

Survey Paper on Online Software Performance Prediction

Mr. Atul S. Mulik, Prof. V. D. Thombre

Department of Computer Engineering, Savitribai Phule, Pune University, SKN Institute of Technology & Science, Lonavala, Pune, Maharashtra, India

Abstract— Now a days Performance is very important non-functional requirement for almost all software system. In survey study we are going to learn how performance prediction is possible before the development of that particular software. For this task we have to implement one analytical model which is going to be used for evaluating the performance of software with some specific parameter like response time, throughput etc.

Keywords— software performance, Model based approach for performance Evolution, Performance Model, Software performance Engineering etc.

I. INTRODUCTION

Performance is very important non-functional requirement for almost all software system. If software system is not able to provide expected performance then users of that system will not use that system due lots of alternatives available on web for same task. So for the success of any software system like CRM, performance of that system play very important role. In CRM system development, the risk of redevelopment is very high for complex and performance critical projects.

Performance Model based on Software Architecture for performance Prediction” will help the developers to Evaluate performance of CRM system in earlier stage of Software Development Life Cycle SDLC. This approach avoids the risk of redevelopment of that system.

Building Architecture of software system having static load is quite easy and based on that one can easily develop performance model can evaluate performance parameter of such software system. But in case of dynamic workload system like CRM system designing the architecture is too difficult due dynamic nature of workload of such system. Which will effect on building performance Model of that system.

Performance Parameters

Basically Response time, throughput resource Utilization are common parameters of Software performance but rather than this depends on nature of software system some parameters will change like precision & Recall are

parameter for measuring the performance of Information retrieval system.

II. LITERATURE SURVEY

Title: Architecture-level software performance abstractions for online performance prediction

Author: Fabian Brosig*, Nikolaus Huber, Samuel Koune.

In this paper author analyzed typical online performance prediction scenarios and the requirements on online performance-modeling approaches at the architecture-level. Nowadays, the analysis revealed that architecture-level performance modeling approaches are not suitable at run-time. In this paper, author proposed new software architecture-level performance abstractions, specifically designed for use in online scenarios. This involves a novel approach to model the component context and parameter dependencies specifically for use at run-time, a new approach to model performance relevant service behavior at different levels of detail, and a meta-model to describe the resource environment and the deployment of the software system.

Title: Towards self-aware performance and resource management in modern service-oriented systems

Author: Kounev, F. Brosig, N. Huber, R. Reussner.

In this paper, authors presented a vision and research agenda aiming to achieve this goal by developing novel techniques for building dynamic service performance models tightly coupled with the system components and automatically maintained during operation. The new models will provide the basis for implementing intelligent techniques for self-aware performance and resource management. We presented a roadmap to realize this vision and discussed two preliminary case studies conducted as initial steps in this direction. The proposed research direction promises a number of benefits such as better quality-of-service, lower operating costs and improved energy efficiency.

Title: Performance evaluation of component-based software systems: A survey, Performance Evaluation

Author: H. Koziolk

In this paper, author surveyed the state-of-the-art in research of performance evaluation methods for component-based software systems which can be predict the performance and reliability. The survey of these approaches classified according to the expressiveness of software performance modelling language and critically evaluated their benefits and drawbacks.

Title: Model-based performance prediction in software development.

Author: Balsamo, A. Di Marco, P. Inverardi, M. Simeoni
In this paper, authors have reviewed the state of the art in model-based software performance prediction. They have

considered a software-designer perspective in order to classify and evaluate the approaches that have lately appeared. Our choice is driven by the generally acknowledged awareness that the limitation of performance requirement validation in current software practice is mostly due to the lack of knowledge/communication gap between software engineers or architects and quality assurance experts rather than due to foundational issues. This situation is more critical because of the short time. The notations like expressive can calculate the numerical results for performance validation.

