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Korean Entertainment Company Bolsters Mobile Game Marketing with Faster Database Performance

"We implemented SQL Server 2014 In-Memory OLTP and measured performance using the 'All Together, Cha Cha Cha' scenario. The results show that SQL Server 2014 delivered 35 times faster performance over the 2012 version in both batch requests per second and I/O throughput."

Lee Sangbong, Deputy Chief, CJ E&M Database Team

Korean entertainment giant CJ E&M is enjoying great success with a series of popular mobile video games. It wants to attract more customers for its games by holding online giveaway events for digital accessories like character costumes and decorations soon after each game is released. But performance issues with the server that handles such items has forced CJ E&M to restrict the frequency of events and the number of items it gives away. To avoid system errors and delays that might drive customers away, the company plans to implement new technology in Microsoft SQL Server 2014 to dramatically improve server performance and support expansion of marketing events.

Customer: CJ E&M
Website: en.cjenm.com
Customer Size: 2,000 employees
Country or Region: Korea
Industry: Media and entertainment

Customer Profile
CJ E&M is the largest entertainment and media company in Korea and is a leader in introducing Korean culture to the world through diverse genres such as motion pictures, broadcasting, live performances, music, and games.

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Business Needs

CJ E&M is Korea's largest entertainment and media conglomerate, with interests in broadcast, movies, music, performance, and online games. Starting with the smartphone racing game "All Together, Cha Cha Cha," the company's games division has rolled out a series of hit arcade-style games and popular mobile role-playing games. But as the customer base has increased, so have loads on the company's IT system, and server performance problems are becoming more frequent.

These problems are particularly acute whenever the company runs in-game item giveaway events, which are seen as essential marketing tools for attracting customers. In a giveaway event, the company sends users a phone push notification to tell them that the event has

begun. Users tend to try to access the event immediately and server traffic surges. Often, more than half a million users try to access the system at the same time, overloading the server and causing service delays.

The company has addressed performance concerns in a number of ways. To reduce the chance of system errors and delays that would drive users away, CJ E&M limited the number of items to be given away to fewer than five per user. It also tried to reduce traffic surges by rearranging the schedules for sending push notifications. In addition, it tried to speed up data access on its high-specification 32-core, 64-gigabyte HP DL580 game item server by replacing its hard disk with a Fusion-io solid-state drive (SSD). But these were interim measures at best, and the database team grew increasingly worried about performance as CJ E&M continued to release new products and hold giveaway events.

Solution

The solution to the problem emerged when Microsoft invited CJ E&M to join the Microsoft SQL Server 2014 Rapid Deployment Program (RDP). CJ E&M was already running SQL Server 2012 software. It was interested in SQL Server 2014 because it introduces new features that could significantly improve performance on existing hardware while retaining features that were already familiar to the IT staff.

One piece of new technology, In-Memory OLTP (online transaction processing), significantly improves the performance of database applications by having data live entirely in memory, where records can be accessed much more quickly than on disk. With In-Memory OLTP, SQL Server no longer needs to use the lock and latch data synchronization mechanisms that can create bottlenecks in high-performance software systems running on multicore processors. Another SQL Server 2014 technology that caught the team's attention is the Buffer Pool Extension (BPE), which improves performance by integrating solid-state drive (SSD) storage into system memory. The BPE uses SSDs as an extension to the database buffer pool, allowing more in-memory processing and reducing disk I/O, which minimizes processing delays.

Convinced that the combination of these new features would help it provide game items to more users, CJ E&M Database Team joined the SQL Server 2014 RDP. It then undertook a series of tests to determine how much performance would improve with SQL Server 2014. To compare the OLTP processing performance of the existing SQL Server 2012 environment with the 2014 version, the database team tested both under the exact same conditions. Using the same server and SSD storage and a demo script provided by Microsoft, the team quickly saw that SQL Server 2014 was about 12 times faster than the earlier version. When it ran tests in an actual operational environment for one of its most popular games, the results were even more dramatic. "We implemented SQL Server 2014 In-Memory OLTP and measured performance using the 'All Together, Cha Cha Cha' scenario. The results show that SQL Server 2014 delivered 35 times faster performance over the 2012 version in both batch requests per second and I/O throughput. The 35-times-faster performance is particularly pleasing given the way it addresses our long-standing issues around mobile game item push service with its complicated logic," said Lee Sangbong, Deputy Chief, CJ E&M Database Team.

As a result of the tests, the database team plans to move its game item server database to SQL Server 2014 before launching new mobile games.

Benefits

In addition to improving server performance, SQL Server 2014 helps CJ E&M use its existing server hardware more efficiently with few operating problems. And with SQL Server 2014, the company can meet marketing goals by supporting more item giveaway events to attract and secure customers.

Efficient Use of Existing Hardware

CJ E&M found that one of the biggest advantages of SQL Server 2014 over SQL Server 2012 is more efficient use of the company's existing hardware. "The current game item server runs at less than 60 percent CPU usage due to the latch problem when a large number of people access at the same time and, as a result, we have not been able to get the best out of our high-priced equipment. However, SQL Server 2014 has no lock and latch problem, meaning it can increase CPU usage up to 90 percent," said Lee Sangbong. "What was even more surprising was that it ensured seamless handling of all requests without an error, even when CPU usage exceeds 90 percent."

Familiar Tools, Fewer Problems

The database team expects SQL Server 2014 to be just as easy to use as SQL Server 2012 because of its built-in tools and familiarity. For example, when the database team built the test environment, it was able to migrate queries from the old environment simply and easily without delays by using the built-in AMR (Analysis, Migrate and Report) tool. In addition, CJ E&M is able to make best use of its technological infrastructure because IT staff already knows how to get the best out of SQL Server. The company expects that migration and service operation would have had more problems if CJ E&M were moving to an in-memory solution provided by an unfamiliar company.

More Marketing Potential

By upgrading its game item server to SQL Server 2014, CJ E&M solves the performance problems that forced the company to limit its item giveaway marketing events. CJ E&M no longer needs to limit the number of giveaway items to five per customer. Instead, it can reach more customers more frequently by dramatically expanding the number of items it gives away and by holding giveaway events more often with less fear of service delays and system errors. "SQL Server 2014 makes it less burdensome to give away game items. The 35-times-faster performance enables us to give away up to 100 items to each user with every event," Lee Sangbong said.

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