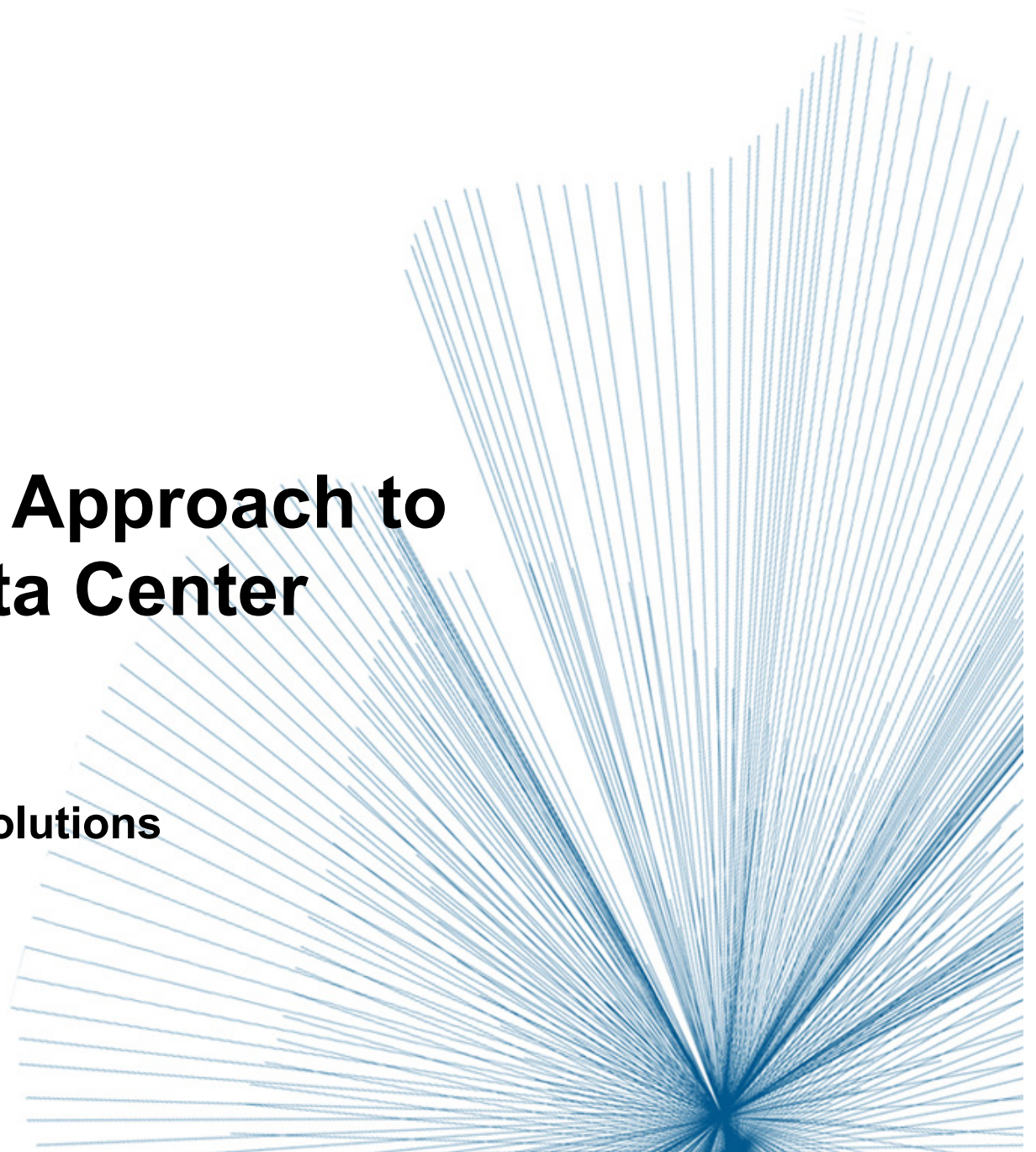




# **An alternative Approach to SSD in the Data Center**

**Gaetano Pastore**

**Sales Manager Flash Solutions**



# Evolution of Storage Platforms

## Server-centric Storage

### Direct-Attach Storage



### Networked Storage (SAN)



- ❑ Shareability
- ❑ Scalability
- ❑ Data availability
- ❑ Data services

## Cloud-enabled Storage

### PCIe Flash Storage (DAS)



### Networked Flash Storage (Server-based SAN)



- ❑ Shareability
- ❑ Scalability
