Innovating Storage Architectures in the Modern Data Center

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The Four Legs of a Great SSD Strategy

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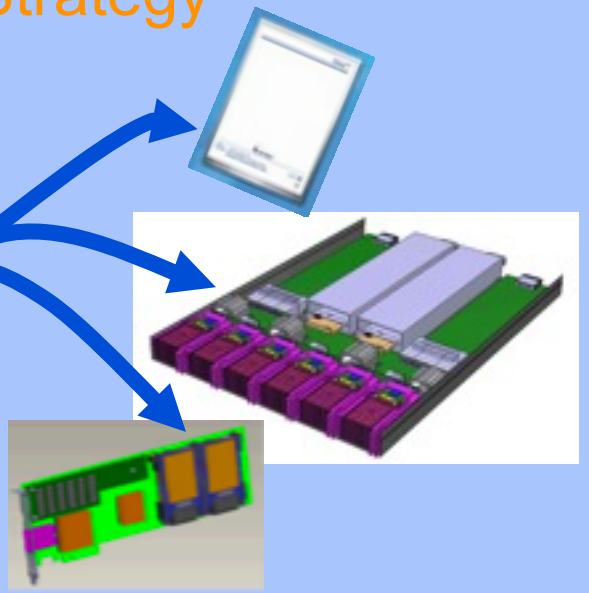

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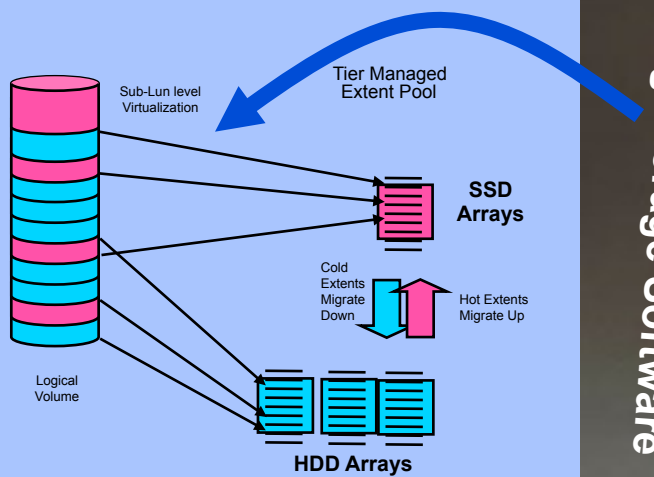

The Four Legs of a Great SSD Strategy


Flash Memory
SUMMIT

What we Should know by Now. . . .

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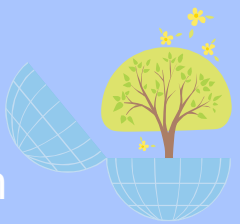

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   - An SSD which can do 30K IOPs is ~6W compared to HDD which can do 300 IOPs at 9W

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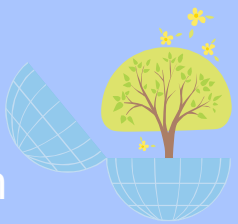

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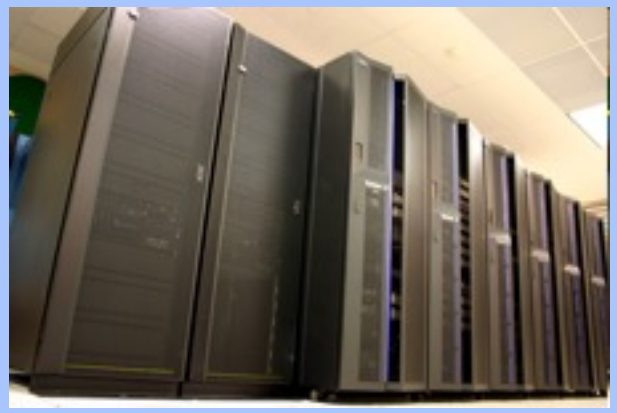
4. Potential for Better Reliability and Availability
   - The industry knows how to make reliable Electronic Assemblies
   - BUT, the Endurance and retention has to be managed.

