姜继

中科院计算所 **Mobile:** 135-010-21029 **E-mail:** jiang.ji@hotmail.com

求职意向:

软件开发工程师.

教育背景

2010–至今 **硕士学位**, 计算机系统结构, 中国科学院计算技术研究所.

2006–2010 **学士学位**, 微电子与纳电子系, 清华大学.

主要项目经历

2011/4 – 2011/11 **基于SSD的HDFS元数据管理**, 项目组核心成员.

- 针对HDFS的树型全内存结构管理文件系统元数据的不足(元数据容量受限,可扩展性差),使用哈希索引实现了基于DRAM与SSD混合存储的元数据管理模块, 以略微降低峰值性能为代价大大提高系统的可扩展性,同时减少系统的故障恢复时间;
- 设计与实现异构存储元数据管理模块,内存中只存储元数据必要索引以**降低内存开销**,通过**聚合元数据**提高SSD性能,使用BloomFilter减少SSD的查询次数;

2011/10 – 2012/5 **虚拟机镜像存储系统**, 项目组核心成员.

- 基于OCFS2开发虚拟机镜像存储系统,实现虚拟磁盘锁并重新设计故障检测与恢复机制,在32节点上启动640个虚拟机进行压力测试并制造较频繁的人为故障,系统稳定运行一周;
- **虚拟磁盘锁** 改变OCFS2中文件写时互斥的语义,针对虚拟机镜像存储系统中的特定语义需求,基于分布式锁管理(DLM)为OCFS2增加虚拟磁盘锁,保证磁盘镜像文件只能被一台虚拟机独占写,其他节点可共享读;
- **故障检测与恢复机制** OCFS2中使用基于磁盘心跳的故障检测机制,对故障响应较迟缓,重新设计故障检测机制,结合磁盘心跳与网络心跳,提高故障检测灵敏度;

2012/5 – 至今 **虚拟化场景下SSD异构缓存的研究**.

- 设计一种SSD异构缓存的管理策略,使用过滤无用数据,写入SSD前聚合,多虚拟机缓存空间划分等技术,有效降低I/O响应时间,最终在Xen的Dom0中实现;

个人技能

编程 掌握Linux环境下C/C++编程,有一定Linux内核编码与调试经验,熟悉常用**本地/分布式文件系统**原理与实现,有**企业项目合作经验**与分布式文件系统开发经验,对缓存算法有深刻理解,熟悉虚拟化原理

算法 优秀的算法与数据结构基础,熟悉HashTable、Bloomfilter等常用数据结构

工具 熟悉Shell编程,熟练使用GDB, Vim, Gnuplot, AWK, LaTeX等工具

运维 服务器网络设备部署,网络规划,常用服务器环境配置(WebServer,Git/SVN等开发服务器,Hadoop/MPI环境),VMware vCenter/Xen机群部署与维护

语言 通过CET4/6((600,560)/710),TOEFL(107/120),GRE(1380/1600), 具有优秀的英文阅读、交流与写作能力

主要社会活动与爱好

- 大学期间参加"清华大学爱心公益协会",曾任副会长并多次参与/组织"毕业捐衣"等公益活动
- 在"Hadoop in China 2011"等多次学术会议期间担任志愿者
- 热衷运动,喜爱篮球、羽毛球、乒乓球、足球等并多次代表班级参加各项比赛

Jiang Ji

Chinese Academy of Science **Mobile:** (86)13501021029 **E-mail:** jiang.ji@hotmail.com

Objective:

Software Development Engineer.

Education

2010–now **Master Degree**, *Computer Architecture*, Institute of Computing Technology, Chinese Academy of Science.

2006–2010 **Bachelor Degree**, *Institute of Microelectronics* , Tsinghua University.

Experience

2011/4 – 2011/11 **SSD-based HDFS metadata management system**, *Designer, main Implementor*.

- In order to mitigate several defects of HDFS's all-in-memory tree-like metadata management architecture(such as poor scalability), we build a hash-based hybrid-storage-aware metadata management module that can improve scalability and reduce recovery time while sacrifice little peak performance.
- In charge of designing and implementing metadata management module. Key points including: 1) Store filename's fingerprint to achieve low per key memory overhead. 2) Reducing hash collision by actions like combining two hash function, storing parent ino, ect. Effectively alleviate SSD's read amplification. 3) Use a metadata-box and copy-on-write way to store metadata, guarantee file system's consistency and make a better use of SSD.

2011/10 – 2012/5 **Virtual machine image management system**, *main Designer, co-implementor*.

- In order to meet a more rigid demand for virtual disk image safety and system stability, we choose OCFS2 against GFS2 as a prototype system and develop a virtual machine image management system. Main contributions include implementing virtual disk-image lock and improve failure detection mechanism.
- **Virtual Disk-image Lock** In order to meet mutex semantics against traditional file system, virtual disk-image lock is designed and implemented based on Distribute Lock Manager to protect virtual disk image's safety.
- **Failure Detection** To meet upper level QoS demand, failure detection mechanism is re-designed which takes network heartbeat into account in order to achieve faster failure detection.

2012/5 – now **A study of SSD-based multi-level cache in virtual environment**.

- As for SSD's unique characters such as high OPS/$ and asymmetric-write, we conduct a deep analysis and experiment on different combination of cache replacement and prefetch policies and propose a new SSD-aware cache management algorithm, effectively reducing execution time. Intend to implement in Xen-based virtual environment.
- In charge of procedure design, implement and debug cache simulator and a number of cache algorithms(LRU, LIRS, MQ, Linux, AMP, etc.), evaluate and analyse the system with several real-world workload.

Skill

Programming	Skilled in C/C++ programming in Linux environment, familiar with and experienced in programming and debugging within Linux kernel, enterprise project experience, Deep understanding of local/distributed file system
Algorithm	Strong background of algorithm and data structure, deep understanding of HashTable、Bloomfilter, etc.
Tools	Skilled in gdb, Shell programming, Vim, Gnuplot,AWK, LaTeX, etc.
Maintainance	Experienced in server deploying, network planning, common application server deploying(WebServer, Git/SVN, Hadoop/MPI), VMware vCenter/Xen cluster deploying and maintainance
Language	Passed CET4/6((600,560)/710),TOEFL(107/120),GRE(1380/1600), capable of oral/written communication in English

Activities

- Participated in Charity Association of Tsinghua University and acted as vice-chairman, participated/organized several times of charity activities such as "Graduation Donation"
- Multiple volunteer experiences in academic conferences such as "Hadoop in China 2011"
- Fascinated in sports such as basketball, badminton, ping-pong, football, selected in class team respectively

(86)13501021029 • jiang.ji@hotmail.com