- ❑ Data availability
- ❑ Data services



# FlashMAX Connect Software Platform



**Data Protection: vHA** enables high-performance synchronous mirroring



**Storage Management: vShare** enables iSCSI-like access to a flash aware partitions of a remote PCIe SSD



**Data Management: vCache** enables construction of transparent block cache devices

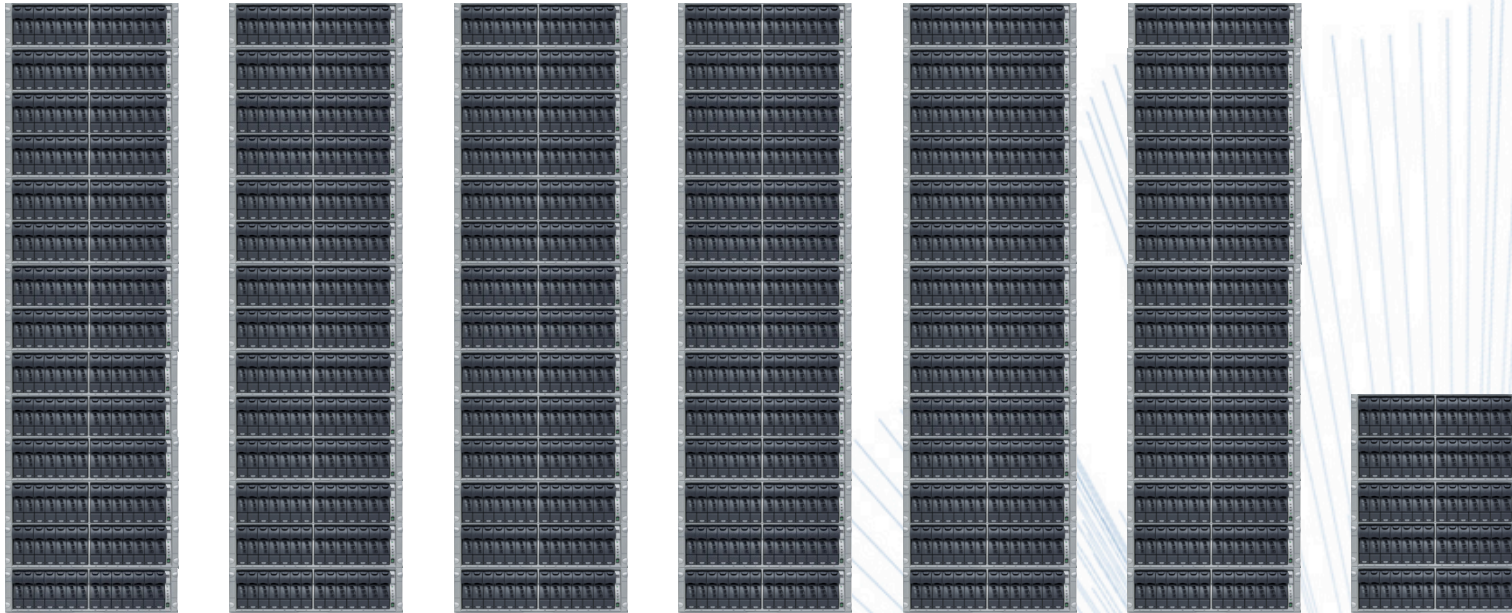


**Performance:** All capabilities of the software with IOPs and latencies of direct-attached PCIe Flash

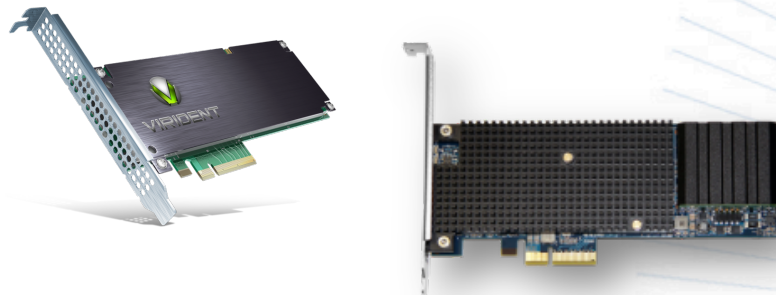


