



Development of A Scalable and Flexible Data Logging System Using NoSQL Databases

M. Kago, A. Yamashita

JASRI/SPring-8, Hyogo, Japan

Oct. 8, 2013



Introduction



Current System

- Relational database management system (RDBMS)
 - Time-series data
 - Stable operation for 16 years

RDBMS is not always the best one for data logging.

New System

- NoSQL (Not only SQL) database

*NoSQL is defined as a new type database management system that is non-relational.

New System Features

□ Scaling-out

The system can easily grow the performance by adding more low-cost servers.

□ High Reliability

There was no single point of failure (noSPOF).

□ Flexible Data Format

The system supports various data type such as integers, reals, strings, arrays and maps.

□ Low Latency Access

Users can take the latest data in microseconds order.



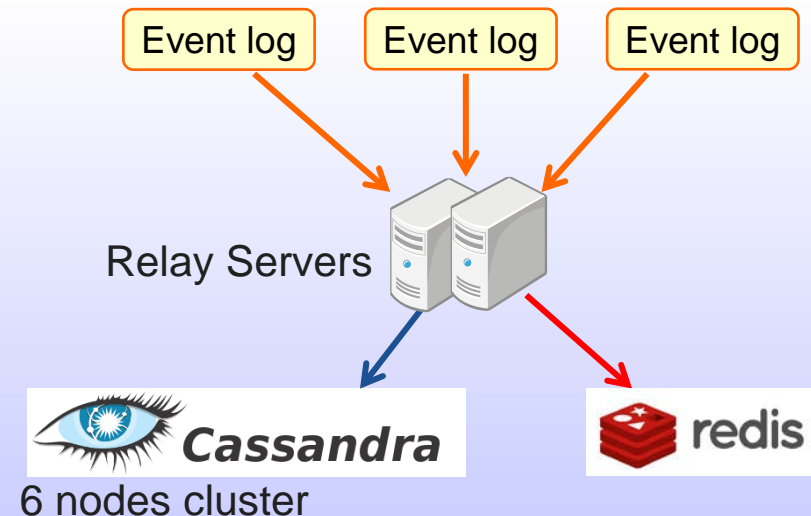
New System



NoSQL Database

- **Apache Cassandra**
 - Distributed database without SPOF
 - Excellent fit for time-series data
 - Perpetual archive
- **Redis**
 - In-memory key-value store
 - Real time data cache

System Overview



Long-term Test

- The system had been inserted **50,000 messages/sec** for **3 months**.
=> **No data loss** during the test even when the server was forced a shutdown.

High reliability and stability

Poster ID : **TUPPC012**