Are SSD Ready for the Mainstream?

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Agenda

Perspective on the SSD market

Market Dynamics

IDC's outlook for SSDs and guidance

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Putting it in Perspective

Celebrating "20 Years of Flash"

HDD technology is over 50 years old

7 NAND OEMs supplying a $14B+ market

Numerous SSDs OEMs supplying a < $400M market

7 HDD OEMs supplying a $30B+ market

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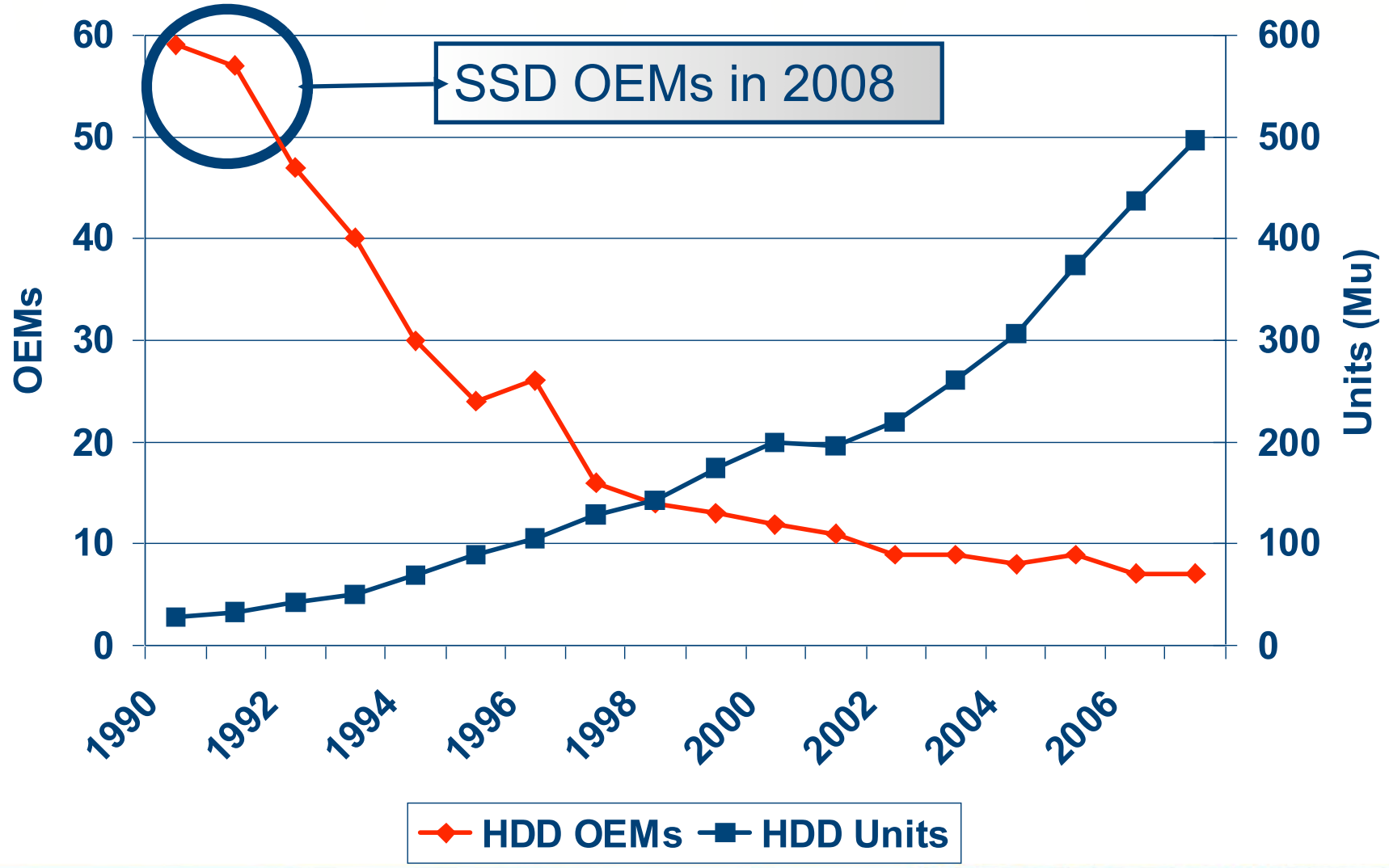
More SSD Perspective

IDC Analyze the Future

Challenges often are opportunities for those that can overcome



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Why … The "Promise" of SSDs

Increased performance

- Faster loading of applications, files, etc.
- Fast boot, shutdown, resume.

