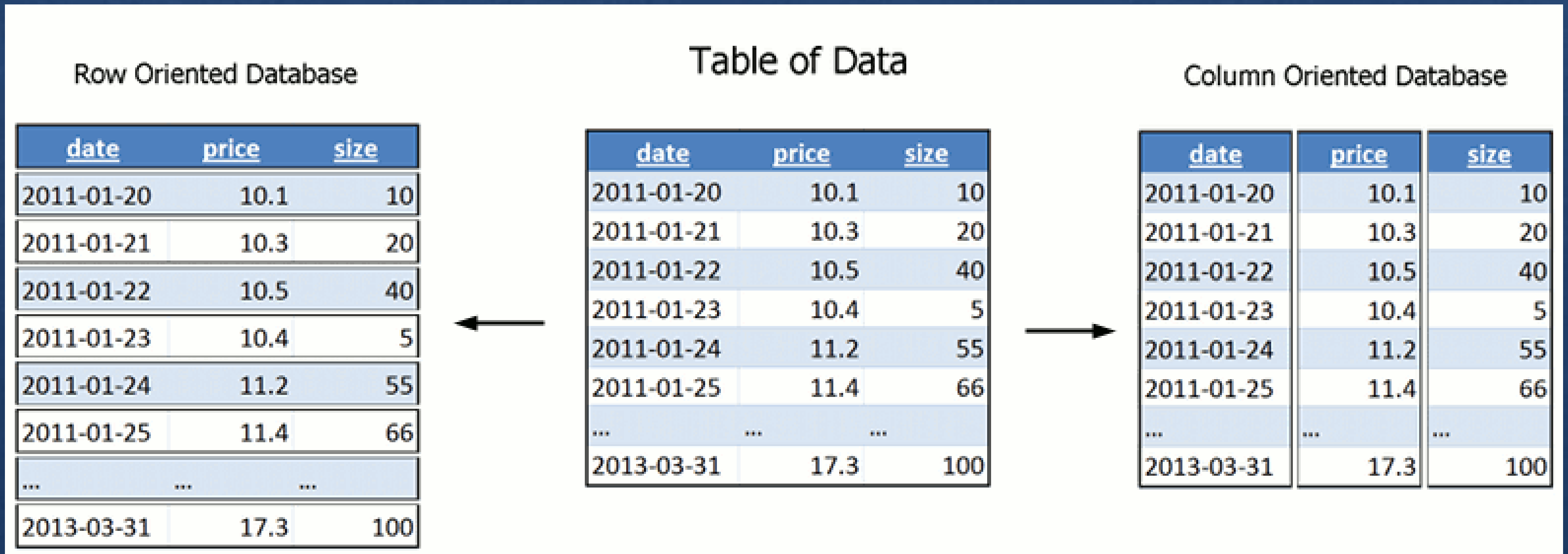
NoSQL To NewSQL

Introduction

- NewSQL a class of modern relational database management system
- SQL Support
- Non-locking concurrency control
- Guarantees of tradition database system
- Performance scalability

Column Oriented

- Data compression and more read/writes performance for large records.
- Good for redundant data



Row Oriented Database

date	price	size
2011-01-20	10.1	10
2011-01-21	10.3	20
2011-01-22	10.5	40
2011-01-23	10.4	5
2011-01-24	11.2	55
2011-01-25	11.4	66
...	...	...
2013-03-31	17.3	100

Table of Data

date	price	size
2011-01-20	10.1	10
2011-01-21	10.3	20
2011-01-22	10.5	40
2011-01-23	10.4	5
2011-01-24	11.2	55
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Column Oriented Database