- ❑ Linux Redhat 5 – 6
- ❑ Oracle EL6
- ❑ Centos 5 – 6
- ❑ SLES 11sp2

**It takes over 6 full racks of 15k rpm hard drives to achieve the same IOPS as 1 of our PCIe cards**



**OR**



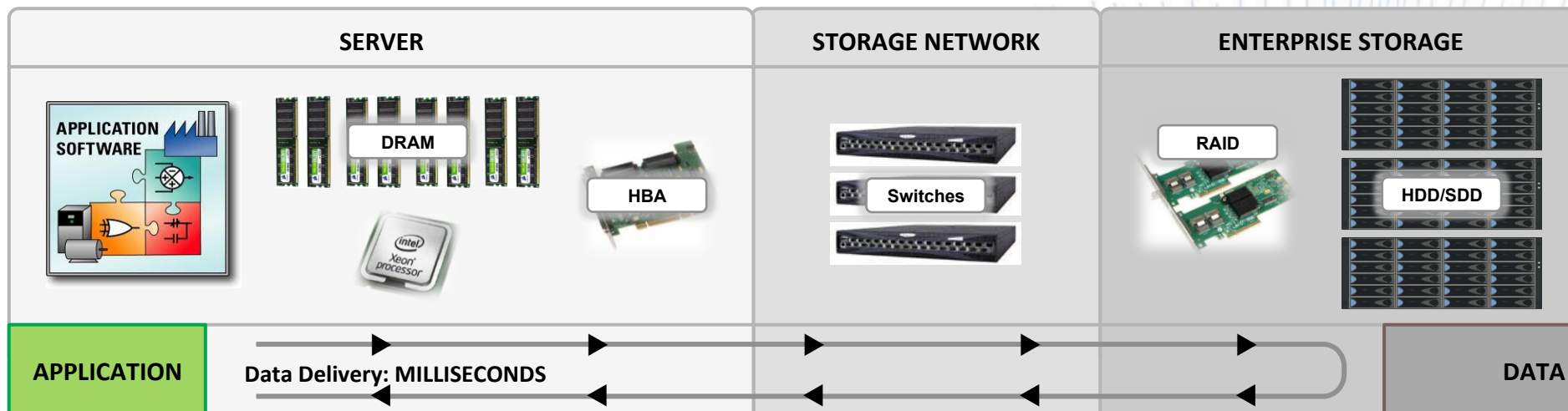
Better performance, equivalent to 6.34 racks

Lower Power & Cooling Costs  
(15,545 Watts vs. 25 Watts or €15,000/  
year for colocation power)

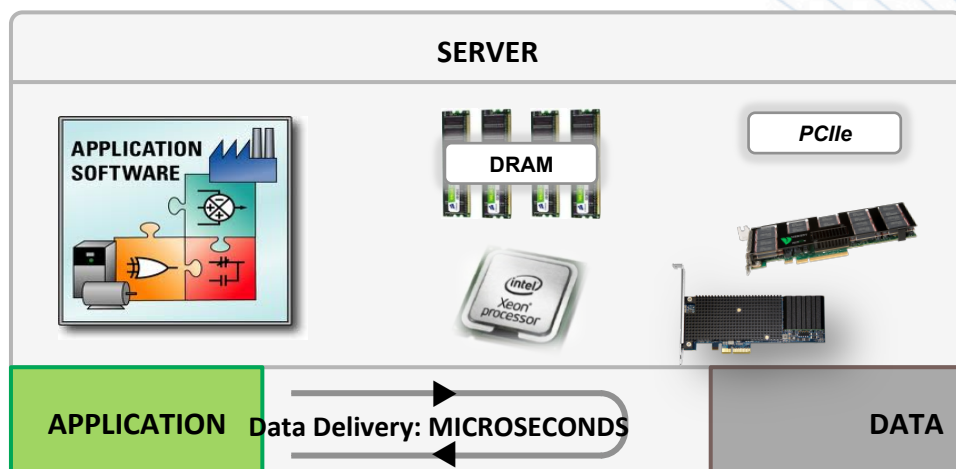
Lower Replacement Costs  
(€686,000 for 6 racks of disks)

