

Spring 2015 Seminar Series

Presented by the CS Division

CLOUD AUTO-PROVISIONING FOR PARALLEL PROCESSING

MONDAY APRIL 20, 2015

10:00 AM – HEC 356

Cloud computing has drawn increasing attention from the scientific computing community due to its ease of use, elasticity, and relatively low cost. Because a high-performance computing (HPC) application is usually resource demanding, without careful planning, it can incur a high monetary expense even in Cloud. We design a tool called CAP3 (Cloud Auto Provisioning framework for Parallel Processing) to help a user minimize the expense of running an HPC application in Cloud, while meeting the user-specified job deadline. Given an HPC application, CAP3 automatically profiles the application, builds a model to predict its performance, and infers a proper cluster size that can finish the job within its deadline while minimizing the total cost. To further reduce the cost, CAP3 intelligently chooses the Cloud's reliable on-demand instances or low-cost spot instances, depending on whether the remaining time is tight in meeting the application's deadline. Experiments on Amazon EC2 show that the execution strategy given by CAP3 is cost-effective by choosing a proper cluster size and a proper instance type (on-demand or spot). In this talk, I will also go over our ongoing research on Hadoop performance model and optimization.

DR. LIQIANG WANG
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Liqiang Wang is a Castagne Associate Professor in the Department of Computer Science at the University of Wyoming. He received Ph.D. in Computer Science from Stony Brook University in 2006. His research focuses on an interdisciplinary area overlapping big data, cloud computing, and program analytics, which includes design and analysis. In the aspect of design, he is working on optimizing performance, scalability, resilience of data-intensive computing, especially on Cloud, GPU, and multicore platforms. In the aspect of analysis, he focuses on using hybrid program analysis to detect and avoid programming errors in large-scale parallel computing systems. He is the recipient of a number of awards including NSF CAREER Award in 2011, Castagne Faculty Fellow Award of University of Wyoming in 2013, and NSFC Overseas Scholar Collaborative Research Award in 2014.

Hosted by: Dr. Lotzi Boloni

