Four Years with the High Productivity Computing Systems Program – A Perspective

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Abstract:

For the past four years, IBM has participated in DARPA's High Productivity Computing Systems (HPCS) program, competing with other contestants in ground-breaking research for peta-scale systems aimed at changing the status quo in high end computing. The HPCS program is unique in that it states productivity as a broader definition of the system value than just performance. Commercial viability is another goal, meant to add realism and produce usable systems at the end of the program with productivity and performance goals that well exceed the projected improvements using today's technology. This unprecedented mix adds interesting and challenging constraints on the research program, and the traditional ways of approaching the problem do not apply. This talk will give an overview of the program as conducted in IBM, including a description of many technologies that were investigated and considered. The talk addresses also the challenges of running projects of this kind, and gives a forward looking statement about the future of the program and its projected impact on the industry and the academic communities.

Bio:

E.N. (Mootaz) Elnozahy: Mootaz is a Senior Technical Staff Member and a Master Inventor at IBM Systems and Technology Group. From 2001 to 2006, He has led IBM's effort under DARPA's High-Productivity Computing Systems initiative, which is an ambitious program to shape an aggressive future for high-end computing. Prior to joining IBM, Mootaz was an Assistant Professor at the School of Computer Science at Carnegie Mellon University. Mootaz's main expertise is in distributed and operating systems. He has worked on several aspects of reliability, including highly-available file systems, replication, rollback-recovery, and reliable middleware. He holds 19 patents in the area of distributed and fault-tolerant systems, and has published over 35 refereed articles in high-quality forums. Mootaz currently serves on the executive board of the IEEE Technical Committee on fault tolerance, and is a member of the steering committee of the International Conference on Dependable Systems and Networks. He serves as Associate Editor for the newly inaugurated IEEE Transactions on Secure and Dependable Computing, and has served in the past as Associate Editor for IEEE Transactions on Parallel and Distributed Systems. Mootaz obtained a B.Sc. degree with Highest Honours in Electrical Engineering from Cairo University in 1984, and the M.S. and Ph.D. degrees in Computer Science from Rice University in 1990 and 1993, respectively.

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