



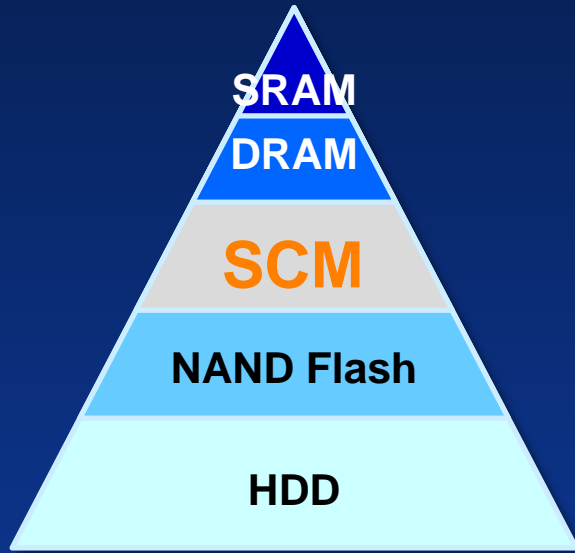
There is no alternative

Amigo (Keiichi) Tsutsui
Sony Corporation

What is SCM application

* Sony and Micron presented the technology in ISSCC2014

Expected Future

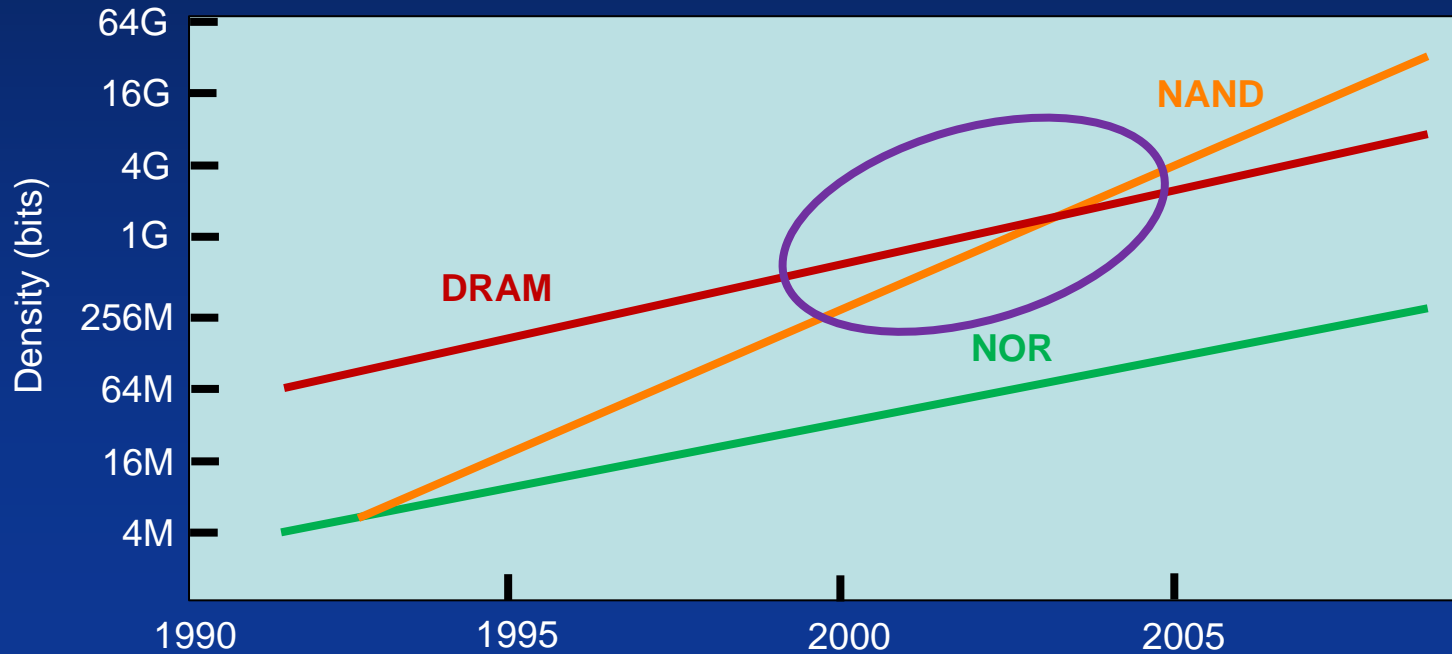


- SCM is main application for ReRAM technologies
- SCM Requirement
 - Performance
Between DRAM and NAND
 - Density (bit cost)
Between DRAM and NAND

