

# Solid-State Drives

## From Disruptive to the New Normal

Rob Crooke

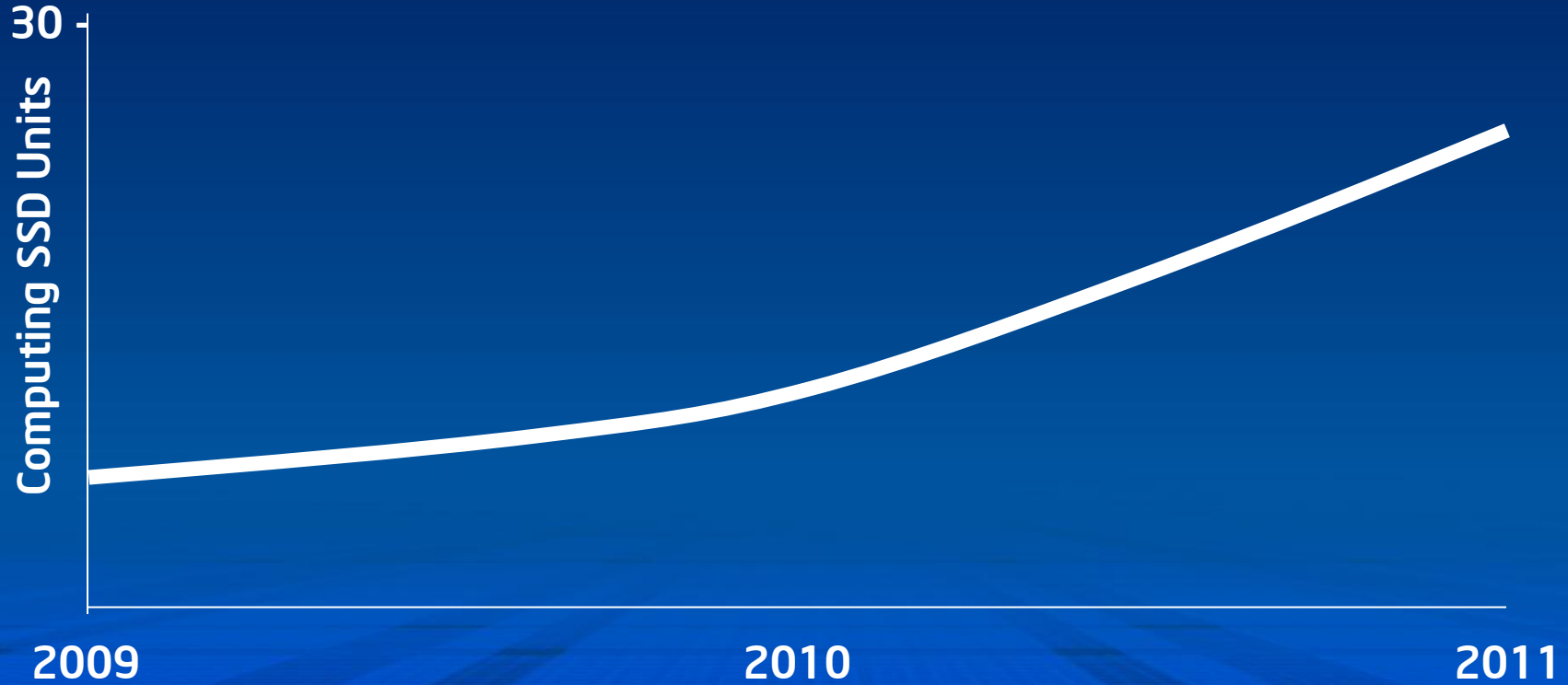
Corporate Vice President, General Manager  
Intel Non-Volatile Memory Solutions Group

