulation, business continuity, disaster recovery…

2. Financial

- total cost of ownership (TCO)
  - brand new
    - new but are constrained by existing legacy
  - may include projects to reengineer legacy architectures, employee training, hiring new employees or consultants, acquiring tools or services to assist in reengineering, and much more.

3. Strategic

- speed-to-market

- If control is the most important strategy: only IaaS; If not SaaS and PaaS.

4. Organization

- If the company does not have strong IT skills in the areas of distributed computing, web development, and service-oriented architectures (SOAs) -> SaaS and IaaS service models

5. Risk

- down time
- security -> private cloud
- data property

作業 2

- 從五個範疇考量採用雲端技術時，舉兩個你覺得影響最大的具體原因。

三種雲端服務模型的適當使用時機

When to Use SaaS

- SaaS is the most mature of the three cloud service models
- most provide web-based user interface, few APIs
- A company should use SaaS to outsource all applications, features, and services that are not a core competen
- salesforce.com
- https://www.youtube.com/watch?feature=player_embedded&v=gO6y-fbEFko

- CRM (enterprise business applications)
- ERP (enterprise resource planing)
- accounting, human resources, and payroll
- security, monitoring, logging, testing
- data: business intelligence, database, data visualization, dashboards, data mining

Assignment 2

- salesforce.com 是一個 CRM 版本測試，找到 Steele John 客戶，提他安排下個任務。將結果畫面呈現在作業。

When to Use PaaS

- PaaS is the least mature of the three cloud service models
- Google, force.com, Microsoft Azure
required buyers use a specific programming language and run on the service provider's infrastructure
PHP, Python…

- Public PaaS service providers manage the underlying infrastructure, networks, storage devices, and OS.
- Tasks like monthly security patching, logging, monitoring, scaling, fail over, and other system administration-related tasks are provided by the vendor so the developers can focus on building cloud-ready applications.

- Private PaaS offers the capability to deploy the PaaS software on both a private and public cloud (hybrid) but at the sacrifice of requiring the service consumer to manage the application stack and the infrastructure.

- *throttling*

PaaS vendors provide a platform that is shared by many customers. In order to manage the performance, reliability, and scalability of each customer and to ensure the heavy loads from on customer do not impact the performance of another customer, the PaaS vendors have various limits that they enforce on developers.

- For some applications, designing around throttles creates unacceptable delays in processing time or it may impact the quality and reliability of the application. **PaaS -> IssS**

- Many workflow-driven B2B-type applications are prime candidates for PaaS.

When to Use IaaS

- If an application or service has performance or scalability requirements that require the developers to manage memory, configure database servers and application servers to maximize throughput, specify how data is distributed across disk spindles, manipulate the OS, and so on, then should be ***IaaS***.

- Another factor is cost. PaaS can reduce costs substantially by reducing the amount of work and the number of resources required to build and deeply applications. However, the PaaS pay-as-you-go model can get extremely expensive when data gets into the tens of terabytes or when the bandwidth or CUP demands exceed normal levels.

- Another reason for leveraging IaaS over PaaS is related to mitigating risks of downtime.
- AWS -> highly publicized outages in recent years-> major websites like Reddit, Foursqure, and others were down -> cross-zone redundancy
- Heroku ->PaaS provider, runs its services on top of AWS

Assignment 3

- 請回應並說明下列二個案例應採用 SaaS, PaaS 或 IaaS

- 你本來用一台 PC 和 ADSL 架線上購物網站，結果一個月後流量大增，未來半年預估可能會增加2000 倍，你的專長是商品挑選，不想把心思放在其它地方。

- 你跟本班6位專精於 IT 的同學成立一家4G電信公司，其中一位同學家裡很有錢，資金不是問題，你們想採用雲端架構。