Increased reliability

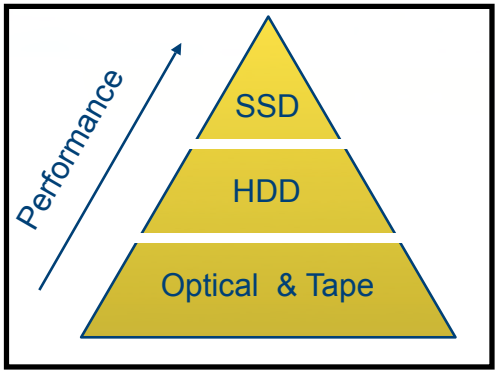
- No failures from mechanical moving parts
- Higher MTBF

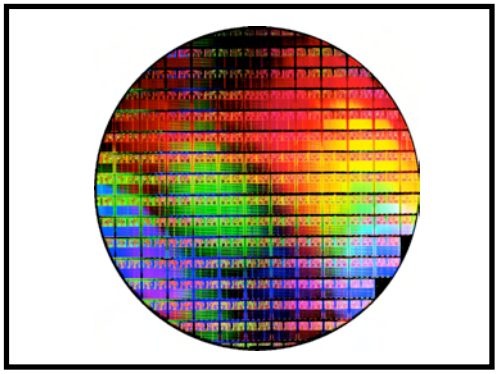
Lower power consumption

- Longer battery life
- Less heat generated

Environmental factors

- Wide temperature & humidity range
- Shock / Vibration tolerance
- No acoustic noise





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BUT … The Debate over SSDs vs. HDDs is Complex

There are some challenges

- High Price Points
  - High Cost for Storage Capacity
- Real and Perceived Reliability
  - Is NAND wearout an issue?
- Write performance
  - Process to erase-write in NAND
- Field proven in PC and enterprise environment

