



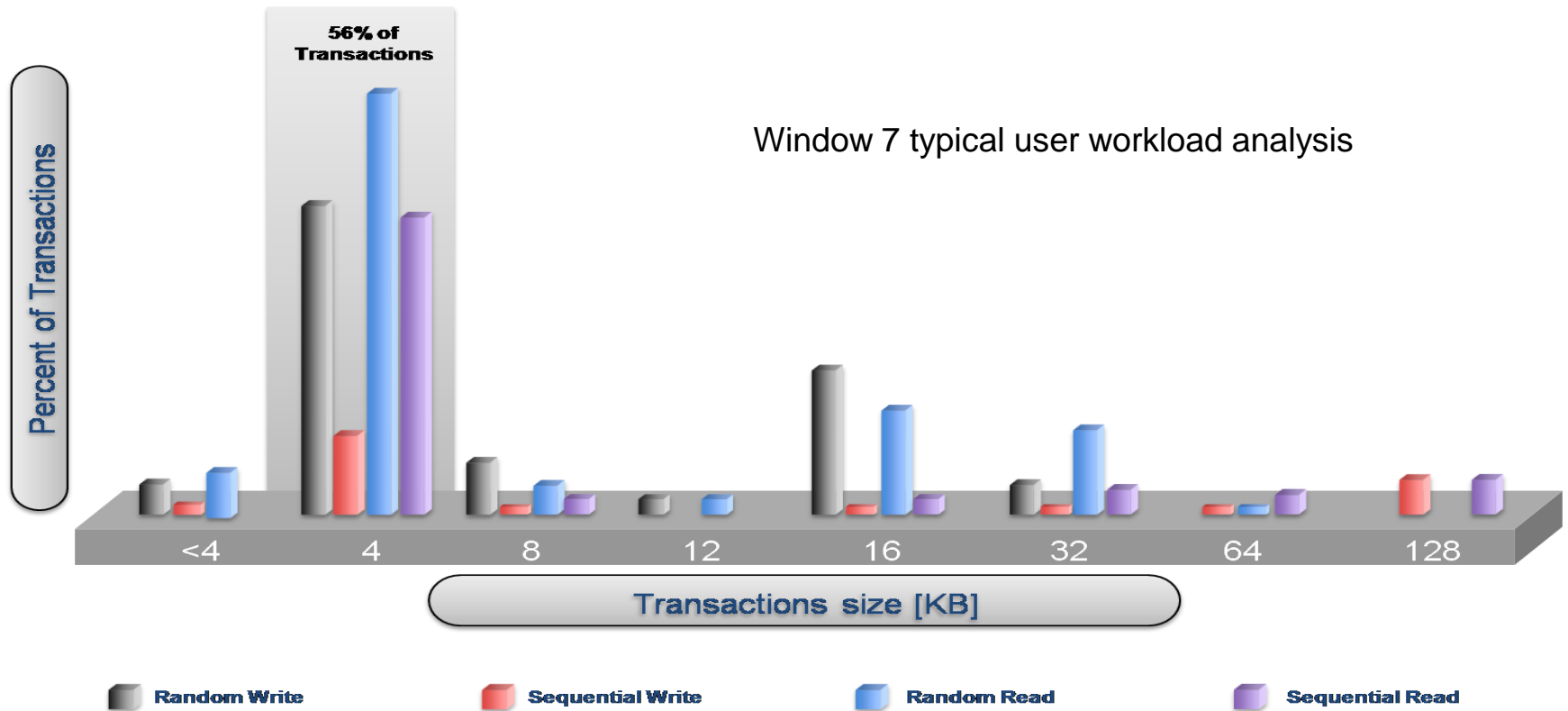
SSD with Hybrid NAND

Smart Controller pushing price barrier

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Which Metric Matters Most?

- Small Size Performance Matters
- Fast 4KB Performance is Better



- Does Performance Scale Go Linearly with What Users Feel?

Which Metric Matters Most?

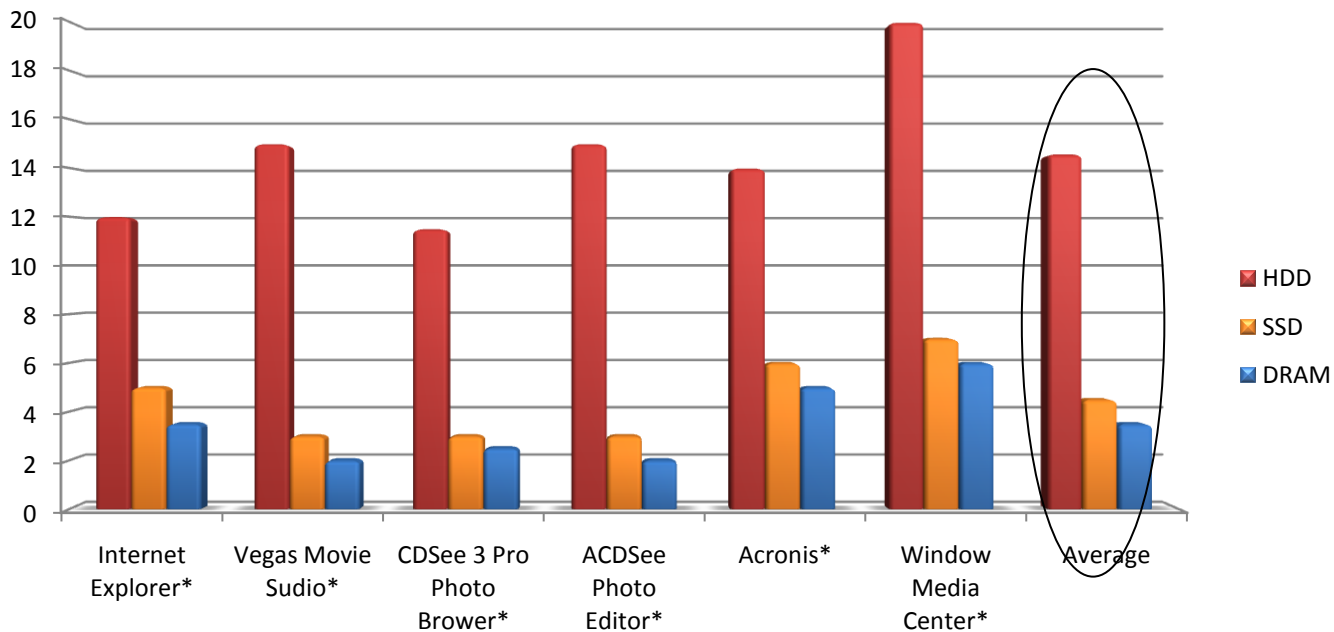
- Lots of Performance Comparison with HDD



- But no comparison between SSDs

What If the SSD Were Infinitely Fast?

- Cached DRAM data represent infinitely fast drive

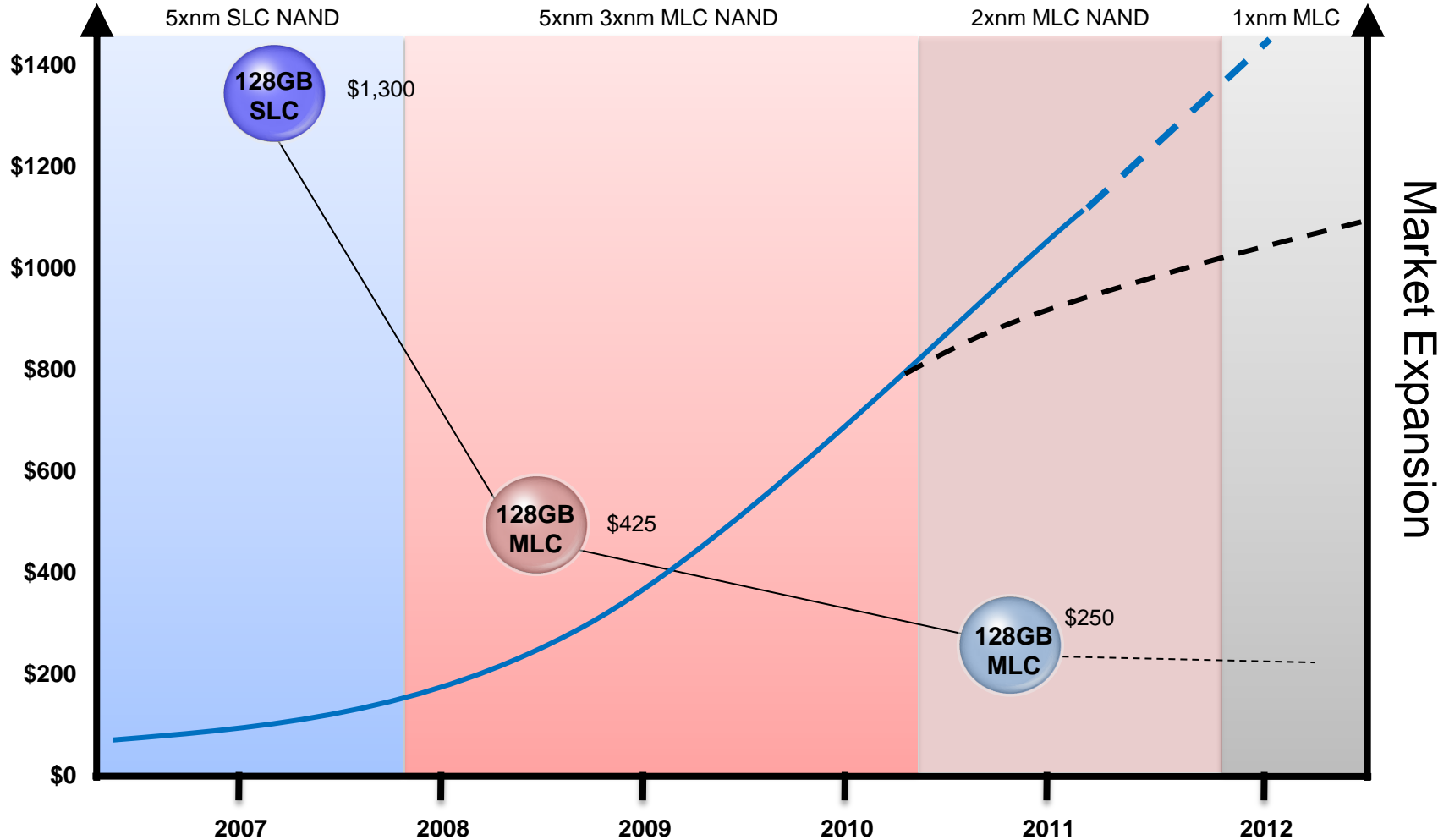


Difference between SSD and infinitely fast drive is small!!

