

DATASHEET

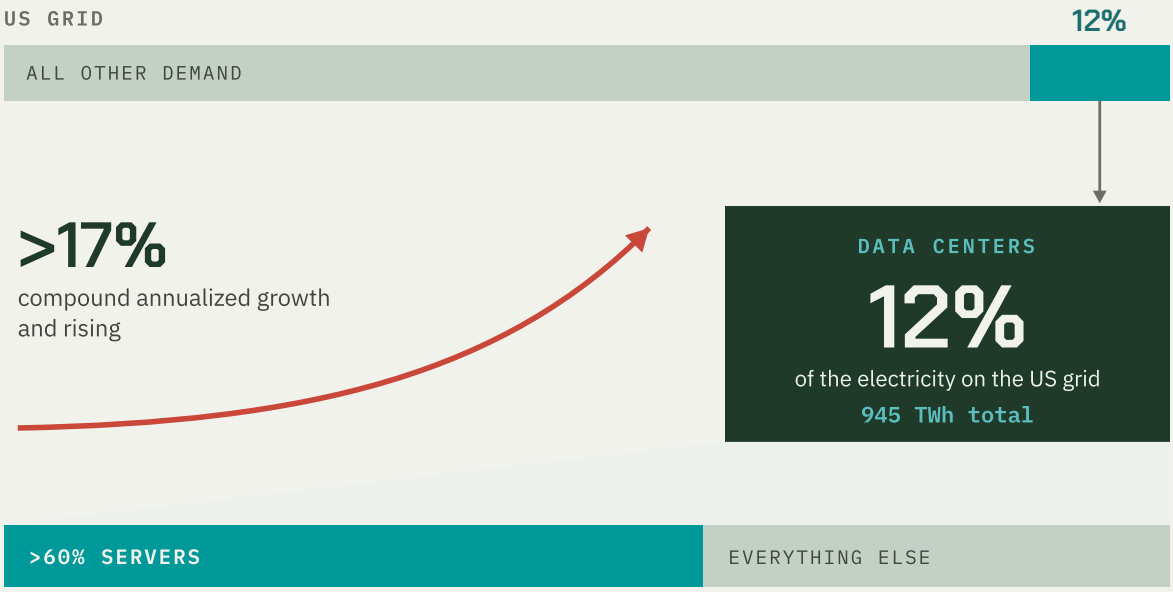
HOW SOFTWARE CAN SAVE DATA CENTERS ENERGY

Efficient Workflows Expend Less Energy

Datasheet · 2026-09-13
TETRA CA PBC · HorneSci
TETRA-CA.COM

SECTION 01

DATA CENTERS IN 2030



>60% OF DATA CENTER POWER FEEDS SERVERS (COMPUTERS RUNNING WORKLOADS)

DATA CENTERS IN 2030	
Consume the electricity on the US grid	**12%**
Total	**945 TWh**
Data center power that feeds servers (computers running workloads)	**>60%**
Compound annualized growth, and rising	**>17%**

