

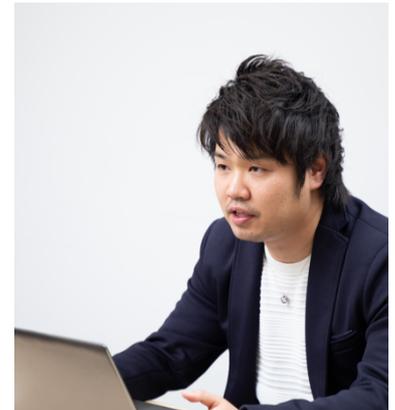


SQUARE ENIX reduced database backup time to 1/6th to offer superb game environment for users worldwide

“As a result of switching from logical backups with mysqldump to physical backups with MySQL Enterprise Backup, we were able to reduce the time taken for backups to one-sixth of what it used to be. Backups that used to take up to 24 hours now take less than four, and with faster restore operations, we can expect a massive reduction in recovery time if anything happens.”

SQUARE ENIX CO., LTD.

**Information Technology Division
Social Game Infrastructure Group
Hisashi Kondo**



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CASE STUDY

SQUARE ENIX CO., LTD. enhanced backup efficiency and restored operations by adopting MySQL Enterprise Edition. The company has also improved its monitoring and analysis capabilities to ensure customers can enjoy responsiveness that is both smooth and seamless.

INTRODUCTION

One of SQUARE ENIX's main businesses is game-based digital entertainment. The company releases a wide range of digital entertainment content developed by leveraging its global cutting-edge development resources and its international business capabilities.

Within this global company, there is a group that handles the mission-critical IT infrastructure, planning and construction for systems like authentication and billing, as well as online games across all platforms, like smartphone games, browser games, arcade games, games for console devices and more.

This group is the Information Technology Division's Social Game Infrastructure Group, to which Hisashi Kondo belongs. It is responsible for many projects, which involves the group overseeing a large number of users and servers.

The company-wide standard filling the database server requirement is MySQL, Oracle's open-source relational database management system.

There are several hundred database servers in operation for popular content, such as DRAGON QUEST OF THE STARS, MOBIUS FINAL FANTASY (service has ended on March 31, 2020), and KINGDOM HEARTS Union χ[Cross]. These servers are expected to run flexibly, according to the usage conditions of each game. Using multiple database management systems would make it impossible to standardize and share operational know-how, and it would cost a great deal to train engineers. For these reasons SQUARE ENIX has consistently sought to master and use MySQL.



The daily work of the Social Game Infrastructure Group is diverse and spans everything from MySQL replication settings to cluster structure verification.

Moreover, as the characteristics of the infrastructure supporting the operation of the game, the group needs to conduct many parameter tunings to respond to rapidly increasing database load at the event. Games for smartphones of late include online battle games that require split-second responsiveness. If the setting values are not meticulously controlled in consideration of data characteristics, performance requirements, user-impact, what would happen in the event of a fault? Users might feel stressed.

The group is primarily responsible for production environment of each game, as well as development and preview environment corresponding to each stage of development.

CHALLENGE

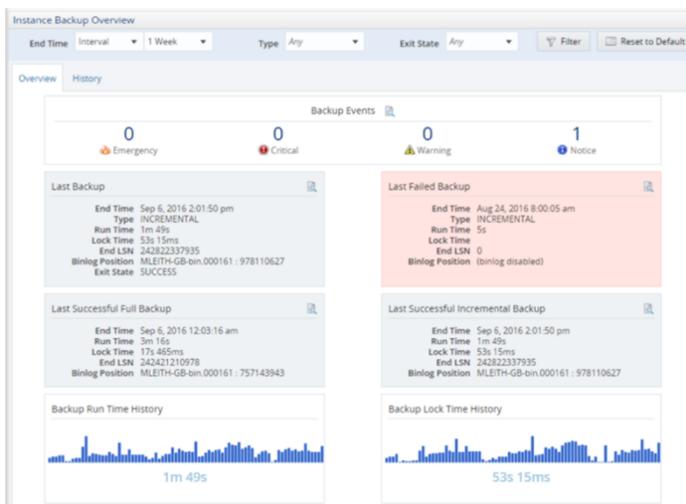
- Foundationally, the group put together a replication structure for the database servers that supports a wide range of game content and ran them with multitasking. However, this mechanism did not automatically perform failover in the event of a fault. If a database server went down, it would take anywhere between several minutes and several dozen minutes to restore it. The impact of a single failure could extend to hours of time with data recovery and data integrity check included.
- The group turned its attention to MySQL InnoDB Cluster and MySQL NDB Cluster to tackle the challenges as mentioned earlier and is undertaking proof of concept (PoC) work while preparing to incorporate them in multiple projects.
- Additionally, the group has struggled with the time needed for backup and restore operations in the last three years. Daily backup work no longer fits into the business hours of the Social Game Infrastructure Group, and it can take up to 24 hours. Accumulated logs of user actions are requirements for games, and the longer a game is in operation, the higher the volume of data will become. As a result, the total amount of data managed with MySQL is on the order of several dozen terabytes.
- If no action were taken regarding the increasing length of time required for backup and restore operations, issues with data protection in authentication and billing systems would result.
- The more users a game has, the higher the processing required for things such as API access. This increase will start to have a noticeable impact on response time. Situations with a large number of users will require the kind of parameter tuning mentioned above, as well as exact information used to determine where bottlenecks are occurring. The result of the parameter tuning must also be swiftly evaluated. Engineers needed query analysis solutions to support choosing proper options rapidly in performance tuning.