Flash Memory Summit 2012



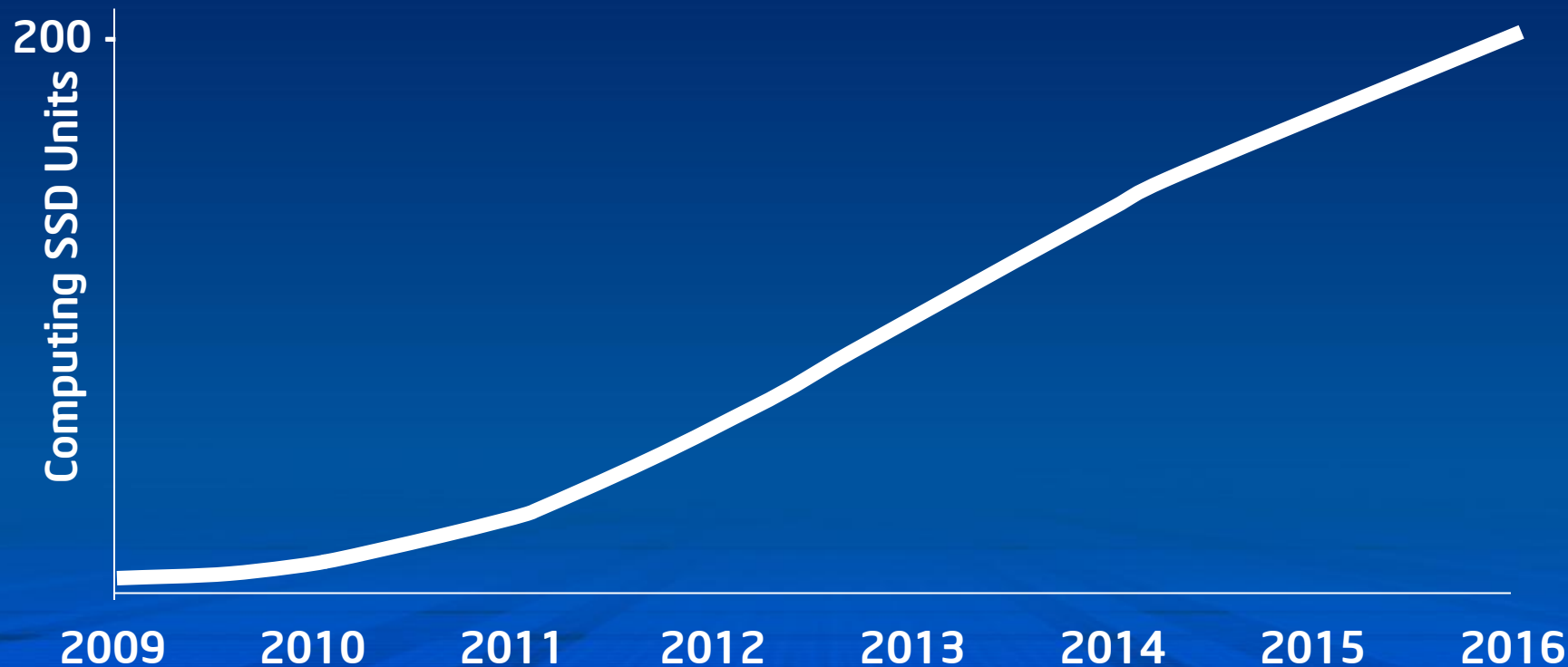
# Great Technology...