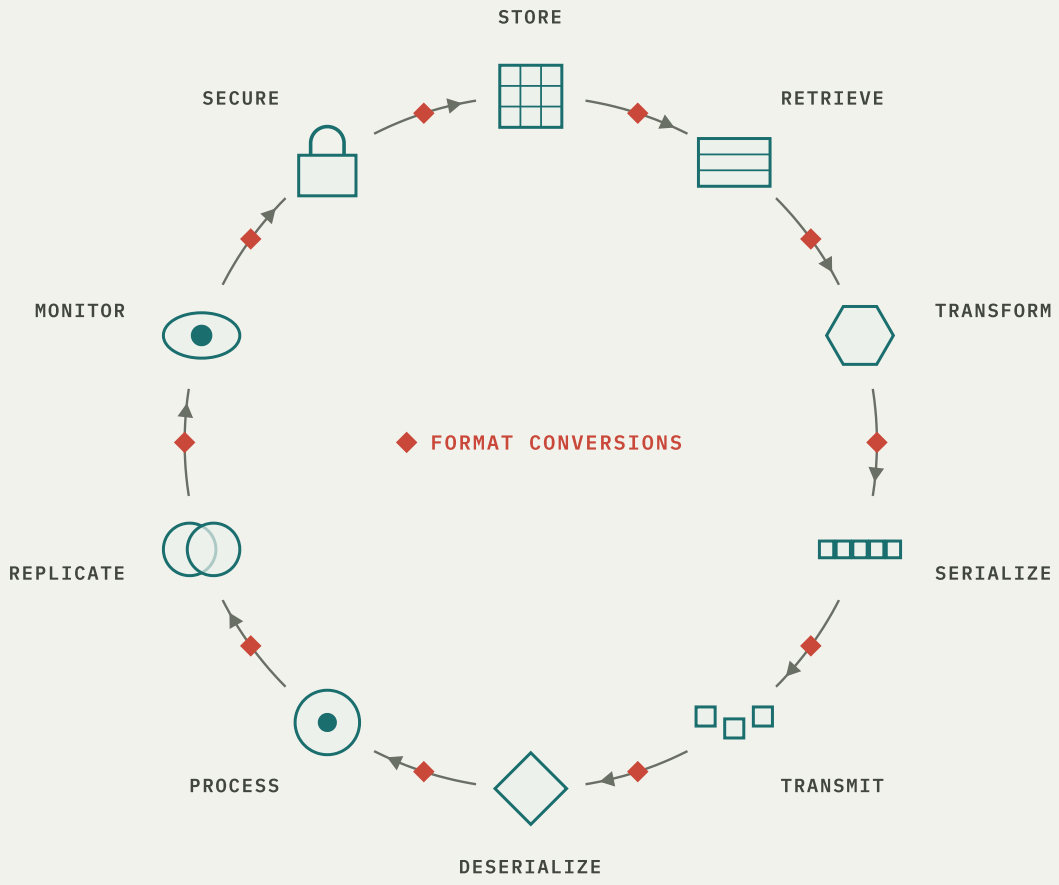
> Software efficiency can directly reduce the infrastructure required to drive the world's compute workloads.

SECTION 02

SOFTWARE HAS AN ENERGY FOOTPRINT

Data costs more energy every time you move it.

Compounding: applications do countless format conversions. Networking accounts for ~10% of a data center's power consumption.



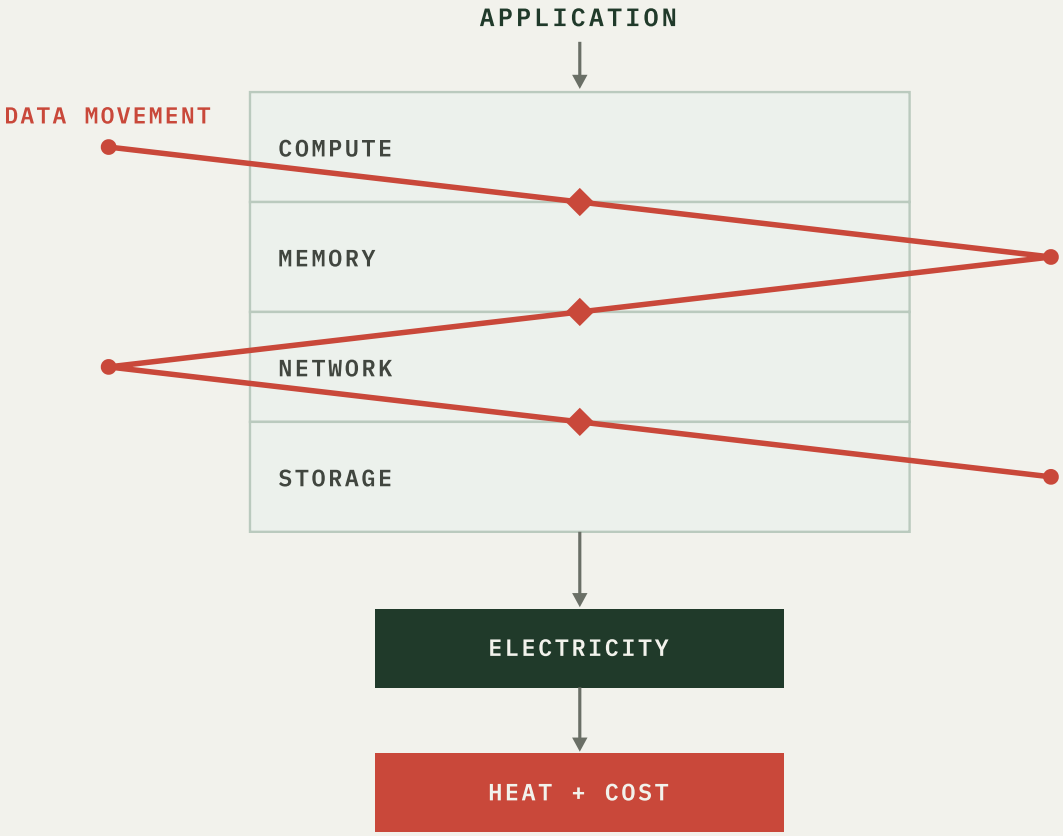
store → retrieve → transform → serialize → transmit → deserialize → process → replicate → monitor → secure → store

