



# Forum F1B/F2B: Flash Memory- Based Architectures: A Technical Discussion

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## Forum F1B/F2B: Flash Memory-Based Architectures: A Technical Discussion

- Key Firmware Architectural Issues:
  - Data integrity, availability and reliability
  - How performance affects cost and architecture
  - Flash Translation Layer (FTL)
  - Standards efforts regarding flash allocation defragmentation issues (e.g., the TRIM command)
  - Interface (e.g., SATA/SAS/USB v. PCIe)
  - How and where ECC is performed

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- You will hear discussions related to these topics throughout the conference
- These topics must be addressed in some fashion by any flash-based device
- Today's Goal:

*Gain an understanding of these topics*

## Forum F1B/F2B: Flash Memory-Based Architectures: A Technical Discussion

- Four morning talks (F1B):
  1. Michael Abraham, Micron: architectural overview
  2. Gary Orenstein, Fusion-io: Flash Translation Layer
  3. Jeremy Werner, SandForce: MLC in the enterprise; end-to-end data protection
  4. Holly Frost, Texas Memory Systems: SLC in the enterprise; controller “secret sauce”

## Forum F1B/F2B: Flash Memory-Based Architectures: A Technical Discussion

- Four afternoon talks (F2B):
  1. Eyal Bek/Avi Klein, SanDisk: multitasking firmware
  2. Swapna Yasarapu, STEC: MLC in the enterprise; benchmarking SSDs
    - Up a notch in the “storage stack”:
  3. Sudipta Sengupta, Microsoft Research: application software layer: flash performance innovation
    - Up another notch in the “storage stack”:
  4. Andy Walls, IBM Almaden Research Center: Data Center architecture based on SSD architecture



## Forum F1B/F2B: Flash Memory-Based Architectures: A Technical Discussion

- All conference presentations will eventually be on the FMS website
- All F1B/F2B presentations are currently on my website at

[www.FlashCornucopia.com](http://www.FlashCornucopia.com)

- This site also includes presentations from my FMS sessions going back to 2007, and much more



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- About myself:
  - Independent consultant
  - Software and firmware developer and designer
  - Specialties: storage and storage interfaces
    - Current focus: flash memory and USB
  - Experienced with intellectual property and patents
  - Berg Software Design: [www.bswd.com](http://www.bswd.com)