SeongJae Park

Seattle, WA, USA | sj@kernel.org | https://sjp38.github.io | last update: 2024-09-09

Experience (Last 10 years)

Software Engineer, *Meta*, Sep 2024 - **Present**

- Developing and maintaining Linux kernel Data Access MONitor (DAMON) subsystem.
- Developing Linux kernel for Meta.

Kernel Development Engineer, *Amazon*, Sep 2019 - Sep 2024

- Developed, upstreamed, and maintained Linux kernel DAMON subsystem.
- Developed DAMON features for AWS products including Aurora Serverless v2.
- Helped adoption of DAMON on other products including SK hynix' CXL memory SDK.
- Developed Amazon Linux kernels for AWS internal/external users.

Graduate Research Assistant, *DCSLAB, Seoul National University*, Sep 2012 - Aug 2019

- Researched for high performance and scalability of memory management systems.
- Developed memory access pattern tracers and automated memory hint injection systems.
- Developed a NUMA-aware RCU extension and a scalable virtual memory system using it.
- Developed a physically contiguous memory allocator for THP and DMA.

Linux Kernel Contributor, *Korea Open Source SW Lab*,
Jan 2016 - May 2019 (part-time), Dec 2013 - Dec 2014 (full-time)

- Hacked/contributed to upstream Linux kernel project in full-time (2014) and part-time.
- Developed a fast, success-guaranteed contiguous memory allocator for Linux.
- Maintained a Korean translation of the Linux kernel memory model documentation.

Education

- Ph.D., Computer Science and Engineering at Seoul National University (Aug 2019)
- B.S., Electrical Engineering / Information and Computer Engineering (dual degree) at Ajou University (Feb 2009)

Selected Research and Projects

Data Access-aware Linux Kernel Memory Management Optimizations

- Developing/maintaining DAMON: kernel subsystem for access-aware system operations.
- Being used for memory auto-scaling (Aurora Serverless v2) and tiering (SK hynix HMSDK).
- Published papers in *MIDDLEWARE'19 industry* and *HPDC'22*.

Automated Data Access Pattern Monitoring and Access-aware Memory Management

- Developed static data access pattern analysis and automated hint injection.
- Presented in *FAST'19 WiP session* and published a paper in *HotStorage'19*.

An RCU Extension for High Performance and Scalability of Updates

- Developed an RCU extension and a scalable memory management system with the extension.
- A paper published in *EuroSys'20*.

Guaranteed Contiguous Memory Allocator

- Developed a Contiguous Memory Allocator that guarantees success and short latency.
- Papers published in *EWiLi 2015* and *Transactions on Computers*.

Selected Publications And Presentations

- **DAMON Presentation Talks.** SeongJae Park. *The Linux Kernel Summit, 2019-2023, Linux Storage | Filesystem | MM & BPF Summit, 2023-2024, Kernel Memory Management Microconference at LPC, 2024, Open Source Summit North America, 2023-2024, Open Source Summit Europe, 2023-2024*.
- **DAMON Community Meetups.** SeongJae Park. *Linux Plumbers Conference*, 2022-2023, Open Source Summit North America, 2024.
- **DAOS: Data Access-aware Operating System.** SeongJae Park, Madhuparna Bowmik, Alexandru Uta. *ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, June 2022.
- **An HTM-Based Update-side Synchronization for RCU on NUMA systems.** SeongJae Park, Paul E. McKenney, Laurent Dufour, Heon Y. Yeom. *ACM European Conference on Computer Systems (EuroSys)*, April 2020.
- **Profiling Dynamic Data Access Pattern with Controlled Overhead and Quality.** SeongJae Park, Yunjae Lee, Heon Y. Yeom. *ACM/IFIP International Middleware Conference (MIDDLEWARE) Industry*, December 2019.
- **Automating Context Based Access Pattern Hint Injection for System Performance and Swap Storage Durability.** SeongJae Park, Yunjae Lee, Heon Y. Yeom. *USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage)*, July 2019.
- **GCMA: Guaranteed Contiguous Memory Allocator.** SeongJae Park, Minchan Kim, Heon Y. Yeom. *Transactions on Computers (TC)*, March 2019.
  The Linux Kernel Summit, November 2018.
- **Scalable Serializable Snapshot Isolation for Multicore Systems.** Hyuck Han, SeongJae Park, Hyungsoo Jung, Alan Fekete, Uwe Rohm, Heon Y. Yeom. *IEEE 30th International Conference on Data Engineering (ICDE)*, March 2014.