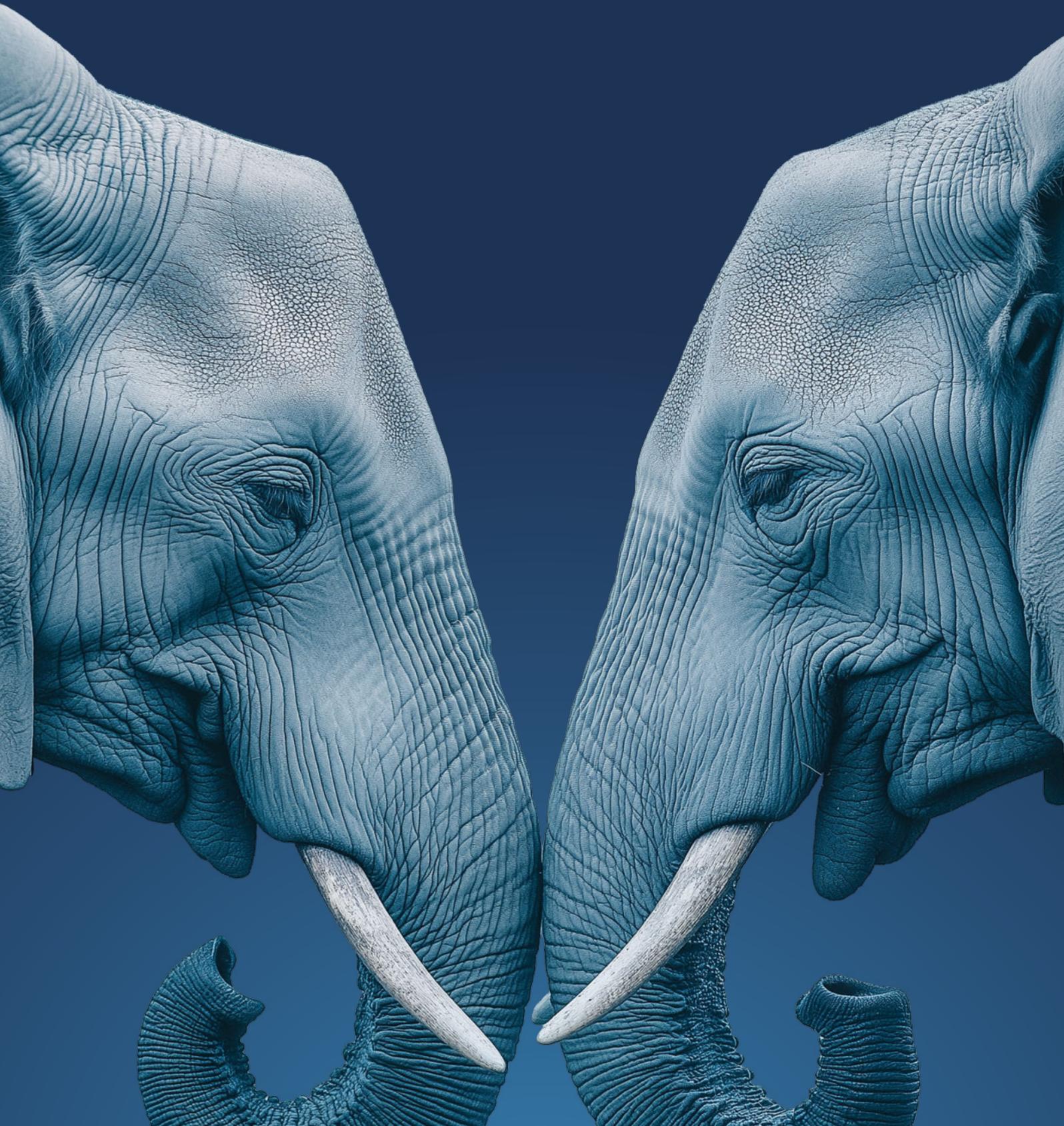


 CYBERTEC

 lightbits

The PostgreSQL Performance & Efficiency Framework



The PostgreSQL Performance & Efficiency Framework

In an era of increasingly complex geopolitical risks and strict legislation, traditional database management often falls short. Many organizations face a critical paradox: the need for rapid scaling paired with the nightmare of manual compliance.

