

A Journey of Cloud Services

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ABSTRACT

Resent trends in computer science research has exponentially growing domains with interdisciplinary fields which are applied in many verticals. One such domain with golden opportunities for research is CLOUD COMPUTING. In this research article we have concentrated on various cloud services with more emphasis on Robot as a Service and Hybrid computing which would serve as a base for our future research in cloud computing.

Key Words: APIs, Iaas, Paas, Rass, Saas.

1. INTRODUCTION

Cloud computing means that instead of all the computer hardware and software we are using sitting on your desktop, or somewhere inside our company's network, it's provided for us as a service by another company and accessed over the Internet, usually in a completely seamless way. Exactly where the hardware and software is located and how it all works doesn't matter to us, the user—it's just somewhere up in the nebulous "cloud" that the Internet represents. Cloud computing is a buzzword that means different things to different people. For some, it's just another way of describing IT (information technology) "outsourcing"; others use it to mean any computing service provided over the Internet or a similar network; and some define it as any bought-in computer service we use that sits outside our firewall. However, we define cloud computing, there's no doubt it makes most sense when we stop talking about abstract definitions and look at some simple, real examples.

2. SERVICES PROVIDED IN CLOUD COMPUTING.

There are many services being provided in cloud computing they are Software as a Services(SaaS), Platform as a Service(PaaS), Infrastructure as a Services(IaaS) and Robot as a

Service(RaaS). Details about each services are explained below.

2.1 SOFTWARE AS A SERVICES(SAAS)

- SaaS applications are designed for end-users, delivered over the web.

Characteristics of SaaS:

- Web access to commercial software
- Software is managed from a central location
- Software delivered in a "one to many" model
- Users not required to handle software upgrades and patches
- Application Programming Interfaces (APIs) allow for integration between different pieces of software

While SaaS is a very valuable tool, there are certain situations where we believe it is not the best option for software delivery. Examples where SaaS may not be appropriate include;

- Applications where extremely fast processing of real time data is required
 - Applications where legislation or other regulation does not permit data being hosted externally
 - Applications where an existing on premise solution fulfils all of the organization's needs
- Software as a Service may be the best known aspect of Cloud Computing, but developers and organizations all around the world are leveraging Platform as a Service, which mixes the simplicity of SaaS with the power of IaaS, to great effect.

2.2. PLATFORM AS A SERVICE(PAAS)

- PaaS is the set of tools and services designed to make coding and deploying those applications quick and efficient

Characteristics of PaaS:

- Services to develop, test, deploy, host and maintain applications in the same integrated development environment. All the varying services needed to fulfil the application development process

- Web based user interface creation tools help to create, modify, test and deploy different UI scenarios
- Multi-tenant architecture where multiple concurrent users utilize the same development application
- Built in scalability of deployed software including load balancing and failover
- Integration with web services and databases via common standards
- Support for development team collaboration – some PaaS solutions include project planning and communication tools
- Tools to handle billing and subscription management

We contend that PaaS will become the predominant approach towards software development. The ability to automate processes, use pre-defined components and building blocks and deploy automatically to production will provide sufficient value to be highly persuasive. That said, there are certain situations where PaaS may not be ideal, examples include;

- Where the application needs to be highly portable in terms of where it is hosted
- Where proprietary languages or approaches would impact on the development process
- Where a proprietary language would hinder later moves to another provider – concerns are raised about vendor lock-in
- Where application performance requires customization of the underlying hardware and software

2.3. INFRASTRUCTURE AS A SERVICES(IAAS)

IaaS is the hardware and software that powers it all – servers, storage, networks, operating systems
Characteristics of IaaS:

- Resources are distributed as a service
- Allows for dynamic scaling
- Has a variable cost, utility pricing model
- Generally includes multiple users on a single piece of hardware

While IaaS provides massive advantages for situations where scalability and quick provisioning are beneficial, there are situations where its limitations may be problematic. Examples of situations where we would advise caution with regards IaaS include;

- Where regulatory compliance makes the offshoring or outsourcing of data storage and processing difficult.
- Where the highest levels of performance are required, and on premise or dedicated hosted infrastructure has the capacity to meet the organization's needs.

2.4 ROBOT AS A SERVICE (RAAS)

Robot as a service (or RaaS) is a cloud computing unit that facilitates the seamless integration of robot and embedded devices into Web and cloud computing environment. Robotics is a field of science and technology dealing with the issues of design, control, applications and maintenance of robots. Robots are now used widely in scientific research, manufacturing technology, civil engineering, as well as in medicine, underwater investigations and space research. An important challenge in this domain is to make robots able to operate and adapt with an autonomous way to their environment. Cloud Computing is a generic term that involves delivering hosted services over the Internet. Cloud Computing has potential to speed up many computationally-intensive robotics. This approach would allow robots to offload compute-intensive tasks like image processing and voice recognition and even download new skills instantly. This paper presents our research on the related concepts of the purpose of this work that is 'Robot as a Service' (RaaS), and an illustration of our design to implement this kind of service.

