



# Exploring SSD Form Factor Evolution in Enterprise Platforms

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# Should SSDs Look Like HDDs?

- Form factor based on magnetic media
- Should NOT determine the physical constraints of a technology that enables increased transactional performance
- SSDs should be any shape or size to get the job done as efficiently as possible





# Evolving Enterprise Storage Requirements

- Higher levels of performance
- Increased capacity
- Enhanced reliability
- Advanced feature set
- Leverage existing infrastructure
- Flexible deployment and easy system scaling  
(high capacity, easy to manage storage that can be inexpensively deployed and scaled as needed)

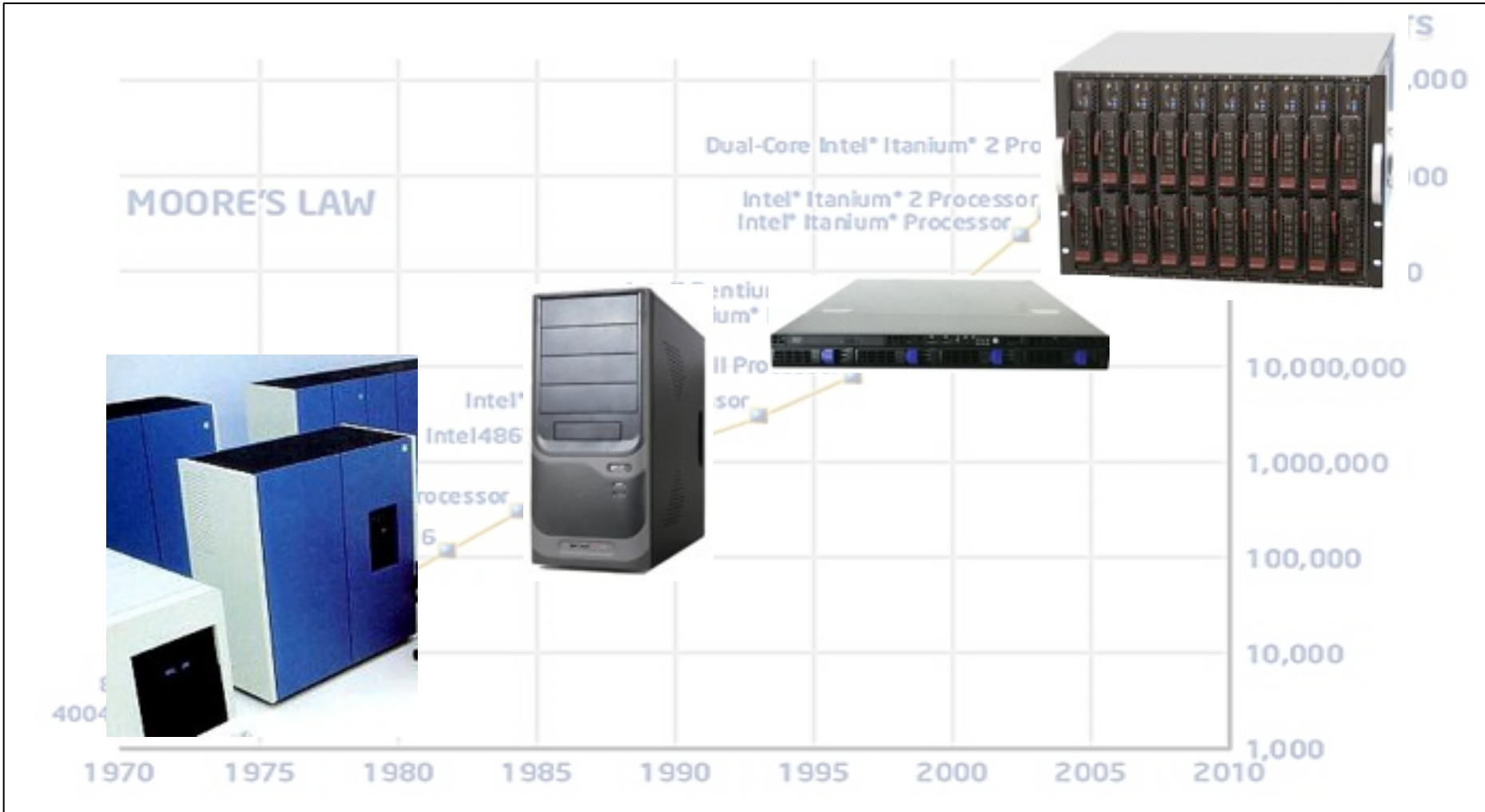
# Advantages of New Form Factors

- Smaller, purpose-built
- Better fit potential – not one size fits all
- Greater per product / subsystem density
- Better per product / subsystem performance
- Reduced power consumption
- Allows for better thermal profile
  - Increased system airflow, reduced cooling costs



# Smaller Servers Increasingly Starving for I/O

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# Evolving Storage Form Factors - Servers