1 Seamless Automation

Driver: CYBERTEC

The Value: Modern databases require agility, not manual tuning. CYBERTEC brings advanced automation tools to the PostgreSQL ecosystem, enabling self-healing clusters, automated failover (HA), and point-in-time recovery (PITR).

The Alliance Synergy: When CYBERTEC automates the database layer, it requires an infrastructure that can provision storage instantly via API. Lightbits supports this by allowing CYBERTEC's automation scripts to spin up high-performance NVMe volumes on the fly, particularly in Kubernetes environments.

2 Frictionless Migration

Driver: CYBERTEC

The Value: Moving away from expensive proprietary databases (like Oracle or Microsoft SQL Server) is a high-stakes operation. CYBERTEC specializes in zero downtime migrations to PostgreSQL, utilizing advanced schema conversion tools and logical replication to ensure data integrity during transition.

The Alliance Synergy: Migrating data requires a landing zone that is fast and reliable. Lightbits provides a high-throughput landing pad that absorbs massive data ingestion rates during the migration process, ensuring the "cut-over" window is as short as possible.



Unified Management

Driver: Joint (CYBERTEC & Lightbits)

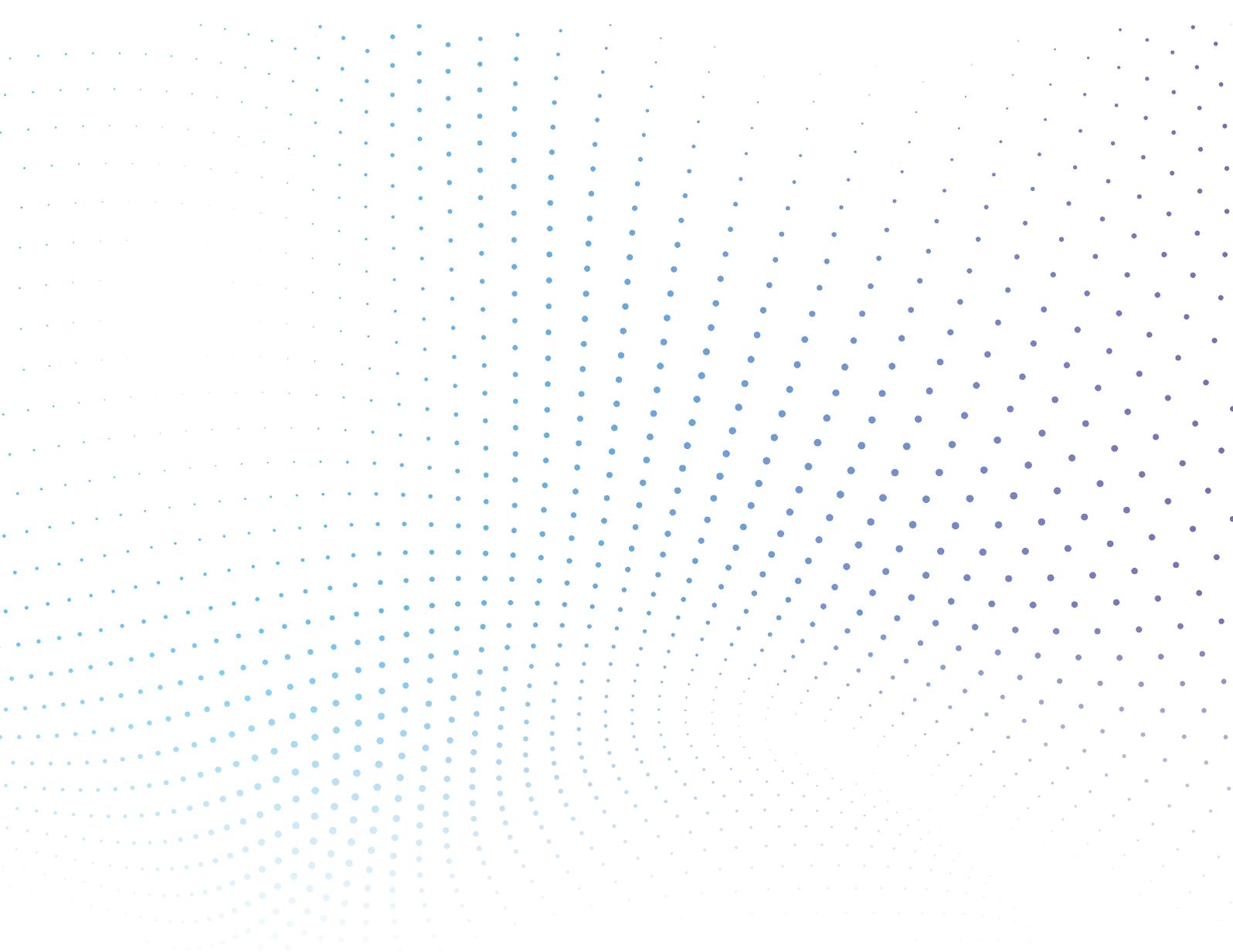
The Value: Complexity is the enemy of uptime. This pillar focuses on simplifying the stack.