The impact SSDs have on real-world performance is key

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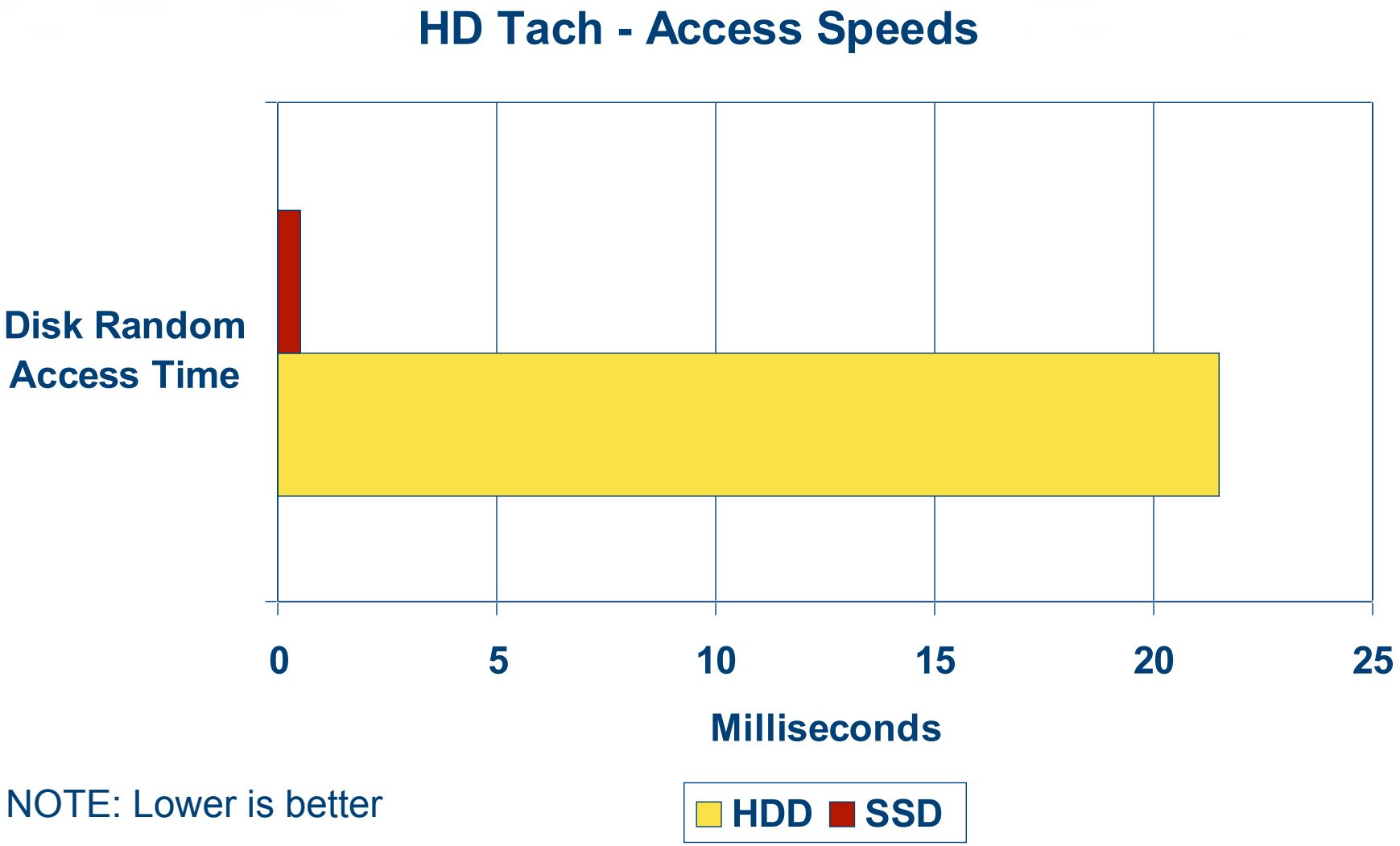
So … IDC compared and contrasted PCs with different storage devices