Success is likely if there is no alternative to realize quite new application

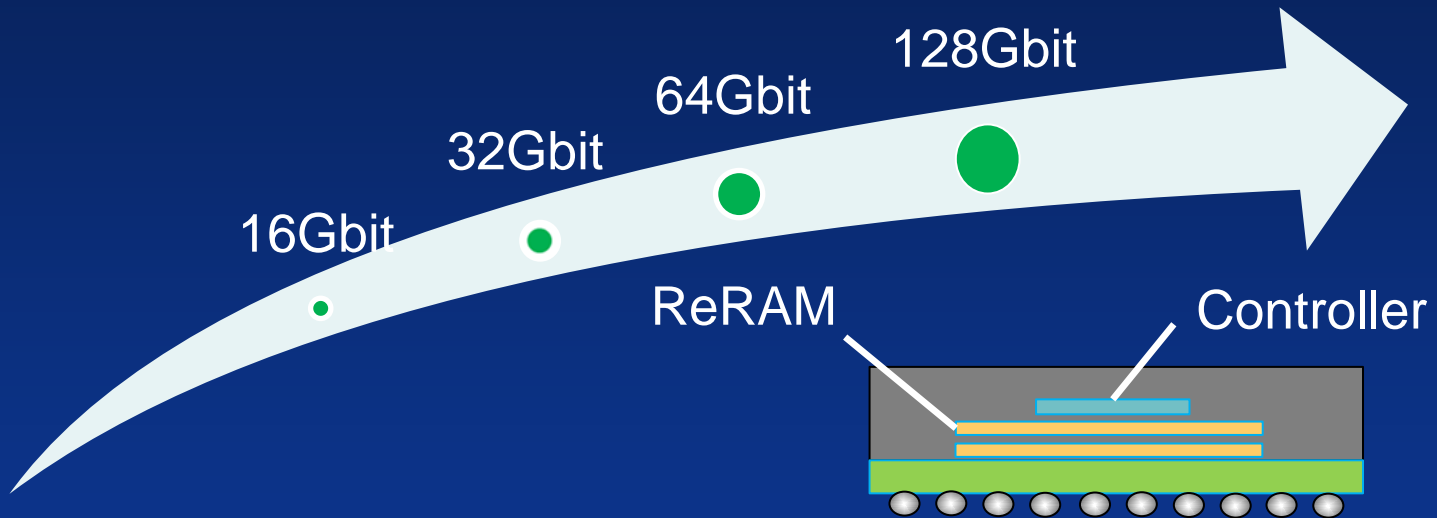
Memory technologies trend

- DRAM use to be the technology driver until early 2000
- In kickoff point, NAND market was very small, but it has been rapidly growing from 2000
- NAND flash card applications were just “there is no alternative”