The Alliance Synergy:

CYBERTEC simplifies the DBA experience by providing deep visibility into query performance, indexing strategies, and replication lag.

Lightbits simplifies the storage admin experience (standard Ethernet networking, no specialized Fibre Channel or RDMA).

Together: They create a "single pane of glass" logic where database performance is not bottlenecked by complex storage area network (SAN) configurations.



Consistent Performance at Scale

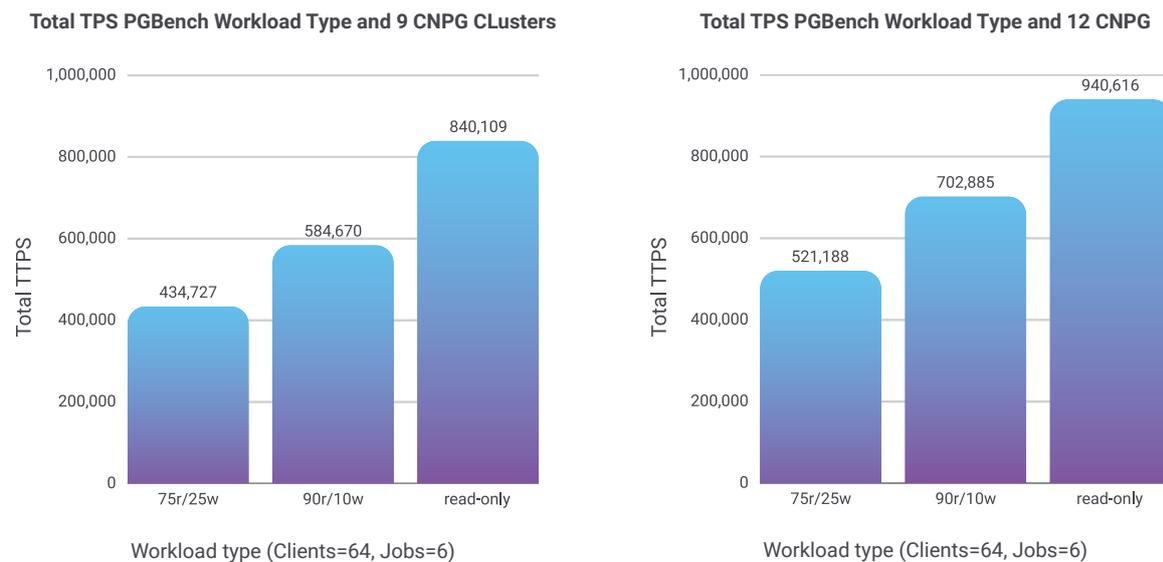
Driver: Lightbits

The Value: As databases grow, latency usually suffers. Lightbits leverages NVMe over TCP to deliver local-flash performance across the network, ensuring low latency even under heavy load.

