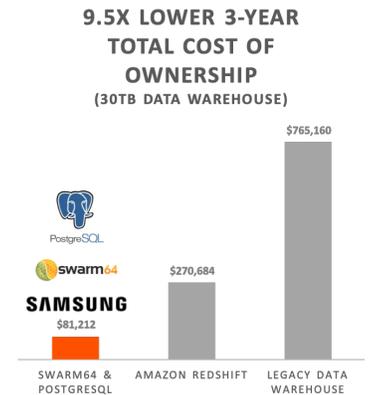


Accelerating PostgreSQL with Swarm64 DA and Samsung SmartSSD® drives

Save millions with free open source PostgreSQL, accelerated by Swarm64 DA & Samsung SmartSSD®

- 15x-150x faster query performance
- Speeds up scanning, filtering, JOINS, text search, and more
- 35x faster data loading
- 5x less storage
- No SQL or coding changes

Move data warehousing, analytics, and machine learning off of proprietary, costly databases and on to free, open source PostgreSQL.



How Swarm64 DA accelerates PostgreSQL

Swarm64 DA extends PostgreSQL with the following acceleration features, and requires no changes to your SQL or application code:

Greater parallelism

The Swarm64 DA extension rewrites query patterns that execute in parallel at every phase of the query. It parallelizes scanning, filtering, joining, and merging, and spins up 5x more parallel threads than standard PostgreSQL.

Columnar indexing

Swarm64 DA loads and queries data stored in a columnar-indexed format within PostgreSQL foreign data tables (FDW). The format is optimized for highly parallel access. Partitioning and range indexes reduce I/O.

I/O reduction

Swarm64 DA compresses data 5x to 25x depending on the data type. Besides reducing storage costs, reading compressed data, along with columnar indexing, reduces I/O by ~20x relative to standard PostgreSQL.

FPGA support

Swarm64 DA initiates 100+ SQL reader & writer processes on the FPGA. The processes work in parallel to accelerate queries and data insertion. It adds massive parallelism at a very low cost, to handle real-time insertion and querying, greater concurrency, or very complex queries.



Data movement: the costly performance bottleneck

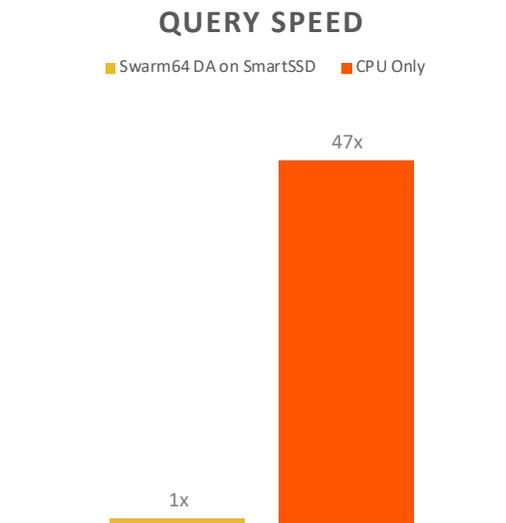
Moving database data from storage to CPUs, inside the server or across the network, is a decades-old performance bottleneck. Caching, memory mapping, asynchronous I/O have helped reduce the problem over the years, but the appetite for data analysis is growing faster than solutions can keep up.

A smarter approach: transport a bit of SQL to computational storage, not terabytes of data to CPUs

Samsung SmartSSD® computational storage drives solve the problem from a new angle. They minimize data movement by enabling Swarm64 DA-accelerated PostgreSQL to send processing (SQL subqueries) to storage for local execution by an integrated Xilinx FPGA. This results in much smaller, pre-filtered, pre-joined, pre-grouped, pre-aggregated data sets being returned to the CPU, thus minimizing data movement and speeding up time-to-insight.



Rack-scale query performance in a 2U form factor



In performance benchmarks, Swarm64 DA-accelerated PostgreSQL on Samsung SmartSSD® drives ran the TPC-H benchmark suite 16x faster than standard PostgreSQL. Some queries ran as much as 47x faster. In user tests, Swarm64 DA-accelerated PostgreSQL ran as fast as legacy data warehouse appliances, but at only one-tenth the cost.



An 80TB database can be processed within a single 2U server equipped with 64-core CPU and 32TB of Samsung SmartSSD storage (~80TB of user data, after Swarm64 DA compresses the data).

Next Steps

If you're interested in experiencing Swarm64-DA PostgreSQL acceleration with Samsung SmartSSD® for your analytic data systems, please visit Swarm64.com for more information. Contact us at info@swarm64.com to schedule a demo or request a proof of concept.