But, How Will They be Used in the Datacenter?



Use Models

1. Placing hot data in faster devices of a multi tier SSD/HDD storage system
   - Manual, Assists and Automated
2. Temporary Placement
   - Data Warehousing
   - Paging

3. Fitting all data for the application in SSDs
   - Many databases less than 4TB
   - Workload optimized servers may benefit from lots of flash to give maximum performance
   - Analytic Engines can better meet their service commitments by using SSDs

SAN vs. DAS

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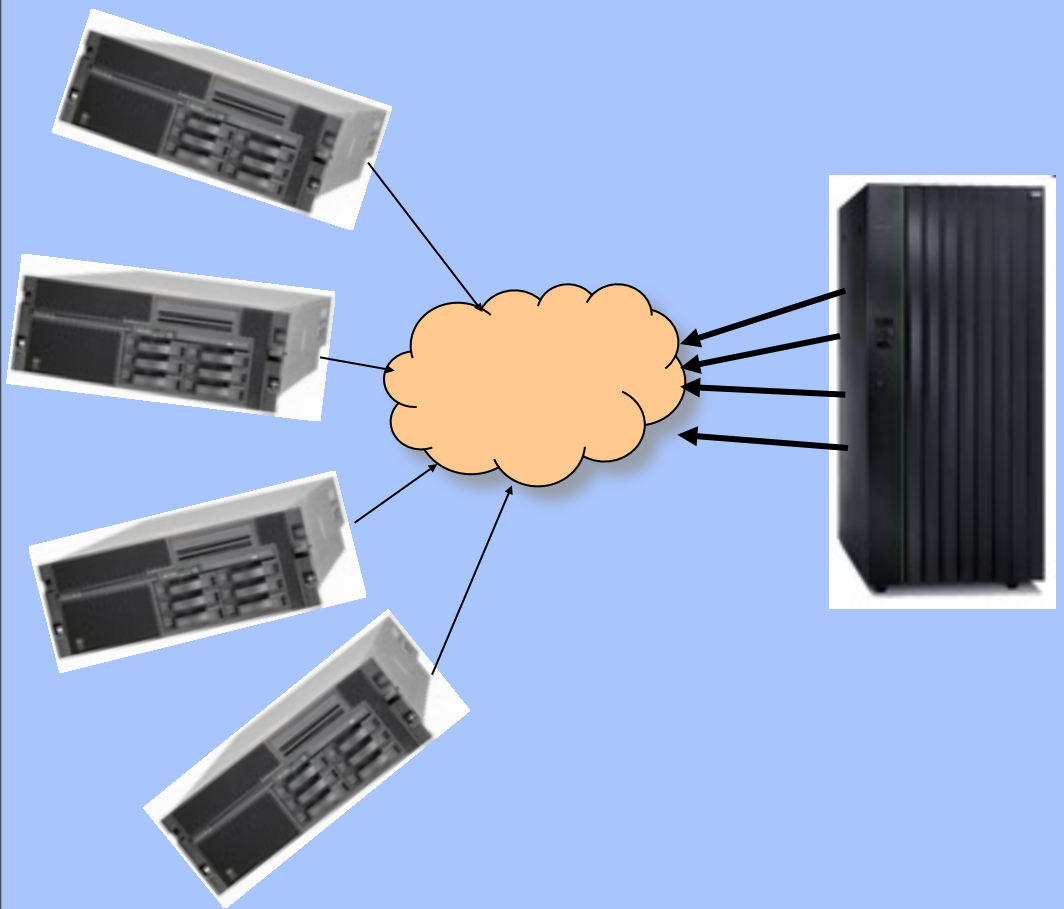

