- Zidian outperforms Myrocks (Facebook) and CockroachDB (Baidu) on *each and every* of the TPC-H bechmark query on 10GB data;
- On average is 33.5X and 20.5X faster than Cockr. and Myrocks, up to 1.3×103 and 1.5×104, respectively.

24

Effectiveness

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
Zidian	3.5×10^{1}	2.8	2.1×10^{1}	4.9	1.4×10^{1}	0.13	1.3×10^{2}	5.8×10^{1}	8.6×10^{1}	1.4×10^{1}	0.12	2.6	3.9×10^{1}	4.0	0.24	6.3	0.046	1.1×10^{1}	0.061	1.3×10^{1}	2.6×10^{1}	1.8
Cockr.	4.2×10^{2}	N/A	1.6×10^{2}	N/A	8.8×10^{2}	1.3×10^{2}	7.3×10^{2}	MAX	MAX	8.3×10^{2}	4.1×10^{1}	1.6×10^{2}	1.3×10^{3}	2.0×10^{2}	3.0×10^{2}	2.3×10^{1}	ERR	6.1×10^{2}	N/A	N/A	N/A	N/A
MyRo.	1.9×10^{2}	3.6	1.2×10^{2}	3.1×10^{1}	7.2×10^{1}	6.7×10^{1}	2.5×10^{2}	1.9×10^{2}	1.3×10^{3}	4.6×10^{1}	2.2×10^{2}	1.3×10^{2}	N/A	7.3×10^{1}	1.2×10^{2}	9.3	7.1×10^{2}	7.4×10^{1}	8.5×10^{1}	1.2×10^{2}	7.0×10^{2}	MAX

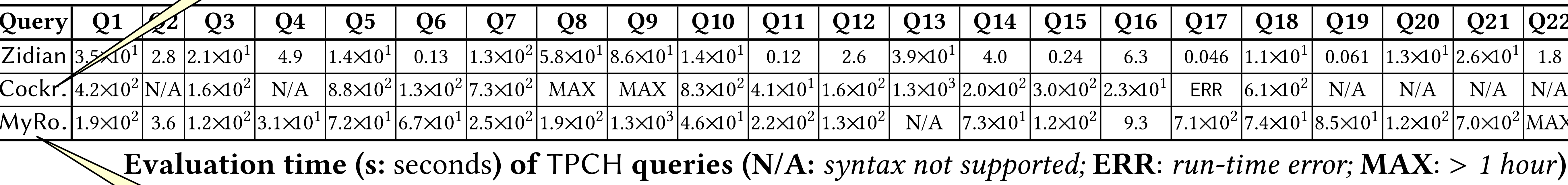
Table 5: Evaluation time (s: seconds**) of** TPCH **queries (N/A:** *syntax not supported;* **ERR**: *run-time error;* **MAX**: > *1 hour*)

used by Facebook

used by Baidu

used by Baidu

Effectiveness



Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
Zidian	3.5×10^{1}	2.8	2.1×10^{1}	4.9	1.4×10^{1}	0.13	1.3×10^{2}	5.8×10^{1}	8.6×10^{1}	1.4×10^{1}	0.12	2.6	3.9×10^{1}	4.0	0.24	6.3	0.046	1.1×10^{1}	0.061	1.3×10^{1}	2.6×10^{1}	1.8
Cockr.	4.2×10^{2}	N/A	1.6×10^{2}	N/A	8.8×10^{2}	1.3×10^{2}	7.3×10^{2}	MAX	MAX	8.3×10^{2}	4.1×10^{1}	1.6×10^{2}	1.3×10^{3}	2.0×10^{2}	3.0×10^{2}	2.3×10^{1}	ERR	6.1×10^{2}	N/A	N/A	N/A	N/A
MyRo.	1.9×10^{2}	3.6	1.2×10^{2}	3.1×10^{1}	7.2×10^{1}	6.7×10^{1}	2.5×10^{2}	1.9×10^{2}	1.3×10^{3}	4.6×10^{1}	2.2×10^{2}	1.3×10^{2}	N/A	7.3×10^{1}	1.2×10^{2}	9.3	7.1×10^{2}	7.4×10^{1}	8.5×10^{1}	1.2×10^{2}	7.0×10^{2}	MAX

Evaluation time (s: seconds**) of** TPCH **queries (N/A:** *syntax not supported;* **ERR**: *run-time error;* **MAX**: > *1 hour***)**

used by Facebook

- Zidian outperforms Myrocks (Facebook) and CockroachDB (Baidu) on *each and every* of the TPC-H bechmark query on 10GB data;
- On average is 33.5X and 20.5X faster than Cockr. and Myrocks, up to 1.3×103 and 1.5×104, respectively.

Summary

Theory: conventional query paradigm no longer suffices

- a new paradigm: query big data with constrained resources
- a data-driven approximation scheme
- fundamental issues: model and complexity bounds

System: provide small companies with big data services

- BEAS: querying big data with constrained resources

Applications:

- Wherever SQL is used
- On top of any commercial RDBMS (MySQL, Postgres) and key-value systems (RocksDB, Cassandra)