Accelerate Oracle with All-Flash

3PAR Flash Accelerator for Oracle and VMAX

Hewlett Packard Enterprise

Oracle databases sit at the heart of a business, demanding the highest levels of performance, availability, and data services. But what if your Oracle database is bogged down by aging storage? What if costs are too high and constant storage tuning is required to keep up with service-level agreements?

When it comes to your Oracle database environment, change can introduce risk, so options are limited for many customers. They don't realize there's an alternative to sinking more money into their legacy storage environment or undergoing a painful rip-and-replace. This brochure describes how you can augment your legacy storage with the 3PAR Flash Accelerator for Oracle and VMAX for a significant performance boost at a fraction of the cost of a legacy storage upgrade. Best of all, it's a minimally disruptive solution that puts you on the path to modernizing your data center at your own pace. With the recent announcement that Dell will acquire EMC, there is no better time to consider an alternative.

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Your challenge: getting more performance out of your Oracle database environment while controlling costs

A recent survey published by Forrester confirmed that performance is the number one enterprise database challenge.[1] And when it comes to database performance, legacy storage is often the culprit, resulting in:

- **Performance limitations resulting in business limitations**—Administrators find themselves continually tuning their apps and storage to attack the problem, all with the intention of improving performance in the face of more rigorous service-level agreements (SLAs).

- **Unsustainable costs and missed opportunities**—Endless legacy storage expansion is not the answer to performance challenges. Increasing cache and adding tiering to the ecosystem are near-term fixes that come with high costs.

- **Aging infrastructure that limits innovation**—Maintaining legacy infrastructure takes resources away from projects that drive true business innovation and competitive advantage. Legacy infrastructure is slow to deliver database copies for application development and business innovation.

- **Entrenched technology that has you pinned**—Your Oracle database is mission-critical, and change means risk, so while you need to do something to break the legacy storage cycle, you also need to be assured that change will not compromise availability.
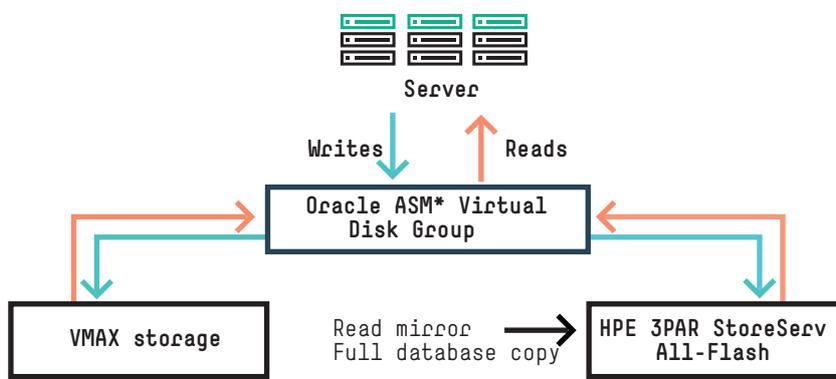
What are your options to break the legacy storage cycle? Modernizing your data center infrastructure with all-flash provides the maximum performance boost and reduction in total cost of ownership (TCO). In addition to breakthrough performance gains, customers who have replaced legacy storage for Oracle with HPE 3PAR StoreServ All-Flash consistently cite benefits such as lower costs (hardware, database licensing, maintenance, etc.), significantly improved user satisfaction and productivity, faster reporting, greater headroom for growth, and the freedom to finally innovate.[2]

[1] Forrester Research, Inc., Global Database Management Online Survey, February 2013. Base = 104 database management professionals with 1,000 or more employees.

[2] Actual HPE client results: Video, "**Sony Network Entertainment—Breaking Boundaries with Flash Storage**"

However, not every customer is ready to make this move. So now Hewlett Packard Enterprise is giving you an alternative solution, using All-Flash HPE 3PAR StoreServ Storage. You now have the ability to insert 3PAR All-Flash in your environment alongside VMAX storage to accelerate database performance—at a fraction of the cost of upgrading your existing EMC VMAX storage, all with minimal disruption.

Figure 1 shows a simplified architectural diagram of the HPE solution. With Oracle 11g and Oracle's Automated Storage Manager (ASM) volume manager and file system, it's possible to configure disk groups to read from a preferred secondary storage group. The HDD storage group is the legacy/VMAX storage. The 3PAR StoreServ All-Flash is configured as the SSD disk group. The 3PAR StoreServ contains a full mirror of the database. Oracle ASM allows this setup to be used for performance enhancement by defining the 3PAR StoreServ All-Flash as the preferred read group. This means that all read traffic is routed first to the All-Flash array. Writes are completed to both the All-Flash Array and the legacy storage device. The net result is a performance boost of greater than 75 percent.[3]

Server

Writes **Reads**

Oracle ASM* Virtual Disk Group

VMAX storage

Read mirror
Full database copy

HPE 3PAR StoreServ All-Flash

* Oracle ASM is a volume manager and file system

Figure 1. Architectural diagram

Figure 2 provides additional detail on the performance results. Pictured here is the read performance data demonstrating a greater than 75 percent read IO throughput improvement. Write improvement is also 75 percent or greater. This is due to the fact that the HPE 3PAR StoreServ AFA acknowledges writes faster, speeding up service times for writes and freeing up processing time for the legacy array.

