



## CASE STUDY

# Ikyu Implements Fusion ioMemory™ PCIe cards to speed up search response and reservations of luxurious hotels

## Solution Focus

- Online search and reservations
- Server storage

## Summary of Benefits

- Search response of less than 2 seconds
- Improved availability with excellent fault tolerance

## Products

- Fusion ioMemory PX600 PCIe application accelerator
- Fusion ioMemory ioDrive®2

## Advantages of Tokyo Electron Device Support

- Fast and extensive support structure for problem resolution
- Accelerated use of devices that are installed backed by abundant product knowledge

## Summary

Established in 1998, Ikyu Corporation, known for its online hotel reservation site, Ikyu.com, focuses on luxurious Japanese hotels and inns. To improve the service level of the reservation website, in terms of rapid searches of hotels and inns, the company has selected Fusion ioMemory PCIe cards for their server storage. This improved search response and availability has enabled the company to achieve its highest user service level to date.

## The Challenge

With more than 3.6 million users, Ikyu Corporation operates online reservation portals, such as Ikyu.com Biz, Ikyu.com, and Ikyu.com Restaurant, which are focused on luxurious Japanese hotels and inns, high-class facilities, higher-grade business hotels, and instant reservations of select restaurants. Ikyu Premium Service was launched for Ikyu.com, Ikyu.com Biz, and Ikyu.com Restaurant in April 2014. For each of four new membership stages, members can avail themselves of various benefits, such as higher award rates and invitations to special sales campaigns. Diamond members, who enjoy the highest membership level, receive special services such as upgrades and late checkout times at partner hotels and inns. In addition, Ikyu offers services such as Ikyu Gift, which has a selection of elite items and Ikyu Market, which is a portal for purchasing coupons. With this increasing number of customers using the services of the company every day, Ikyu.com become concerned about the performance of the system that constitutes the backbone of the services.

Mr. Isao Senba, System Foundation and Infrastructure Team Manager at Ikyu.com, described the situation. "In terms of service level, our target response time is less than two seconds for users searching for hotels and inns. However, when searching with a wide range of conditions, for example 'Hotels in the entire Tokyo region' or 'Hotels and Japanese inns in the entire Hokkaido region in off season', it had become very difficult to maintain the response time of less than two seconds." In addition, slower response had become a problem when there was heavy traffic of users due to a marketing or advertising campaign.



*“Irrespective of search conditions, it became possible to achieve response time of less than two seconds, which is the target service level. At the same time, data writing for booking processes and batch processes also became high-speed processes. More than two years have passed since our first implementation, and the system is operating in a stable manner without any malfunction.”*

**Mr. Isao Senba, System Foundation and Infrastructure Team Manager, Ikyu.com**



In order to solve this problem, Mr. Senba focused on the I/O of storage installed in the servers. “Because the number of servers is not that high, it is essential to increase the speed of each server in order to improve the service response,” he told us. “Search conditions, such as dates and location, differ each time by customer, and we can hardly expect high-speed search with cache. Therefore, we decided that the most effective way is to improve the I/O of the storage, which can easily become the bottleneck.”

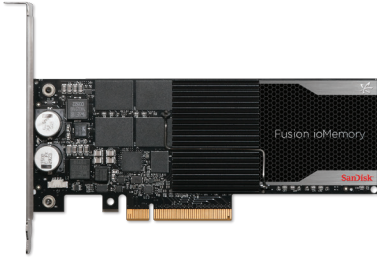
Simultaneous with improving response, Ikyu also wanted to further improve availability. In addition, one of their targets was optimizing IT investment. “For improving the satisfaction and convenience of customers, the underlying condition is to ensure stable operations without any service interruption,” explained Mr. Senba. “As part of the specific measures taken, we wanted to improve the availability of the storage infrastructure.”

**The Solution**

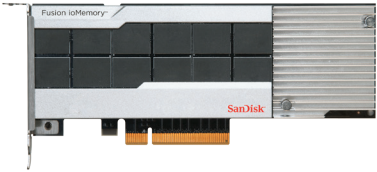
The measure adopted by Ikyu for solving these problems was a plan to migrate from hard disk storage to flash storage. “Flash storage is significantly faster than hard disk, and we expected a significant improvement in response,” said Mr. Senba. “Besides, its structure is simpler compared to RAID, and it has excellent fault resistance.” Mr. Senba conducted a comparative study by actually testing products of multiple companies. As a result, he selected Fusion ioMemory ioDrive®2 PCIe cards from SanDisk®, based primarily on the high IOPS value. This ultra-high-speed semiconductor storage—a Fusion ioMemory PCIe card equipped with NAND flash memory—is used for achieving performance and reliability equivalent to large-scale SAN storage.

In the summer of 2012, Mr. Senba installed the Fusion ioMemory PCIe card with the support of Tokyo Electron Device Limited. “Tokyo Electron Device offers thorough support, which is a great help. Earlier, when some problems occurred in the firmware, their friendly staff immediately prepared a detailed manual for us. This was very reassuring for us, because we did not want to stop the service. They immediately responded to our questions, such as commands of our desired functions.” IOPS values were evaluated prior to migrating the system into production. In addition, the system was optimized for availability and high-speed search response to generate the best value from the IT investment.

Mr. Senba continuously strengthened the infrastructure by purchasing servers equipped with Fusion ioMemory. Furthermore, in 2014, he started looking into the possibility of installing the latest generation of the Fusion ioMemory PCIe card, the Fusion ioMemory PX600 PCIe application accelerator. Mr. Senba highlighted several reasons for continuously selecting the Fusion ioMemory series of PCIe cards. “Above all, it is about high-speed storage I/O. When we actually embedded it in our server and used the server, it delivered the expected performance. Reliability and stability are also satisfactory. We are continuously using it because of these results.”



Fusion ioMemory PX600  
PCIe application accelerator



Fusion ioMemory ioDrive®2

## The Results

Ikyu has reaped several benefits by implementing the Fusion ioMemory cards in the server storage. The first benefit is improved search response. "IOPS of storage increased significantly, and speed of reading data also increased," Mr. Senba told us. "As a result, search response improved. Irrespective of search conditions, it became possible to achieve response time of less than two seconds, which is the target service level. At the same time, data writing for booking processes and batch processes also became high-speed processes." Mr. Senba is also pleased by the improved availability of the online service due to the implementation of Fusion ioMemory products. "More than two years have passed since our first implementation, and the system is operating in a stable manner without any malfunction," said Mr. Senba. "We have never had a situation where the system had shut down because of NAND flash memory."

Furthermore, the high-speed IOPS performance has provided a favorable impact on optimization of IT investments. "Storage no longer remained a bottleneck, and we could now adequately use the server resources," said Mr. Senba. "Therefore, even if the CPU has a lower performance than an earlier CPU, we can get the targeted performance from the server on the overall basis. We have been getting maximum benefits with minimum investment."

Going forward, Ikyu plans to continue to implement and reinforce Fusion ioMemory PCIe cards as required. In addition, Ikyu will continue to avail the support of Tokyo Electron Device and strive to strengthen the company's competitiveness by continuously improving service quality.

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