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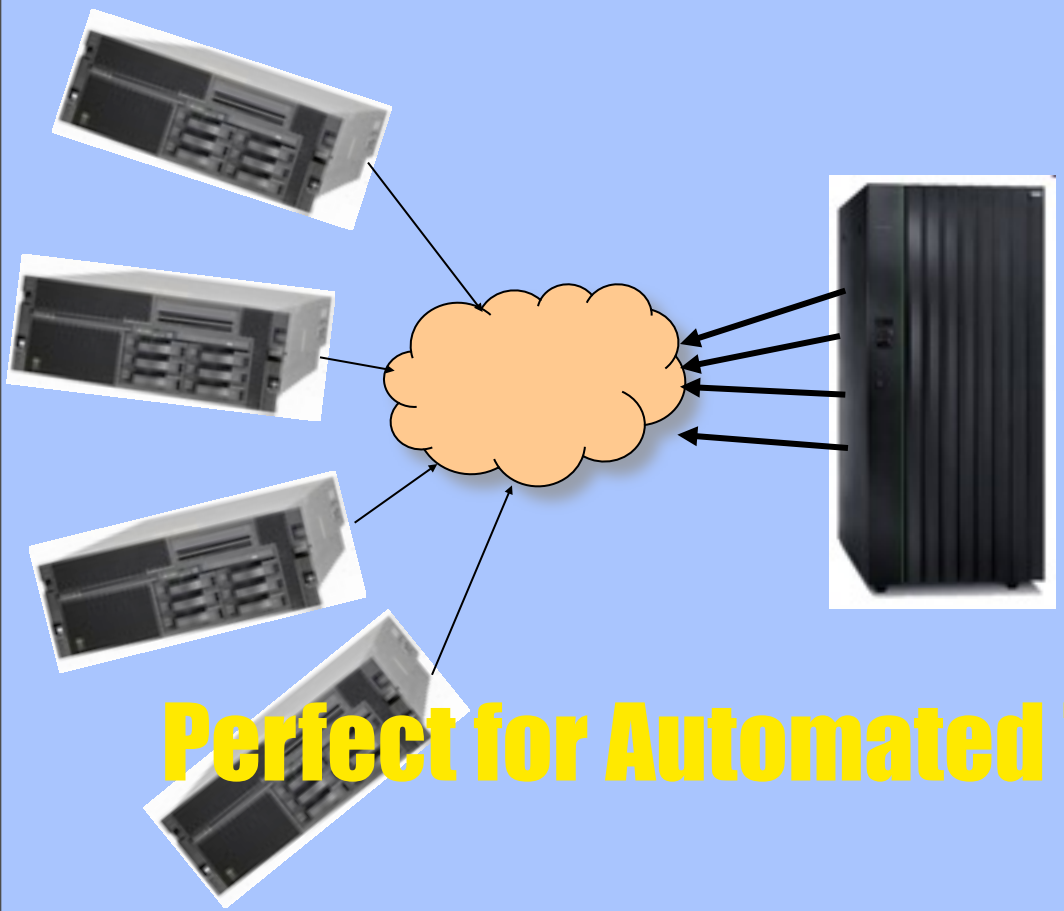