Latency reductions are also significant: 6X latency reduction in the heavily constrained case and 4X reduction in the moderately constrained case, as a result of co-locating the 3PAR StoreServ and EMC VMAX.
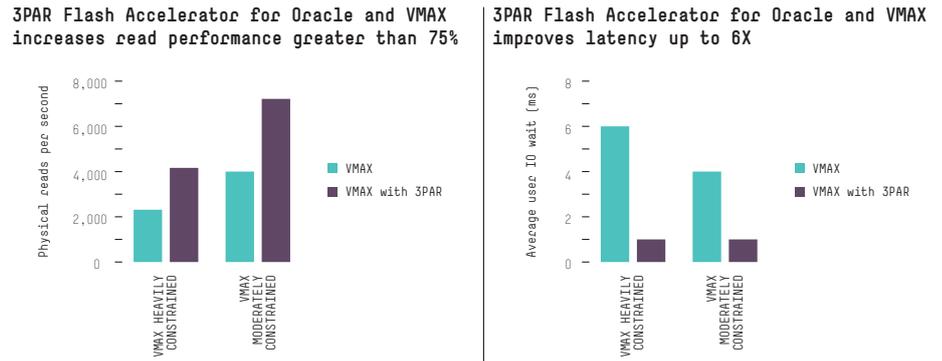
3PAR Flash Accelerator for Oracle and VMAX increases read performance greater than 75%

3PAR Flash Accelerator for Oracle and VMAX improves latency up to 6X

Figure 2. Performance

Inserting All-Flash HPE 3PAR StoreServ Storage into your legacy storage environment for Oracle will significantly increase performance, reduce costs, allow for easy access to All-Flash full database copies, and provide additional growth headroom—all with trusted and proven infrastructure from HPE and HPE TS Consulting field experience to accelerate your time to ROI.

TCO savings
The best part is that achieving these kinds of performance results by adding All-Flash HPE 3PAR StoreServ Storage to your existing VMAX environment is that the cost is less than half of what it would cost to upgrade your EMC VMAX array.

Figure 3 shows results of a three-year TCO analysis comparing the cost of a VMAX upgrade vs. the addition of the 3PAR Flash Accelerator for Oracle and VMAX. The 3PAR solution is 50 percent of the cost of a VMAX upgrade.[4] Savings come from lower hardware costs plus reduction in Oracle licensing and server costs. The three-year TCO analysis assumed a database size of 50 TB. The VMAX upgrade was from four to eight controllers with 100K IOPS required. The 3PAR AFA is a 4-node 8450 with 62 TB usable in RAID5 with no compression or dedupe. Also included in the 3PAR AFA figures were costs for additional HBAs and consulting services.

3PAR Flash Accelerator for Oracle and VMAX is less than half the cost of a VMAX upgrade

Source: Wikibon, November 2015

Figure 3. TCO comparison

Enabling application developers—and doubling productivity

In addition to savings from the cost of the array, Oracle license, and server savings, the 3PAR Flash Accelerator for Oracle and VMAX affords significant innovation and also savings in the area of application development. Developers are demanding full database copies, ready database copy access for DevOps—particularly mobile development—and also high-performance copies, like those from an All-Flash array instead of a hybrid array. The HPE 3PAR StoreServ All-Flash solution solves this challenge with ready capacity on the 3PAR AFA mirror.

3PAR AFA provides database volume copies with All-Flash performance. What's more, database volume copies on 3PAR AFA are created with 3PAR Virtual Copy snapshots with copy on write technology. These 3PAR snapshots are highly efficient compared to full copies/clones, and also significantly reduce the storage capacity consumed by traditional copy proliferation. The net-net of all these benefits is a doubling of productivity for the application development community. Using the same three-year TCO model described above for a community of 10 application developers the additional cost savings to the business in productivity is $1.6 million USD.[4] This assumes a 50 percent boost in productivity with application developer salary of $140,000 USD and benefits kicking in six months into the three-year period.