SOFTWARE ENERGY FOOTPRINT

Networking, share of a data center's power consumption	**~10%**

SECTION 03

EACH PHASE REQUIRES WORK



Public facing concerns: cooling fans and water

These systems dissipate heat; if software can optimize instructions to output less heat, it helps reduce cooling requirements.

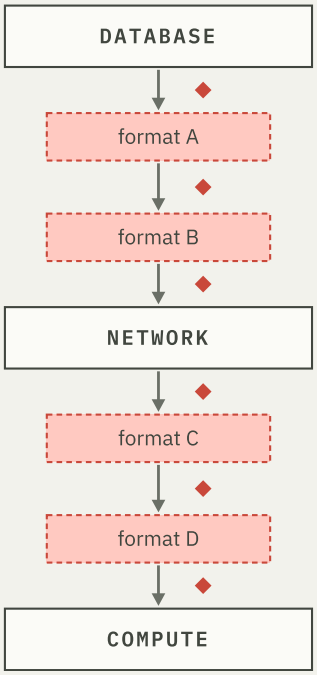
SECTION 04

TETRA DATA MATRIX

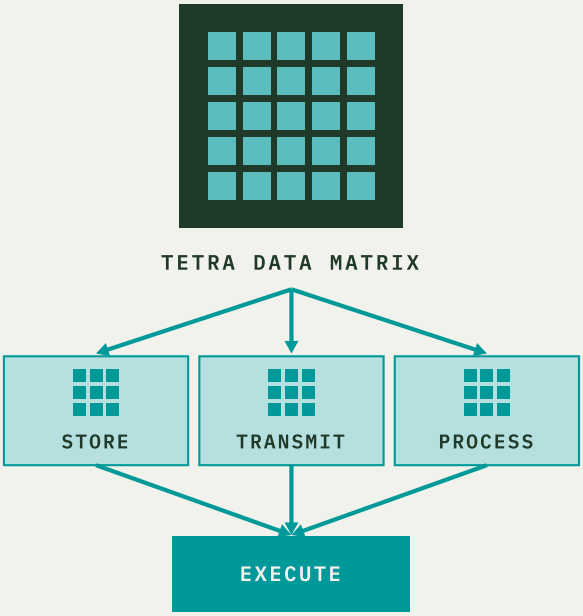
One representation across the data lifecycle.

Store. Transmit. Process. Execute. No friction.

