Performance Requires more than FASTER Devices

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Holy Grail

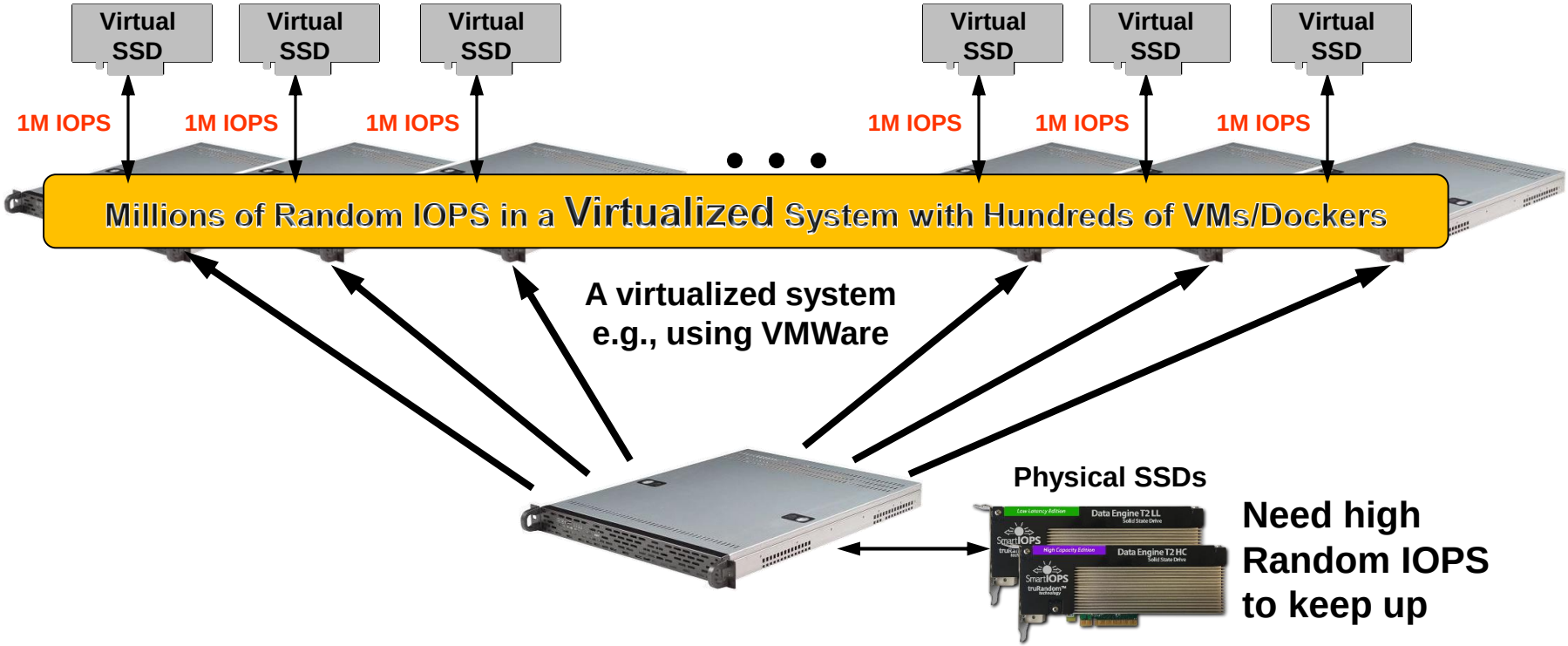
Enable Billion IOPS Data-Center

with

Best Price for Performance ($/IOPS)

