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Vocational Training for Undergraduate University Students and Teachers in Jordan (VTC)



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Cloud

Computing

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What you think about Cloud computing?

"First to mind when asked what 'the cloud' is, a majority respond it's either an actual cloud, the sky, or something related to weather." – Citrix Cloud Survey Guide (August 2012)

So don't be afraid if you didn't got it from the first time.



Introduction

- Started in the early of 2008
- The computing resources become available, power full and less-cost as previously not.
- This technological orientation leads to new model called cloud computing.
- The rent and lent procedure between job owners and service providers.
- The <u>infrastructure providers</u> and <u>the service providers</u>.

Cloud computing definition

• NIST definition of cloud computing: "Cloud computing is a model for enabling ubiquitous(founded every where), convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

More simple

• It is a service like your phone, electricity, water bell.

- Don't worry about the location of the sever, just turn-on your device and get your service.
- The **OUTSOURCING** concept.

Cloud computing service providers

• Amazon

• Rackspace

• VMware

• IBM

• Microsoft

• Critix

• Google

• Openstack



Cloud computing services

- cloud storage
- cloud database
- cloud application

Cloud computing features

- No up-front fees:
- Pay for just what you rent.
- Pay as you go.
- No construction for the infrastructure.
- Low operating cost:
- Dynamic resources rent.
- resources could be released dynamically to save money from wasted in a nonuseable capacities.

Cloud computing features (cont.)

- High scalable:
- Rapid development in businesses.
- Enable the service providers to develop and extend its service to manage and handle this rapid growth in service demands.

• Easy access:

- Applications well moves with the user.
- Ease of access.
- Any net-connected device.

Cloud computing features (cont.)

• Reducing business risk and maintenance expenses:

- Infrastructure providers take the risk.
- Staff training cost.
- Maintenance cost.

Cloud computing business models

- Infrastructure as a service (IaaS):
- Delivers hardware resources such as CPU "Physically", or virtual machines controlled by "HyperVisor" brought users by "cloud carrier".
- Disk space or network components as a service.
- Client has full control of the virtualized platform.
- Users are responsible of managing & maintaining their SW's and OS's
- Platform as a service (PaaS):
- Its provided by cloud provider.
- Provide platform resources (application platform as a service) like operating systems and applications.
- User can deploy and customize their applications (programming languages and tools supported by the cloud provider).
- Users doesn't have full control but they restricted by the provider constraints.

Cloud computing business models (cont.)

• Software as a service (SaaS):

- Software (application) provide by the cloud provider (on-demand application),
- The user just use it without any control.
- This service can update, enhance, maintain and patching this software (applications).
- Free applications.
- Network as a service (NaaS):
- Cloud services enabled the users to use network and transport connectivity services.
- Optimization of resource allocations by considering network and computing resources as a unified whole (VPN, bandwidth on demand (BoD), and mobile network virtualization).

Cloud Computing Types

Private Car vs. Rental or Public Vehicle ?



Cloud Computing Types

- Public cloud (external cloud): 32%
- Service providers offers their resources as a service to the public.
- Shifting the risks to infrastructure providers.
- Scalable and dynamic.
- Lakes to the security.
- Private cloud (internal clouds): 10%
- Designed specifically for single origination(private network).
- Organization has the highest degree of control over performance.
- Reliability and security.
- Organization well need to be charged for that service.

Cloud computing types (cont.)

- Hybrid cloud: 58%
- Combination of public and private cloud models.
- Address the limitations of each approach.
- Swings between both(Flexibility).
- Offers the security and control over application data and expansion in capacity if needed.
- *Cloud Bursting:* (application runs in a private cloud or data center and "bursts" to a public cloud in case of increasing demand of computing capacity)



public clouds vs. private clouds

comparison	Public cloud	Private cloud
Initial cost	Typically zero	Typically high
Running cost	Predictable	Unpredictable
Customization	Impossible	Possible
Privacy	No (Host has access to the data)	Yes
Single sign-on	Impossible	Possible

Cloud Computing

Pros

- Convenience (anywhere)
- Backups
- Collaboration (sharing)
- Environmentally friendly

Cons

- Security breaches
- Outages
- Slow speeds.
- Limited features

The future of cloud computing

- Cloud computing is the future
- "Clouded" systems
- Expected operating systems is going to run on the cloud
- People Fears of the roll of IT managers.
- Cloud is a competitive player in the business.

Evolution of Memory Storage











Can cloud be green ??

- due to Cloud computing business models (SaaS, NaaS, IaaS, PaaS)
- Business Efficiency → Energy Efficiency = Efficiency itself is Green.
- virtualization (resource saving → cost saving → energy saving)

