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HIGH PERFORMANCE COMPUTING IN THE CLOUD
Dejan Milojicic, Ph.D.
HP Labs, USA, IEEE Computer Society President-elect for 2013

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Mathematical Institute of the Serbian Academy of Sciences and Arts
Knez Mihailova 36, room 301f

Abstract:

Cloud computing has emerged as an economical alternative to supercomputers for some of the high-performance computing (HPC) applications. Particularly suitable are applications that can scale without high-end interconnects; during testing; debugging; and for smaller-scale deployments. An increasing number of HPC users adopts hybrid deployments, where part of the resources are in-house and part of them are in the cloud. This raises the question of which platform is better for which applications, problem sizes, data sets, and scale. In this presentation, we explore the economical tradeoffs of running applications in the Cloud vs. on supercomputers. We characterize HPC applications running on platforms from dedicated supercomputers to commodity clusters, both in-house and in the cloud, and for different degrees of virtualization. We then propose mechanisms to match HPC applications to the best deployment platform. We analyze the performance-cost tradeoffs and show that careful mapping can substantially reduce the cost without incurring significant performance penalty.

About the Speaker:

Dr. Dejan Milojicic is a senior researcher and director of the Open Cirrus Cloud Computing testbed at HP Labs (1998-present). He has worked in the areas of operating systems, distributed systems, and service management for more than 20 years. Dr. Milojicic has published over 120 papers in many journals and conferences. He is an inaugural editor in chief of IEEE Computing Now, a front end to IEEE Computer Society publications. He holds 10 patents and has many more patent applications. He has been engaged in standardization bodies, such as OMG and Global Grid Forum. He is an ACM distinguished engineer, IEEE Fellow and member of USENIX. He received his BSc and MSc from University of Belgrade and his PhD from University of Kaiserslautern. Prior to HP Labs, he worked at the Institute "Mihajlo Pupin," Belgrade (1983-91) and at OSF Research Institute, Cambridge, MA (1994-98). He has been voted IEEE Computer Society 2013 president-elect.