Million Units

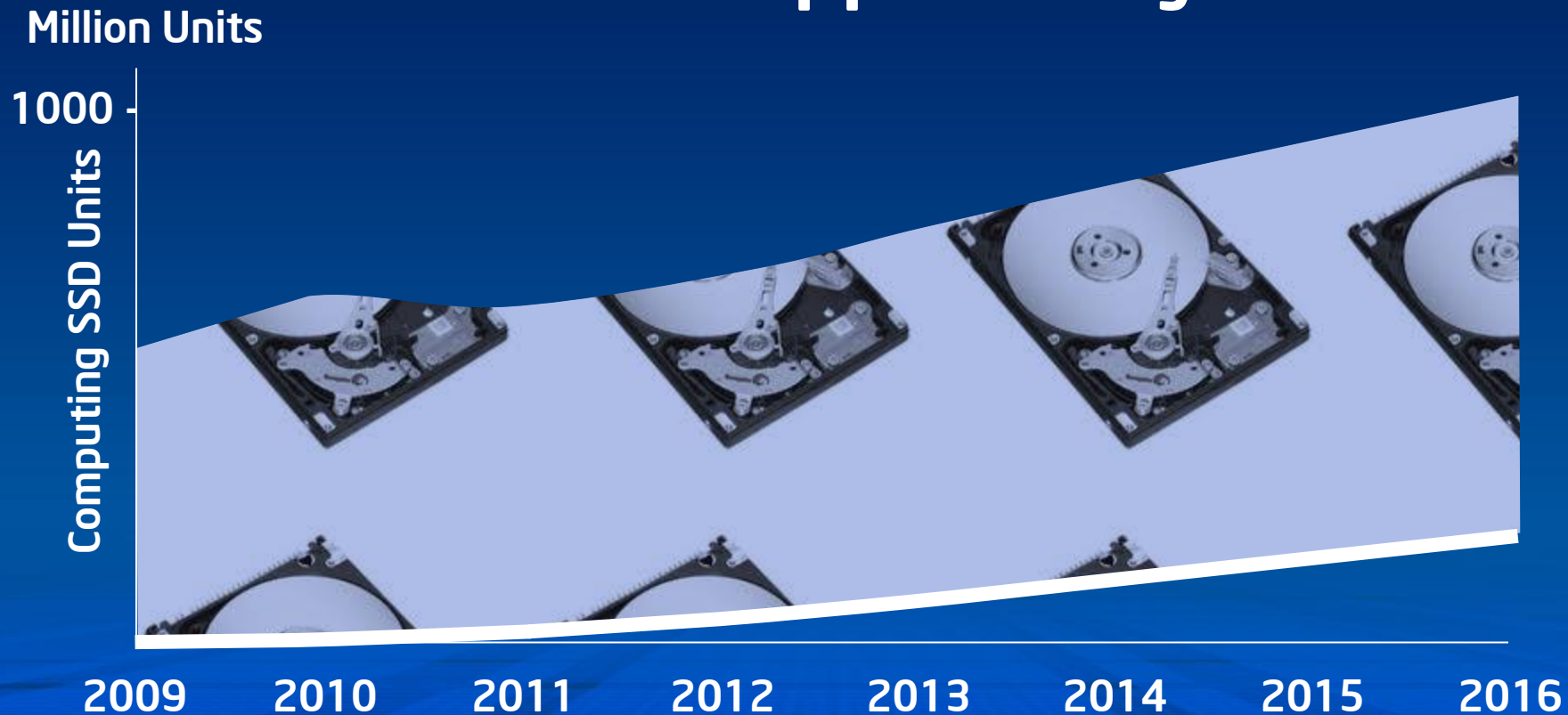


# ...Adoption Growing

Million Units

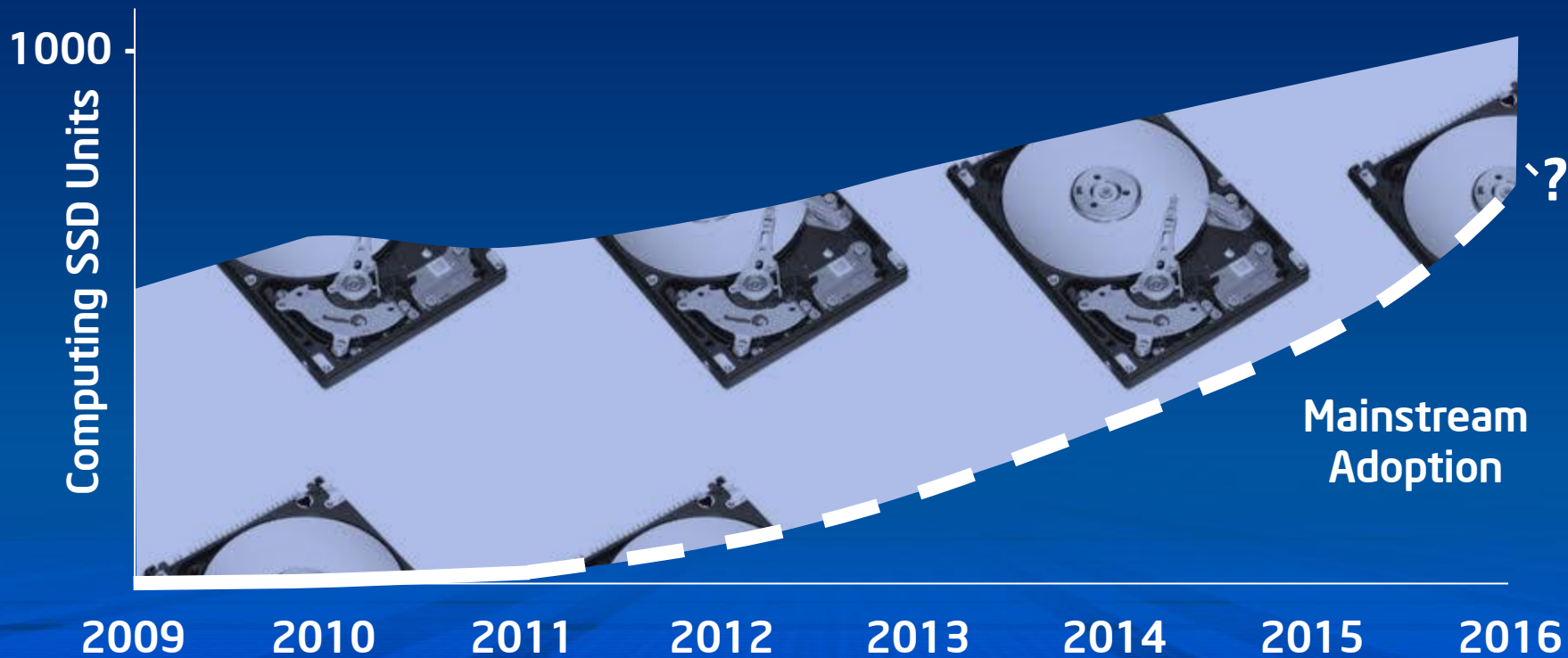


# The Real Opportunity...



# ... We are at the cusp of a transition

Million Units



# Market Barriers

**Ease of OEM  
Adoption**

**Fragmented  
Market**

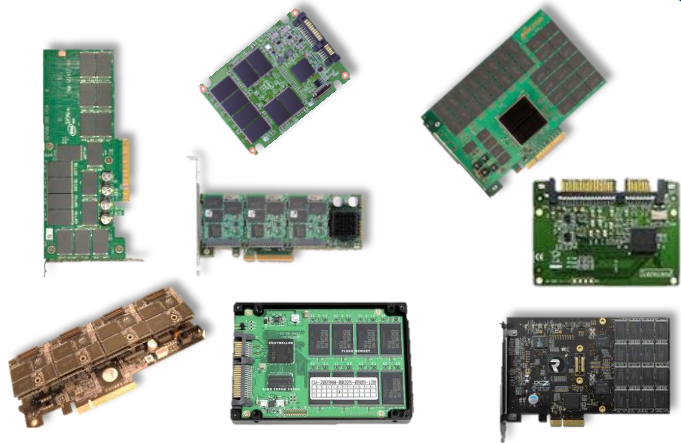
**Cost**

**End User  
Awareness**



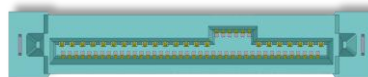
# Embrace New Industry Standards

## Legacy Standards

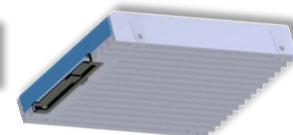


Based on HDD

## Emerging Standards



Enterprise SSD  
Form Factor



SFF 8639

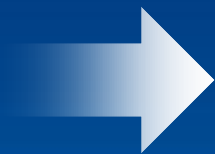
Optimized for NVM

# Ease of Platform Integration

Align on cadence, market cycles, and schedule

Pre-validate software and hardware solutions

Produce high quality products



Easy for OEMs to integrate SSD's into platforms



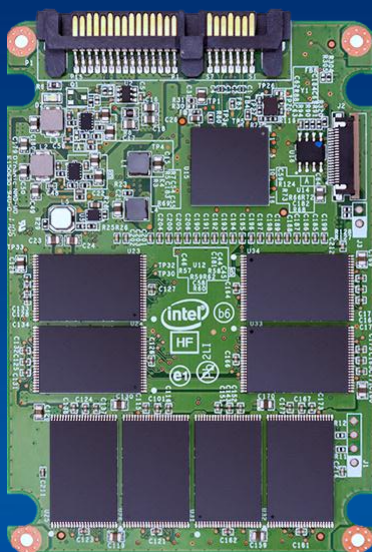
# Embrace New Form Factor Standards

2.5"



9.5 mm  
7 mm

2.5"



