Zachary H. Jones

Performance Analyst, Computer Scientist, Software Developer,
Kernel Hacker, and Data Storyteller

EXPERIENCE

Verizon Media Platform — *Principal Performance & Kernel Engineer*
MAR 2017 - PRESENT

Helped charter and build a performance engineer team responsible for the server performance of 8% of the Internet.

- Improved performance by 5x across hardware specifications, kernel 10tunings, and software optimizations drove CDN capacity to reach 140Tbps.
- Led engineering efforts to improve load balancing and DDoS capacity by 2x by leveraging XDP/BPF programing.
- Devised, published, and presented a methodology for performance analysis of XDP programs.

Served as Systems & Performance Architect to drive performance engineering efforts across the larger engineering and operations organizations.

- Built custom kernel infrastructure for providing performance and security enhancing patches and configuration changes.
- Steered generational server hardware specifications to right size hardware to optimally match software requirements and provide flexibility for POP expansion and new POP growth.
- Instigated AI/ML research projects to add autonomic self-protection and self-optimization features to CI/CD process to allow auto advancing and reverting of code deployments in production.
- Refined automatic provisioning workflow and debugged failures from cross-system interactions to minimize engineers time overseeing the process while maintaining high levels of customer performance.

Demonstrated leadership through advocacy and mentorship.

- Designed a performance test harness, a framework to design a performance project/infrastructure for repeatable testing, analysis, and reporting for junior engineers and interns to take ownership of and lead their projects.
- Promoted the use of Jupyter Notebooks to create reproducible data documents for effective sharing and collaboration of project data and improve decision making across teams.
- Provided interns with impactful and meaningful projects while providing guidance on achievable goals for their tenure.

NetApp — *Performance Analyst, Analytics Platform Developer*
DEC 2011 - MAR 2017

Technically led platform engineer team producing modern analytics platforms for an internal performance monitoring product and cloud-based customer monitoring product.

- Developed services to transform/query performance data generated by ONTAP and metrics engine/recipes to convert data into higher-level forms to enable decision making from developers to executives.
- Delivered an analytics platform prototype that exceeded MVP target in 8 weeks by leveraging open-source projects and AWS elastic services.

SUMMARY

An emerging technical leader with 12 years of engineering and innovation experience driving performance changes into solutions; and leading efforts across teams to wrangle, manage, and understand data.

CONTACT

zach@zacharyjones.us

SKILLS

- Performance Engineering & Analysis
- Internet Scale System Design & Architecture
- XDP / BPF / Linux Kernel
- Data Management / Software Defined Storage
- *nix / VMs / Containers
- Python / JS / C
- Jupyter / SciPy Stack

PATENTS

US 9083608 & 9088479
Automatically selecting appropriate platform to run application in cloud computing environment

US 9075643 & 9075645
Automatically selecting optimal transport protocol in a cloud computing environment

US 8965754 & 8972245
Text prediction using environment hints

US 8949848
Reducing usage of resource utilized by a virtual machine whose resource utilization is adversely affecting neighboring virtual machines

Integrated Jupyter Notebooks into the performance development and analysis workflows to allow sharing and collaboration between performance analysts, engineers and support.

- Designed and developed extensions to Jupyter to convert notebooks into static reports and an interface to generate dynamic reports.
- Built exploratory and reporting tools to meet an unfilled need. The efficiency improvements provided by the tools resulted in use by 100+ engineers daily.

Led analysis investigations on next-generation software defined platforms: ONTAP Select & Cloud.

- Increased performance between 100% and 300% across various platforms and workloads.
- Shepherded weekly technical deep-dive meetings with engineering to drive performance critical changes into ONTAP and communicated with leadership on successes and challenges.

Led analysis for development of File & Free Space Reallocation defragmentation technologies in ONTAP.

- Collaborated with support organizations to determine when and how to engage with customers on proper use.
- Analyzed data collected across the customer base to understand the rate of aging to FAS platforms and presented findings at several company-wide tech talks.

Contributed to and validated the design and implementation of SPEC SFS® 2014.

PRIOR EXPERIENCE

IBM MAY 2007 - AUG 2009, NOV 2010 - DEC 2011
Performance Engineer Intern, Performance Engineer for WebSphere Product Family

Toyota Racing Development USA MAY 2010 - DEC 2010
Performance Engineering/HPC, Simulation Engineering, Video Processing/Data Extraction

Clemson University, School of Computing AUG 2006 - DEC 2010
Graduate Research Assistant, Sporting Events Mobile App/Infrastructure Developer, System Administrator

EDUCATION

Ph.D. Computer Science — *Clemson University* — Dec 2010
B.S. Computer Science & Mathematics — *High Point University* — May 2006

CONFERENCES

Jones, Zachary H. **Performance Analysis of XDP Programs.** *34th Large Installation System Administration Conference (LISA21)*, June 2021.

Jones, Zachary H. **Integrating IPython into Large-Scale Development Environments.** *13th Python in Science Conference (SciPy 2014)*, July 2014.

PUBLICATIONS

Geist, Robert, Jones, Zachary H., and Westall, James. **Predicting (Disk Scheduling) Performance with Virtual Machines.** In *Proceedings of Performance Evaluation of Computer and Communication Systems: Milestones and Future Challenges* (PERFORM 2010), October 2010.

Geist, Robert, Jones, Zachary H., and Westall, James. **Virtualizing High-Performance Graphics Cards for Driver Design and Development**. In *Proceedings of the 19th Annual Int. Conf. of the IBM Centers for Advanced Studies on Collaborative Research* (CASCON), pp. 261-269, November 2009.

Geist, Robert, Jones, Zachary H., and Westall, James. **Virtualization of an Advanced Course in Operating Systems** (Extended Abstract). In *Proceedings of the 3rd International Conference on the Virtual Computing Initiative*, pages 61-64, October 2009

Dean, Brian C. and Zachary H. **Rank-Sensitive Priority Queues**. In *Proceedings of the Algorithms and Data Structures Symposium* (WADS), pp. 181-192, August 2009

Geist, Robert, Jones, Zachary H., and Steele, Jay. **Parallel Processing Flow Models on Desktop Hardware**. In *Proceedings of the 46th ACM Southeast Conference* (ACMSE), pp. 417-422, March 2008.

Dean, Brian C. and Jones, Zachary H. **Exploring the Duality between Skip Lists and Binary Search Trees**. In *Proceedings of the 45th ACM Southeast Conference* (ACMSE), pp. 395-399, March 2007.