NOTE: Lower is better

Source: IDC Benchmarking Study (Doc #213285), 2008

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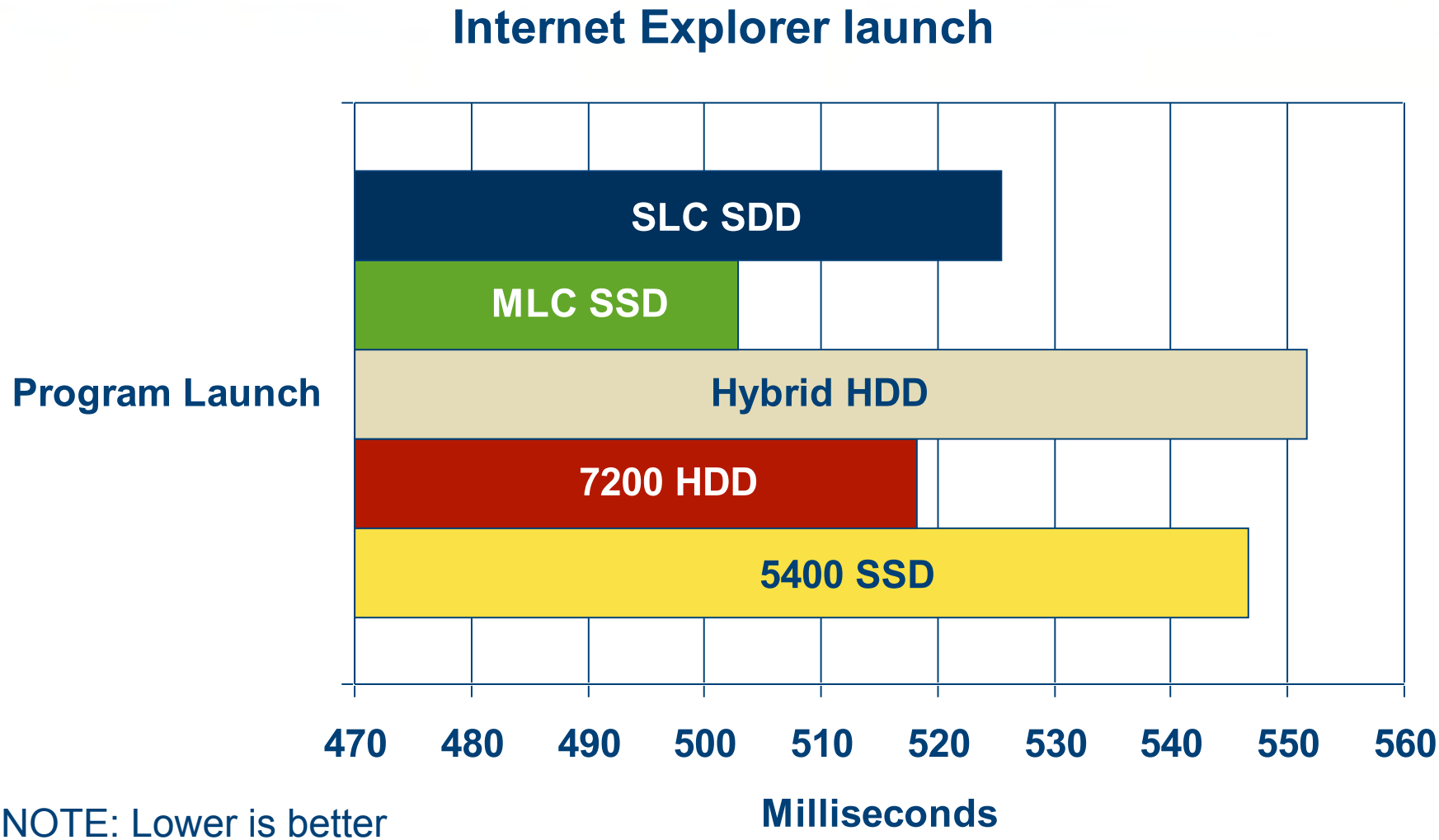
Real-world PC performance



NOTE: Lower is better

Source: IDC Benchmarking Study (Doc #213285), 2008

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Storage is part of the system

- Today the system is optimized for HDDs
  - Hardware
  - Performance
  - Form Factor
  - Operating System
- OS, BIOS, hardware and applications will need to be fine-tuned to exploit inherent advantages
- SSD designs and controllers will need to manage the memory efficiently
- Smart system design can overcome bottlenecks

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Are SSD Ready for the Mainstream?

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Analyze the Future

A Year of Progress …

Growing evidence that SSDs are making in-roads

- Notebook PC now offer SSD as an option
- Blade servers use SSDs
- Enterprise storage systems feature SSDs
- ULC PC have an SSD

The technology improving

- Large number of companies investing in SSDs
- MLC based SSD
  - Lower price point
- Read/Write speeds are improving

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Sorting out the details

- The computing market is dynamic
- As markets evolve, system OEMs insert other requirements into the decision matrix
  - For Example: ULCPC
- Usage models vary depending on your application
  - Important for SSDs because of performance and reliability characteristics
- Competition is increasing
  - Effectively communicating with customer is key

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SSDs are Still a Significant Premium to HDDs!