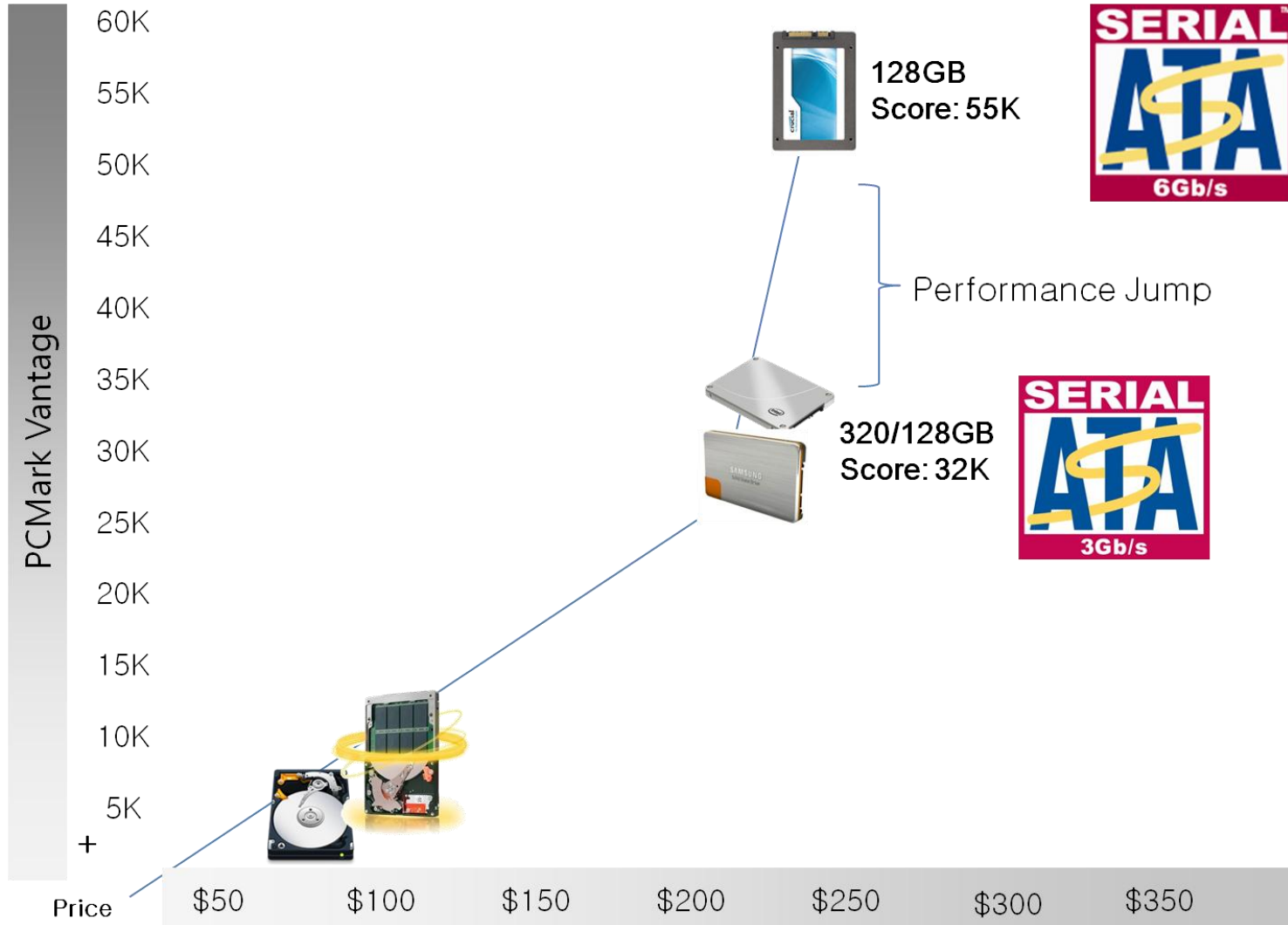
- Test system: Intel® Core™ i7-2600 8MB L3 3.4GHz P67, 4GB DDR3
- DRAM SSD Simulation Test Method: Launch an application to cache it in the dram and then exit & re-launch to measure the application launch time.
- Intel S320 300GB SSD is used for SSD. Seagate Momentus* 7200 rpm ST9500420AS 500GB is used for HDD

What Really Matters Today?

