



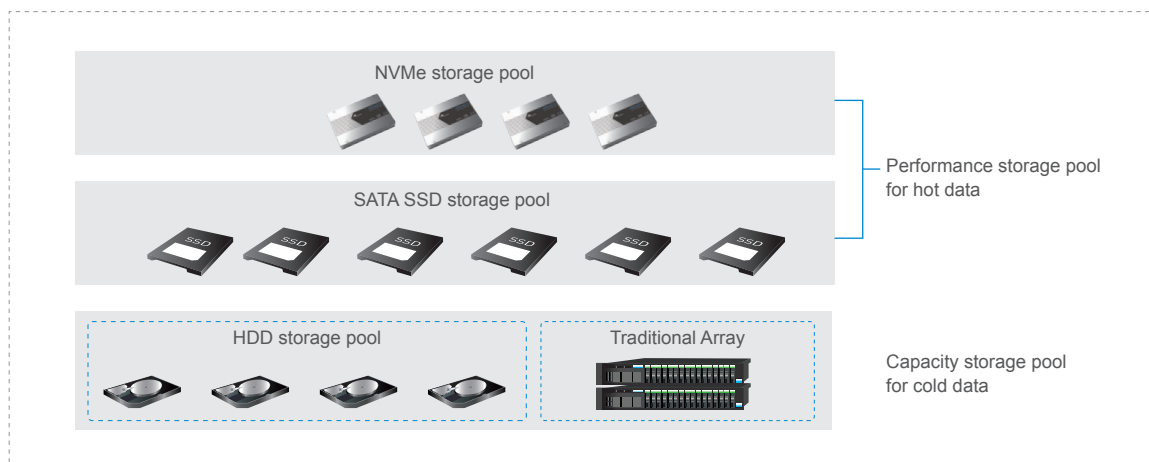
# PBlaze SSD + *FlashRAID*® Improve MySQL Performance and Reliability

MySQL is now the most popular open source database, and is widely used in network and vertical industries. At the same time, technologies like master-slave copy, read write separation and MySQL cluster, etc. are influencing MySQL and even the entire data center architecture whilst it evolves.

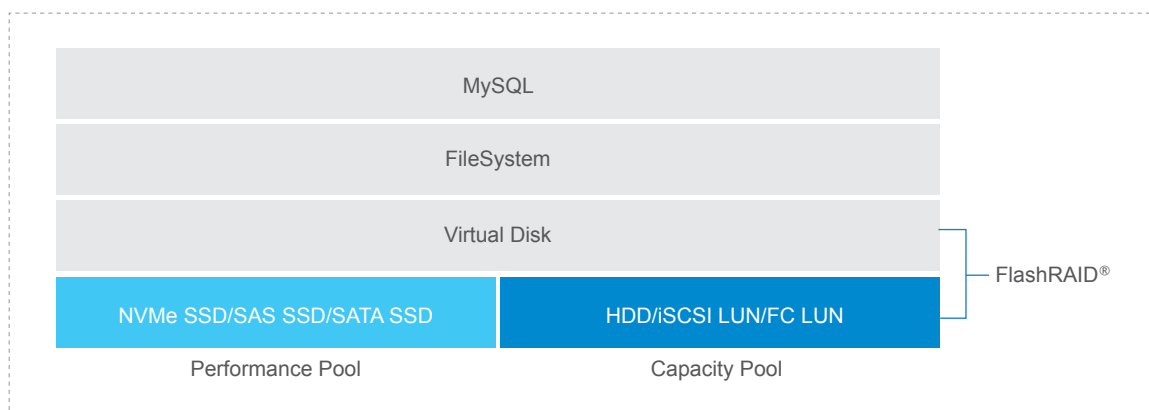
When increasing Cluster Scale it is very hard to break through the SATA/SAS SSD storage bottleneck. NVMe SSD can fundamentally resolve this problem. When NVMe SSD is not just a Cache, but high speed main storage media, enterprises need to deploy a more effective data protection and storage management solution. Memblaze's FlashRAID® data protection solution focuses on the lack of NVMe data protection, and helps database users to use NVMe SSD safely and effectively whilst still benefiting from NVMe's exceptional performance!

