Concepts of Cloud Computing

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Cloud computing: Definition

The only form of cloud originating from earth that has the chance to be loved by the astronomers.

Example Scenario

- You have founded a transportation company

- You are specialized in unusual cargo transportation, like rare live fish.

- You have the know-how to do this

- Your cargo is usually small but expensive fish, like koi fish

How to proceed? Buy a small truck

Occasionally you need to transport something bigger, a dolphin. Now what? A bigger truck.

So far so good. But what about a whale? Many tried and many failed.

You know how to do this! But you need something as big as this:

You have a choice

- To keep all the trucks

- To keep only the biggest one

Both choices are inefficient

- If you keep all trucks, you will end up with two big trucks parked most of the time

- If you keep only the biggest one, you will end up transporting two pounds of koi with a huge truck that can carry scores of tons.

- In both cases the expenses will be too high for your business to be successful

Solution – Rent a Truck

- When you need it

- The size you need it

- Pay only when you use it

- Forget about the drivers – comes with the truck

- Forget about the truck maintenance – done by the owner

Cloud Trucking - A truck from the Cloud

Imagine a company that has the technology to build a truck, just as you need it and when you need it, from stored pars. And after it has been used to undo it and store its parts to be reused in another truck that fits somebody else's needs.

Cloud Computing

Now imagine a company that has the technology to build a virtual computer, by allocating resources from a pool of real resources, just as you need it and when you need it. And after it has been used to release the resources to be reused in another virtual computer that fits somebody else's needs.

You do not have to imagine it. This technology already exists - this is Cloud Computing.

Features

- Hardware and location independence
- High reliability
- Dynamic provisioning and scalability
- Easy maintenance
- Multitenancy
- Rapid and inexpensive re-provisioning
- Needs a client to access (web browser or specific client)
- Cost effective
- Secure (?)

Categories

- Application as a Service (AaaS)

- Platform as a Service (PaaS)

- Infrastructure as a Service (IaaS)

Cloud Models

- Private – hosted and used by one organization

- Hybrid – hosted and provided by many organizations each providing different resources.

- Community – used by many organizations/users that share similar needs.

Issues

- Privacy – data is usually stored in the cloud hosted by a third party

- Security – data is accessed via network

- Compliance – often it does not meet government regulations about data protection

Examples

- Google – Apps Engine

- Amazon – EC2

- Microsoft – Windows live

- NASA – Nebula Platform

- Xform Computing – AlwaysOnPC

AlwaysOnPC

- You get fully functional virtual PC preloaded with many applications – OpenOffice, Firefox, GIMP, Thunderbird, ICQ, Skype and many more.

- You can install new applications and even develop your own or compile existing apps.

- You get storage space.

- You get a lot of mobility – with iPhone OS and Android based mobile devices.

- You get a lot more :)

AlwaysOnPC: Screens

Cloud in astronomy

- Unpredictably or rapidly growing databases

- Highly scalable web applications

- In general: Every network based astronomical service imaginable is a candidate to be run in the cloud.

Thank you!

For letting me waste your time.