MAIN AREAS THAT THE IRMOS PLATFORM ADVANCESTHE STATE OF THE ART IN SLAS

Deepak Kumar Kaushik, Dr. Rajesh Pathak

HOD Deptt. of Computer Science, & Engg.
GNIT Institute of Technology,Gautam Budh Nagar, U.P.
Research Scholar, CMJ University, Shillong, Meghalaya

INTRODUCTION

The main areas that the IRMOS platform advances the state of the art in SLAs are: (i) requirements can be expressed in the language of the application domain, (ii) the user's needs are dynamically translated to infrastructure requirements in fine grained SLAs, (iii) evaluation and mitigations mechanisms are able to quickly detect SLA violations and take necessary actions at run-time. Thus, it is evident, that the proposed framework adds to the already known benefits of cloud computing the possibility to execute interactive and resource-demanding applications with guaranteed QoS, that existing commercial offerings lack. Therefore service providers will be able to accommodate emerging future Internet applications that involve a broad class of interactive and collaborative tools and environments, including concurrent design and visualization in the engineering sector, media production in the creative industries, and multi-user virtual environments in education and gaming. Many of these applications tend to use dedicated hardware in order to achieve the desired Quality of Service (QoS), greatly increasing the overall cost for maintaining the needed resources. This can be a major hindrance to small businesses and startup companies that want to make innovative solutions available easily. Adopting a QoS-enabled Cloud solution alleviates this problem by providing the option of pay per use without the need to own expensive equipment.

Still, open research issues to be further investigated in this context include

- How to formally specify QoS requirements at the SLA level in such a way that the offered and received QoS be verifiable by the interested parties (mainly the customer and the provider, but also the end user)? For example, what are a proper observation window and the exact conditions to observe, for claiming an SLA violation?

- How to solve disputes between the parties signing a T-SLA or A-SLA, for example in the cases in which the customer claims that the promised QoS level he/she is paying for was not delivered? By what ways can a provider certify its provided QoS levels and the customer on the other hand certify it's received ones?

- considering the complexity of delivering precise QoS levels at the A-SLA level, and the will of the provider to only offer guarantees on a probabilistic basis [5], what is a reasonable business model and SLA model that allows for a temporary graceful degradation of the delivered QoS with an associated pay-back penalty from the provider to the customer, or discount in cases of a pay- per-use model?

These and further challenging issues are to be investigated in further research.

REFERENCES

I. *T. Voith, M. Kessler, K. Oberle, D. Lamp, A. Cuevas, P. Mandic, A. Reifert. ISONIWhitepaper v2.0. September 2008. Available on-line at: http://irmosproject.eu/Files/IRMOS_WP6_7_ISONI_White_Paper_ALUD_USTUTT_v2_0.p df*

II. *T. Cucinotta, G. Anastasi, F. Checconi, D. Faggioli, K. Kostanteli, A. Cuevas, D. Lamp, S. Berger, M. Stein, T. Voith, L. Fuerst, D. Golbourn, M. Muggeridge. IRMOS Deliverable D6.4.2 - Final Version of Real time Architecture of Execution Environment. http://www.irmosproject.eu/Files/IRMOS_WP6_D6_4_2_SSSA_v1_0%5B1%5D.pdf.*

III. *F. Checconi, T. Cucinotta, D. Faggioli, G. Lipari. Hierarchical Multiprocessor CPU Reservations for the Linux Kernel. In Proceedings of the 5th International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT 2009). Dublin, Ireland. June 2009.*

IV. *T. Cucinotta, F. Checconi, G. Kousiouris, D. Kyriazis, T.Varvarigou, A. Mazzetti, Z. Zlatev, J. Papay, M. Boniface, S. Berger, D. Lamp, T. Voith, M. Stein. Virtualised e-Learning with Real-Time Guarantees on the IRMOS Platform. In Proceedings of the IEEE International Conference on Service-Oriented Computing and Applications (SOCA 2010). Perth, Australia.Dec. 2010.*

