Abstract

The goal of this research was to investigate how application architecture impacts the performance of cloud-based applications. One specific area of examination was to determine the correlation between throughput and scalability of applications in a cloud computing environment.

The experimental methodology was adopted for the study. Microsoft Azure cloud platform and Microsoft Visual Studio Team Services were used to conduct graduated load performance tests. A convenience sample for the experiment consisted of seventeen web applications. Advanced statistical analysis of the results was conducted using Pearson Correlation Coefficient analysis.

The results revealed that there was a strong positive correlation between throughput and scalability of cloud based applications, which was statistically significant. Therefore, through the experimental methodology, the null hypothesis was rejected and the alternative hypothesis was accepted.
References

1. Yu, W. and Chen, J. (2011). Semantic Service in Cloud Computing. In: Advances in Information Technology and Education. Communications in Computer and Information Science, vol 201. [online] Berlin, Heidelberg: Springer, Berlin, Heidelberg, p.156. Available at: https://link.springer.com/chapter/10.1007/978-3-642-22418-8_23 [Accessed 9 May 2017].
2. Pallis, G. (2010). Cloud Computing: The New Frontier of Internet Computing. IEEE Internet Computing, 14(5), pp.70-73.
3. Linthcum, D. (2016). The Benefits of Cloud Computing for the Enterprise. [Blog] CloudAcademy Blog. Available at: http://cloudacademy.com/blog/the-benefits-of-cloud-computing-for-the-enterprise/ [Accessed 14 May 2017]
4. Alkhalil, A., Sahandi, R. and John, D. (2016). A decision process model to support migration to cloud computing. International Journal of Business Information Systems, [online] 24(1), pp.102-126. Available at: https://dl.acm.org/citation.cfm?id=3031057 [Accessed 22 Oct. 2017].
5. Haines, S. (2006). Pro Java EE 5 performance management and optimization. Berkeley, Calif: Apress, p.224.
6. Vogels, W. (2006). A Word on Scalability. [Blog] All Things Distributed. Available at: http://www.allthingsdistributed.com/2006/03/a_word_on_scalability.html [Accessed 22 Nov. 2017].
7. Cecchet, E. (2006). A Word on Scalability. [Blog] All Things Distributed. Available at: http://www.allthingsdistributed.com/2006/03/a_word_on_scalability.html [Accessed 22 Nov. 2017].
8. Kersey, M. (2000). Scalability vs OOD. [Blog] Google Groups. Available at: https://groups.google.com/forum/?hl=en#!msg/microsoft.public.inetserver.asp.components/c4G5Ehcr86c/FY9nj5BrhNkJ [Accessed 21 Nov. 2017].
9. Explorable (2008). Experimental Research. [Blog] Explorable. Available at: https://explorable.com/experimental-research [Accessed 30 Nov. 2017].
10. Explorable (2009). Non-Probability Sampling. [Blog] Explorable. Available at: https://explorable.com/non-probability-sampling [Accessed 30 Nov. 2017].
11. Haines, S. (2006). Pro Java EE 5 performance management and optimization. Berkeley, Calif: Apress, p.224.
12. Statistics.laerd.com. (2013). Pearson Product-Moment Correlation. [online] Available at: https://statistics.laerd.com/statistical-guides/pearson-correlation-coefficient-statistical-guide.php [Accessed 12 Jun. 2017].

Index Terms

Computer Science

Information Sciences

Keywords
Scalability, Throughput, Cloud-based Applications, Cloud Migration, Web Applications, Graduated Load Test.