VirginiaTech
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Computer Science Seminar Series

National Capital Region

Optimizing I/O Virtualization in Data Centers

Speaker: Prof. Howie Huang
The George Washington University
Friday, February 28, 2014
1:00PM- 2:00PM, NVC 325

Abstract

Large-scale data centers leverage virtualization to achieve high resource utilization, scalability, and availability. While ideally the performance of an application running inside a virtual machine (VM) shall be independent of co-located applications and VMs that share the physical machine, current systems are yet to achieve this goal. In this talk, I will describe our efforts in addressing a number of challenges in order to achieve optimal I/O performance in such virtualized systems. Specifically, Swiper and TRACON construct mathematical models and scheduling algorithms to mitigate the interference problem; Matrix leverages machine learning and optimization techniques to realize the "equivalence" property of virtualization with the best cost-efficiency; and VIO-prefetching fundamentally changes the prefetching scheme in virtualization architecture and improves virtual I/O throughput.

Biography

Howie Huang is an assistant professor in Department of Electrical and Computer Engineering at the George Washington University. His research interests are in the areas of computer systems and architecture, including cloud computing, big data computing, high-performance computing and storage systems. His projects won the Best Poster Award at PACT'11, ACM Undergraduate Student Research Competition at SC'12, and a finalist for the Best Student Paper Award at SC'11. He was a recipient of the NSF CAREER award in 2014, NVIDIA Academic Partnership Award in 2011, and IBM Real Time Innovation Faculty Award in 2008. He received his Ph.D. in Computer Science from the University of Virginia in 2008.