

Cloud Computing for Beginners (Part 1)

– Software as a Utility –

A Little Less Cloudy

Application Service Provider, Infrastructure as a Service, grid computing, utility computing, Platform as a Service, all of these terms and more have at one time or another been referred to as cloud computing. What is cloud computing? What isn't cloud computing?

Welcome to Cloud Computing for Beginners, where we want to make cloud computing a little less cloudy! So what is cloud computing really, and more importantly what can it do for you?

Cloud computing is the convergence of three major trends:

1. **Internet/broadband** – when systems become connected and access becomes simple, widespread and fast
2. **Virtualization** - where applications are separated from infrastructures
3. **Utility Computing** - where server capacity is accessed across a grid as a variably priced shared service

But hold on, we are getting ahead of ourselves. To understand cloud computing we have to get back to the beginning of time.

Internet/Broadband

In the beginning, Al Gore gave us the internet. Then broadband got very cheap and some smart folks realized that not everyone had to build in-house data centers. In fact they realized that the computers running the application could be pretty far away from the person using it and only a fast connection was needed between them.

Service Based Models

This discovery led to a whole series of business models where software makers provided their applications remotely and the focus was much more on providing services rather than on the actual application or technology underneath it. In these models, there are essentially big fast machines in someone else's data center running an application that we access using our favorite web browser. Someone else owns the application and we pay a fixed subscription fee.

Awesome! Well yes and no. On the plus side we don't have to worry about the machines running the application because they don't belong to us. They are the other guy's problem and we don't have to devote time and resources to developing and maintaining an application that we are not expert in. So far, so good! But at the same time, the 'one size fits all' approach, these Software as a Service (SaaS) vendors provide, doesn't work for large enterprises with complex requirements. Also, some companies don't like the idea of data outside of their buildings!

What enterprises really want is the convenience and simplicity of the service based models with the flexibility of traditional computing. In other words a hybrid solution that allows any software to easily be run as a service in a data center that someone else owns and manages. But enterprise applications are so darn difficult to deploy in a new environment.

Virtualization

Enter virtualization! With virtualization, applications and infrastructure are independent allowing servers to be easily shared by many applications and applications to run virtually anywhere. That is as long as the application is virtualized. Virtualizing the application involves packaging the application bits with everything that it needs to run including databases, middleware, and operating systems.

This self-contained unit, a virtual image of the application and all its necessary components, can run pretty much anywhere. If it can run anywhere, it doesn't have to run in your data center or in the application provider's data center. It can run in the cloud.

The Cloud

The cloud is like an electricity grid of data centers providing pure computer power and data storage capacity over the internet. Like the electricity grid it contains separate power stations owned by specific companies providing different add-on services. In cloud computing examples of companies providing computing power would include Amazon, Google, IBM, Salesforce and many others. Some provide computing power only for their own applications (like Salesforce) – this is called Software-as-a-Service (SaaS). Others are only focused on providing a common platform for developing cloud applications (like Google with Google App Engine) – this is called Platform-as-a-Service (PaaS). And others simply provide raw computing power (like Amazon) – this is called Infrastructure-as-a-Service (IaaS). So the cloud as a whole is actually comprised of several key components - pure computing power, development tools and of course services. .

Utility Computing

Together these components create 'the cloud' that everyone is talking about and they are essentially packaged together as a computing service that charges you based only on the amount of computing resources that you use. This pay as you go feature is the hallmark of today's cloud computing and one of the things that sets it apart from the earlier service based only models.

So why adopt cloud computing? Basically you can't afford not to. Think of it this way. Traditional licensed software was like buying a premium sedan. For a fixed price, you got all of the bells and whistles and support, the extended warranty, whether you used it or not. Oh, and you paid cash, up front! With the service models it was like leasing a car, you got a nice vehicle, but you couldn't make any significant changes to it because it really didn't belong to you. You paid the same amount monthly and were guaranteed a certain level of service on the car.

With cloud, it is like have a metered cab at your disposal whenever you want it. You only pay by the distance you travel. You don't pay for maintenance, tolls or any costs associated with the cab. You pay based upon where you want to go that day and it is so economical that you can vary the length of your trips and not have to worry about the costs. Before you hit the road, you might want to take a look under the hood to see what makes your taxi go. The engine that powers cloud computing is virtualization. You can't move without your engine and you can't deploy applications to the cloud without virtualization.

The first step in any cloud initiative is to adapt applications to run as virtualized images. In a turbulent economy, cloud computing is even more attractive. Why pay for more computing capacity than you need when you can pay only for what you use. Go for the high fuel efficiency of cloud computing and you will never own your own car again.

Summary

So that is it, cloud computing made a little less cloudy. We have covered a lot of ground in a very short time, hopefully now you can see that the cloud is so much more than hype. The cloud is real!

Watch out for part 2 of “Cloud Computing for Beginners” to learn about the 30+ year journey from mainframe to cloud computing.