With this solution, you can:

- Improve performance by greater than 75 percent[3] on average by using Oracle ASM Read Redirect to offload the majority of reads to 3PAR StoreServ All-Flash

- Lower costs by 50 percent[4] compared to the cost of upgrading your legacy VMAX storage

- Easily create high-performing full database copies for application deployment using 3PAR StoreServ All-Flash

- Free up legacy storage cycles for repurposing to other tasks

- Preserve current processes such as backup and recovery

- Deploy with minimal risk

- Accelerate your time to ROI with HPE Consulting Services

- Proactive technology refresh with HPE Financial Services

- Invest incrementally in modern storage to support the transition to an All-Flash data center infrastructure

75%

Performance improvement[3]

50%

Lower cost[4]

**HPE 3PAR 8000 All-Flash
Storage array**

All-Flash HPE 3PAR StoreServ 8450 Storage
All-Flash HPE 3PAR StoreServ Storage is the only platform in the industry to deliver the performance advantages of a purpose-built, flash-optimized architecture without compromising resiliency, efficiency, or data mobility.

Part of the HPE 3PAR StoreServ 8000 family, the 3PAR StoreServ 8450 All-Flash is ideal for accelerating your Oracle database environment due to its enterprise-class features and midrange pricing. In fact, in a recent Gartner Critical Capabilities report for Midrange Storage Arrays,[5] 3PAR StoreServ scored the highest in all use cases—beating EMC, NetApp, and Nimble in all areas.

This flash-optimized architecture reduces performance bottlenecks that can choke general-purpose disk arrays that have been retrofitted with solid state drives (SSDs) and outperforms other All-Flash platforms. When co-located with EMC VMAX, your All-Flash 3PAR StoreServ provides these unique innovations:

• Ability to turn off in-line deduplication for lowest possible latencies

• Instant All-Flash database copies with HPE 3PAR StoreServ Virtual Copy snapshots

• Ensured service levels with QoS optimization where 3PAR All-Flash will be shared with Oracle database and other applications

• Up to 20 percent additional latency reductions for Oracle environments with 16 GB Fibre Channel SAN and HPE 3PAR Express Writes capability[6]

• Six-nines availability with a rich set of Tier 1 data services, a complete set of persistent technologies, and a five-year warranty on all SSDs

The time is now to modernize your storage infrastructure
HPE 3PAR StoreServ is the only storage architecture in the industry that meets the requirements of mid-tier, enterprise, and All-Flash storage customers. Every other storage company needs three independent products to cover a customer's complete needs. 3PAR StoreServ, with its scale-out design, was designed to support virtualized, IT-as-a-Service, and cloud environments. Other older architectures were designed in the early 1990s, at a time when database growth was predictable and easy to plan. 3PAR offers the performance advantages of flash with the economics of traditional disk storage. Traditional scale-up architectures can incorporate flash technology, but in reality, all they are doing is moving the bottleneck from the back-end disk drives to the controller. 3PAR's modern architecture seamlessly leverages flash technology to deliver breakthrough end-to-end system performance.

There has never been a better time to consider modernizing legacy storage infrastructure onto 3PAR StoreServ. Dell's acquisition of EMC will generate cost-cutting to service their tremendous debt, which is sure to further stifle the already ageing VMAX product family.

Now is the time to modernize your storage infrastructure.
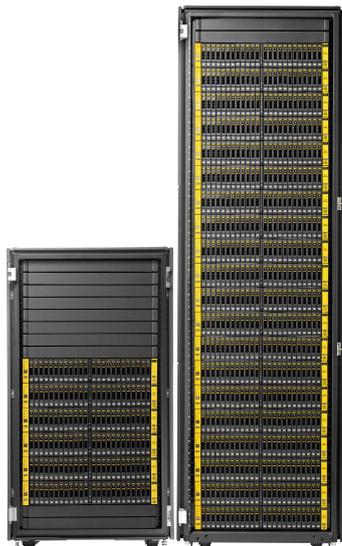
[5] Critical Capabilities for General-Purpose, Midrange Storage Arrays, Published: 21 October 2015 Analyst(s): Stanley Zaffos, Valdis Filks, Santhosh Rao, Roger W. Cox

[6] Demartek Evaluation, "**Improving Oracle Database Response Times with All-Flash HP 3PAR StoreServ 7450c**," June 2015

Resources

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Complete your solution with HPE Technology Services

Information Management and Application Transformation Services
HPE Technology Services Consulting is able to combine Information Management and Application Transformation Services to enable you with 3PAR All-Flash for your legacy storage environments. Information management considerations include processes, tools, and governance as well as data protection. HPE's application expertise for Oracle spans 30 years with 4,200 HPE-badged Oracle professionals serving customers in 170 countries.

HPE Services can help you deploy new solutions with reduced costs and operational risks while aligning IT to business goals, eliminating dependencies on obsolete technologies, and enabling applications for the future.

Learn more at **hp.com/services/applications-TEW**

Get better performance and lower costs ASAP

You already know that the declining performance and escalating costs of your legacy storage environment for Oracle are not sustainable. There is an alternative to the status quo; contact your authorized HPE sales representative to learn more about this ground-breaking solution and see if a proof-of-concept is right for you.

Download the assets
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Read the Flash Changes Everything brochure
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