講題：

Multi-Channel Architecture-based FTL for Reliable and High-Performance SSD

講綱：

everal excellent researches have been proposed to improve the performance of solid-state drives (SSDs) by exploiting I/O parallelism of multi-channel architecture. However, these researches do not fully explore the internal parallelism and do not take wear leveling into consideration. In our work, I/O performance is further improved by interleaving requests in channel level and striping sub-requests in plane level. A wear-leveling-aware distributed garbage collector is proposed to improve SSD lifetime and reclamation efficiency. To balance the utilization of user space among all channels, data migration is performed implicitly during channel selection and explicitly during garbage collection. To the best of our knowledge, this is the first work on the design of distributed garbage collector for multi-channel flash-memory storage system. The experimental results showed that the proposed scheme can achieve good wear leveling and improve the overall performance by 34% for the Windows workload, 56.5% for the Linux workload, 88.4% for the multimedia workload, and 9.3% for the On-Line Transaction Processing (OLTP) workload under the two-die-two-plane architecture, compared with the related work.