

# FlipKart Improves Peak Web Performance and Customer Experience with Virident's FlashMAX



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*India's largest online retailer streamlines MySQL database performance, improves site integrity and conserves power with Virident's storage-class memory solution*

## The Challenge

Following its launch in 2007, FlipKart grew rapidly and is now India's largest online retailer. While FlipKart's explosive growth was clearly a business success, its datacenter infrastructure lagged behind and was unable to handle peaks in traffic. According to Burzin Engineer, director of engineering at FlipKart, "Our website performance was unpredictable under load, and during peak load, our MySQL database replication lagged. The MySQL slaves would never catch up. We needed to re-create the slaves with a backup and restore to get the slaves back in sync. This got to the point where it was happening every couple of days."

In addition, FlipKart's typical MySQL databases were stored on three servers with six 15K 146G hard disk drives (HDDs) per server. The MySQL servers were running at less than 50 percent of CPU utilization because of the storage I/O bottleneck. FlipKart needed a solution that would solve the problem quickly.

## The Solution

Amod Malviya, vice president of engineering, heard about Virident and acquired its FlashMAX solution based on his recommendation and Virident's 45-day free trial offer. After a quick lab test, it was clear that FlashMAX was the solution to FlipKart's database and website performance problems. Burzin replaced most of FlipKart's 15K HDDs in the MySQL server with Virident FlashMAX PCIe SSDs. "The problem was solved quickly," Burzin said. "FlashMAX allowed us to focus on our core business, instead of on database tuning and administration."

## Performance

FlashMAX completely eliminated the I/O bottleneck caused by the HDDs. "After installing FlashMAX, our web performance was outstanding right through the peak performance periods," Burzin said. "We had been thinking about replacing the MySQL servers, but they now have sufficient unconditional peak performance to meet our needs."

## Improving site integrity add

Virident's FlashMAX cards performed much better than the former disk arrays, but more importantly for FlipKart, they improved the integrity of its site. "When the slave MySQL servers were so far behind, we would deliver out-of-date information to our customers. With Virident, our customers always receive the most up-to-date information," said Burzin.

## Cutting Power Usage

Power consumption in the datacenter is always a concern for any enterprise. This is especially true in India, which struggles to deliver enough power. Burzin said, "FlashMAX enabled us to improve our I/O performance by 10 times with approximately half the power." Before deploying FlashMAX, FlipKart had eight 15K HDDs in a RAID 10 to meet its performance and reliability requirements. FlashMAX now delivers more than 10 times the performance with the same reliability through a RAID 5 running on the FlashMAX board. According to Burzin, "The money we save on power and cooling alone further justifies our Virident investment and could easily pay for the cards over their lifetime."



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## The Results

Before deploying Virident, FlipKart's MySQL environment included:

- Three MySQL servers (one master, two slaves)
- Eight SAS 15K 146G HDDs in RAID 10
- 32 total HDDs

FlipKart replaced the 32 HDDs with four FlashMAX TB PCIe SSDs, resulting in the following benefits:

- Performance increases of 50 percent
- Improved user experience and site integrity
- Stable website with unconditional peak performance
- Extension of the MySQL server's lifetime by at least a year
- Reduction of storage power usage by half

By simply replacing hard drives with Virident FlashMAX PCIe SSDs, FlipKart achieved dramatic improvements in customer experience, IT performance, OpEx and CapEx.

## About FlipKart

Flipkart.com, India's largest online retailer, went live in 2007 and since then has grown rapidly with the introduction of innovative features such as collect on delivery, 30-day replacement guarantees and its own delivery network. Today its product portfolio ranges across 14 categories from books to music, mobiles, computers, cameras, home and kitchen appliances, TV and home theatre systems, personal and healthcare products, and the newly launched stationery items. The site ranks among the top 30 in India (per Alexa rankings) and receives more than 12 million visits every month.