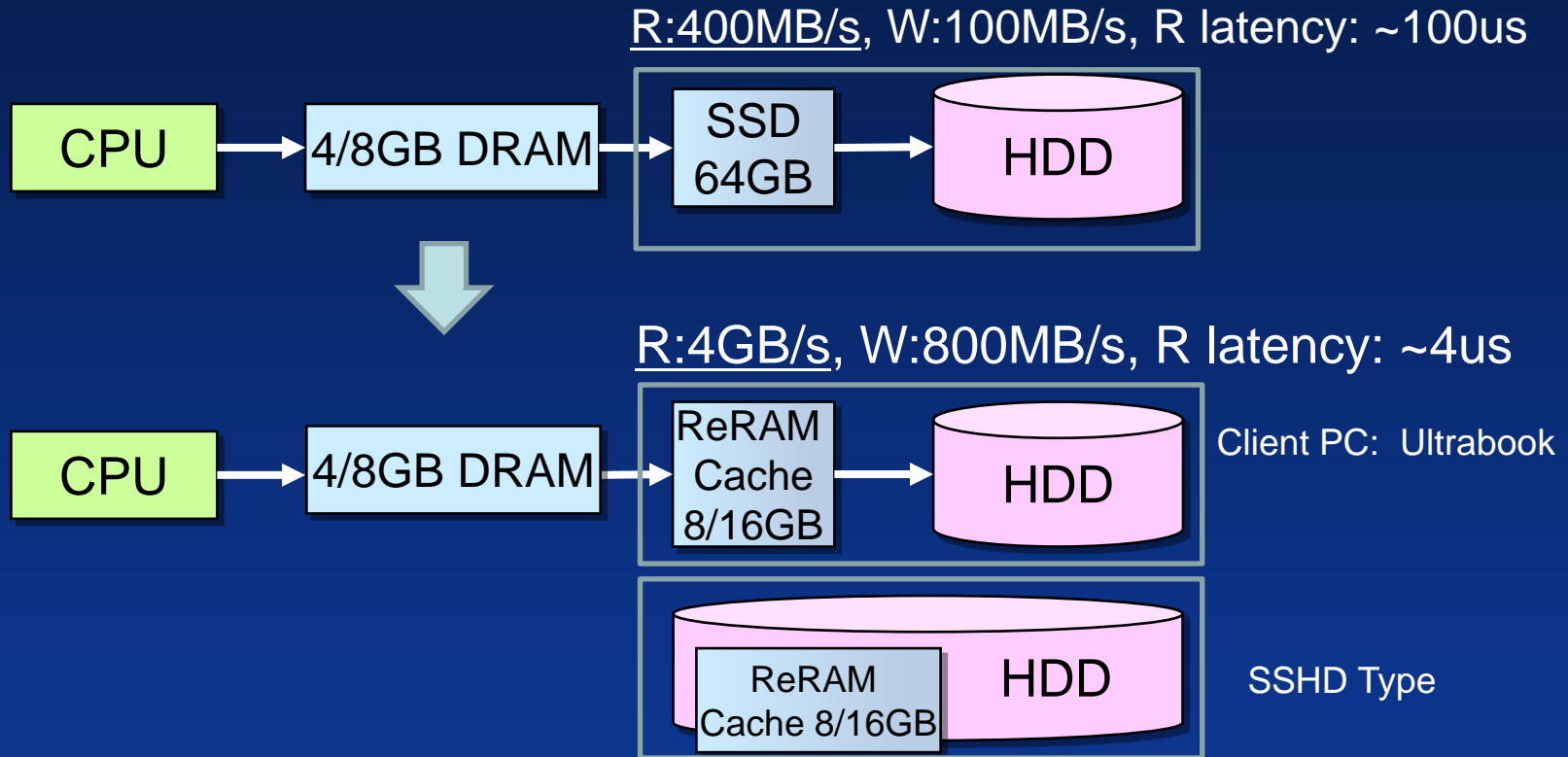
DRAM I/F or Storage I/F

- As assumption, NVM needs controller technology for scaling
- DRAM I/F is deterministic with low latency
- SCM shall not use DRAM I/F, but storage I/F



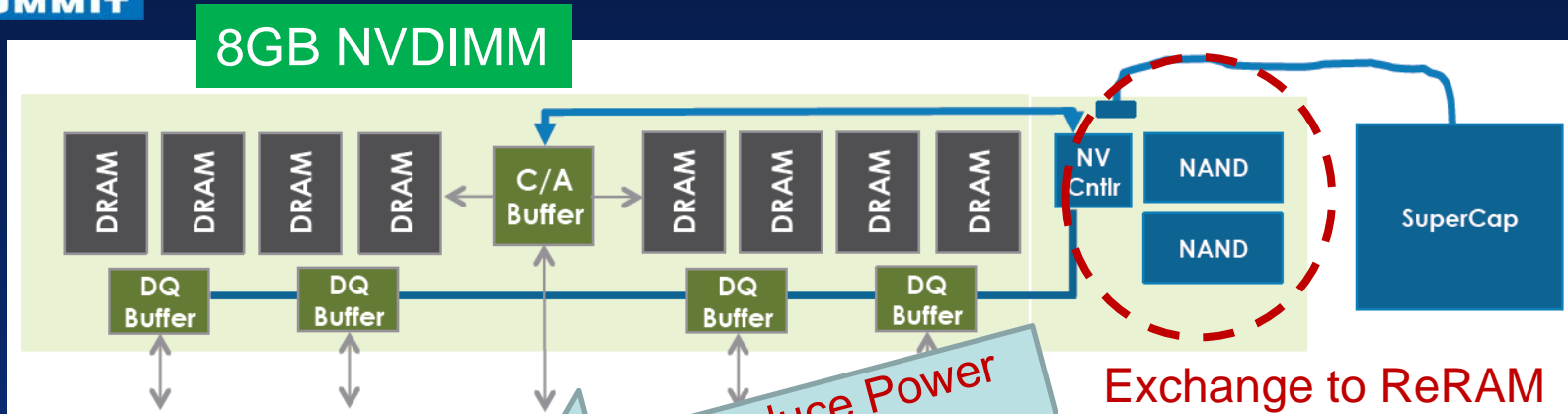
- ✓ Storage I/F doesn't care for 1 us latency
- ✓ SCM application has to differentiate from NAND application through storage I/F

Example (1) Fast Boot for Client



**In boot up,
SSD takes 10s and ReRAM cache takes 1s to transfer 4GB data**

Example (2) Fast Boot and Small Size



**75% Reduce Power
Smaller Cap**





Thank you!

For questions, please contact
Amigo Tsutsui
Keiichi.Tsutsui@jp.sony.com