# PCIe Breakthrough Architecture

## Legacy Storage Architecture



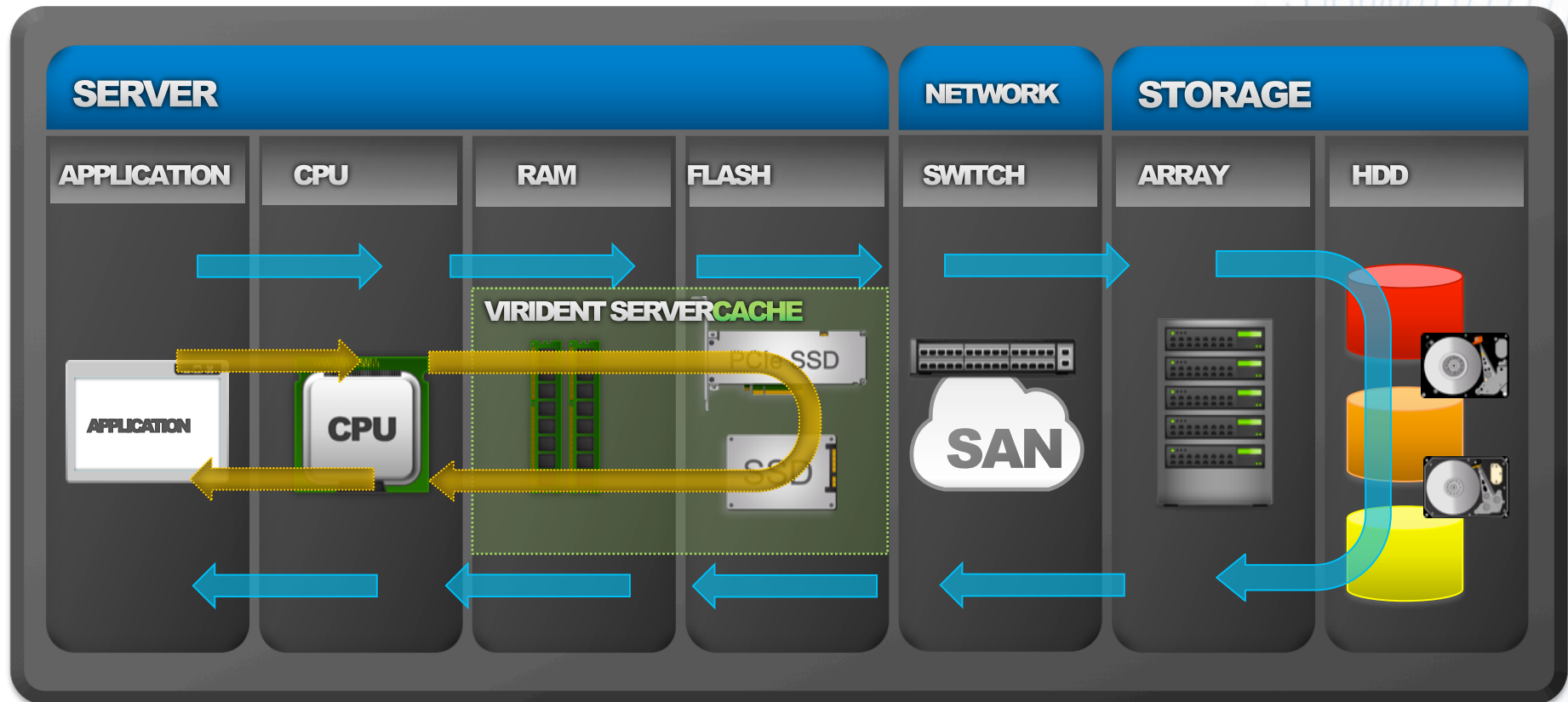
## Breakthrough PCIe Flash Architecture



**Increased Performance**  
**Higher Resource Utilization**  
**Lower costs**  
**Less Complexity**  
**Improved Data Service**



# ServerCache – Single Server Caching



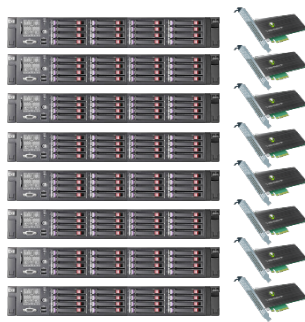
*Improves application performance by creating a rapid-access copy of data on flash*

## Server-Side All-Flash Storage for Oracle RAC vs. Oracle Exadata

Get consistently high performance of **all-flash** storage at **1/5** to **1/2** of Exadata cost with **flexibility** of commodity server hardware

- ✓ Choose the right amount of storage: 0.5 TB to 72 TB of flash per node, up to 64 nodes
- ✓ Choose the right OS: Redhat, Oracle Linux, SUSE
- ✓ Choose the right server type: 1U/2U/4U, 1/2/4/8/16 CPUs, HP/Dell/IBM/Cisco/Hitachi/Fujitsu
- ✓ Reduce Oracle licenses or maximize performance by selecting the right CPUs: 4-12 cores, up to 3.5GHz
- ✓ Increase performance by using more DRAM, up to 768 GB in 2-CPU servers

### Virident FlashMAX



Commodity servers  
with PCIe flash

VS.



Rack of proprietary DB servers and  
storage servers with HDDs and flash



- ❑ 10x Latency Reduction on Oracle Single Instance
- ❑ 46x faster Report Generation on MS SQL
- ❑ 10x Latency Reduction for Exchange
- ❑ 6x Server Consolidation on MySQL
- ❑ 7x Increase in No. of VDI Instances