- Price were, is and will be the Key Driver

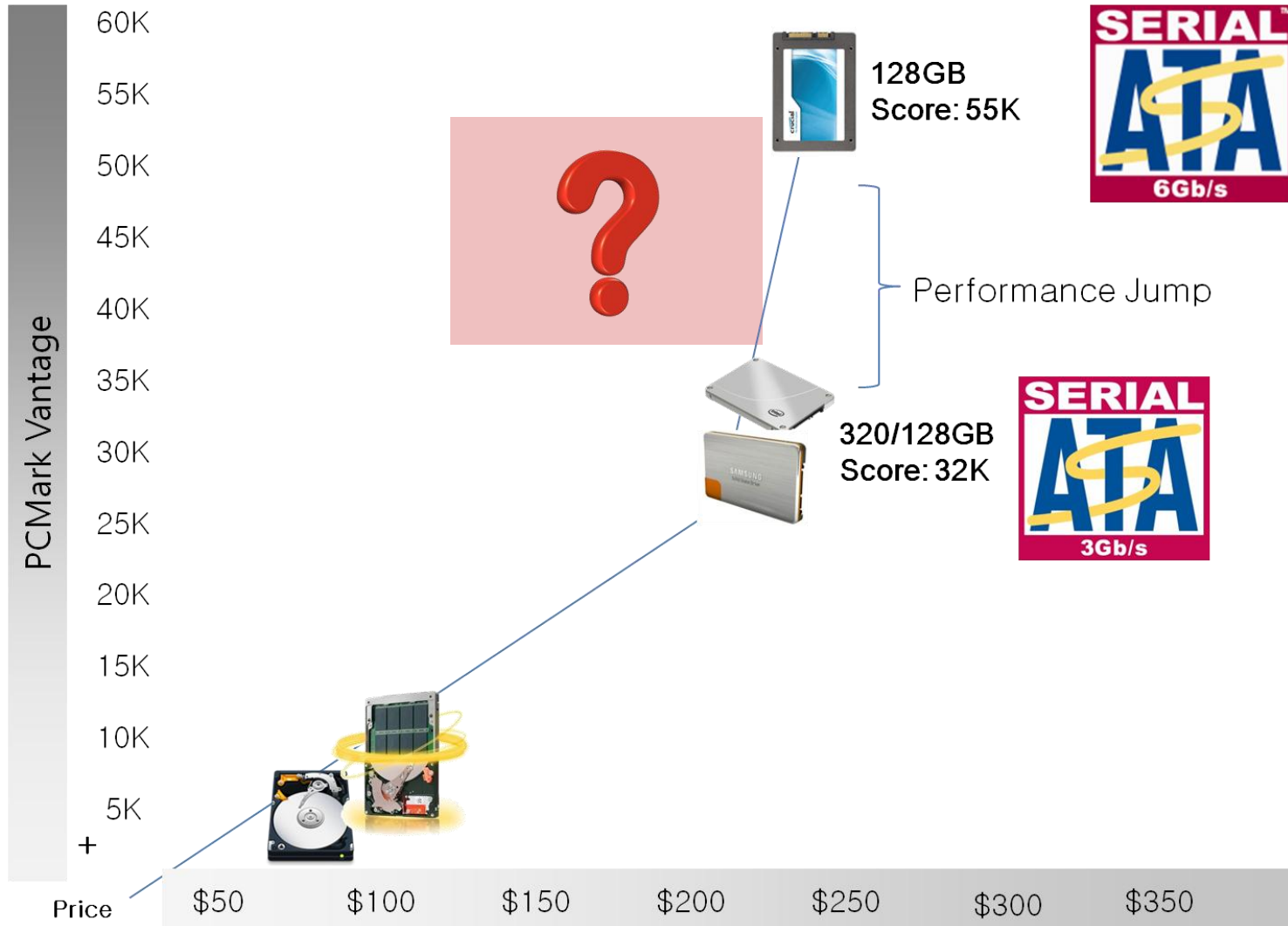


Any Room for Price Reduction without Trading off Performance

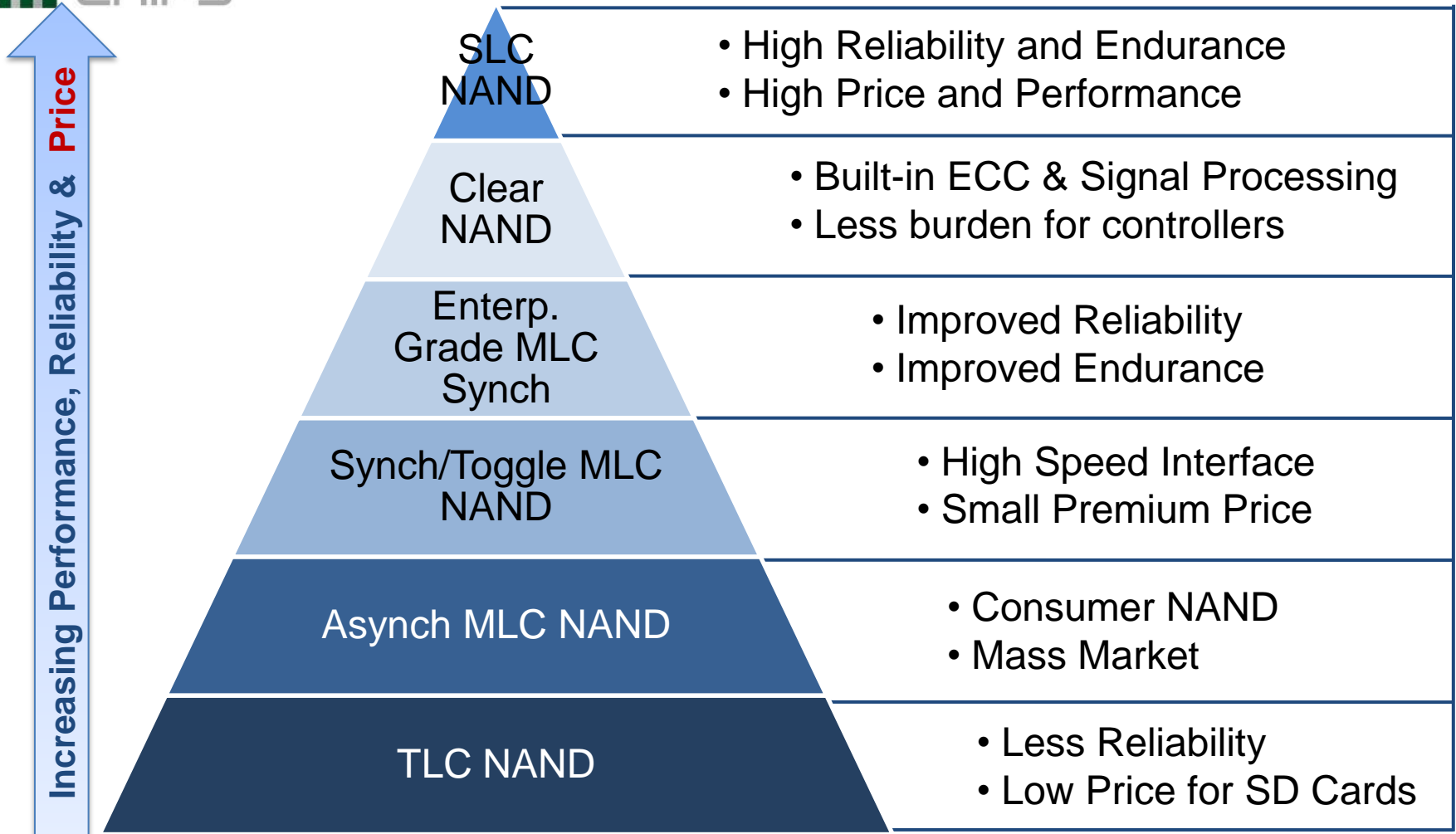


• Source: Price reference from Newegg.com

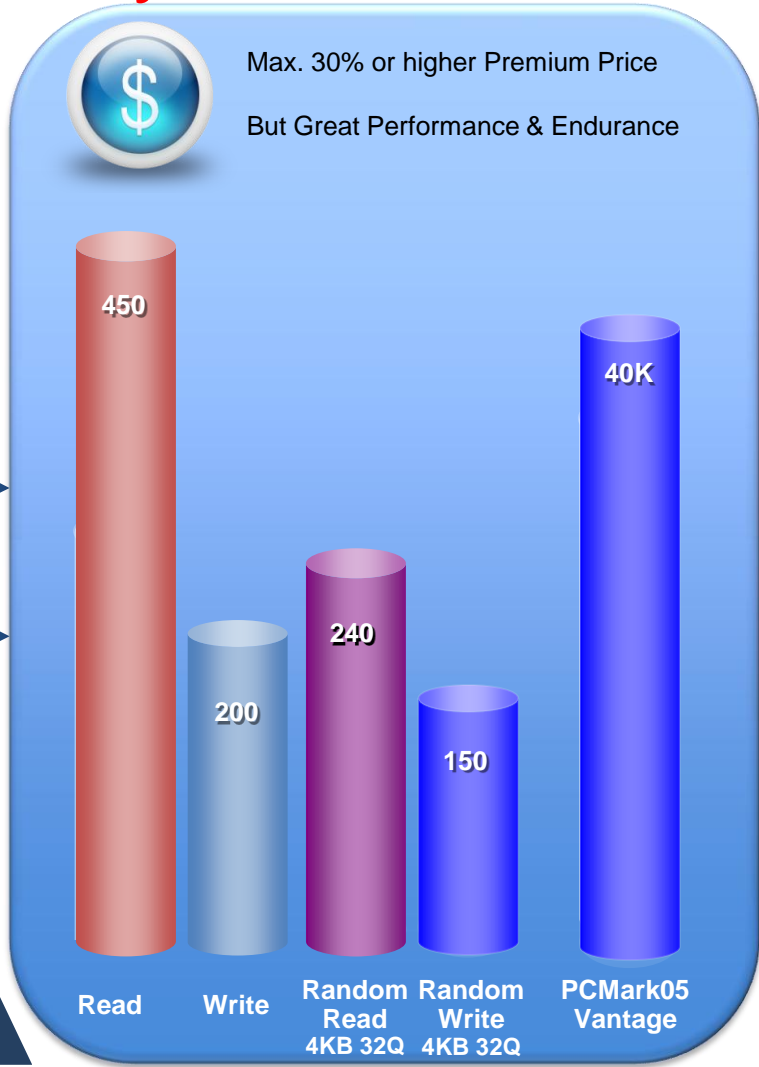
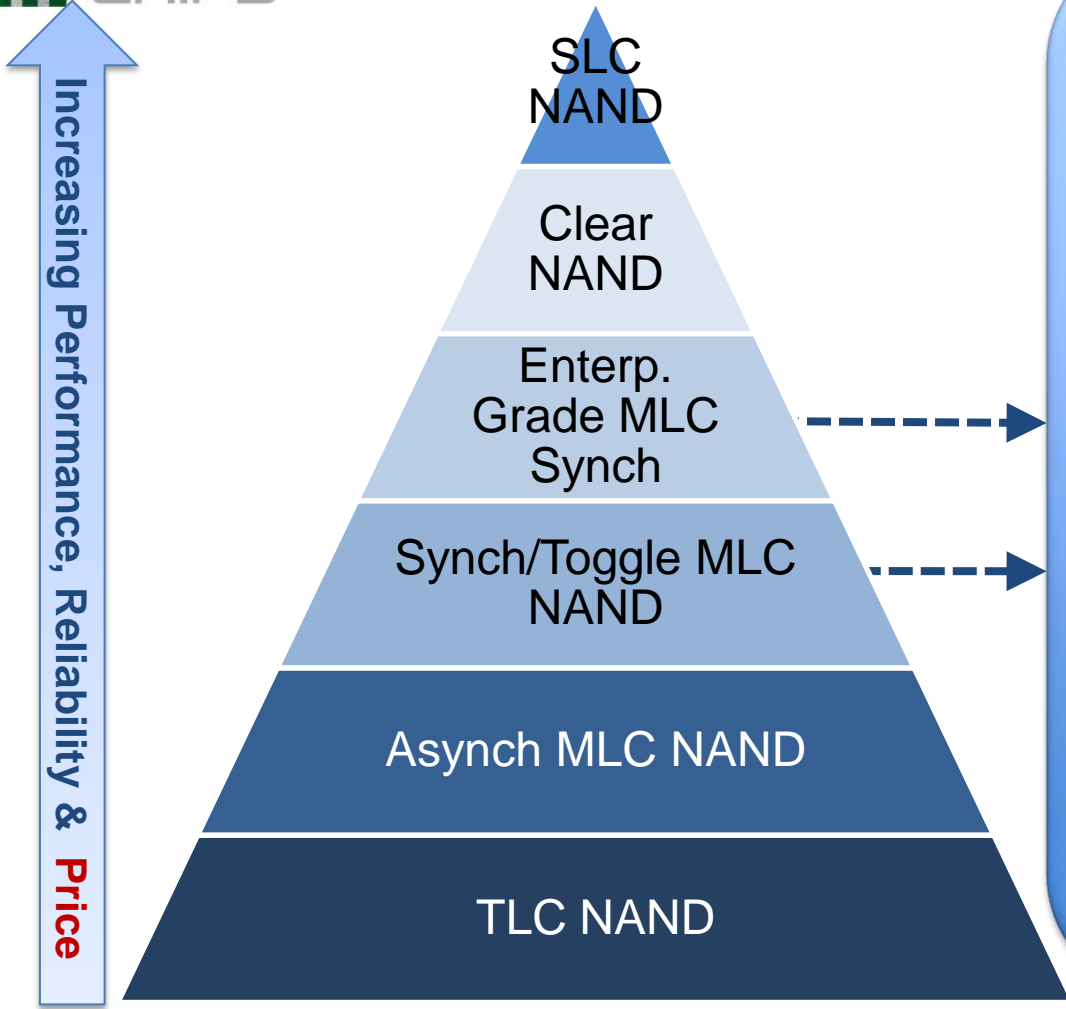
Any Room for Price Reduction without Trading off Performance