The Alliance Synergy: PostgreSQL creates "noisy" I/O patterns (checkpoints, vacuuming) that can crush standard storage. Lightbits isolates this noise, ensuring consistent response times for applications.

*"A good storage system hides a lot of database crimes!
It might be as simple as a bad query plan."*

By providing massive IOPS headroom, Lightbits acts as a safety net for unoptimized queries, keeping the application responsive while CYBERTEC works on the long term optimization.



Server info for the Lightbits targets (3) and Kubernetes worker nodes (3) :
SuperMicro AS -1116CS-TN (AMD EPYC 9455 48-Core Processor, 384GB RAM.
Each Lightbit server had 12x 3.5TB KIOXIA drives.

CNPG Operator 1.26, PostgreSQL 16 with each CNPG cluster consists of:

- CPU: 18
- Mem: 10Gi
- 1 x 100GB PVC PGDATA
- 1 x 100GB PVC WAL
- 8 x 100GB PVCs = 8 TBs = 8 Partitions for accounts and history tables
- Standby replica for CNPG and 2 replicas at the storage level.

Better TCO / ROA (Total Cost of Ownership / Return on Assets)

Driver: Joint Outcome

The Value: Reducing the cost per transaction.

The Alliance Synergy: PostgreSQL creates "noisy" I/O patterns (checkpoints, vacuuming) that can crush standard storage. Lightbits isolates this noise, ensuring consistent response times for applications.

- **Hardware Efficiency:** Lightbits allows you to disaggregate storage, meaning you don't have to buy expensive CPU licenses just to get more disk space (a common issue in hyper-converged setups).
- **Licensing Savings:** CYBERTEC facilitates the move from restrictive, high-cost proprietary licenses to open-source PostgreSQL without sacrificing enterprise-grade features.
- **Result:** You run on standard Ethernet and commodity servers (Lightbits) using open-source software (CYBERTEC), drastically lowering CapEx and OpEx.

About CYBERTEC

CYBERTEC is a full-service IT provider and a globally recognized authority in the PostgreSQL open source database landscape offering a wide range of products and services. With over 25 years of specialized expertise, CYBERTEC's mission is to help enterprises worldwide achieve innovative, cost-effective, and highly performant data management. As a major contributor to the PostgreSQL project, CYBERTEC employs numerous core developers and experts dedicated to sustaining the community and ensuring the project's long-term stability. Headquartered in Austria, and with offices in Estonia, Poland, South Africa, Switzerland, India and Uruguay, CYBERTEC supports its global client base including organizations in high-compliance sectors like automotive and finance, with premier consulting and 24/7 technical support. All solutions meet the highest security and environmental standards, backed by the ISO/IEC 27001:2022 / ISO 14001 certifications and TISAX (Trusted Information Security Assessment Exchange).

To learn more about CYBERTEC, visit www.cybertec-postgresql.com and follow CYBERTEC on [LinkedIn](#), [GitHub](#) and [YouTube](#).

About Lightbits Labs

Lightbits Labs® (Lightbits) invented the NVMe over TCP storage protocol, embedding it natively into their software-defined block storage to deliver ultra-low latency and exceptional throughput while leveraging commodity infrastructure—essential for reducing the cost and complexity of data infrastructure at scale. Built from the ground up for high performance, scalability, resiliency, and cost efficiency at scale, Lightbits software delivers the best price-performance value for real-time analytics, transactional, and AI workloads. Lightbits Labs is backed by enterprise technology leaders [Cisco Investments, Dell Technologies Capital, Intel Capital, Lenovo, and Micron] and is on a mission to deliver best-in-class block storage for performance-sensitive workloads.

To learn more about Lightbits Labs, visit www.lightbitslabs.com and follow Lightbits Labs on: [LinkedIn](#), [X](#), [Facebook](#), [Instagram](#), and [YouTube](#).

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Notes

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