Accepted Manuscript

Comparing time series with machine learning-based prediction approaches for violation management in cloud SLAs

Walayat Hussain, Farookh Khadeer Hussain, Morteza saberi, Omar khadeer Hussain, Elizabeth Chang

PII: S0167-739X(17)33040-6
DOI: https://doi.org/10.1016/j.future.2018.06.041
Reference: FUTURE 4303

To appear in: *Future Generation Computer Systems*

Received date : 31 December 2017
Revised date : 8 May 2018
Accepted date : 24 June 2018

Please cite this article as: W. Hussain, F.K. Hussain, M. saberi, O.k. Hussain, E. Chang, Comparing time series with machine learning-based prediction approaches for violation management in cloud SLAs, *Future Generation Computer Systems* (2018), https://doi.org/10.1016/j.future.2018.06.041

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Comparing time series with machine learning-based prediction approaches for violation management in Cloud SLAs

WALAYAT HUSSAIN, School of Systems, Management and Leadership, Faculty of Engineering and Information Technology, University of Technology Sydney, NSW, Australia
FAROOKH KHADEER HUSSAIN, Centre for Artificial Intelligence, School of Software, Faculty of Engineering and Information Technology, University of Technology Sydney, NSW, Australia
MORTEZA SABERI, School of Business, University of New South Wales, Canberra, Australia
OMAR KHADEER HUSSAIN, School of Business, University of New South Wales, Canberra, Australia
ELIZABETH CHANG, School of Business, University of New South Wales, Canberra, Australia

Corresponding Authors:

Walayat Hussain: WALAYAT.HUSSAIN@UTS.EDU.AU
Farookh Khadeer Hussain: FAROOKH.HUSSAIN@UTS.EDU.AU

Abstract:

In cloud computing, service level agreements (SLAs) are legal agreements between a service provider and consumer that contain a list of obligations and commitments which need to be satisfied by both parties during the transaction. From a service provider's perspective, a violation of such a commitment leads to penalties in terms of money and reputation and thus has to be effectively managed. In the literature, this problem has been studied under the domain of cloud service management. One aspect required to manage cloud services after the formation of SLAs is to predict the future Quality of Service (QoS) of cloud parameters to ascertain if they lead to violations. Various approaches in the literature perform this task using different prediction approaches however none of them study the accuracy of each. However, it is important to do this as the results of each prediction approach vary according to the pattern of the input data and selecting an incorrect choice of a prediction algorithm could lead to service violation and penalties. In this paper, we test and report the accuracy of time series and machine learning-based prediction approaches. In each category, we test many different techniques and rank them according to their order of accuracy in predicting future QoS. Our analysis helps the cloud service provider to choose an appropriate prediction approach (whether time series or machine learning based) and further to utilize the best method depending on input data patterns to obtain an accurate prediction result and better manage their SLAs to avoid violation penalties.

Keywords:

Cloud computing, SLA monitoring, QoS prediction methods, Machine learning prediction algorithms, Time series prediction approaches, SLA management, prediction accuracy, cloud service provider

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/6872828

Download Persian Version:

https://daneshyari.com/article/6872828

Daneshyari.com