Capacity

Tier 0  
Performance

Caching

Tier 0, Boot, Caching  
Hybrid DDR/SSD

# Maximizing Existing Infrastructure



- 400GB SSD
- 3TB HDD
- 60K IOPS



- 6.4TB SSD
- 4TB HDD
- 960K IOPS

**Modular Approach Provides 16x  
Advantage in SSD Capacity and  
Performance**



# Typical Blade Server



**Pre-defined and Limited DRAM and Storage Space**

# Maximizing Blade Capabilities



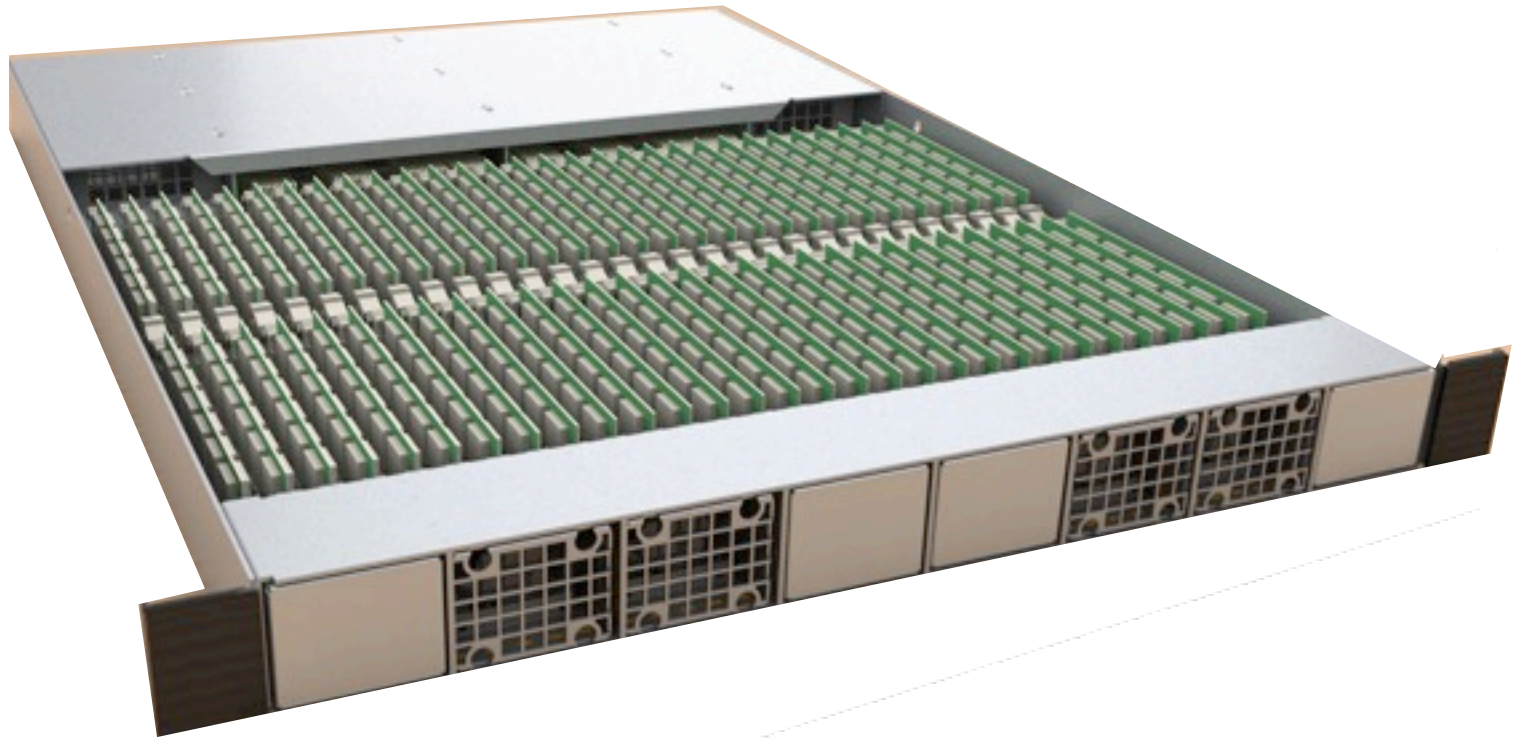
**Mix DRAM and DIMM SSD to Address More Applications**

# Maximizing the Storage Array



- **Designed for Legacy Hard Disk Drives**
  - Oversized and heavy, designed for rotational vibration and thermal characteristics of HDD
  - Larger, more costly and inefficient power supplies
  - Inefficient use of rack space

# Flash Form Factor Optimized Array

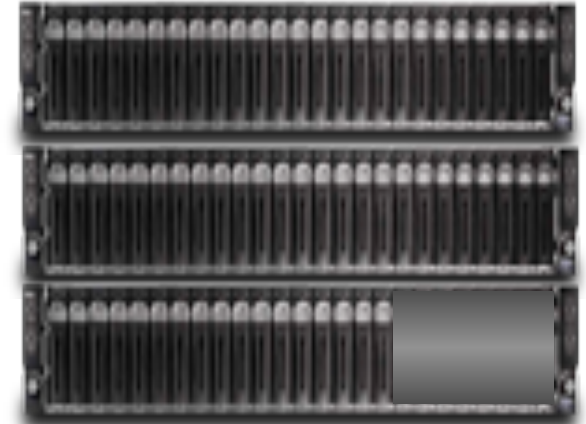


# Optimized Trumps Traditional

1U Storage Array



3 (2U) Storage Arrays



**6 to 1  
Advantage**

Solution Comparison	SSD Optimized	Traditional Enclosure
Number of SSDs	64	64
Max Capacity	32 TB	32 TB
Rack Space Consumed	1U (1.75")	6U ( 10.5")
Capacity / Rack Unit	32 TB	5.3 TB
Performance / Rack Unit	3.6M IOPS	600K IOPS

# Should SSDs Look Like HDDs?



Choose the Right Tool for the Job

