ScaleDB

“ScaleDB looks to be the MySQL version of Oracle RAC”
--- Brian Aker, Drizzle Architect, Sun Microsystems

Xin Jia
Mar 05, 2012

Source: http://www.scaledb.com/
What’s ScaleDB

• ScaleDB is a pluggable storage engine for MySQL. It turns your MySQL application into an enterprise-class, highly-available, clustered database that scales elastically in a public cloud, private cloud, or on premise.

• ScaleDB is a NewSQL pioneer, delivering the advantages of both SQL and NoSQL, while targeting the cloud.

Source: http://www.scaledb.com/
MySQL Architecture(1)

MySQL Architecture

Bottleneck:
1. Disk Speed (I/O)
2. CPU
3. Capacity (users, data)
4. Performance

ScaleDB improvements:
1. Large numbers of concurrent users
2. Large data sets
3. Large numbers of tables queries
4. Load balancing
5. Cloud elasticity
6. Lower TCO

ScaleDB cluster with Mirrored Storage

What’s New:

1. Shared-Disk Clustering
2. Multi-Table Indexing
3. CAS (Cache Accelerator Server)
4. Locality

Source: http://www.scaledb.com/architecture.html
The Performance Challenges

1. Data contention
   - Locality to reduce data movement (certain nodes in the database specialize in certain data)

2. Sharing data via the disk
   - Shared cache done through CAS

3. Maximize local cache
   - Improving cache hit ratio using CAS

4. Network traffic for messaging
   - Locality eliminate synchronizing messaging

5. Network traffic for large chunks of data
   - Local processing by CAS to send results only

Source: http://www.scaledb.com/architecture.html
## Features Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>Shared-Disk</th>
<th>Shared-Nothing</th>
<th>ScaleDB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elasticity</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>High-Availability</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>Medium</td>
<td>Easy</td>
<td>Easy</td>
</tr>
<tr>
<td>Ease of Scaling</td>
<td>Easy</td>
<td>Hard</td>
<td>Easy</td>
</tr>
<tr>
<td>Software Costs</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Storage Costs</td>
<td>High (SAN/NAS)</td>
<td>Low (PC)</td>
<td>Low (PC)</td>
</tr>
<tr>
<td>Performance</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: http://www.scaledb.com
Features Summary

- **High-Availability**: Node failure affect less
- **Flexibility**: Share workload
- **High Performance**: MTI (Multi-Table Index)
- **Seamless scalability**: Add nodes & storage with shutting down
- **Less TCO** (Total Cost of Ownership):  

<table>
<thead>
<tr>
<th>Innovative high-speed indexing</th>
<th>High-performance transaction processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-and-Cluster™ simplicity</td>
<td>Graceful fault-tolerance</td>
</tr>
<tr>
<td>Automatic data recovery</td>
<td>Row-level locking</td>
</tr>
<tr>
<td>ACID compliance</td>
<td>Multi-node concurrency control</td>
</tr>
<tr>
<td>Shared-everything architecture</td>
<td>Eliminates the requirement to partition data</td>
</tr>
</tbody>
</table>

Source: http://www.scaledb.com
Different with H-Store

- **ScaleDB**
  - Locality
  - CAS other than disk
  - Paired CAS on different nodes
  - Data contention lock
  - Cluster Manager

- **H-Store**
  - CTA
  - Main Memory
  - Partition Data replica on different nodes
  - Multi-partition txns
  - Site Coordinator
Answer questions

• 1. Does the system support distributed transactions?
   – No.

• 2. Is the system open-source?
   – NO. (Except for connectors for MySQL)

• 3. Does the system support stored procedures?
   – NO.
Sources