**CLOUD COMPUTING**

Purchasing time and space on servers in another data center. There is no cloud! Paying money to use the computing time and space. Services – Software, storage, computing.

Why Cloud computing?

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With Cloud computing you are still paying for the service, a VM, a server and eliminate all of those costs to a great extent. Someone else manages all of that for you. You pay by the hour or day – there are different cost strictures.

Another two benefits – scale up and down capacity easily to meet demands, and you can try something new with a new server from the provider and shut it down when you are through with your experiment.

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Example – UNO uses Gmail as email services instead of installing their own servers.

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**Infrastructure as a Service:**

Provides a VM, or database or whatever, and you have full access to do whatever you want with it. Egs, Amazon EC2, Microsoft Azure, Google Compute Engine, Digital Ocean.

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**Downside**:  
This also means that if for example you have a security vulnerability in our application or a software that you install on the machine, it’s your responsibility.

**Platform as a Service:**

Here, they are restricting your access to the Virtual machine, for example – restricting what languages you can use.

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Good thing is, example – in open shift if they discover there are security vulnerabilities, they will fix that and patch it up, unlike IaaS.

**Downside:**

The environment limited. If a new language comes up tomorrow, you would probably not be able to spin up an instance of this or deploy that app.

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**Software as a Service:**

Example – UNO uses Gmail and pays them $10 per user

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**Downside:**

Least flexible option.

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Sales force.com provides a CRM with which you can do everything to manage customer relationship management. They have been wildly successful because you can have a CRM without hosting or running it yourself. They do it very effectively and offer customization within the application.

Salesforce also expanded to Force.com this allows you to develop entirely new applications on their site. You can develop, test and sell these applications to other people.

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It’s limited compared to PaaS. But provides more customization that SaaS.

There are important considerations when you move to cloud computing:

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HIPPA – Healthcare industry privacy requirements.

PCI – Credit card information privacy requirements

Sarbanes-Oxley – Accounting data

**Risks:**

What happens when something goes down – Outage. Use a reliable web server.

Ensure your secret/private keys are not kept in your cloud accounts. Example – AWS asked users to not upload their private GitHub keys to AWS accounts.

Another thing to note when going cloud is Service Level Agreement:

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Also, there are options with Cloud Computing. In private cloud, set up your own environment, example set up file sharing service within your organization and some applications on cloud. This depends on your organization’s needs.

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What pushed cloud computing forward?

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AJAX – An environment for running your application which makes it look and act a lot like a desktop interface. Example – to add a new customer to the website, instead of going to a new webpage, you can pop up a new form right on top of it, perform your functions, without ever leaving the original webpage. Doesn’t need the entire website to reload.

**Virtualization** enabled Cloud Computing. You can have separate applications/Operating systems running on the same hardware.

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Multiple organizations can purchase a VM. When you don’t need it, delete the OS and the resources can be sold to someone else. With virtualization – you can run one OS in another.

**Benefits** of Virtualization:

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