Perfect for Automated Tiering

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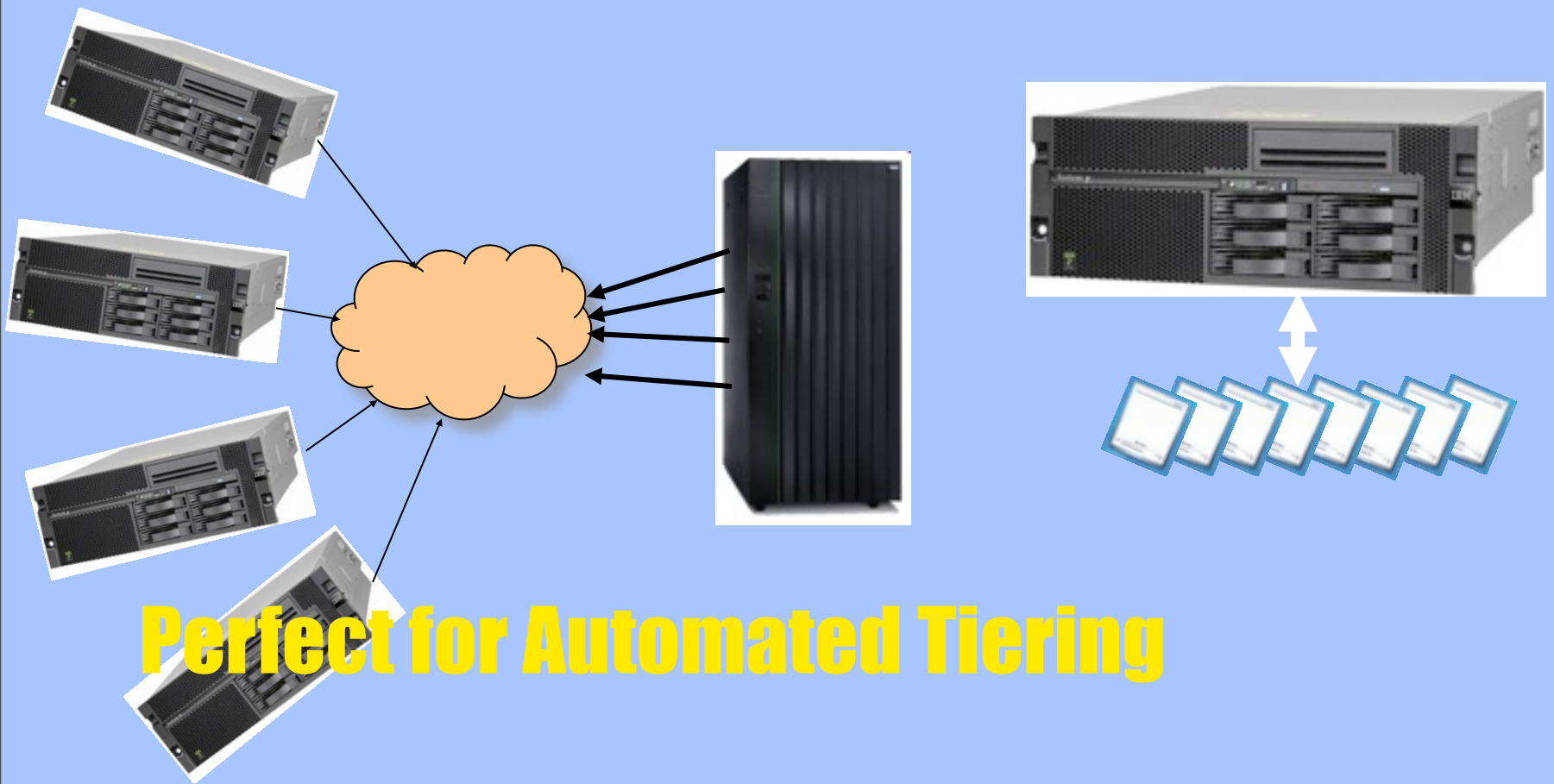