III. COMPARISON TABLE

Sr No.	Title	Author	Method Used	Drawbacks
1	Architecture level software performance abstraction for online performance prediction	Fabian Brosic, Nikolaus Huber, Samuel Kaune	Architecture level software performance abstraction	Analysis of performance is restricted.
2	Towards Self-aware performance and resource management in modern service oriented System.	S. Kounev, F.Brosig, R. Reussner.	Proxy Implementing Intelligence techniques	Newly emerging research area.
3	Performance Evolution of computer-Based software Systems	H. Koziolk.	Expressiveness of performance	Low Accuracy
4	Model Based Performance Prediction in Software Development.	S. Balsamo, A. Di Marco, P. Inverardi, M. Simeoni	Model-based software performance prediction	Critically evaluated the benefits and needs further validation.

IV. CASE STUDY

Consider an example of online shopping of the music files. In this case user is uploading and downloading the music files. For this we can compare predictions on the basis of architectural specification and implementation of the architecture. For this case study consider an architecture of Web audio store which is of three tiers i.e. client, server and database. User can download and upload files by using browser by DSL lines with a throughput of 128Kbits/s. The component Web Form is connected to the Audio Store component. Database adapter used for connecting the MySQL server and database. The network between the application server and the Database is a maximum throughput of 512 Kbit/s. As a performance critical use case, the response times for uploading music files to the store shall be analyzed and improved. It is possible for users to upload multiple files at once to add complete music albums to the store. There is an encoder to reduce the file size because the response time for this architecture is too high.

V. CONCLUSION AND FEATURE

In this paper, we studied to evaluate performance of CRM system based on it software requirement by using architecture level performance model for driving performance of CRM system. To check the performance accuracy decided to compare performance parameters with developed CRM system's performance parameter. Feature of this paper is to implement the analytical formula for predict the performance of software before implementation of that software. This formula can calculate the value with respect to the some parameters like as response time, throughput etc.

ACKNOWLEDGMENT

We would like to thanks to all library media, our guide & respected teachers for their constant support and motivation for us. We are also grateful to SKN Sinhgad

Institute of Technology and Science to develop our skill and capabilities.

REFERENCES

- [1] Burcu Ozcelik and Cemal Yilmaz, Member, IEEE: A Lightweight Online Failure Prediction Approach, 2016
- [2] Juraj Feljan, Federico Ciccozzi, Jan Carlson and Ivica Crnković, Mälardalen Real-Time Research Centre Mälardalen University Västerås, Sweden : Enhancing model-based architecture optimization with monitored system runs, 2015
- [3] Fabian Brosig, Nikolaus Huber, Samuel Kounev "Architecture level software performance abstraction for online performance prediction" Elsevier (2013) Data management with attribute based encryption method for sensitive users in cloud computing. Vidyasagar Tella, L.V Ramesh. IJETR ISSN: 2321-0869, vol-2, issue-9, September 2014
- [4] Attribute S. Kounev, F. Brosig, N. Huber, R. Reussner, Towards self-aware performance and resource management in modern service-oriented systems, in: Proceedings of the 7th IEEE International Conference on Services Computing (SCC 2010),
- [5] D.A. Menascé, H. Gomaa, A method for design and performance modeling of client/server systems, IEEE Transactions on Software Engineering 26 (2000) 1066–1085.
- [6] R. Nou, S. Kounev, F. Julia, J. Torres, Autonomic QoS control in enterprise grid environments using online simulation, Journal of Systems and Software 82 (2009).
- [7] J. Li, J. Chinneck, M. Woodside, M. Litoiu, G. Iszlai, Performance model driven qos guarantees and optimization in clouds, in: Software Engineering Challenges of Cloud Computing, 2009. CLOUD '09. ICSE Workshop on, pp. 15–22.
- [8] G. Jung, M. Hiltunen, K. Joshi, R. Schlichting, C. Pu, and Mistral: Dynamically managing power, performance, and adaptation cost in cloud infrastructures, in: Distributed Computing Systems, ICDCS, 2010 IEEE 30th International Conference on, pp. 62–73.
- [9] S. Becker, H. Koziol, R. Reussner, The palladio component model for model-driven performance prediction, Journal of Systems and Software 82 (2009) 3–22.
- [10] V. Grassi, R. Mirandola, A. Sabetta, Filling the gap between design and performance/reliability models of component-based systems: A model-driven approach, Journal of Systems and Software 80 (2007) 528–558.