Cloud Platforms

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Introduction

The aim of this report is to investigate Cloud Platforms for Nicole's Petrol Tracker Application, requested by Dr. Christophe Meudec. This document contains the 3 different Cloud services, pros and cons considering Cloud Platforms and 3 examples of companies providing Cloud Services.

The term "Cloud" started to be used when multiple companies needed to explore different alternatives to storage data and computer power[1].

A little more than a decade ago the Cloud became popular, as different companies like Google, Oracle and Amazon were offering remote access to infrastructure also named computer resources: data storage, computing power and software as a service[1].

In layman's terms great companies like the ones mentioned above, are possessing multi-billion dollar warehouses filled with kilometers of servers all connected to really fast internet. Other companies, in need of more computing power, are "renting" the resources they need, paying only the amount they are using or they estimate they need, without having to actually buy their own computers and build their own servers.

An application developed on a cloud platform performs most of the processing is happening into the platform. Ofcourse, there is some processing happening onto the user's device, but most of the performance is running on the cloud. This is very beneficial for the mobile users as their battery life will not be drained and the application will be smaller in size[1].

The Cloud providers are offering 3 main categories as services:

SAAS - Software as a Service
This is the most popular product as the Cloud provider will supply the client with the infrastructure needed and also software such as: email service, file storage, social applications and even complex applications as Google Docs and Microsoft Products[2,3].

PAAS - Platform as a Service

This product is a level down from the SAAS. This product is usually used by developers and companies that build applications and software as this option provides all the tools needed to sustain a software in development. It is very popular as the companies that are using it do not need to manage and maintain the infrastructure. The different options that this service can provide are available on demand and managed via a website[2,3].

IAAS - Infrastructure as a Service

This is the most basic option from the cloud, where the client is renting just servers from the providers.This option needs to be managed by an IT person that has remote access to the Operating System of the server[2,3].

The Cloud, is just a part of the Internet used to help other companies in need of computing resources, as long as there exists Internet connection. Everything is away of a click of a button.

Now that the basic conceptions about the Cloud are understood, the next step will be to state the advantages and disadvantages of using this service.

Pros of Cloud Platforms

1. **Costs** – since everything is saved into the cloud there is no reason to spend money on paying for the hardware that is intended to store all the data and process all the information. Since there is no need to purchase any hardware equipment there is no need for Nicole to invest in a larger work environment as hardware can take up space. This in turn will also lead to cheaper rental and electricity costs which could build up over time [5].

   Another benefit of using the Cloud is lower IT operation expenses, because there is no need of IT professionals to set-up, maintain and manage the servers[2].

2. **Recovery** – if Nicole was to run her project through in-house servers her data could easily be lost if there was a fault with the hardware. By using the cloud all her data is automatically backed up and she could recover her most up to date files in the case of hardware failure making things easier and less expensive [4,5].

3. **Scalability** – The ability of the service to expand and shrink the use of resources needed according to the traffic load[20].

   Using the Cloud, there is no limit using the resources. It allows you to start small and it supports the growth of the business needs and the traffic of the application over time, without any interruption in the process[20].

4. **Performance** – The cloud services are usually running on a worldwide network of secure data centers. These data centers are regularly upgraded to the latest generation of fast and efficient computing hardware. This would benefit Nicole by taking away the worry of

making sure that all her hardware is up to date and not getting any slower over time, which will speed up production time [5].

5. **Security -** Many cloud companies offer far better data security than what can be achieved by a small business through their own efforts, they offer a password protected storage that is encrypted when it is being sent over the internet[22]

Cons of Cloud Platforms

1. **Cloud Services may cost more in the long run.**
    a. Cloud computing is a small investment at the start, but you will be stuck with a monthly payment if you wish to continue to use the service.
    b. Alternatively, you can purchase a server and set it up in-house. Initially this is a large investment (IT maintenance). However, you will own the server for life. No monthly cost [4,21].
2. **Security Issues**
    a. When you use a third-party cloud platform to store your data, you need to consider if the data you keep from your users is too sensitive to be on the cloud.
    b. Cloud security is essential, it could lead to lawsuits. You must trust a third party to keep the data safe.
    c. Hacking is a well-known problem with the cloud. As seen in mainstream media with celebrity's sensitive data being leaked [4,8].

3. **Expansion Costs**
    a. You will have limited storage place. A premium paywall prevents you from upgrading. Bandwidth, storage place and accessibility can be upgraded. You need to be sure your business can support the budget required for growth [4].

4. **Issues with The Cloud**
    a. If you have trouble when working with the cloud, you must contact the technical support for help. This may come with difficulty as some providers don't give 24/7 technical support [10].

5. **Vendor Lock-in**
    a. If the need to change platform arises, this could have a huge impact over the budget. Hosting and running software on your current cloud may be entirely different on another, raising support issues and other problems. Following these issues security can become a major risk. The software will be vulnerable throughout the changeover.
    b. A great amount of planning and extra budget is required to make a switch successfully. This is often why customers may choose to stay with a provider that doesn't entirely meet their needs. In some cases it simply doesn't make sense to try the switch[8,9].

Examples of Cloud Platforms

With the Pro's and Con's taken into consideration let us take a look at some different Cloud providers and how it could benefit Nicole's project over local storage/hosting.

Amazon Web Services	Largest IaaS & PaaS Cloud Provider. They own 35% of all IaaS & PaaS servers. 165 Services (From Storage - >Networking). 22 Countries with server farms [12, 13]. They provide a 12 month free trial with a trial period for Premium Services [14].
Microsoft Azure	Second Largest Cloud Platform with 11%. They have IaaS, PaaS & SaaS. Over 100+ Services [12, 15]. They also provide a 12 month free trial but include $200 credit to use on Premium Services [16].
Google Cloud Platform	Fourth Largest Cloud Platform with 5%. Over 90+ services [12, 17]. They provide 12 months access* and $300 credits for premium services** [18, 19]

***:** The SQL DB has a limit of "50,000 reads, 20,000 writes, 20,000 deletes per day limit". [19]
****:** While they provide 12 months access and $300 credits. If the $300 is used up before the 12 months the free trial is finished. [19]

Conclusion

According to our findings we would advise Nicole for the Petrol Tracker Application, to be developed using a PAAS Cloud Platform.

PAAS provides the necessary tools for developers to sustain all the life cycle developing an application and optional other services like software to measure her audience and usage is also available. A PAAS platform will allow Nicole to expand, attract new users, customers and extend the value proposition.

The best provider, that we think would fit Nicole's project best would be Amazon Web Services. Since they have the highest amount of services alongside and no strings attached. 12 Month trial it gives Nicole and her team time to develop, test and release her application. This option will provide her enough time to solve any other problems that might occur during the development. AWS also has a server farm located in Ireland which will help with latency if Nicole plans to keep the application in Ireland.

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