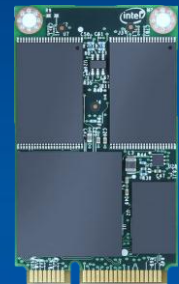
9.5 mm  
7 mm

1.8"



5 mm

mSATA



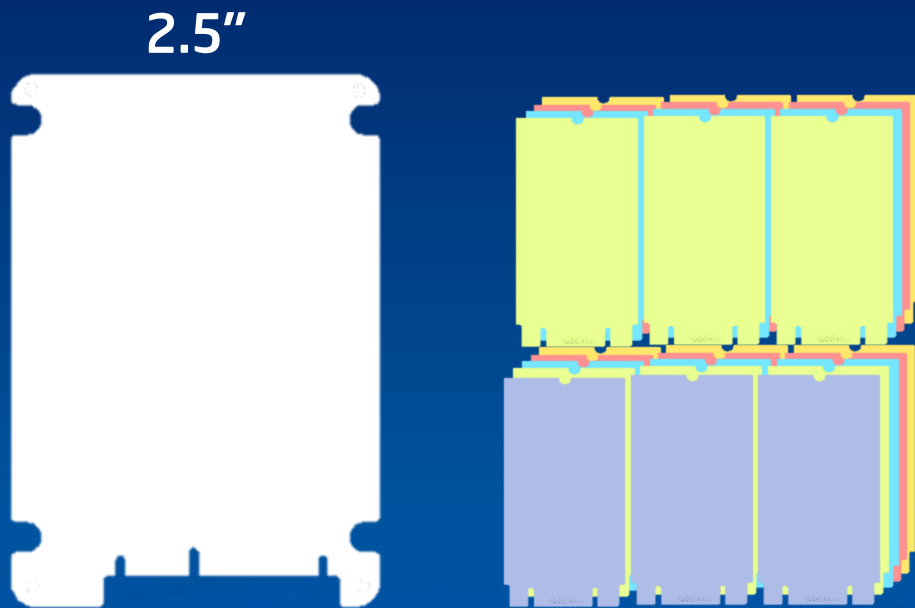
4.85 mm

NGFF



2.3 mm

# Embrace New Form Factor Standards



Don't be encumbered by the past



**Empower designers to push the envelope**

# Software Collaboration

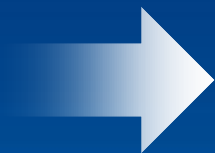
Caching

Virtualization

Cloud Storage

Security

Gaming



Enhanced user  
experience

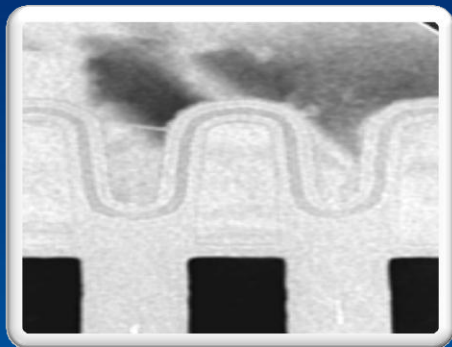
## Unleash the CPU!