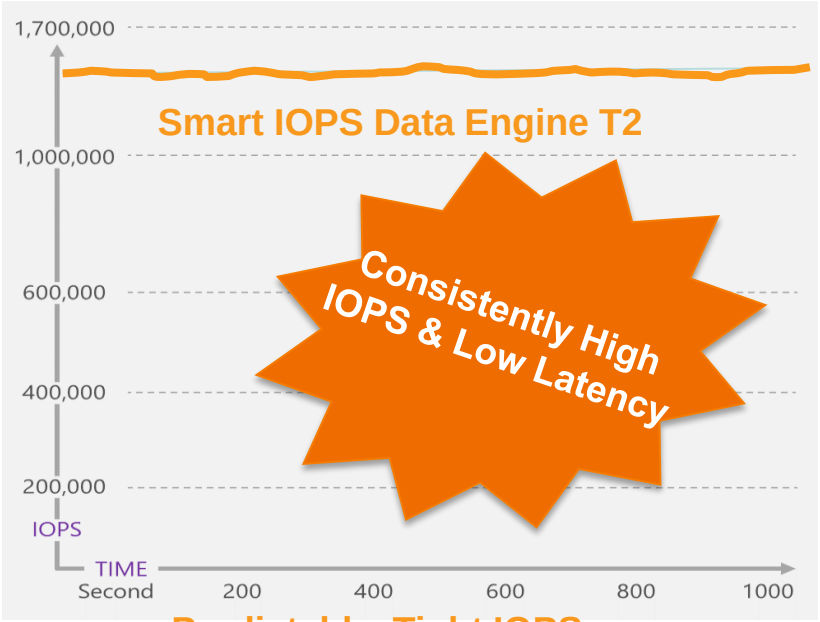
Best Price for Storage ($/GB)

Performance Bottleneck in Virtualized Systems

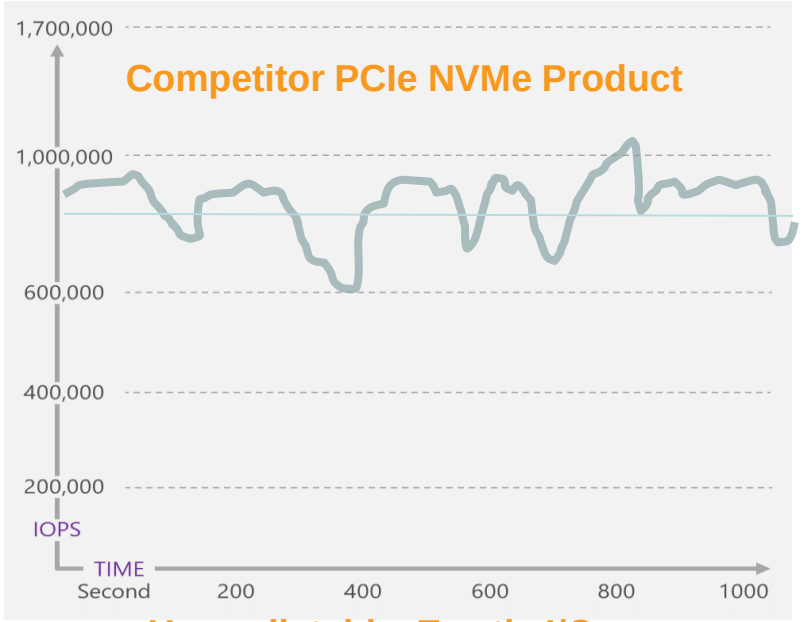


Requests in a Virtualized System

- Random Request Die Distribution
- Sustained high IOPS, regardless of data type, result in better performance and throughput



Predictable, Tight IOPS
4K Random Read Workload



Unpredictable, Erratic I/O
4K Random Read Workload

Some Points to Consider

- Theoretical Maximum IOPS for PCIe NVMe gen3x8
  - 8 Gbps/Lane * 8 Lanes / 4KB Block – Protocol Loss = **1.74M**
- Device Technology
  - Inherent device latency reducing
  - Read time improving even with 3D Flash
  - Capacity increasing

Need an Holistic Approach

- Innovation at Multiple Levels
  1. Architecture
  2. Algorithm and Heuristics
  3. Implementation