

JIN ZHANG

Email: jinzhang3002@gmail.com

Personal Website: <https://xianliang66.github.io/>

RESEARCH INTERESTS

Operating system, virtualization, data center

EDUCATION

Shanghai Jiao Tong University

2018-2021

M.E. in Software Engineering, March, 2021

- Thesis: *An Efficient Resource Migration Approach based on Distributed Shared Memory*
- Advisor: Prof. Zhengwei Qi

Shanghai Jiao Tong University

2014-2018

B.E. in Software Engineering, June, 2018

WORKING EXPERIENCE

Alibaba Cloud

Hangzhou, Zhejiang, China

Software Development Engineer

Mar. 2021-present

Optimization of the cloud scheduling, with the focus of minimizing the vCPUs' tail latency.

Trip.com Group

Shanghai, China

Internship

Jul. 2017-Oct. 2017

Develop data management applications.

PROJECTS

GiantVM

Oct. 2017–Oct. 2019

- Homepage: <https://giantvm.github.io/>
- A distributed hypervisor based on QEMU-KVM. It enables one VM to run on a cluster of physical machines. By leveraging distributed CPU, I/O, and memory (a.k.a, DSM), a unified x86 ISA is provided for the guest OS. Unmodified OSes such as Linux can thus utilize resources from a cluster. The experiments show that GiantVM can improve applications' performance up to 3.4x compared to Spark.

Falcon

Jan. 2020–Jan. 2021

- A timestamp-based self-invalidation cache coherence protocol for DSM. The traditional write-invalidation protocol may send useless invalidations to cached objects that have been evicted. Instead, the update requests in a self-invalidation protocol are always issued by objects that are not evicted. Falcon uses the logical lease to determine when to send such update requests. The lease is backed by per-operation logical timestamps, which reflects the sequential consistency. The evaluation shows that the optimal protocol can improve the performance of a KV database by 27% and a graph processing application by 71.4%.

Yanni

Jan. 2021–Sep. 2021

- A fast VM live migration system for data center load-balancing. A major problem for the VM live migration is its overwhelming network bandwidth consumption. Yanni addresses this by an empirical result that applications have read-only pages. Such pages are replicated at the destination before the migration, and the subsequent migration consumes little network bandwidth. Yanni also designed a dedicated compression algorithm to save the memory space of such read-only replica. The evaluation shows that Yanni reduces the network bandwidth use and the migration time by 69% and 83%, respectively, compared to VM live migration. The compression can achieve a space-saving of 83.6%.

PUBLICATIONS

Jin Zhang, Xiangyao Yu, Zhengwei Qi, and Haibing Guan. Falcon: A Timestamp-based Protocol to Maximize the Cache Efficiency in the Distributed Shared Memory. (IPDPS'22, *To Appear*)

Jin Zhang*, Xingguo Jia*, Boshi Yu, Xingyue Qian, Zhengwei Qi, and Haibing Guan. GiantVM: A Novel Distributed Hypervisor for Resource Aggregation with DSM-aware Optimizations. (TACO'22, *To Appear*)

Jin Zhang, Zhuocheng Ding, Yubin Chen, Xingguo Jia, Boshi Yu, Zhengwei Qi, and Haibing Guan. GiantVM: a Type-II Hypervisor Implementing Many-to-one Virtualization. (VEE'20)

Jin Zhang, Xingguo Jia, Zhengwei Qi, and Haibing Guan. Yanni: A Novel Resource Reallocation Approach to Improve CPU Utilization in Data Centers. [Under Review]

TEACHING EXPERIENCES

Programming and Data Structure (SE 117)	<i>Shanghai, China</i>
Teaching Assistant	Sep. 2019-Dec. 2019

Virtualization and Cloud Computing	<i>Shanghai, China</i>
Teaching Assistant	Sep. 2020-Dec. 2020

AWARDS

Excellent Undergraduate Scholarship	<i>2015-2016</i>
--	------------------

Excellent Undergraduate Scholarship	<i>2016-2017</i>
--	------------------

SKILLS

Programming Languages	C/C++, Java, Python, SQL, Bash
Software & Tools	HTML, LaTeX, Git, MongoDB, MySQL
Systems	Linux, QEMU-KVM, Spark, Hadoop, PGAS, MPI