

1 Flash-Based SSDs

Vocabularies

1. Solid-State Storage

- Is a type of non-volatile computer storage that stores and retrieves digital information using only electronic circuits, without any involvement of moving mechanical parts

2. NAND-Based Flash

- Is an electronic non-volatile computer memory storage medium using NAND-gate that can be electrically erased and reprogrammed.

3. Flash Page

4. Flash Block

5. Single-Level Cell

6. Multi-Level Cell

7. Triple-Level Cell

8. Banks

9. Planes

10. Pages

11. Wear Out

12. Head Crash

13. Disturbance

14. Flash Transition Layer

15. Wear Leveling

16. Direct Mapped

17. Logging

18. Logical Block Address

19. Program Disturbance

20. In-Memory Mapping Table

21. Garbage
22. Garbage Collection (GC)
23. Dead Blocks
24. Cache Flush
25. Trim
26. Overprovision
27. Background
28. Page-Level FTL
29. Hybrid Mapping
30. Log Blocks
31. Switch Merge
32. Partial Merge
33. Full Merge

1.1 Storing a Single Bit

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1.2 From Bits to Banks / Planes

1.3 Basic Flash Operations

1.4 From Raw Flash to Flash-Based SSDs

1.5 FTL Organization: A Bad Approach

1.6 A Log Structured FTL

1.7 Garbage Collection

1.8 Mapping Table Size

1.9 Hybrid Mapping

1.10 Wear Leveling

1.11 SSD Performance And Cost