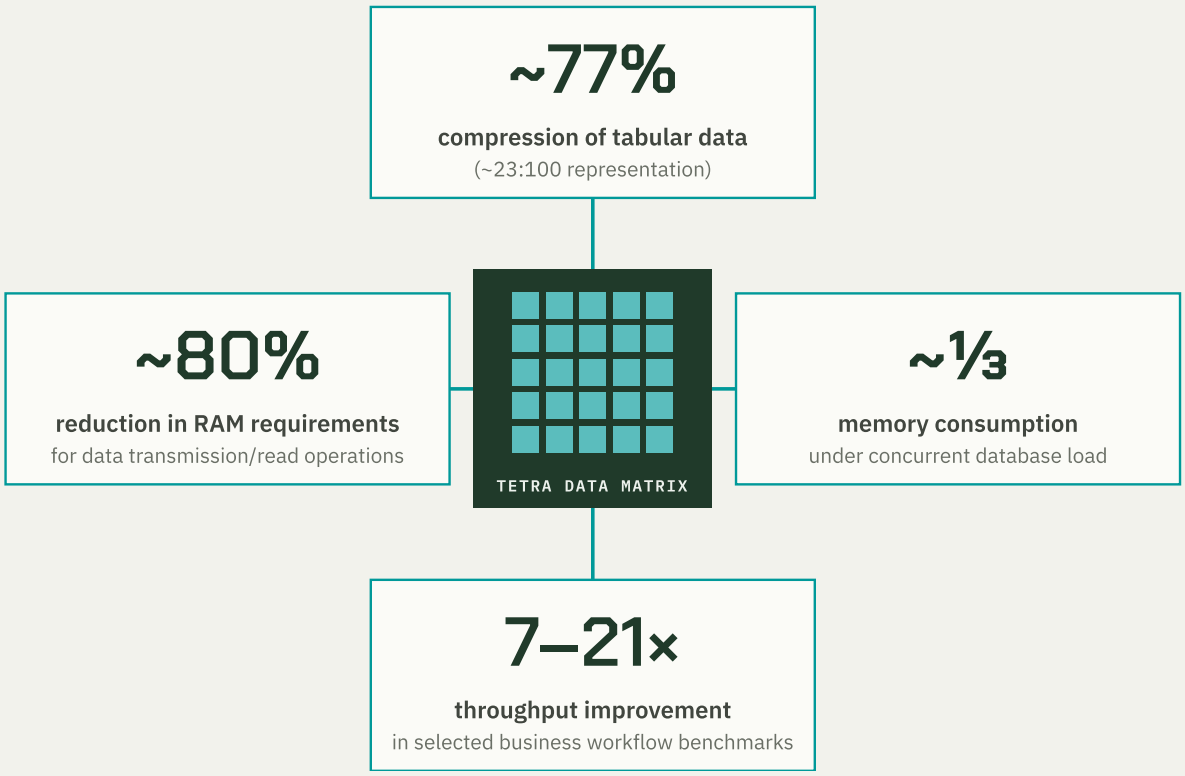
MANY REPRESENTATIONS



ONE REPRESENTATION

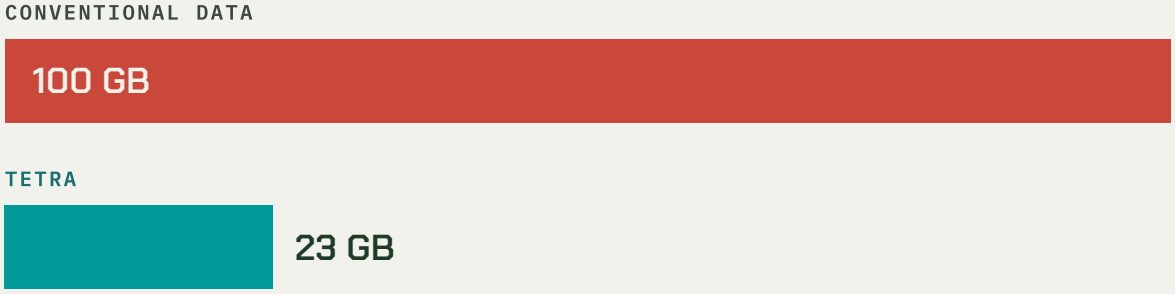


TETRA benchmarks*



MEASURE	TETRA
Compression of tabular data	**~77% (~23:100 representation)**
Reduction in RAM requirements for data transmission/read operations	**~80%**
Memory consumption under concurrent database load	**~⅓**
Throughput improvement in selected business workflow benchmarks	**7–21×**

* Benchmarks are workload-dependent and represent current TETRA CA testing; HorneSci acceleration is not included in these TETRA benchmarks. Mixed-load “read and write” benchmarks ARE included, the system is business-complete.