## Description

Consuming very limited system resource, FlashRAID® can protect the valuable data in the database, and will not decrease the database performance. FlashRAID® can be installed on the same platform as and with the database. FlashRAID® guarantees the upstream application performance during the storage capacity expansion process and in the event of a NVMe SSD failure without shutting down the system. With the FlashRAID®, system performance and capacity can grow without disturbing the system stability. Superior performance, higher reliability and stability can help customers to reduce the application cluster scale and reduce investment.



FlashRAID® Architecture

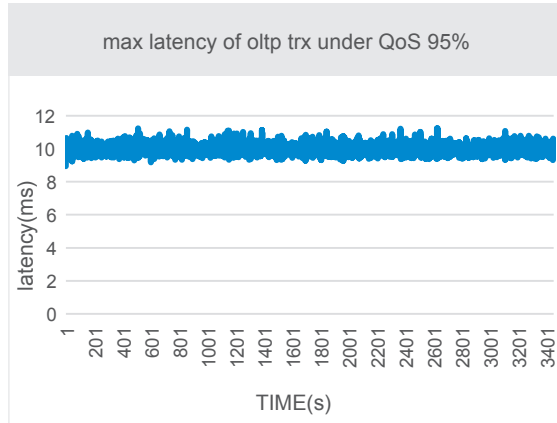
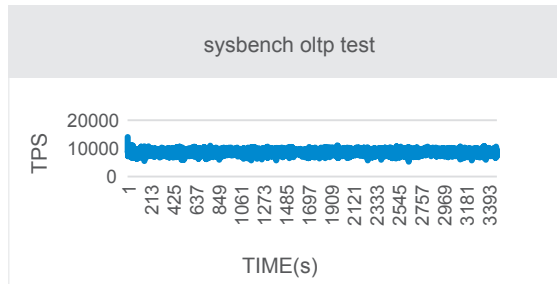


Solution logic architecture

## Advantages

Based on RAID 2.0 technology, FlashRAID® improves both the performance and stability at the same time

In the same storage pool, users can create volumes with different stability levels. Support load balancing between disks, data migration, NVMe SSD hot plug, disk roaming. Guarantee application reliability and continuity. IO path lock-free. Fully utilize multiple CPU cores whilst Global wear leveling avoids multiple SSD failure at the same time.



### Test Environment

Server: Supermicro SuperServer 1028U-TN10RT+,  
2 Intel® Xeon® CPU E5-2695 v3 @ 2.30GHz\*28,  
96GB DRAM

Storage device: 4 x Memblaze® 3.2T PBlaze4 for FlashRAID®

Test tool: sysbench 0.5, MySQL OLTP model test tool

Software: CentOS 7.1

FlashRAID® v1.2

MySQL 5.7.11(innodb)

FlashRAID® Configuration

RAID: 5, chunk size: 4MB, stripe unit: 8KB

Performance of MySQL database on FlashRAID® + 4\*PBlaze4 NVMe SSD

## Support Tiered Storage, Capacity/Performance Expansion Dynamically

Provides tiered storage on different storage media, supports NVMe, SAS, SATA disks equally, support storage pool and volume capacity dynamic expansion. Invest on demand, decrease TCO.

## Improve Resource Utilization

RAID technology can improve resource utilization. Integrating performance and capacity of multiple devices can help reduce the hardware deployed, maintenance cost and overall investment.



Beijing Memblaze Technology Co., Ltd. [www.memblaze.com](http://www.memblaze.com)

Address: B2-A302, 66 Xixiaokou Rd, Haidian, Beijing, China

Contact Email: [contact@memblaze.com](mailto:contact@memblaze.com)

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