The Cloud

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Cybersecurity Principles

CYSE 600

August 6, 2021

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Author Note

This is my own work and has been done solely by me. This paper has been written for the Old Dominion University's CYSE 600 Cybersecurity Principles class and not used for any other purposes.

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Abstract

This paper analyzes the paper Towards an accurate evolution of quality of cloud service in service-oriented cloud computing by Shangguang Wang, Zhipiao Liu, Qibo Sun, Hua Zou, and Fangchun Yang discussed. First, a brief introduction and explanation to cloud computing, services, and types will be explored. Second, a literature review where the authors' proposed method is described and the reason for the research will be stated. Third, a brief discussion focused on themes, challenges, and processes are examined. Lastly, a summary of the topic (cloud computing), the literature, and future research will be considered.

The Cloud

Introduction

IBM describes cloud computing as on-demand access, via the internet, to computing resources – applications, servers (physical servers and virtual servers), data storage, development tools, networking capabilities, and more – hosted at a remote data center managed by a cloud service provider (CSP) (Vennam, 2020). In recent times many large organizations such as Google and Amazon have invested in large data centers (Wang, Liu, Sun, Zou, & Yang, 2014). However, these data centers have proven expensive to operate and maintain. Hence, in order to reduce data centers' overall cost, these organizations have started moving to cloud computing (Wang et al., 2014).

Most cloud computing falls under three general categories:

1. Infrastructure as a service (IaaS) = provides on-demand access to fundamental computing resources–physical and virtual servers, networking, and storage—over the internet on a pay-as-you-go basis (Vennam, 2020).
2. Platform as a service (PaaS) = provides software developers with an on-demand platform—hardware, complete software stack, infrastructure, and even development tools—for running, developing, and managing applications without the cost, complexity, and inflexibility of maintaining that platform on-premises (Vennam, 2020).
3. Software as a service (SaaS) = application software hosted in the cloud and that you access and use via a web browser, a dedicated desktop client, or an API that integrates with your desktop or mobile operating system (Vennam, 2020).

Aside from cloud services, there is also three types of cloud computing on which to implement cloud services on:

1. Public cloud = owned and operated by third-party cloud service providers (Vennam, 2020).
2. Private cloud = used exclusively by a single business or organization; maintained on a private network (Vennam, 2020).
3. Hybrid cloud = combination of public and private cloud (Vennam, 2020).

Literature Review

Wang et al. state that cloud computing promises to provide high quality, on-demand services with service-oriented architecture (Wang et al., 2014). However, Wang et al. warn that cloud services typically come with various levels of services and performance characteristics, which makes the Quality of Cloud Service or QoCS high variance (Wang et al., 2014). In other words, cloud computing is so versatile (services and types can be stacked, combined, and configured multiple ways), and different cloud service providers offer diverse degrees of services that it is difficult for users to evaluate cloud services. An incomplete evaluation of a cloud service provider might result in a decision that might meet requirements. Wang et al. propose an accurate evaluation approach of QoCS in service-oriented cloud computing by employing fuzzy synthetic decisions to evaluate cloud service providers according to cloud users' preferences and then adopt a cloud model to compute the uncertainty of cloud services based on monitored QoCS data. Said differently, the author suggests using a range of preferences from already established users combined with performance evaluations of cloud service providers.

Discussion

Wang et al., paper is well organized, and his method is well explained. Wang et al. present a solution to deciding on a cloud service provider that will fit user needs and requirements. The author presented a combination of:

- fuzzy logic decision making,
- data on performance evaluations of cloud service providers, and
- use an algorithm to calculate the uncertainty of cloud services.

Challenges that may lower the accuracy of the method proposed are the range of knowledge of the users used to compare preferences. Second, to what degree does cost influence decisions. Third, the unpredictability of the Internet environment, for example, any changes in network condition, time, and many other factors, may impact the quality of these cloud services.

Summary

Cloud computing has gained much attention in the last few years (Wang et al., 2014). However, the topic of QoCS provision in cloud computing environment has not received much attention (Wang et al., 2014). Nevertheless, research is growing in this field due to interest from industrial and academic communities (Wang et al., 2014). Cloud computing technology is here to stay and can offer many flexible benefits for individual users and organizations. The more interest is drawn to the quality of service; the more advances will be made in those services, especially when it comes to reliability and security. Cloud service providers will be pressed to offer better services and more transparency. Standards and securities that benefit users of cloud services will emerge for an improved experience.

References

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