SECTION 05

HORNESCI: DELTAROUTING

DeltaRouting reduces computational movement, kind of like an efficient Rubik’s cube solver that can always see the shortest solution. Same answer, more efficient calculations.



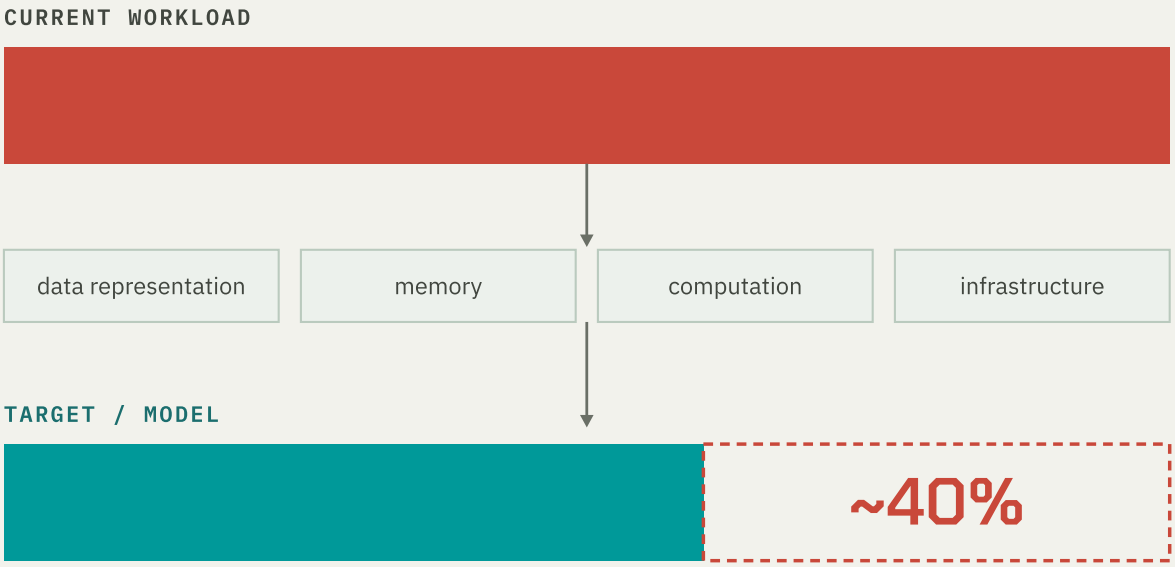
MEASURE	HORNESCI DELTAROUTING
Tensor-based routing acceleration	**~15x - 21x**

HorneSci acceleration is not included in the TETRA benchmarks.