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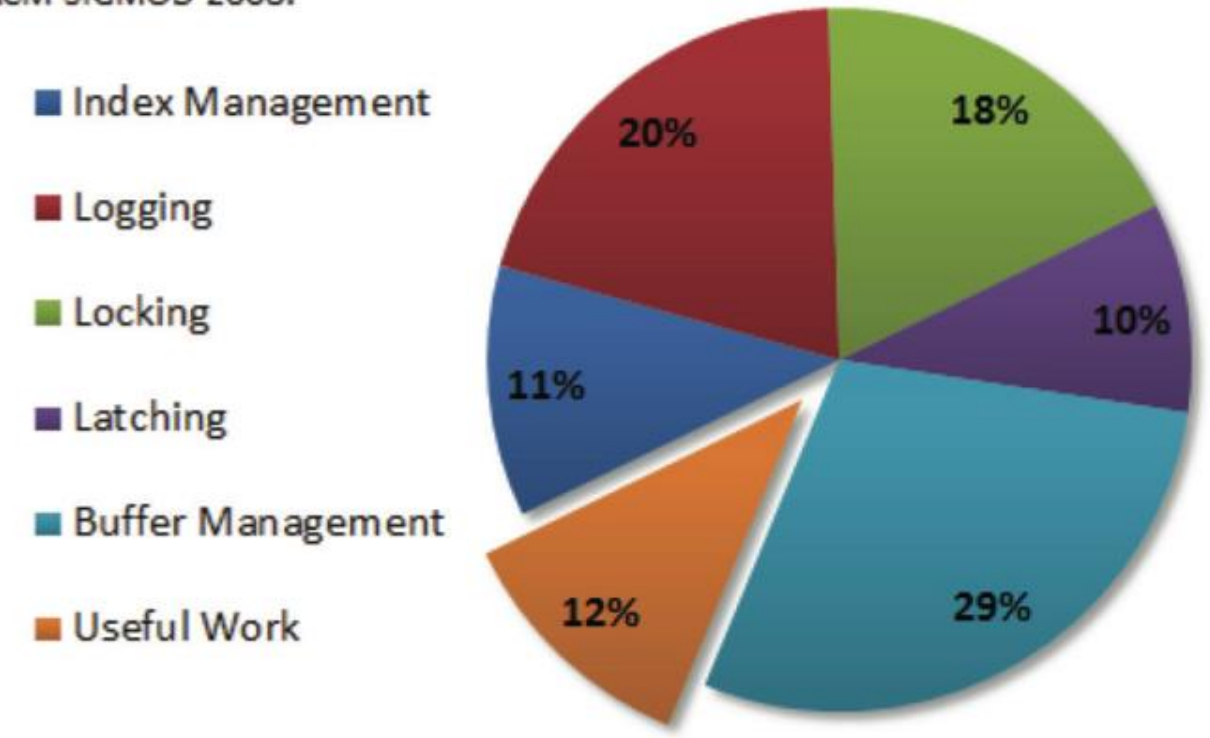
Traditional DBMS

General Purpose RDBMS Processing Profile

OLTP Through the Looking Glass, and What We Found There
Stavros Harizopoulos, Daniel Abadi, Samuel Madden, and Michael Stonebraker
ACM SIGMOD 2008.



NewSQL Architecture

- Minimize or avoiding locks
- Process in timestamp order
- Multi version and concurrency control
- Heavy reliance on memory

NoSQL Summary

- Appropriate for non transactional systems
- Support for Non Relational Data
- Eventual Consistency
- Non Transactional
- Modern OLAP Architecture