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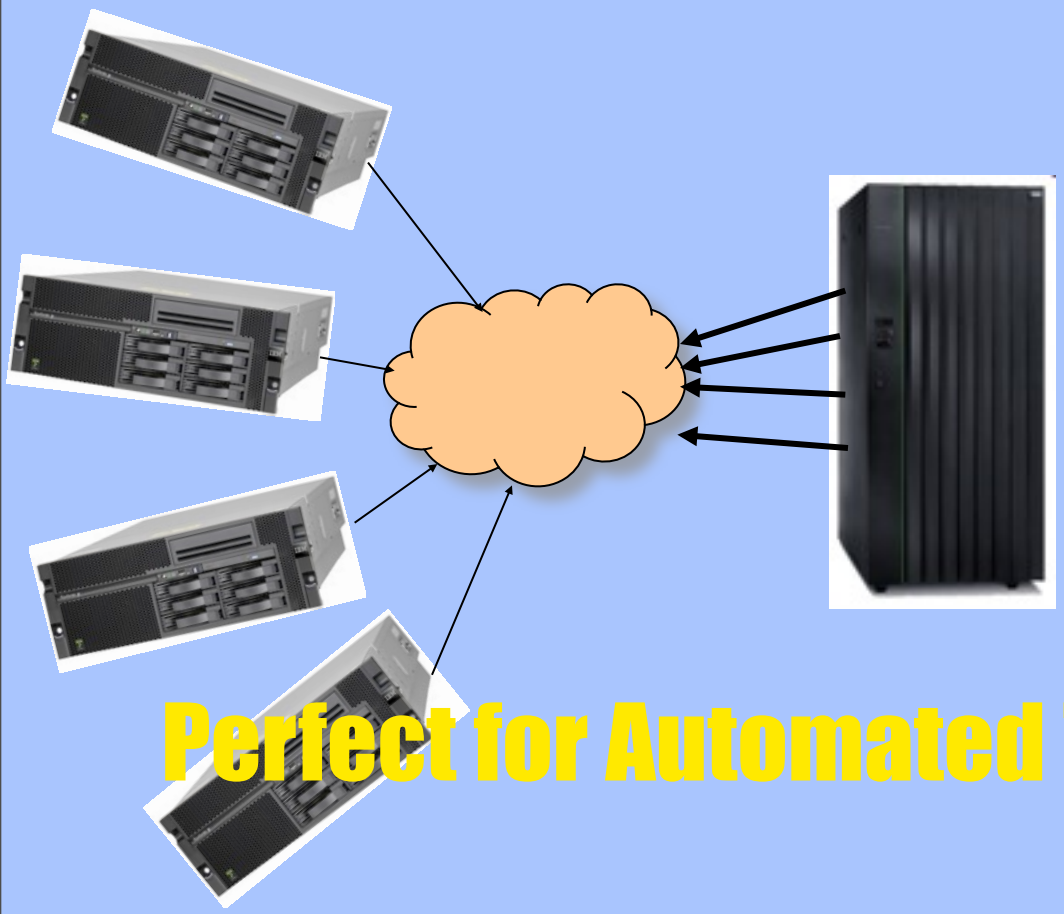