SECTION 06

MATERIAL ENERGY DEMAND REDUCTIONS

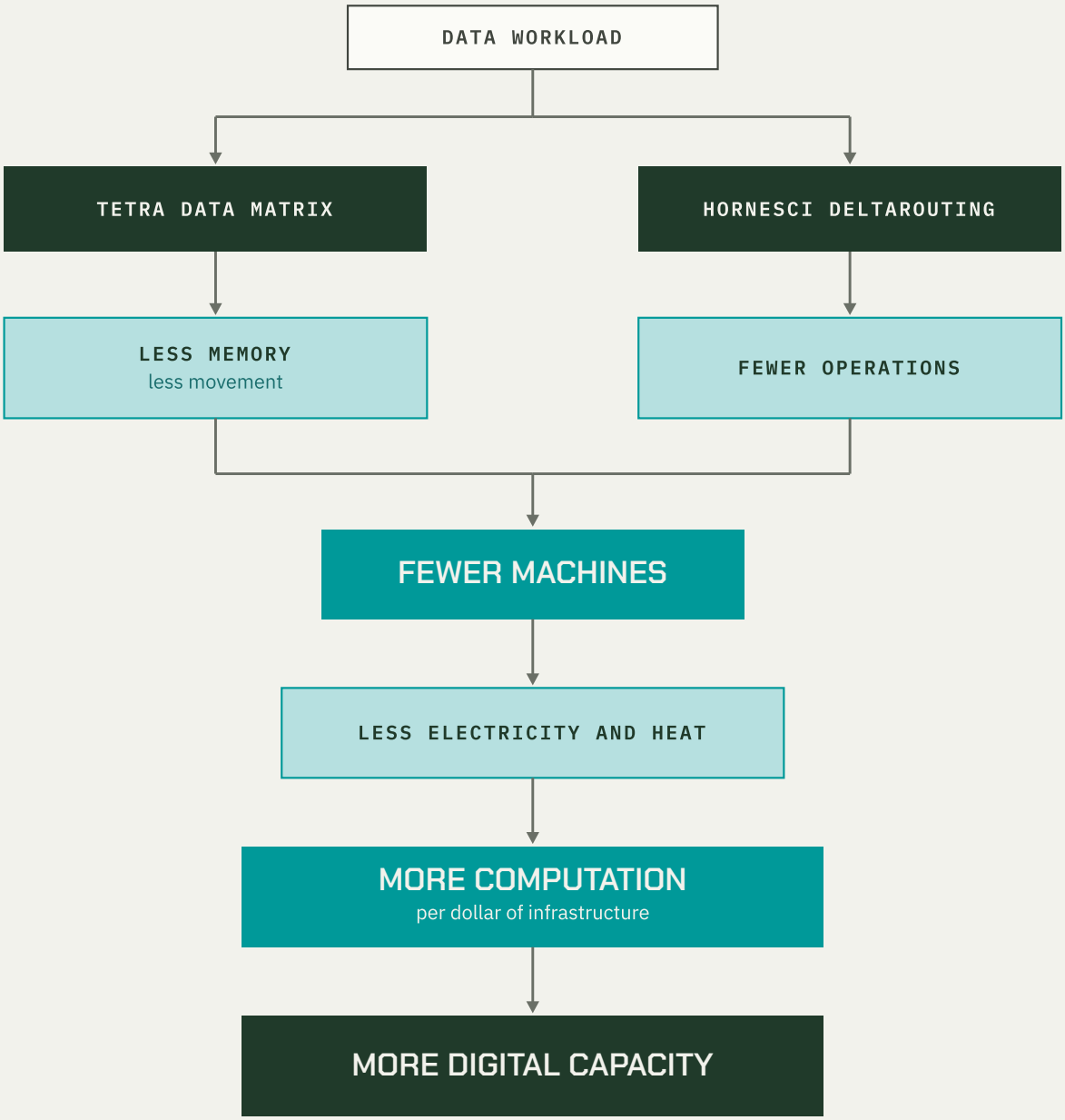
Current TETRA benchmarks indicate substantial reductions in storage, memory and processing requirements. HorneSci's independent execution technology targets the same underlying bottleneck at the processor level. Our working system-level model indicates the potential for ~40% reduction in energy associated with data workloads, subject to validation at production scale.



SECTION 07

REDUCE DATA IMPEDANCE

Fewer operations. Less memory. Less movement. Fewer machines.