Various NANDs in Today's Market

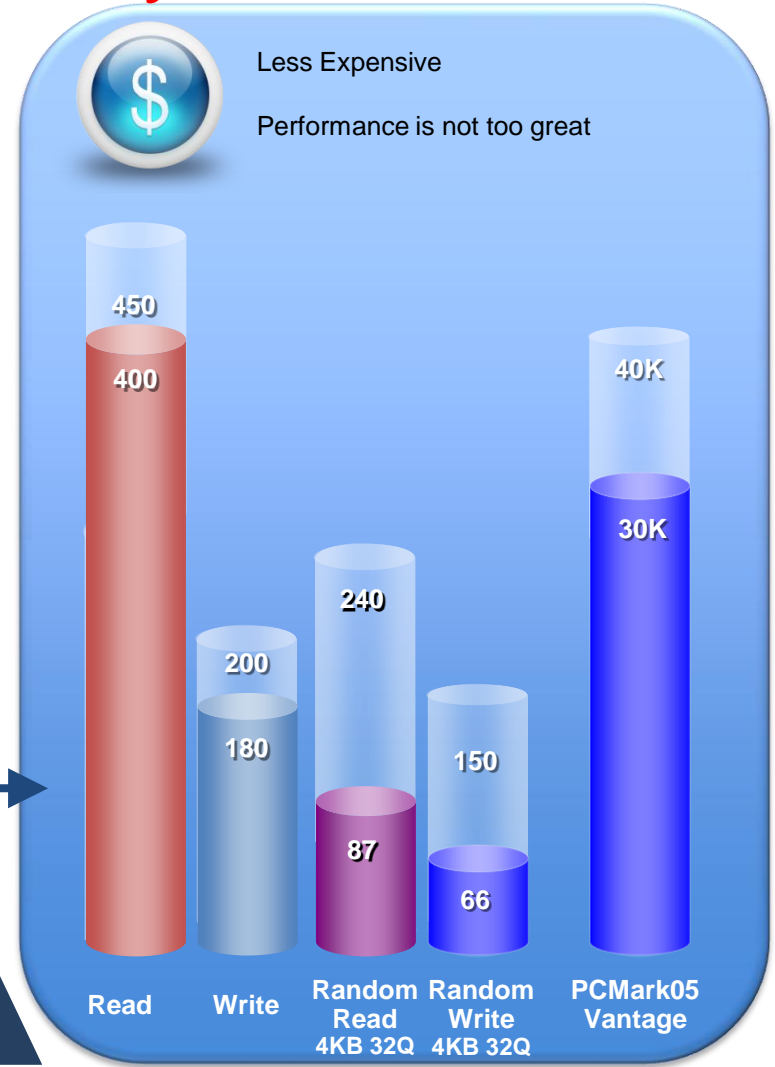
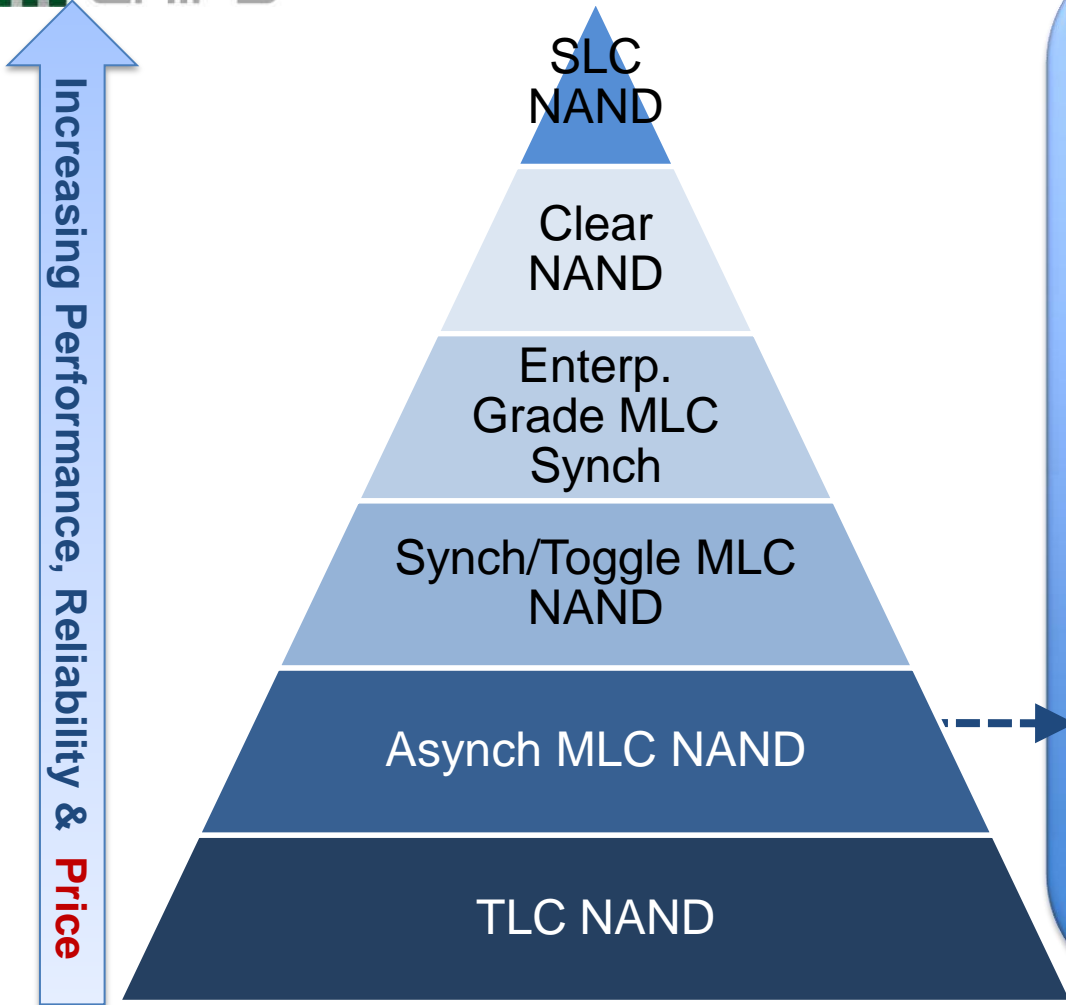


New Segments with Hybrid NAND



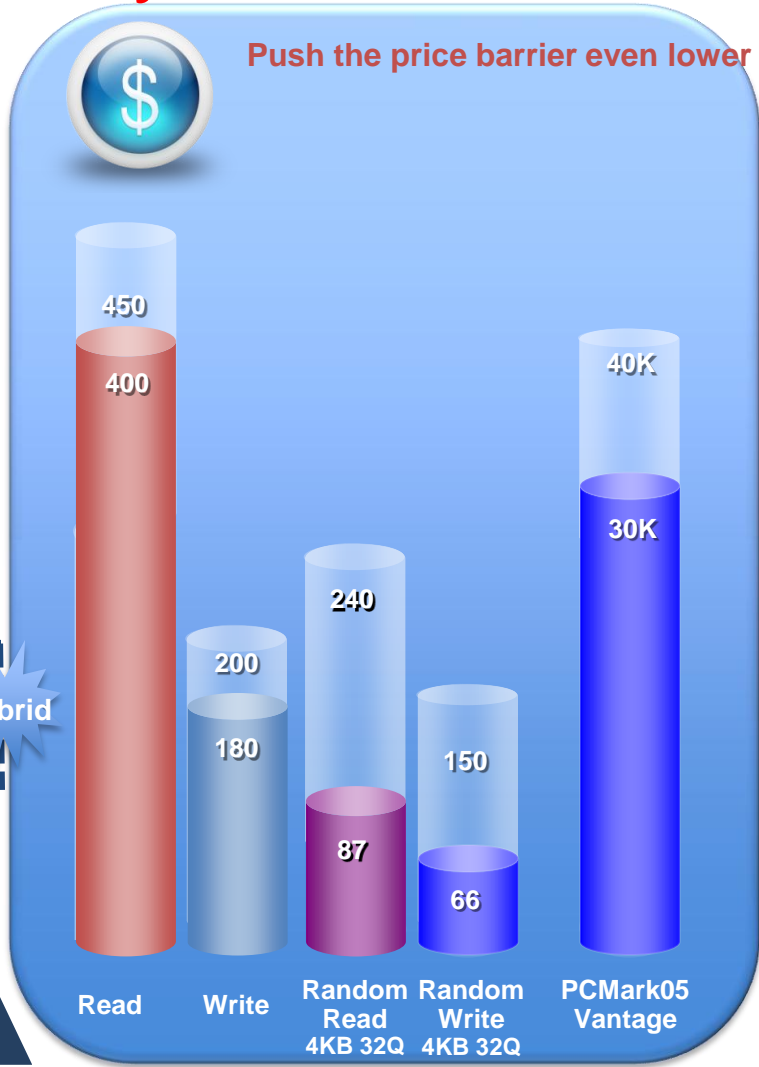
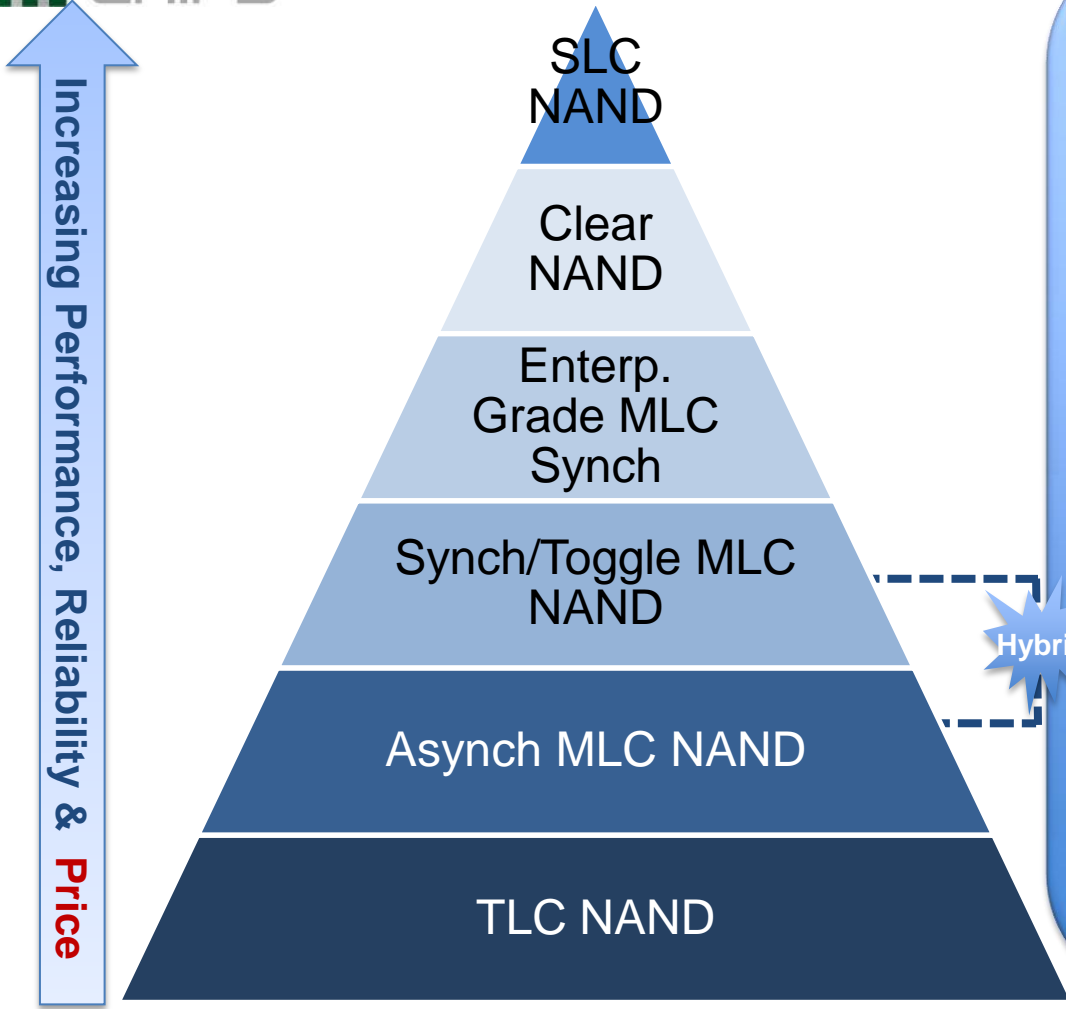
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- SATA 3, 128GB SSDs are tested. One with 25nm Synch NAND and the other with 34nm Asynch NAND.
- Hybrid NAND SSD performance is projected performance with internal simulation result.