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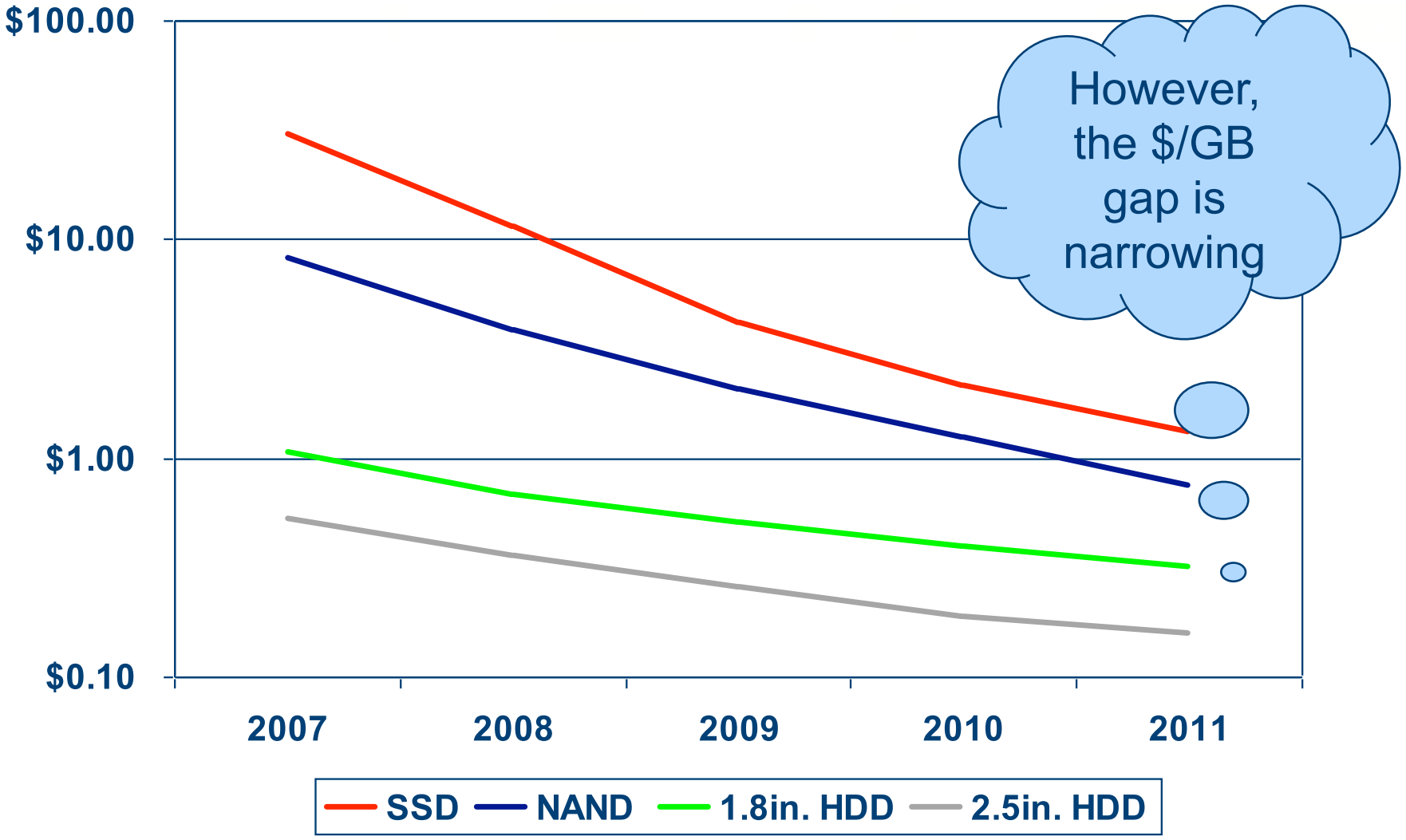
$/GB is important, but not the deciding factor