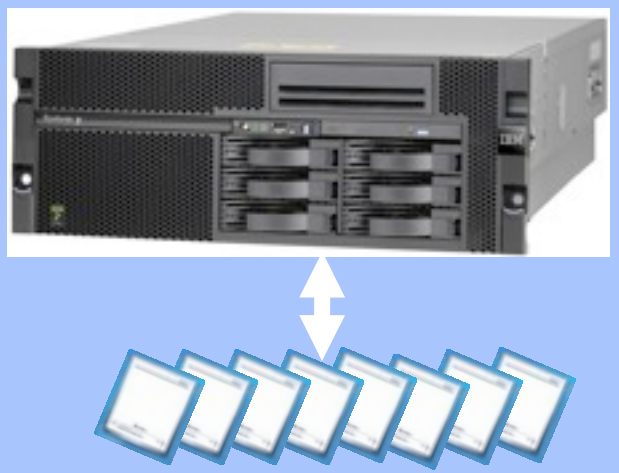

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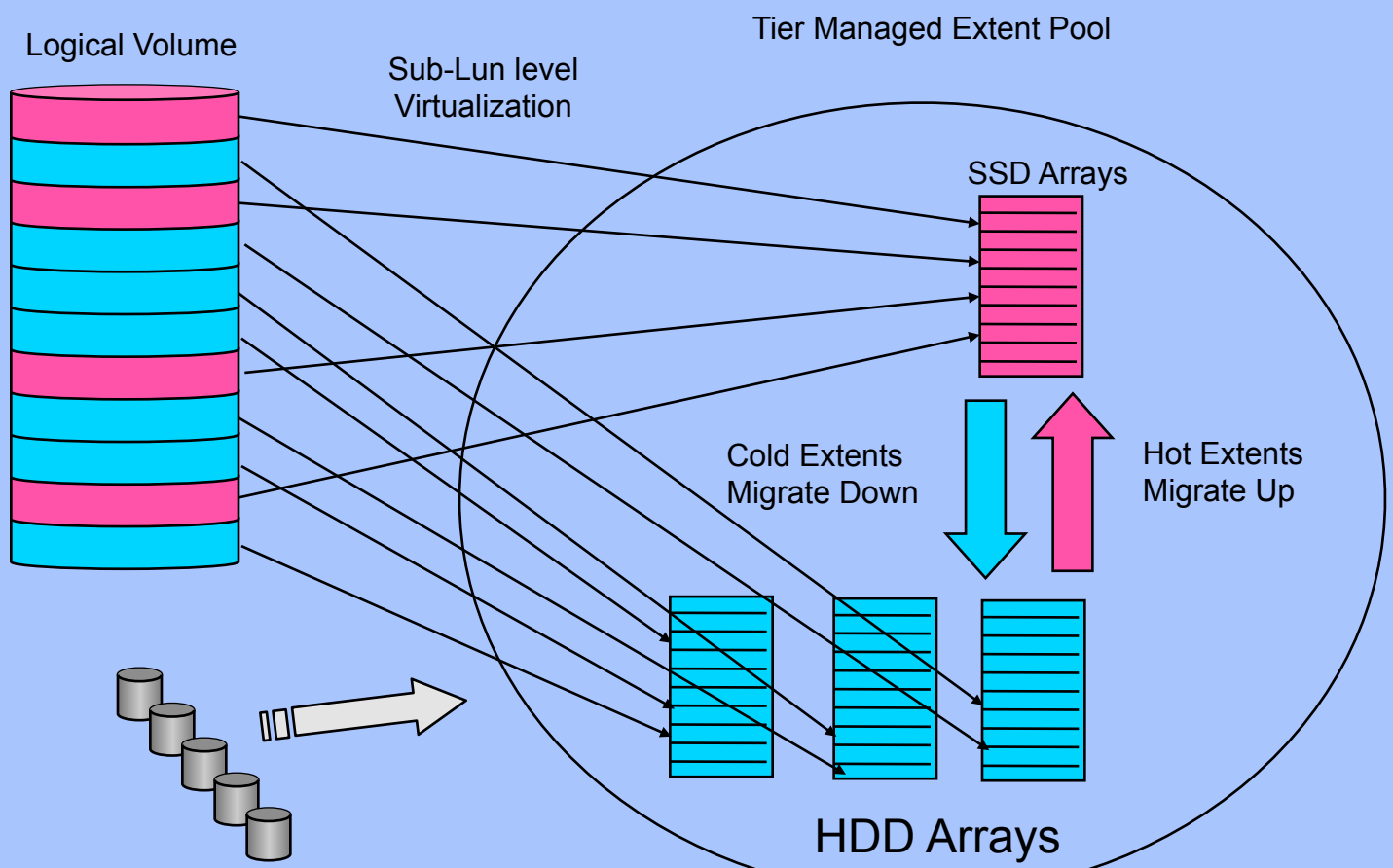
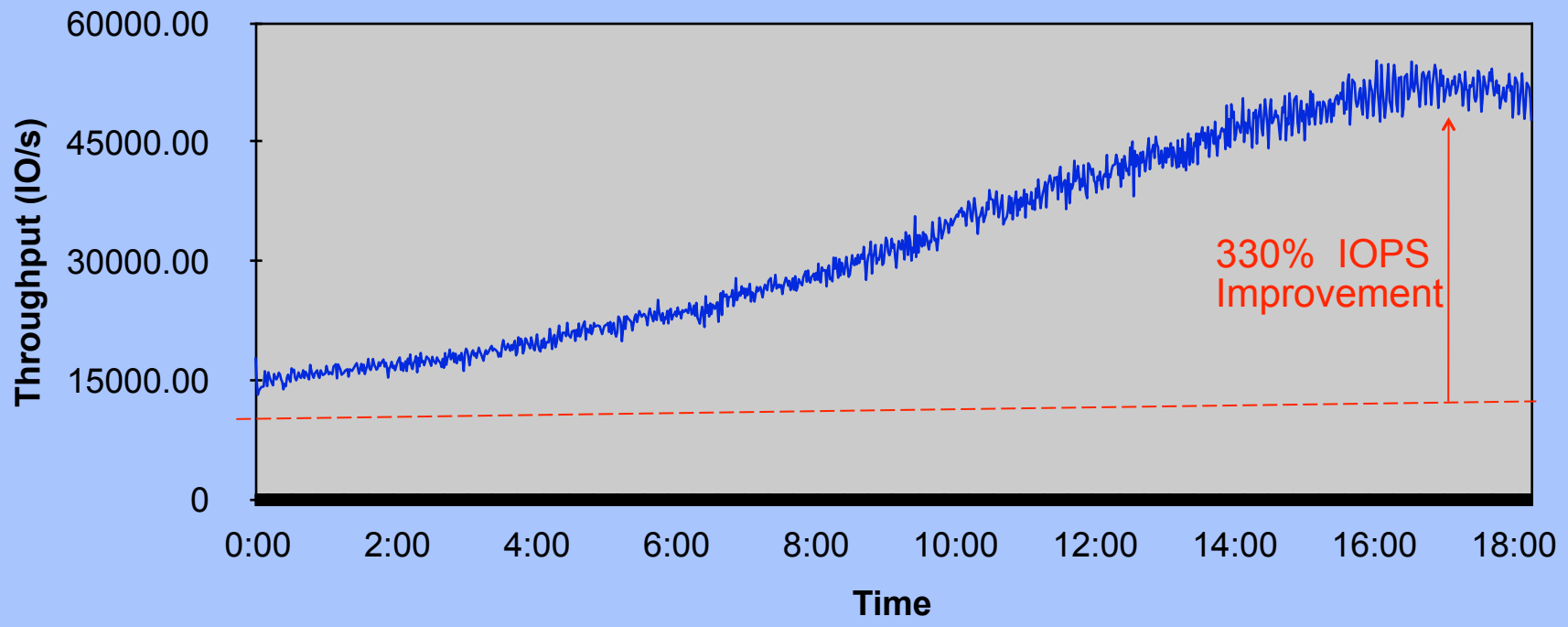
Good for Automated Tiering and Pure SSD.

Automatic Tiering



Automated Tiering Capability

- SPC1 Benchmark workload demonstrates capability of Automatic Tiering
  - 2.3 TB of SSDs and 96TB of SATA
- Demonstrated autonomic improvement by learning the workload and improving system IOPs by 330% without user intervention.



Transactional Processing

- Typically non uniform access methods – can benefit substantially from Automated Tiering.
- Small Databases may be easier to just put entirely on SSD
- Financial and Banking Industries

Analytics

- Data Warehousing and analysis
  - Scan rate important from disk to SSD
  - Scan rate important from SSD for analyzing trends and analysis
  - Results written back to SSD and or to HDDs.
- Fraud and threat identification
  - Infosphere Identity Insight
  - Analytics require complex event processing requiring significant IO
  - Public Sector, Commercial security

Tiered DRAM and Flash

- Exploding number of cores driving up need for more memory
- Many applications have insatiable appetite for memory
- Paging
- Logfiles
- Finding ways which can offload lesser used objects and put them on Flash can provide more virtual DRAM.