New Segments with Hybrid NAND



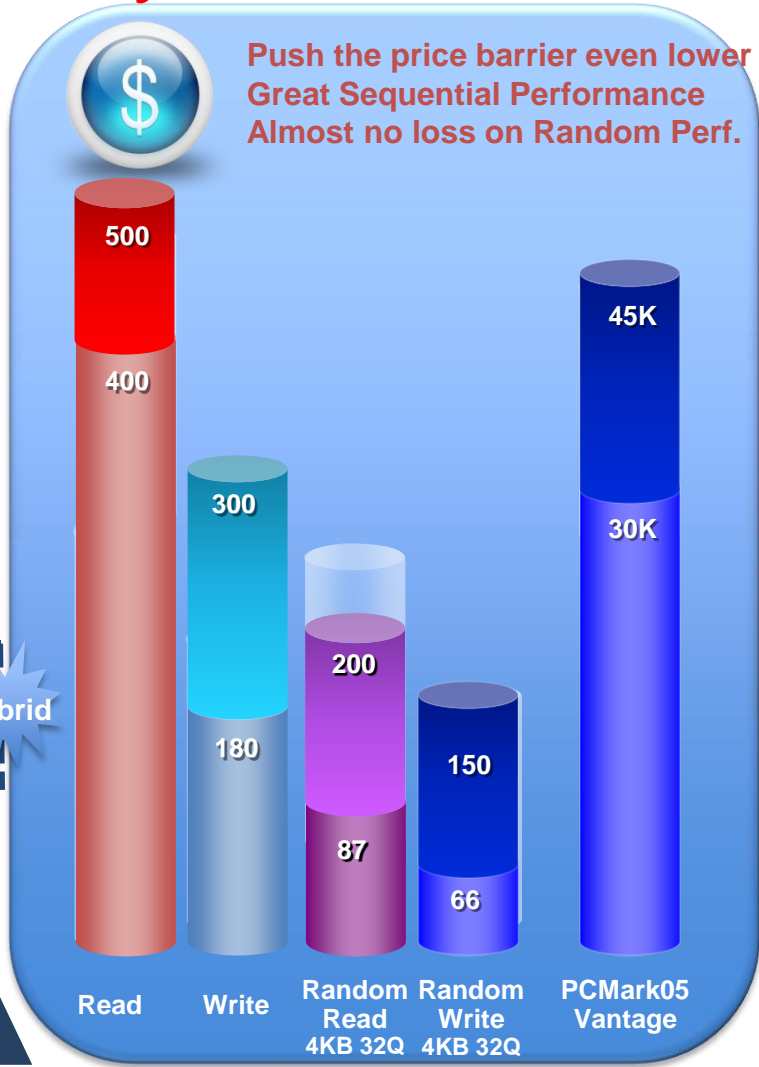
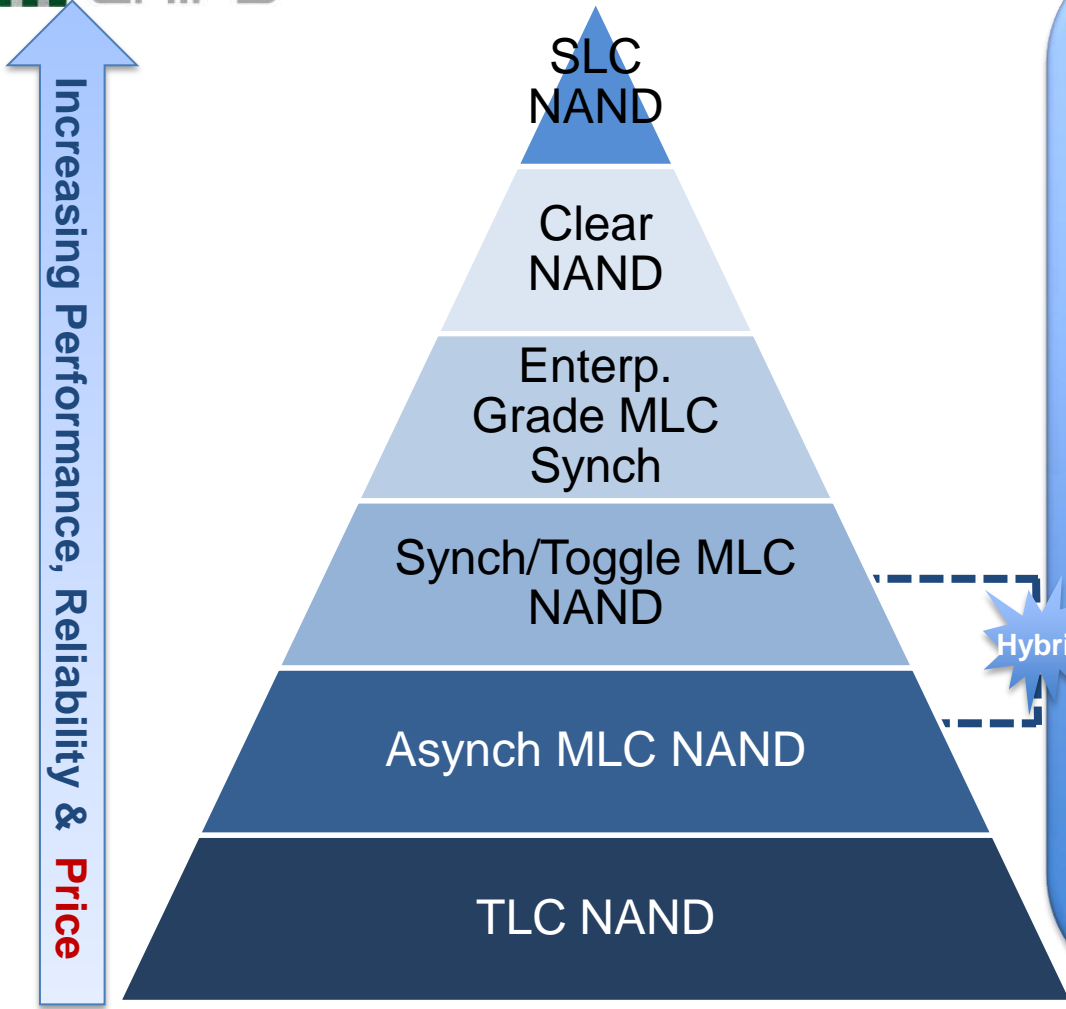
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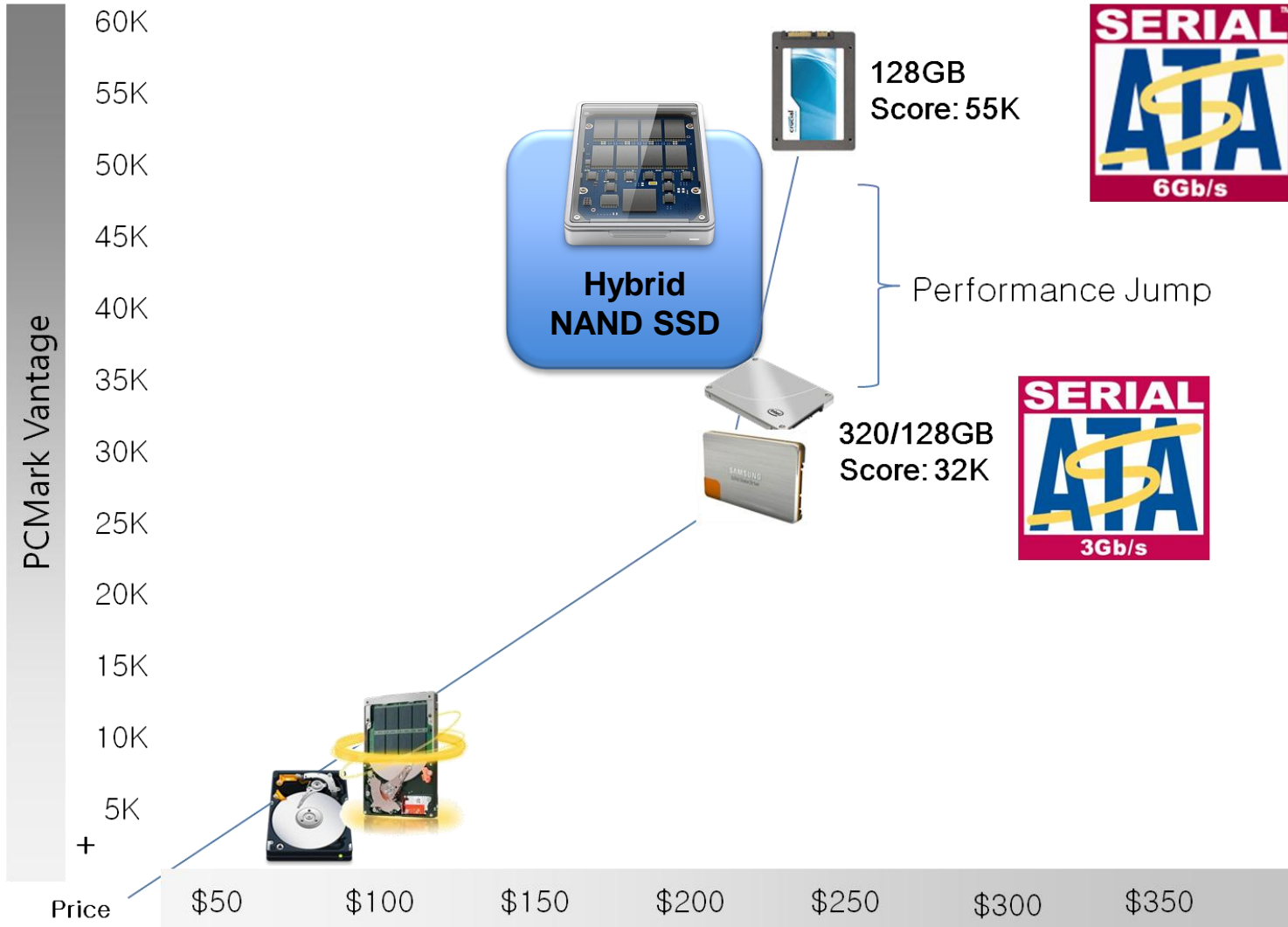
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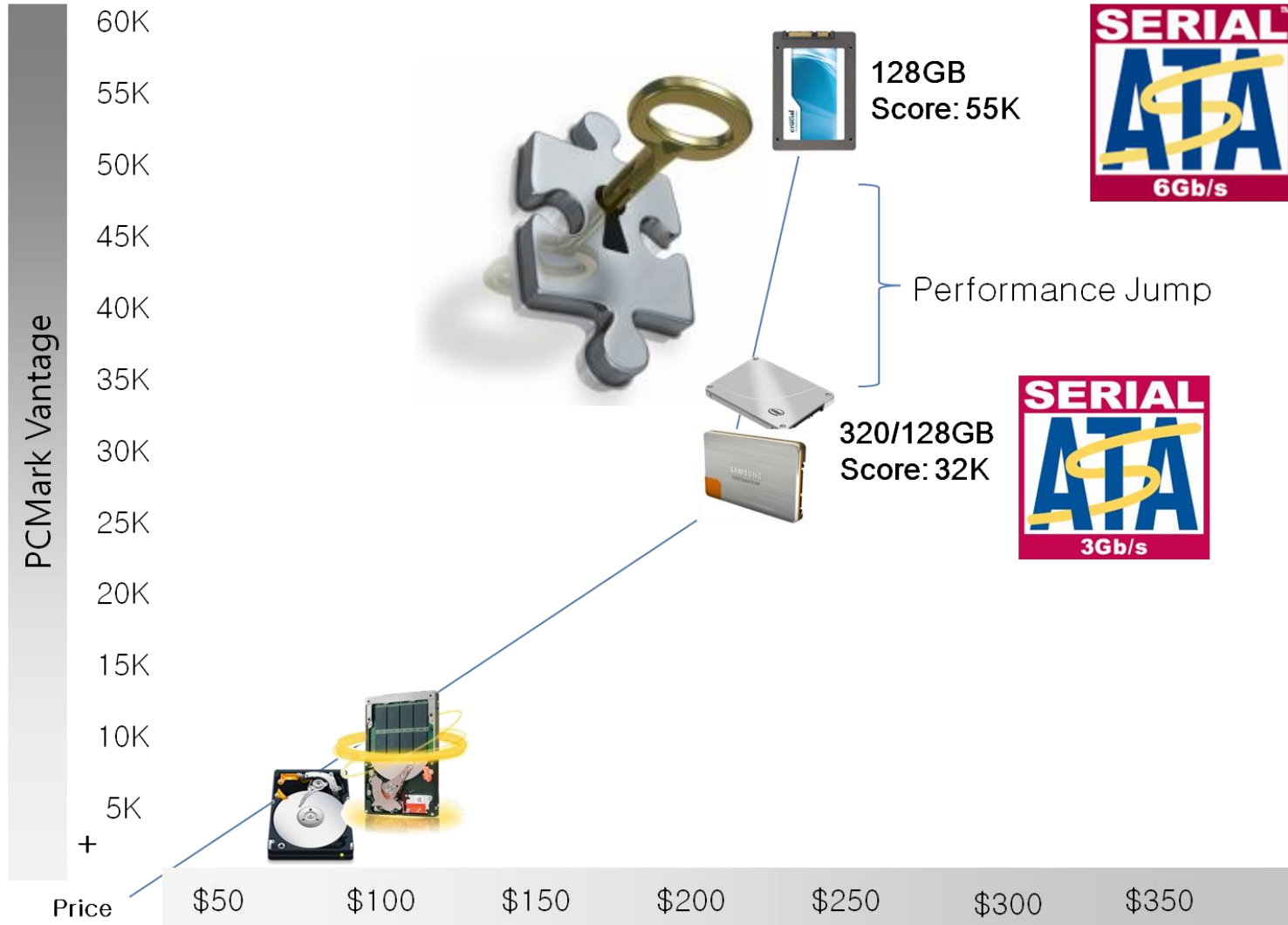
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Smart Controller is Key to New Price Segment