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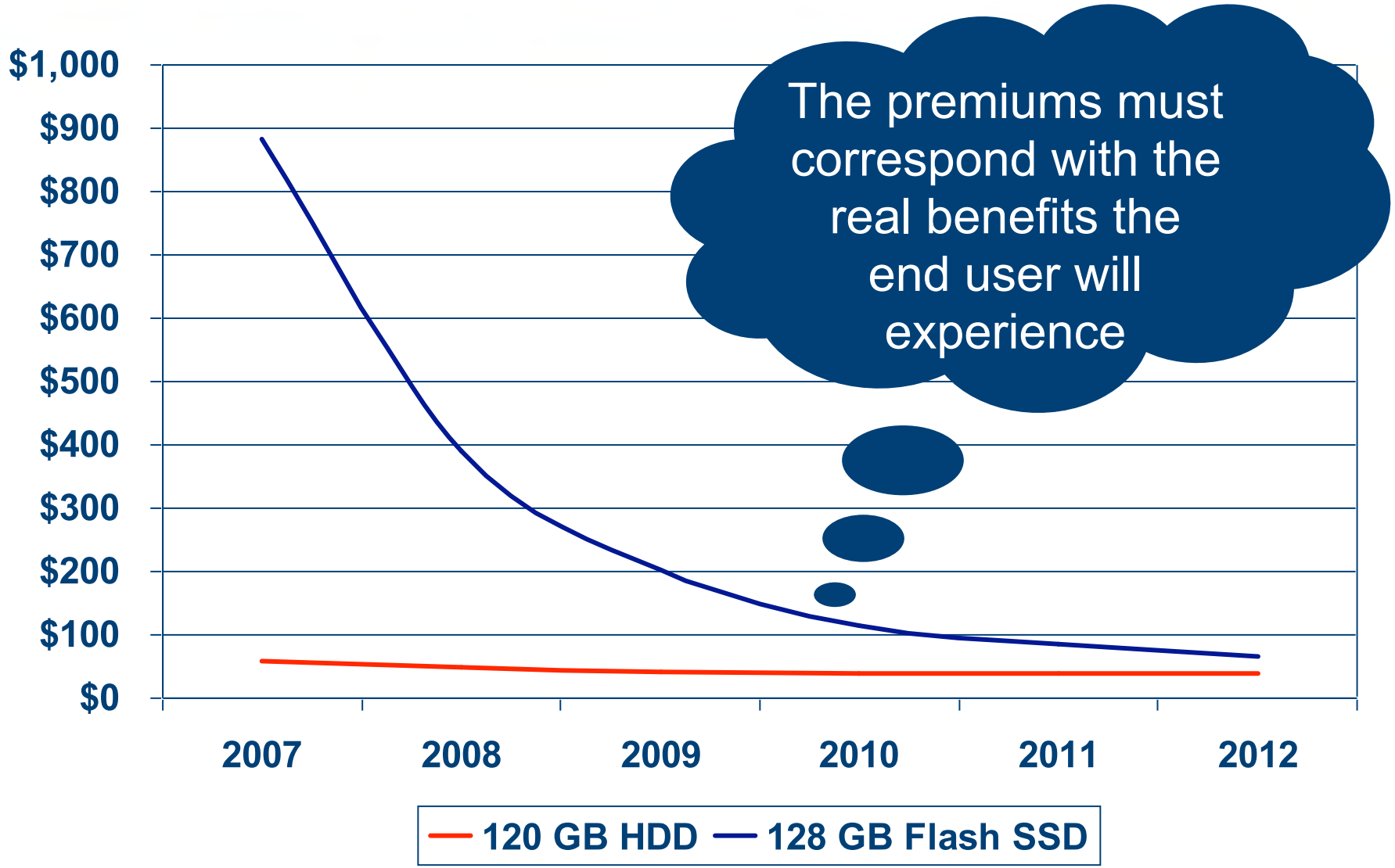
HDD and SSD Price Comparison



