



Intel® SSD 910 Series with PCI Interface Selected for Social Game Database Server Achieves Operational Workload at Lower Cost and with Faster User Response Times



GCREST, Inc.

Headquarters:

Sumitomo Fudosan Shibuya Garden Tower,
16-17 Nanpeidaichō, Shibuya, Tokyo

Established:

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Capital:

237,000,000 yen

Business activities:

Planning, development, operations, and sales of online games; Planning, development, operations, and sales of content for mobile phones

<http://www.gcrest.com/>

Issues

- Faster storage I/O needed to improve user response times
- Scalability of server storage
- Cost savings and reduction in administration workload

Solution

- Database server fitted with Intel® SSD 910 series
- Use of Remote Housing to handle server installation and operations

Benefits

- Superior user experience : 2-4X the performance & responsiveness of SATA SSD's
- Longer life (30X the durability¹) and reduced administration workload attained through use of self-monitoring, analysis and reporting technology (S.M.A.R.T.)

¹ compared to conventional MLC drives

Intel® SSD 910 Series Chosen for Ease of Use and Fast Response with PCI Interface

A member of the CyberAgent Group, GCREST, Inc. is a game portal and online gaming company. The company has selected the Remote Housing data center service of Sakura Internet Inc. to provide the system platform for its social game Dragon's Shadow (released in February 2013), with the game service being run from servers installed at the Ishikari Data Center. GCREST has also selected Intel® SSD 910 series storage for its game database servers. As the first solid-state drive (SSD) from Intel to use the PCI Express* interface, the Intel® SSD 910 features significantly faster throughput than previous SSDs. Tetsuya Ishibashi of the GCREST Corporate Administration Department explained that the choice of the Intel® SSD 910 was due to its speed of response and ease of use, elaborating as follows.

"The ability of the PCI interface on the Intel® SSD 910 to transfer large amounts of data quickly provides a step up in server response. Because we develop our games from a small start, we looked at SSD storage because of its ease of scaling and fast disk I/O speed. While prioritizing disk I/O in the past required use of expensive

SSD storage, the low cost of the Intel® SSD 910 made it a viable proposition and this is what led to our choice."

Implementation of Social Game Database Server Brings Dramatic Improvement in Service Level

The database servers for Dragon's Shadow use six Intel® SSD 910 drives (400 GB model) configured as three sets of two made up of one master database server and one slave database server. As the 400 GB model appears to the server as two 200 GB drives, a software RAID is used to operate these in a single drive configuration.

Load testing of a database server fitted with Intel® SSD 910 storage was conducted prior to the service release. The test software applied a repeated load of writing to and reading from the SSD and found that, in practical terms, there was no limit on the disk I/O. Mr. Ishibashi described the benefits of installing the SSDs as follows.

"The fast response of the Intel® SSD 910 provides a step up in the service level delivered to users. Because the PCI interface connects the Intel® SSD 910 directly to the CPU, it

High-Speed SSDs for Data Centers Combine High Performance with Reliability and Durability

eliminates bottlenecks in the writing, reading, and transfer of data and therefore achieves a response roughly equivalent to the processing speed of the CPU itself, with a speed that is more than three times faster than before.”

Significant Reduction in Operational Workload Achieved through Use in Conjunction with Remote Housing Service

The Remote Housing service selected by GCREST to host the platform for its social game houses the user servers and other network equipment in racks at Sakura Internet’s Ishikari Data Center. Unlike services used previously that required them to take care of server delivery and installation themselves, these tasks are all handled by Sakura Internet, which also provides 24-hour, 365-day operation and maintenance support. In addition to users supplying their own hardware, Sakura Internet also offers a rental option. In GCREST’s case, they chose to send their own server hardware to the Ishikari Data Center and have Sakura Internet purchase and retrofit the Intel® SSD 910 drives. Michiharu Nakazawa of the Planning Department of Sakura Internet commented that, “The concept behind the Remote Housing service provides the flexibility to install whatever hardware you want, as in a city-based data center, while also giving easy access via remote operation. We are used to dealing with a wide variety of user requests, and in this case our response to a request from GCREST, one of our long-time customers, for an improvement in database server response times was to suggest the Intel® SSD 910 drive, which also features significantly improved reliability.”

To satisfy user requirements, Remote Housing offers wide range of server storage options, including SATA HDDs, SAS HDDs, the Intel®

SSD 520 series, and SSDs from other vendors. The advantages quoted by Mr. Nakazawa of choosing the Intel® SSD 910 with a PCI interface over these other options included the scope for disk consolidation, the high degree of scalability, and efficient maintenance.

Mr. Nakazawa commented that, “While HDDs or SSDs with a SATA interface can be consolidated in a RAID configuration, the half-duplex data transfer used by SATA results in performance degradation because disk I/O bottlenecks arise whenever read and write requests occur simultaneously. As a result of installing Intel® SSD 910 drives with a PCI interface in the GCREST system, however, the low latency and full duplex data transfer provided by the PCIe interface means that disk consolidation can be achieved at low cost without any loss of performance when simultaneous read and write requests occur. Another significant advantage is the availability of S.M.A.R.T. information for ease of administration.”



Ishikari Data Center, the base for Sakura Internet’s Remote Housing service

Lacking the rotating parts of a disk drive, SSDs have a low failure rate and this reduces the associated maintenance workload. The Intel® SSD 910 uses MLC NAND flash memory produced using a 25 nm process and featuring proprietary technology for enhanced durability. This provides it with approximately 30 times the durability of conventional MLC flash

memory products. A simplified calculation of the total write capacity gives a figure of 7 PB (for the 400 GB model), indicating there is no risk of the SSD life expiring within the guarantee period of the server. The major benefit of this is that service users can concentrate on the operation of system resources without worrying about the physical lifespan of the infrastructure.

Considering the Use of Hadoop* for Distributed Processing of Big Data

Recognizing its ease of use and excellent cost-performance, GCREST intends to make greater use of the Intel® SSD 910 in the future as its standard PCI interface SSD. Mr. Ishibashi said, “In addition to server storage, we are also considering its use for the structural analysis of user characteristics in conjunction with Hadoop* software for the distributed processing of big data. Accordingly, we are looking forward to the availability of SSDs with even larger capacities.”

Meanwhile, Sakura Internet intends to actively recommend the use of the Intel® SSD 910 series in its Remote Housing service. They are also currently conducting tests aimed at offering services that incorporate the Intel® SSD DC S3700 series released for use in the next generation of data centers. Speaking about Intel, Mr. Nakazawa concluded by saying, “We are looking forward to the future release of new SSDs that combine a high level of absolute performance with both ease of use and cost performance.” For its part, Intel intends to continue responding to the needs of GCREST and Sakura Internet by further enhancing its range of SSD products.



Tetsuya Ishibashi
Technology Management Group
Corporate Administration Department
GCREST, Inc.



Michiharu Nakazawa
Leader
Planning Department
Sakura Internet Inc.



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