# Embrace Process Technology Innovation

Lower costs  
Increased density

# Embrace Process Technology Innovation

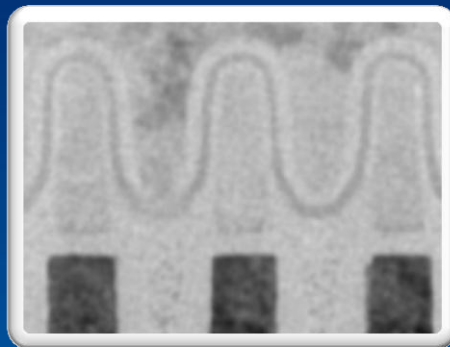
2009



34nm

Conventional Wrap Cell

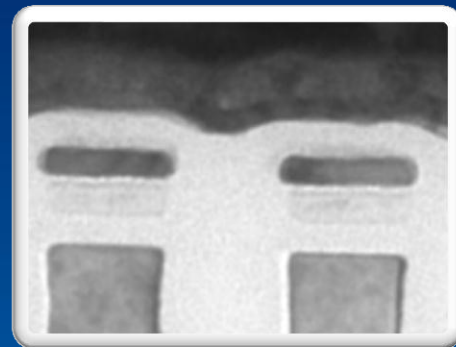
2010



25nm

Conventional Wrap Cell

2012



20nm

Hi-K Dielectric Metal Gate  
Planar Cell

## Targeted for Computing

# Great Technology ≠ Mainstream Adoption

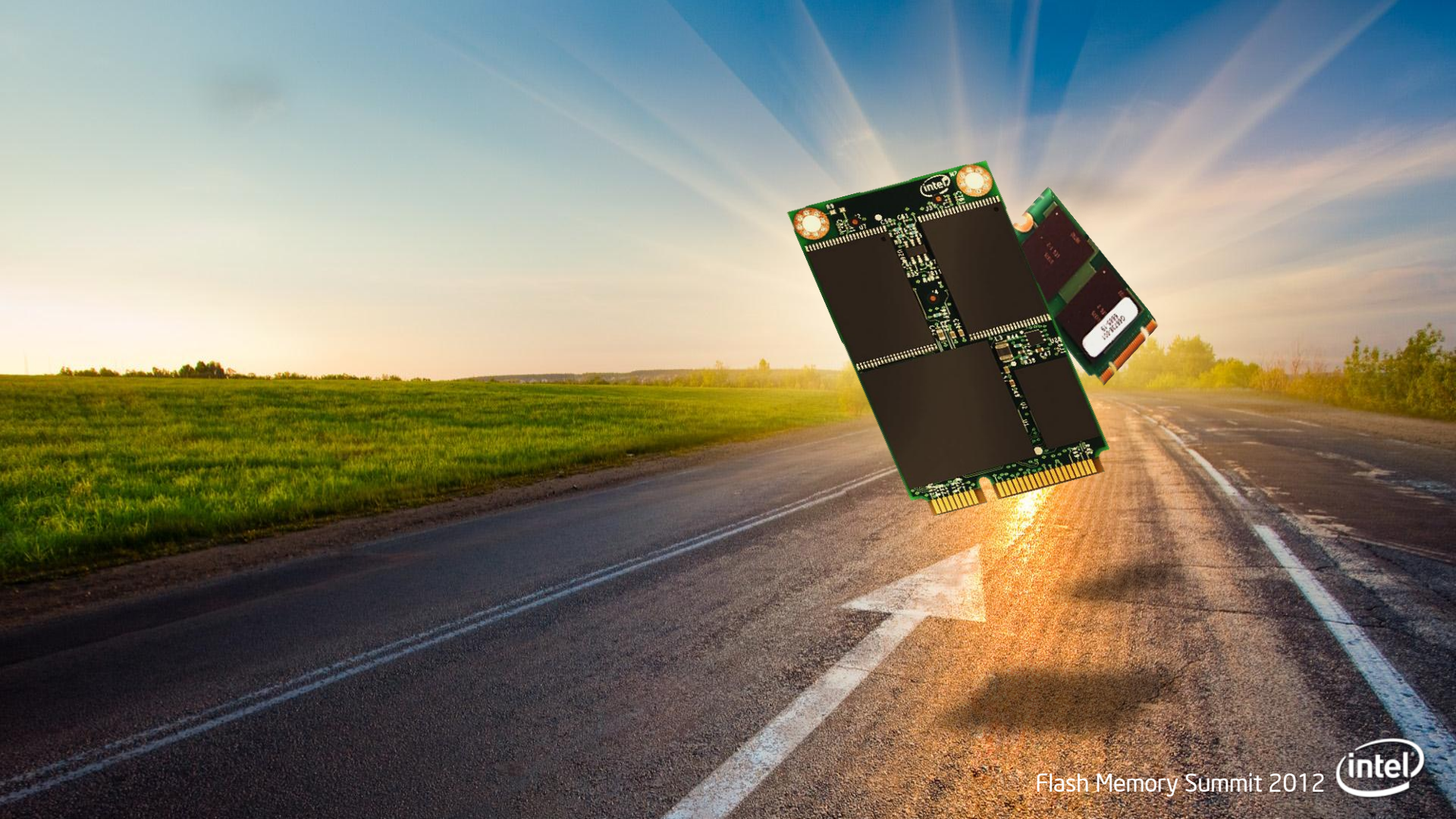


# SSD - HDD Volume Crossover?

Billion Units







Flash Memory Summit 2012