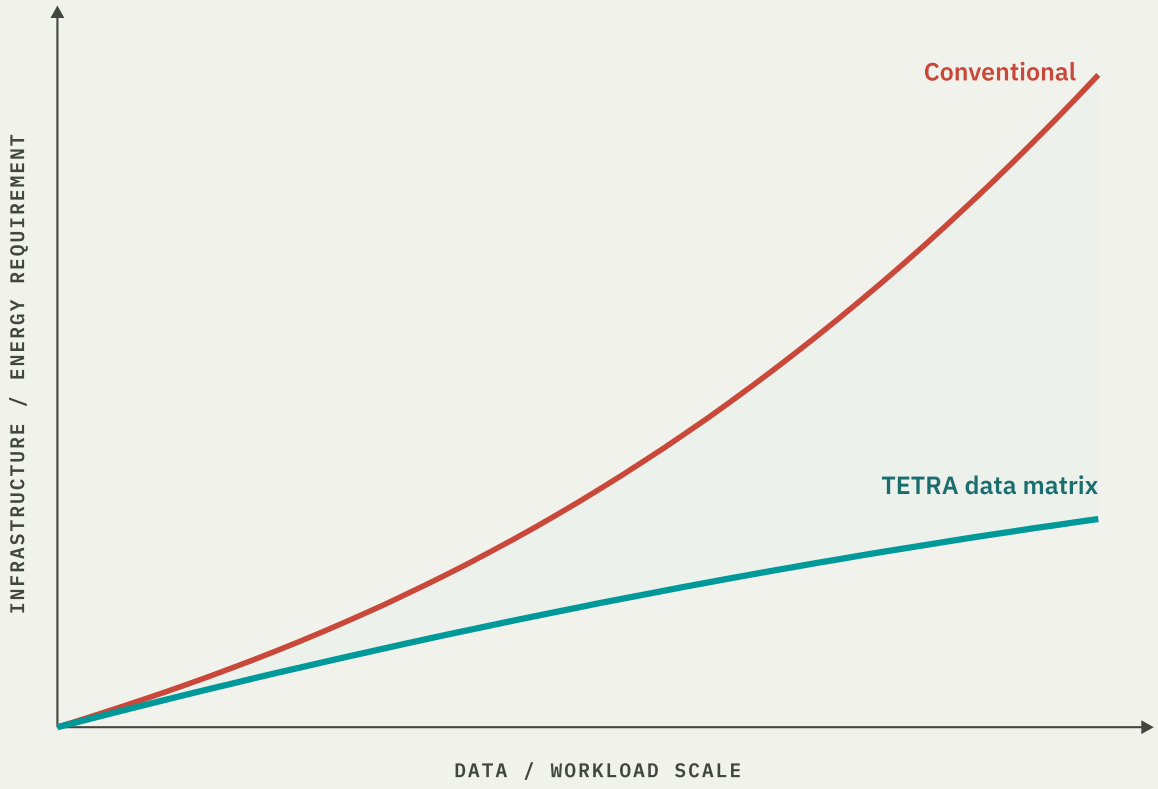


Less electricity and heat. More computation per dollar of infrastructure. More digital capacity.

SECTION 08

BENDING THE CURVE

Data scales superlinearly. The data matrix scales sub-linearly.



> We do not just reduce expenses, we change the trajectory of data center energy requirements.

SECTION 09

SUMMARY

Improving software efficiency materially impacts data center energy consumption.

TETRA's data matrix and HorneSci's DeltaRouting combined demonstrate improved efficiency by an order of magnitude while leveraging existing server hardware.

We project ~40% reductions in a data center's overall energy consumption. The data matrix and DeltaRouting can operate on any vendor's chips and uses conventional memory systems. The estimate does not include residual cost reductions from longer equipment lifespans.

AT A GLANCE

Data centers in 2030: share of US grid electricity	12%
Data centers in 2030: total	945 TWh
Compression of tabular data*	**~77%**
Reduction in RAM requirements for data transmission/read operations*	**~80%**
Memory consumption under concurrent database load*	**~⅓**
Throughput improvement in selected business workflow benchmarks*	**7–21×**
HorneSci tensor-based routing acceleration	**~15x - 21x**
Projected reduction in a data center's overall energy consumption	**~40%**

* Benchmarks are workload-dependent and represent current TETRA CA testing; HorneSci acceleration is not included in these TETRA benchmarks. Mixed-load "read and write" benchmarks ARE included, the system is business-complete.

SECTION 10

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