3. TYPES OF CLOUD COMPUTING

Cloud computing is divided into three type to minimize the cost and to maximize the efficiency. They are Public Cloud, Private Cloud and Hybrid Cloud. Details about each type of cloud is given below.

3.1. PUBLIC CLOUD

A public cloud is basically the internet. shared data center infrastructure of hardware and software is used in implementation of Public cloud. A Public Cloud can be used in a Hybrid Cloud. Public cloud is easy to set-up and use because the cost of hardware, software and bandwidth is low as compared to Private Cloud. And the wastage of resources is also very low

because you pay for what you use. The following image (Figure 1) describes the Public Cloud.

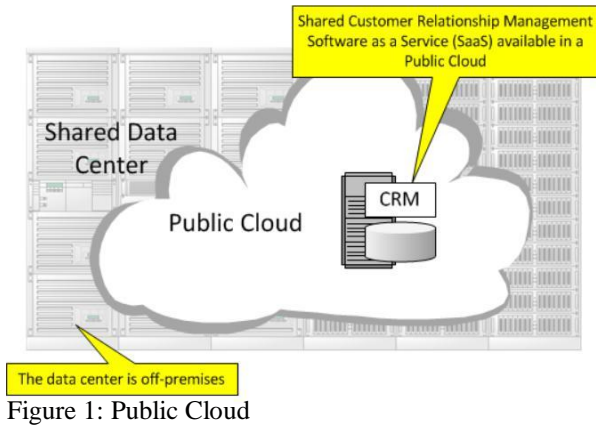


Figure 1: Public Cloud

3.2. PRIVATE CLOUD

A dedicated data center infrastructure of hardware and software is used in implementation of Private Cloud and it is used privately by an organization. A Private Cloud is not shared with other public and organization. We can also change the computing resources on-demand. A data center which is shared are called Virtual Private Cloud. A Private Cloud can be used in Hybrid Cloud. The following image (Figure 2) describes the Private Cloud.

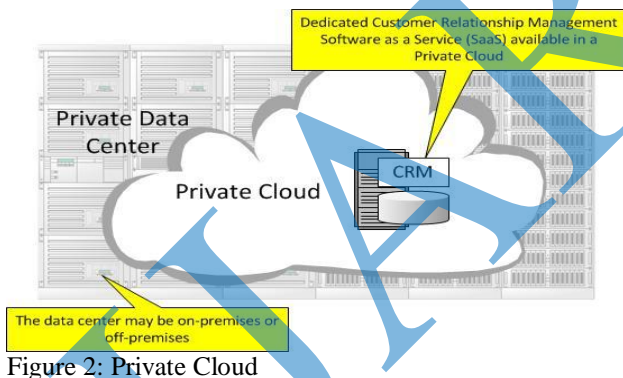


Figure 2: Private Cloud

3.3. HYBRID CLOUD

A Private Cloud and one or more Public Cloud can be used to make Hybrid Clouds. It could be used as a Virtual Cloud as well as one or more Public Cloud. A Hybrid Cloud let us enjoy a mix of virtual and physical infrastructure. The following image (Figure 3) describes the Hybrid Cloud.

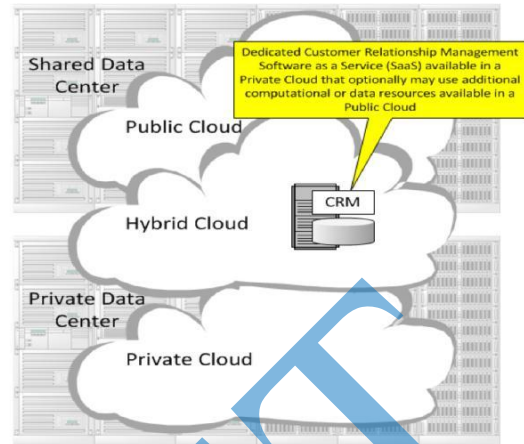


Figure 3: Hybrid Cloud

4. CONCLUSION

Cloud computing is a really cheap way for companies to have all the resources they need in once place. It's a much better way to spread resources, and it becomes easier to access things from longer distances. So, while cloud computing is really really great either for business or for personal means. In spite of the several limitations and the need for better methodologies processes, cloud computing is becoming a hugely attractive paradigm, especially for large enterprises.

Cloud Computing initiatives could affect the enterprises within two to three years as it has the potential to significantly change IT.

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