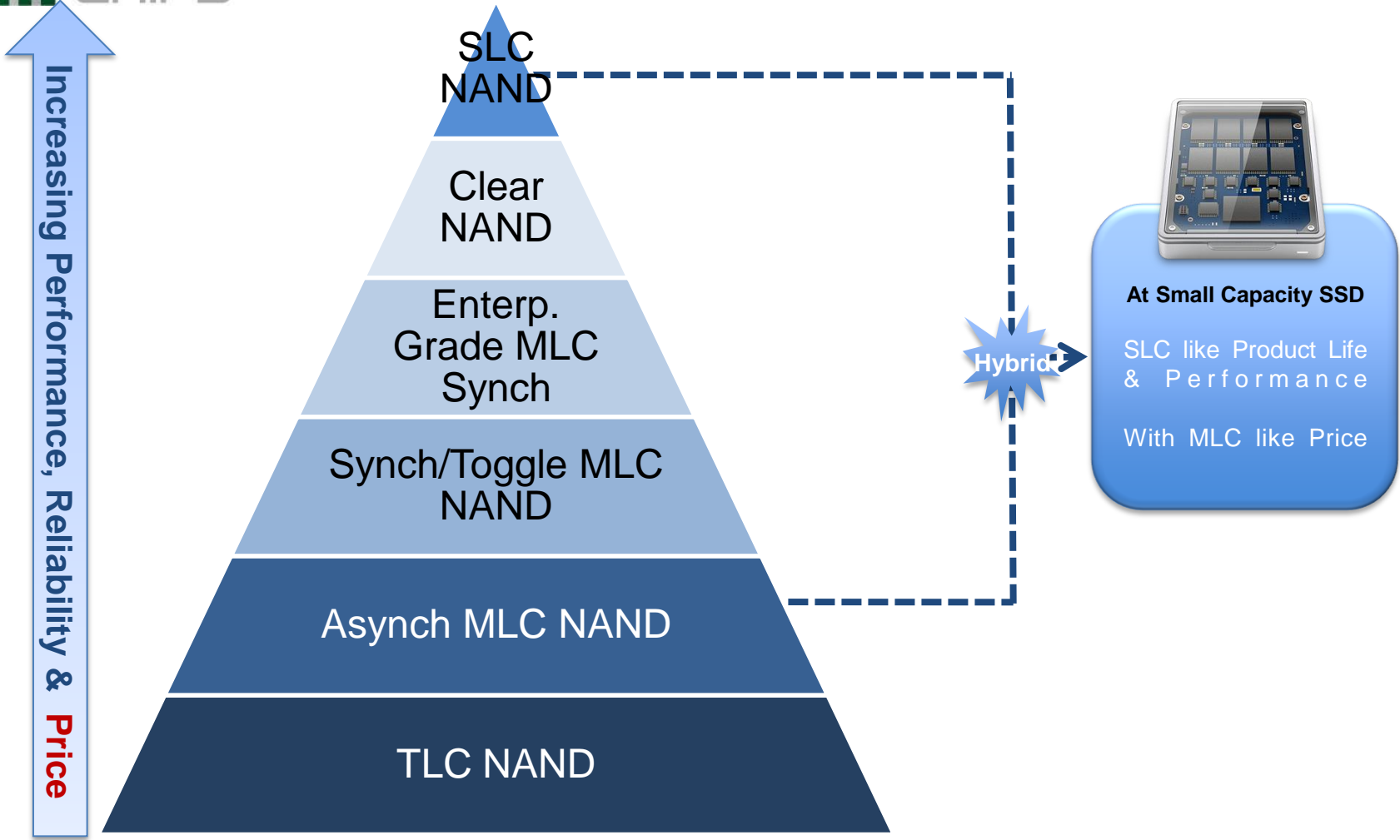


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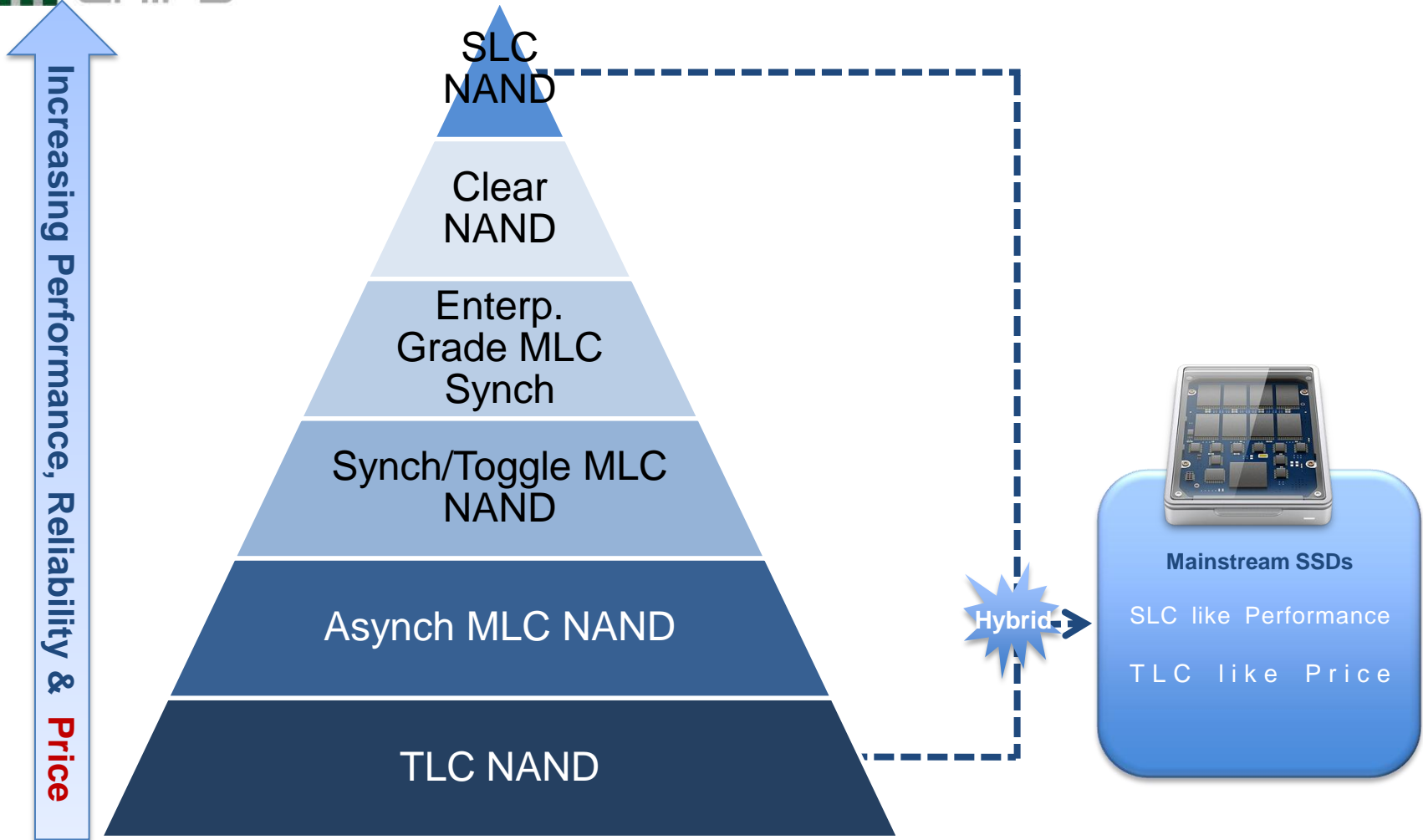
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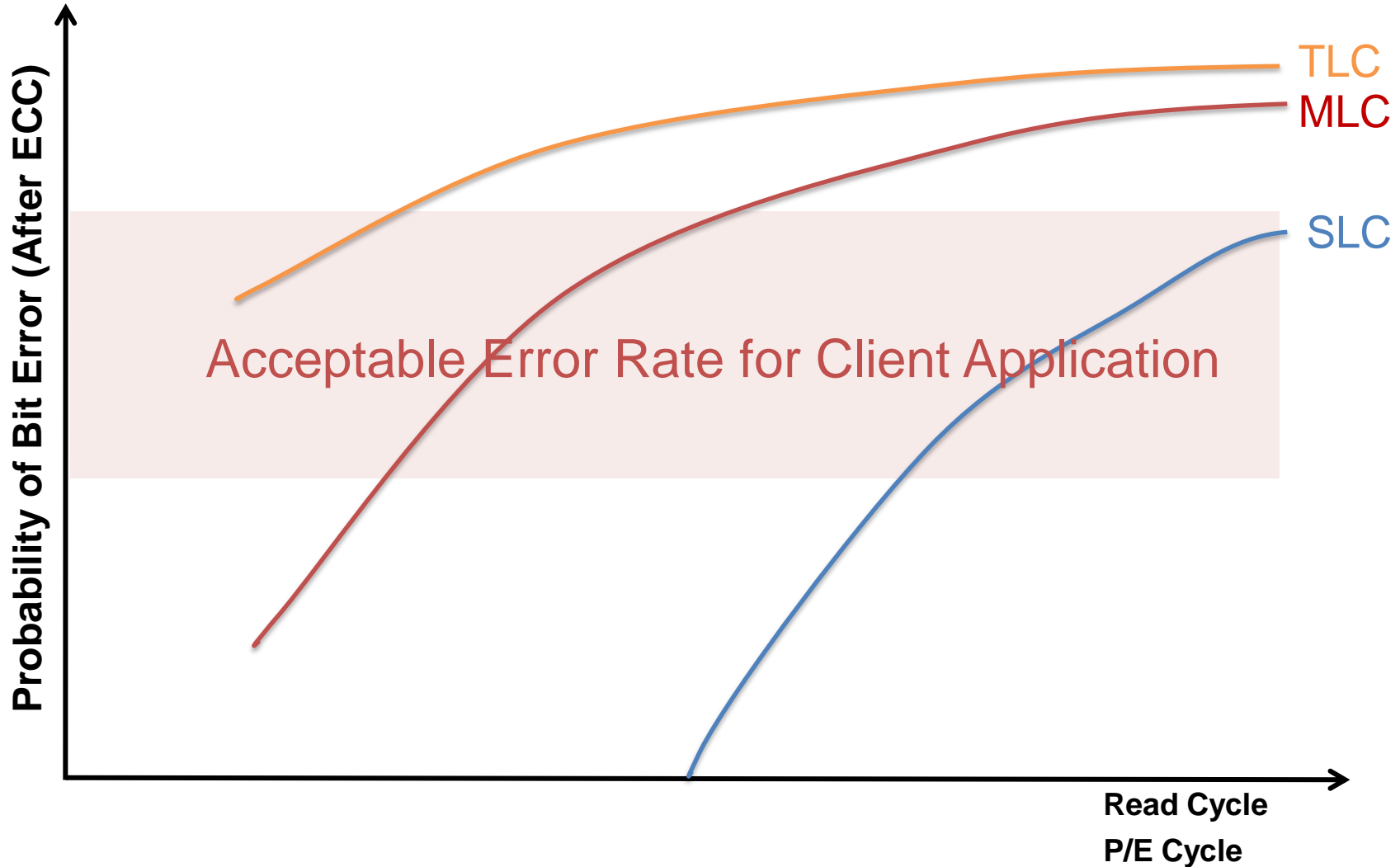
New Segments with Hybrid NAND



