Title (EN): **Computation resilience and performance optimization for large-scale applications in high-performance and distributed environments**

Title (SK)**: Adaptabilita výpočtov a optimalizácia výkonu výpočtovo-náročných aplikácií vo vysoko-výkonných a distribuovaných prostrediach**

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Scientific project: VEGA 2/0167/16

Annotation: The research aims at effective computation resilience for complex simulations in high performance and distributed environments such as HPC clusters, Grid and multi-cloud environments. Computation resilience [1, 2, 3] is a complicated and delicate area; it deals with many types of simulation cores, many types of data on various input levels and also with many types of end-users, which have different requirements and expectations. Predictions about system and computation behaviors must be done based on deep knowledge about underlying infrastructures, and simulations' mathematical and realization backgrounds. Our conceptual framework is intended to allow independent collaborations between domain experts as end-users and providers of the computational power by taking on all of the deployment troubles arising within a given computing environment.

A new architecture for multicriteria optimization has been proposed. The approach has been verified experimentally. The aim of our experiment is carried on a portal offering a platform according to the users' requirements [2]. The work [3] aims at enhancing service capability with multiple finite capacity server queues in cloud data centers. The proposed approach allows reducing service waiting time for jobs and managing elastically the service capability.

Main scientific outputs:

1. HLUCHÝ, Ladislav - NGUYEN, Giang - ASTALOŠ, Ján - TRAN, Viet - ŠIPKOVÁ, Viera - NGUYEN, Binh Minh. Effective computation resilience in high performance and distributed environments. In Computing and informatics, 2016, vol. 35, no. 6, p. (0.524 - IF2015). ISSN 1335-9150. Typ: ADDA
2. BOBÁK, Martin - HLUCHÝ, Ladislav - TRAN, Viet. Application performance optimization in multicloud environment. In Computing and informatics, 2016, vol. 35, no. 6, p. (0.524 - IF2015). ISSN 1335-9150. Typ: ADDA
3. NGUYEN, Binh Minh – TRAN, Dang – NGUYEN, Giang: Enhancing service capability with multiple finite capacity server queues in cloud data centers. Cluster Computing - The Journal of Networks, Software Tools and Applications, Springer Science+Business Media New York, 2016, Volume 19, Issue 4, pp. 1747–1767, DOI 10.1007/s10586-016-0653-y. (1.514 - IF2015). ISSN 1386-7857. Typ: ADCA