

# **Study of Information Storage Systems for Large-scale Data**

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Information Storage Systems play a key role to manage large-scale data created by users of information systems. If the information storage systems become slow down, services provided by the information systems may be stopped. In this case, the users of the services may not utilize the contents until the data stored in the information storage systems can be accessed normally. Moreover, if the data is broken, then the contents are lost permanently. Therefore, data is important, and we conduct research on the information storage systems.

## **Research 1: Data Protection from Large-scale Disaster**

When large-scale disasters occur, such as the Great East Japan earthquake, the data stored in servers or information storage systems may be broken because of shaking, tsunami, and so on. To protect stored data from large-scale disasters, data replication technologies are currently proposed<sup>(1)</sup>. The technologies back data up to remote site. And the backup data in remote site is copied to recovery site to restore services. We research and develop the methods of fast data restoration to restore the services immediately after disasters.

## **Research 2: Access Performance Improvement of Data in Remote Site**

Recently, cloud services grew popular, and a large amount of data is stored in the cloud services. Therefore, it is important to improve the data access performance of cloud service from end-user's PC. To improve the access performance of the data stored in remote site (cloud storage), we will develop methods, such as efficient parallel data access. The technologies aim to achieve low latency and broadband data access.

## **Research 3: Large Scale Information Storage Systems**

There are some implementations of open source software (OSS) to build a large-scale information storage system, such as Ceph<sup>(2)</sup> and GlusterFS<sup>(3)</sup>. We will work on the performance and scalability of OSSs to apply the information systems. And we will develop new functions to break down limitations.

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(1) S. Matsumoto, T. Nakamura, H. Muraoka, "Risk-aware Data Replication to Massively Multi-sites against Widespread Disasters," Rangsit Journal of Information Technology, Vol. 1, No. 2. pp. 22-28, 2013

(2) <https://ceph.io/>

(3) <https://www.gluster.org/>