

COMPUTER SCIENCE RESEARCH SEMINAR

Rethinking Cloud Storage System Software under Multi-Tenancy

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Friday, January 26th at noon in room R15, Engineering Building

Abstract: Virtualization-based cloud computing has dominated today's data centers by supporting consolidated servers, converged infrastructures, and horizontal scalability. To provide high resource density and low cost of ownership, current clouds typically involve a multi-tenancy architecture, which consists of a mix of layered software and hardware to realize virtually dedicated computing and storage capabilities for tenants. Despite significant benefits of multi-tenancy, new challenges arise in the aspects of efficiency, fairness and customizability of cloud resource sharing.

In this talk, I will focus on my research efforts towards new system software support for cloud storage resource sharing under multi-tenancy. I will start with a novel byte-addressable storage software stack, BASS, to overcome the problem of data granularity mismatch on the end-to-end data path of a block storage system, achieving higher efficiency. Then, to address the (un)fairness of storage resource sharing, I will present a new I/O scheduling scheme, vFair, which takes per-I/O cost into consideration for fine-grained storage resource allocation and sharing. To enable software-defined storage services, I will introduce a storage middle-box platform, StorM, for deploying tenant-defined, highly-customizable storage data security/reliability services. I will conclude with my future work in supporting next-generation cloud infrastructures, driven by emerging IoT applications and high-performance hardware.

Bio: Dr. Hui Lu joined the Department of Computer Science at Binghamton in 2017. His research interests span operating systems, systems virtualization, cloud computing, file and storage systems, computer networks, and systems performance optimization. He has collaborated with leading research labs including IBM Research, Microsoft Research, AT&T Labs and NEC Labs. His research has appeared in top system and cloud computing conferences such as SoCC, VEE, DSN, and ATC. Hui received his Ph.D. degree in the Department of Computer Science at Purdue University. He received his bachelor's and master's degrees from Shanghai Jiao Tong University. For more information, please visit: <http://www.cs.binghamton.edu/~huilu/>

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Pizza will be provided!