Performance and Energy Efficiency Analysis of Join Algorithms on GPUs

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Database on Many-Core systems

- Implementing database operations on parallel platforms improves performance
- GPUs have been proved to speed up database operations
- GPUs as well as CPUs have made efforts to be more energy efficient
GPU Architecture

- Massive cores
- High memory bandwidth
- Hardware optimized for high parallelism tasks and energy efficiency.
Empirical Result

![Graph showing average speedup comparison between NINLJ, INLJ, SMJ, and HJ for Titan vs. E5 and 980 vs. E5.](image)

![Graphs showing energy (Joule) consumption for different data sizes (M) for E5, I7, Titan, and 980.](image)
Summary

• GPUs achieve up to 20X speedup in performance compared with CPUs.
• GPUs have done better than CPUs along the way to energy efficiency,
• GPUs might be a promising computing platform as it provides both performance and energy efficiency that are needed for data centers, data warehouses and other enterprise-level and scientific applications.