Exploring SSD Suitable Allocation Schemes Incompliance with Workload Patterns

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Abstract : Whether the data has been well parallelized is an important factor in the Solid-State-Drive (SSD) performance. SSD parallelization is affected by allocation scheme and it is directly connected to SSD performance. There are dynamic allocation and static allocation in representative allocation schemes. Dynamic allocation is more adaptive in exploiting write operation parallelism, while static allocation is better in read operation parallelism. Therefore, it is hard to select the appropriate allocation scheme when the workload is mixed read and write operations. We simulated conditions on a few mixed data patterns and analyzed the results to help the right choice for better performance. As the results, if data arrival interval is long enough prior operations to be finished and continuous read intensive data environment static allocation is more suitable. Dynamic allocation performs the best on write performance and random data patterns.