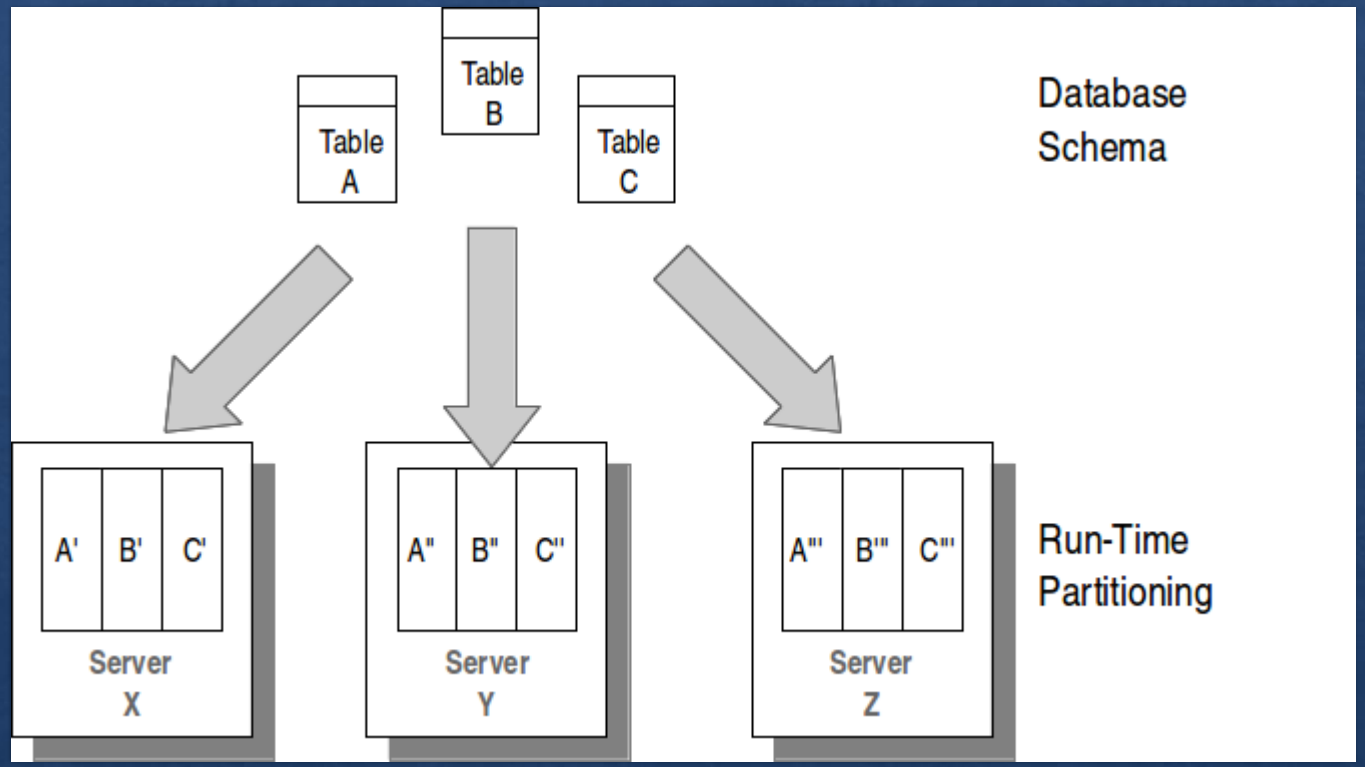
Paper

- OLTP paper by MIT
- INTRODUCTION :
- Modern general purpose online transaction processing (OLTP) database systems include a standard suite of features: a collection of on-disk data structures for table storage, including heap files and B-trees, support for multiple concurrent queries via locking based concurrency control, log-based recovery, and an efficient buffer manager. These features were developed to support transaction processing in the 1970's and 1980's, when an OLTP database was many times larger than the main memory, and when the computers that ran these databases cost hundreds of thousands to millions of dollars.

Volt DB

- VoltDB avoids the traditional DBMS overheads
- K-safety for fault tolerance
- In memory operation for maximum throughput
- Single threaded partition
- Built to horizontally scale

Query Execution VoltDB



Security

- Hacked interfaces and APIs
- Compromised credentials and broken authentication
- Denial of Service Attacks
- Network and Traffic

Summary

- It’s a SQL based, scalable, vendor support Relational Database Management System.
- Built in Administration tool
- Developer friendly
- Optimized application complexity stronger consistency and transaction support
- VoltDB for data-intensive applications, while offering an integrated high-throughput.
- Scale speed of NoSQL, but with stronger consistency with powerful SQL query language.
- Right Technology implementation

References

- OLTP Through the Looking Glass, and What We Found There : http://nms.csail.mit.edu/~stavros/pubs/OLTP_sigmod08.pdf
- https://en.wikipedia.org/wiki/NewSQL
- http://dataconomy.com/sql-vs-nosql-vs-newsql-finding-the-right-solution/
- http://www.slideshare.net/tmcallaghan/volt-db-preso-20101019
- http://www.timestored.com/time-series-data/what-is-a-column-oriented-database
- http://www.slideshare.net/IvanGlushkov/newsql-overview
- https://docs.voltdb.com/UsingVoltDB/IntroHowVoltDBWorks.php
- http://www.infoworld.com/article/3041078/security/the-dirty-dozen-12-cloud-security-threats.html