RESULTS

- To tackle these new challenges, SQUARE ENIX brought in MySQL Enterprise Backup and MySQL Enterprise Monitor, two components from MySQL Enterprise Edition. The company had looked into other solutions and products, but concluded that MySQL Enterprise Edition solved those issues with minimum impact on current systems and operations.
- MySQL Enterprise Backup supports full backups, incremental backups, partial backups, point in time recovery, and compressed backups. It also reduces the risk of data loss by running backups for active databases online.
- MySQL Enterprise Backup yielded results immediately. As a result of switching from mysqldump to MySQL Enterprise Backup, the group was able to reduce backup time to one-sixth of what it once was. It is now possible to do backups, which used

to take up to 24 hours, in less than four. Additionally, with faster restore operations, massive reductions in recovery time can also be anticipated.

- If the group wanted to achieve the same level of backup and restore operations as MySQL Enterprise Backup with more backup servers and more parallelism, it would have required a significant investment. This means that the adoption of MySQL Enterprise Backup has brought significant cost benefits.
- The actual work involved in implementing MySQL Enterprise Backup was also very smooth, and it was about as simple as adding a MySQL plugin.
- The company is currently implementing MySQL Enterprise Backup into database servers according to a predetermined order of priority. This implementation is contributing to better data protection through things, such as hourly backups, instead of weekly ones.
- MySQL Enterprise Monitor links with MySQL Query Analyzer to constantly monitor databases and discover potential problems. These potential problems get flagged, allowing them to be addressed. Acting as something of a virtual DBA assistant to the user, it provides advice on best practices for matters such as eliminating security vulnerabilities, improving replication, and optimizing performance. As a result, it contributes to increased productivity on the part of the engineers involved in database design and operation.
- Furthermore, MySQL Enterprise Monitor has reliably accelerated the discovery of security vulnerabilities and the identification of problem areas. Thanks to this, it has provided swift response times, as well as all other things that ensure a smooth and seamless user experience. MySQL Enterprise Monitor is also highly regarded by the engineers involved with the design and operation of databases for the content of each game. It's popular for the usability of its user interface, and regular use is starting to take root.



MySQL Enterprise Monitor screen in MySQL Enterprise Edition

WHY ORACLE

In addition to the MySQL Enterprise Edition that SQUARE ENIX adopted for use here, the company also uses MySQL Standard Edition for other projects. It rates Oracle's support service for both of these products highly. As opposed to the service desks of other vendors, where support is provided via an operator, MySQL technical support service of Oracle boasts a support team comprised of MySQL engineers. They are thoroughly familiar with and can directly provide advice on things like the development, operation, and management of applications that use MySQL.

“Our group members have a pretty high level of knowledge and skills when it comes to MySQL, so we can deal with almost all problems that occur daily by ourselves. However, we sometimes face special cases where problems cannot be quickly resolved, such as version upgrades and MySQL NDB Cluster verification. Depending on how fast we can be provided with a suitable resolution, the lost opportunities can extend for upwards of several hours. We are responsible for supporting mission-critical infrastructure, and Oracle is irreplaceable as a backup for us.”

- Hisashi Kondo, Social Game Infrastructure Group, Information Technology Division, SQUARE ENIX CO., LTD.

While promoting the use of the cloud, SQUARE ENIX is designing various middleware based on PaaS. The company wants to use MySQL as a PaaS in the future. However, there are concerns related to availability and performance when it comes to PaaS, so the company has very high hopes that Oracle solutions will meet these requirements.

SQUARE ENIX

ORACLE CUSTOMER

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ORACLE SOLUTIONS USED

- MySQL Standard Edition
- MySQL Enterprise Edition (MySQL Enterprise Backup, MySQL Enterprise Monitor)

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