V. *K. Konstanteli, T. Cucinotta, T. Varvarigou. Optimum Allocation of Distributed Service Workflows with Probabilistic Real-Time Guarantees. Springer Service Oriented Computing and Applications, Vol. 4, No. 4. Dec. 2010.*

VI. *B. Lin, P. Dinda, Vsched: Mixing batch and interactive virtual machines using periodic real- time scheduling, Proceedings of the IEEE/ACM Conference on Supercomputing, pp. 8,November 2005.*

VII. *C.L. Liu, J. W. Layland, Scheduling Algorithms for Multiprogramming in a Hard-Real-Time Environment, J. ACM, vol. 20,No. 1, January 1973, pp. 46—61, ACM, New York, NY,USA.*

VIII. *F. Checconi, T. Cucinotta, D. Faggioli, G. Lipari, Hierarchical Multiprocessor CPU Reservations for the Linux Kernel, Proceedings of the 5th International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT), June 2009, Dublin, Ireland.*

IX. *L. Abeni, G. Buttazzo, Integrating Multimedia Applications in Hard Real-Time Systems, Proceedings of the IEEE Real-Time Systems Symposium, 1998, Madrid, Spain.*

X. *B. Lin, P. Dinda, Towards Scheduling Virtual Machines Based On Direct User Input, Proceedings of*

the 2nd International Workshop on Virtualization Technology in Distributed Computing, Washington,DC, November 2006, IEEE Computer Society.

XI.   R. Nathuji, A. Kansal, A. Ghaffarkhah, Q-Clouds: Managing Performance Interference Effects for QoS-Aware Clouds, Proceedings of the 5th European conference on Computer systems (EuroSys), April 2010, Paris, France.

XII.   J. W. Lee, K. Asanovic, METERG: Measurement-Based End-to-End Performance Estimation Technique in QoS-Capable Multiprocessors, Proceedings of the 12th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), pp. 135-147, 2006.

REFERENCES

[Boehm 06] Boehm, Barry. "Some Future Trends and Implications for Systems and SoftwareEngineering Processes." Systems Engineering 9, 1 (Spring 2006): 1-19.

[Booch 05] Booch, Grady. Architecture Web Log (2005).

[Hefley 06] Hefley, William E. & Loesche, Ethel A. The eSCM-CL v1.1: Model Overview and The eSourcing Capability Model for Client Organizations (eSCM-CL) v1.1. Information Technology Services Qualification Center, Carnegie Mellon University, 2006.

[Hofmann 07] Hofmann, Hubert F.; Yedlin, Deborah K.; Mishler, John W.; & Kushner, Susan. CMMI(R) for Outsourcing: Guidelines for Software, Systems, and IT Acquisition. Boston, MA: Addison-Wesley, 2007.

[IEEE/EIA 98a] IEEE/EIA. IEEE/EIA 12207.0-1996, Industry Implementation of International Standard ISO/IEC 12207: 1995, ISO/IEC 12207, Standard for Information Technology – Software life cycle processes. New York: IEEE, March 1998.

[IEEE/EIA 98b] IEEE/EIA. IEEE/EIA 12207.0-1996, Industry Implementation of International Standard ISO/IEC 12207: 1995, ISO/IEC 12207, Standard for Information Technology – Software life cycle processes – Life cycle data. New York: IEEE, April 1998.

[IEEE/EIA98c] IEEE/EIA. IEEE/EIA 12207.2-1997, Industry Implementation of International Standard ISO/IEC 12207: 1995, ISO/IEC 12207, Standard for Information Technology – Software life cycle processes – Implementation considerations. New York: IEEE, April 1998.

[Maier 06] Maier, W. Mark. "System and Software Architecture Reconciliation." Systems Engineering 9, 2 (2006): 146-158.

[D&B 00] Dun & Bradstreet. Press Release about Barometer of Global Outsourcing Report, February 29, 2000