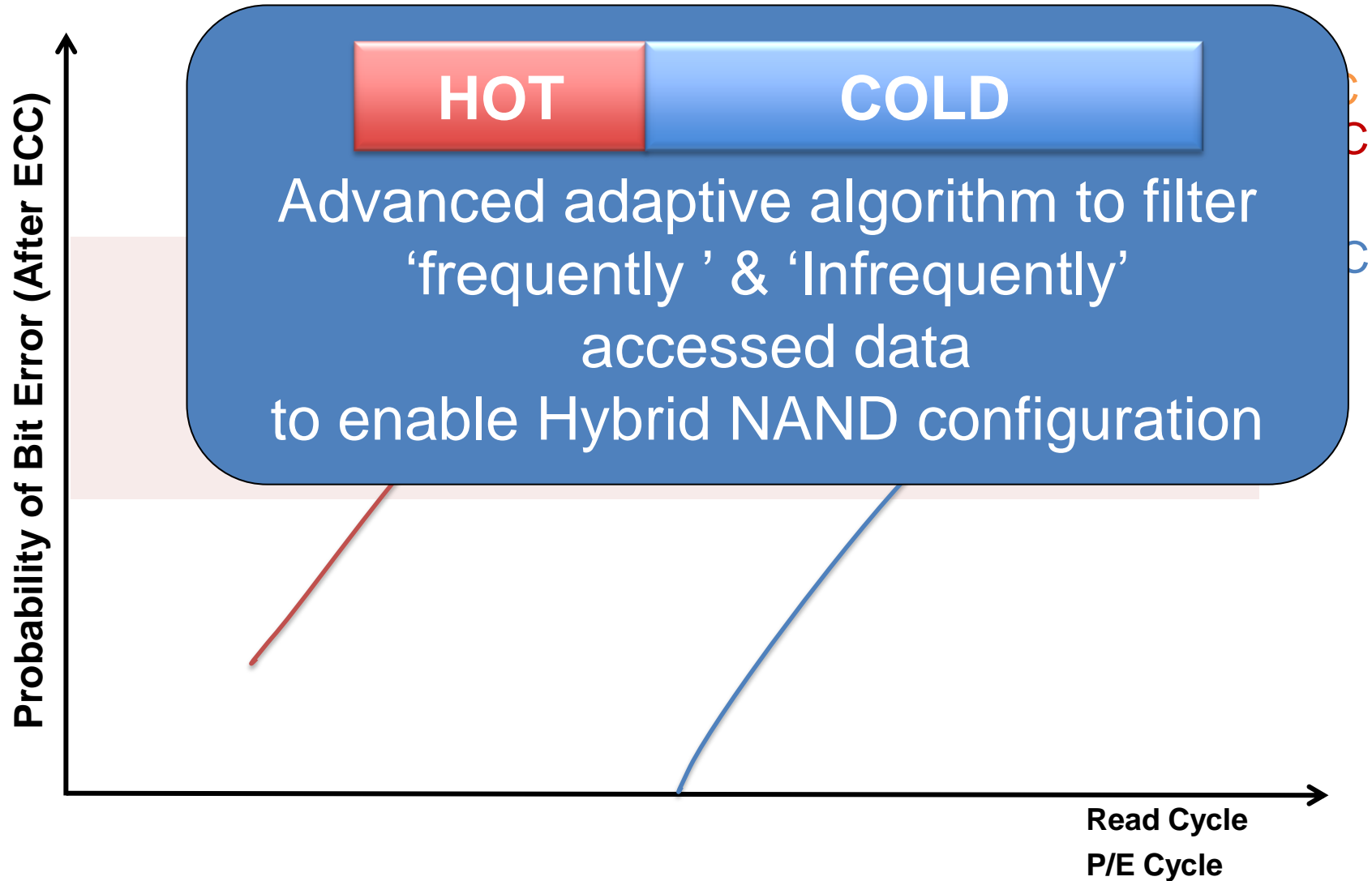
New Segments with Hybrid NAND



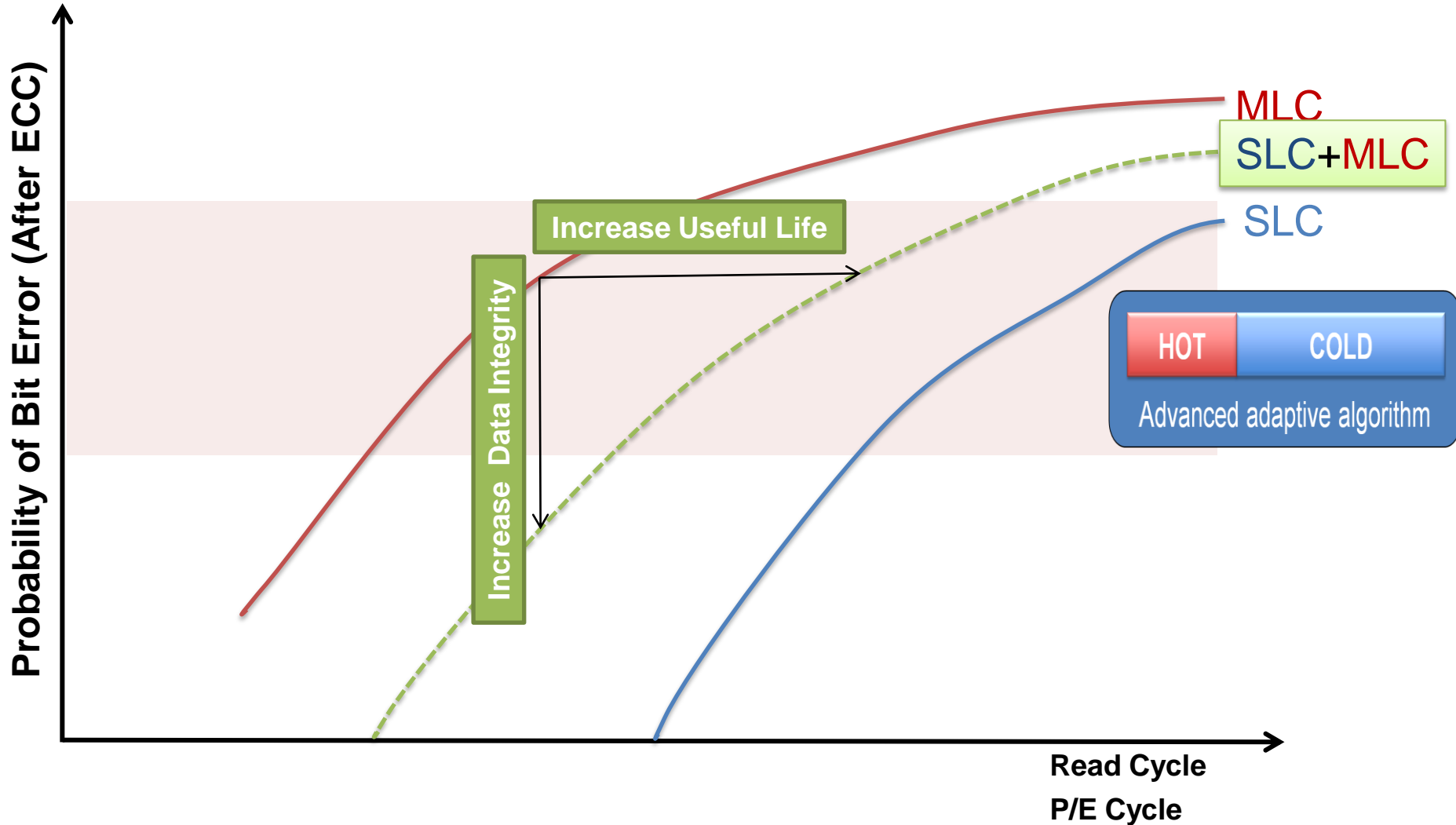
Reliability and Product Life Improvement with Hybrid NAND



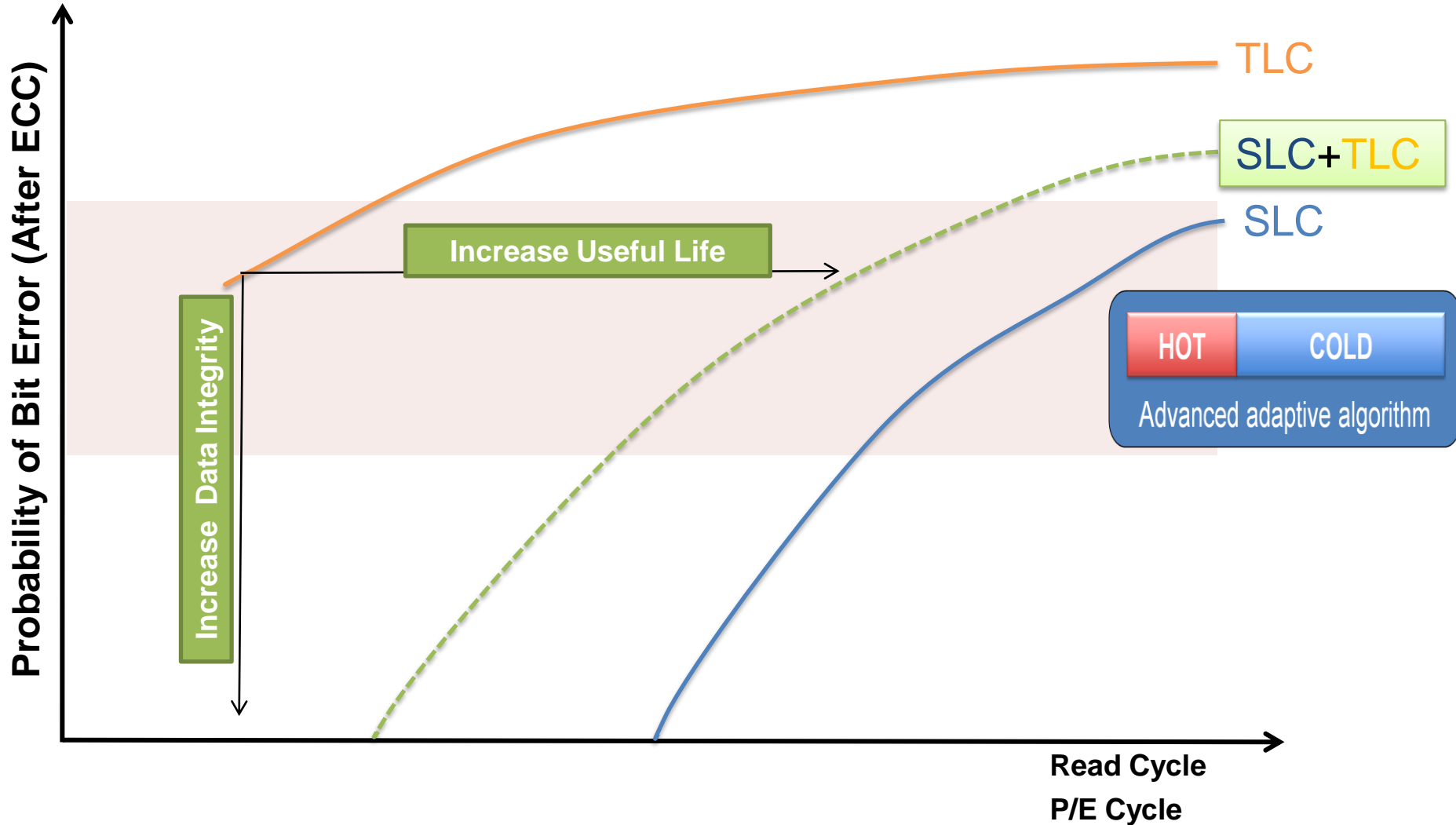
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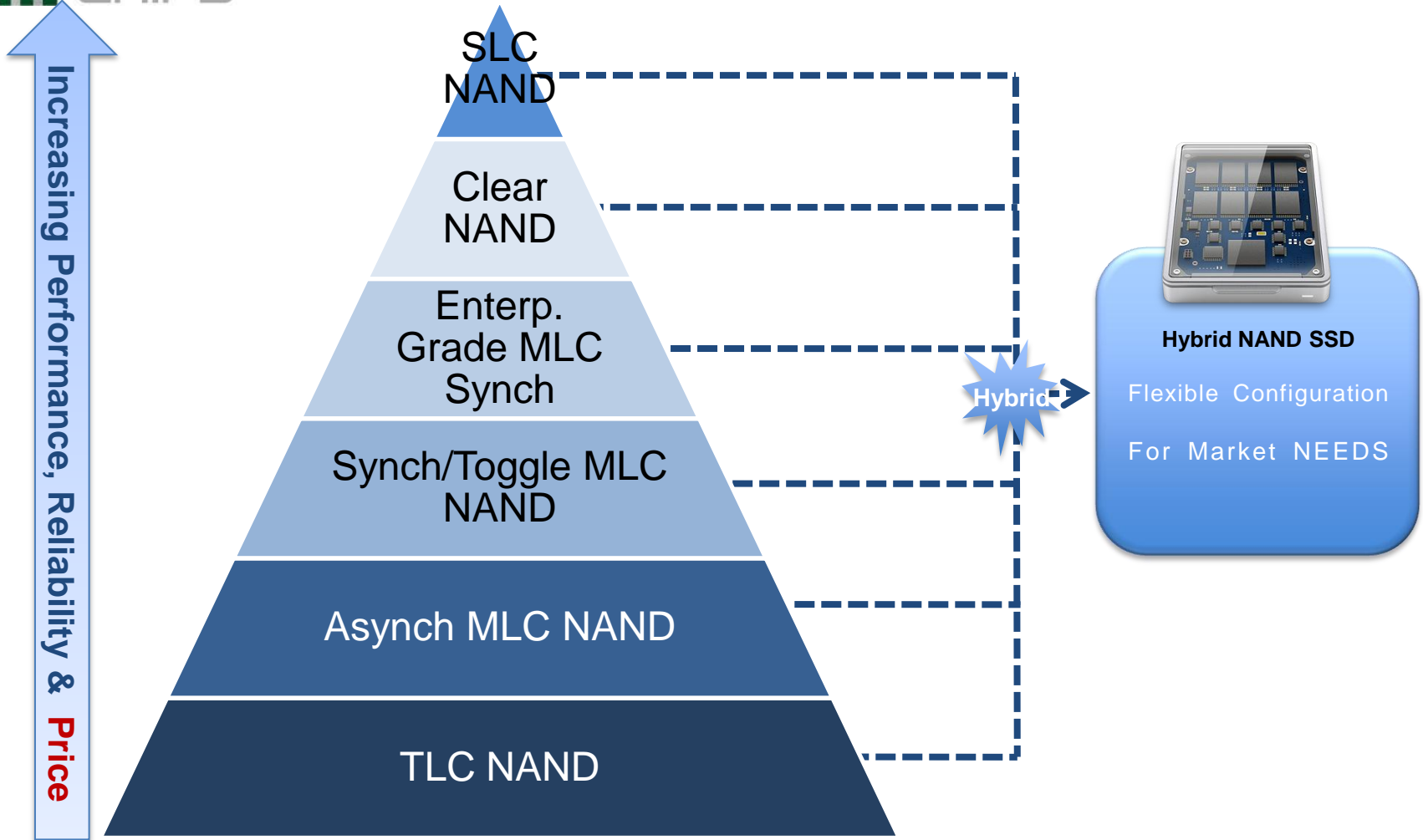
Reliability and Product Life Improvement with Hybrid NAND



Reliability and Product Life Improvement with Hybrid NAND



New Segments with Hybrid NAND



New Segments with Hybrid NAND

Increasing Performance, Reliability & **Price**

SLC
NAND

Smart SSD Controller can flexibly configure various NANDs from today's market

Not only it can expand the market by pushing the price barrier but also create new market segments according to various market needs

TLC NAND

Thank you

For Any Questions;
Please contact Bob Chang / NOVACHIPS Co., Ltd.

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