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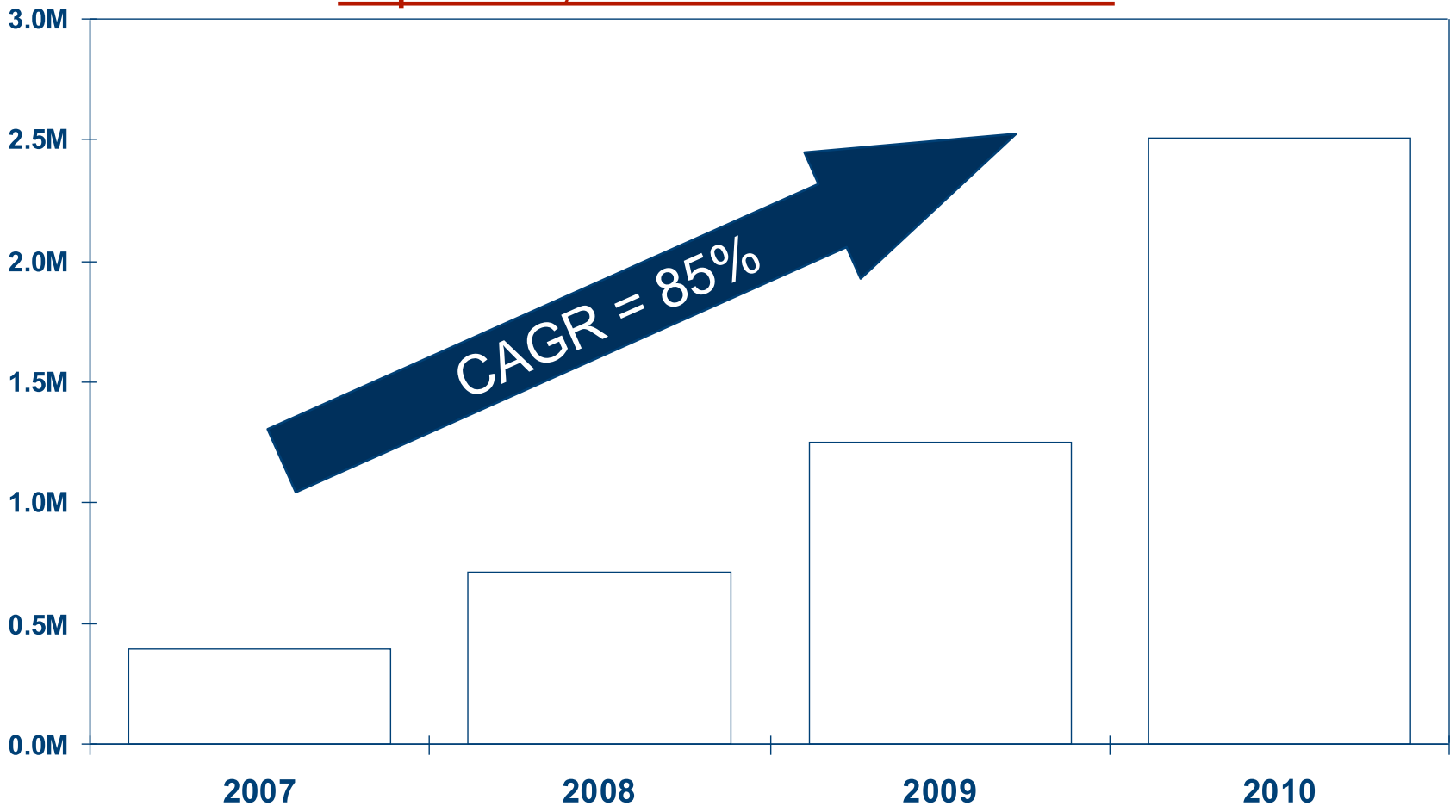
IDC's Worldwide SSD Forecast

Adoption will increase as price points decline, technology improves, and use-cases evolve



Source: IDC 2008

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Essential Guidance

- The future for SSDs continues to look bright
  - Continue to push technology, while addressing challenges
- SSD OEMs must understand the value proposition of their customers
  - Attending profitably to these markets that fit
- Competition is increasing
  - Educating the consumer is important
- SSD and systems need to be optimized around specific solutions
  - This provides an opportunity to innovate and differentiate for SSD OEMs.

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Thank You

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