



AI database tuning B2B SaaS

**Reduce cloud spend & improve operational efficiency**

Unveiling the power and value of automated database parameter tuning

# Introduction

*DBtune is an **AI-powered** database parameter tuning service.*

*Spun out of research at Stanford University, DBtune autonomously optimizes the configuration of databases through **machine learning**.*

*It observes, iterates and adapts until converging and delivering the **optimal** settings for any individual workload, use case and machine.*



# C-suite business priorities in 2024



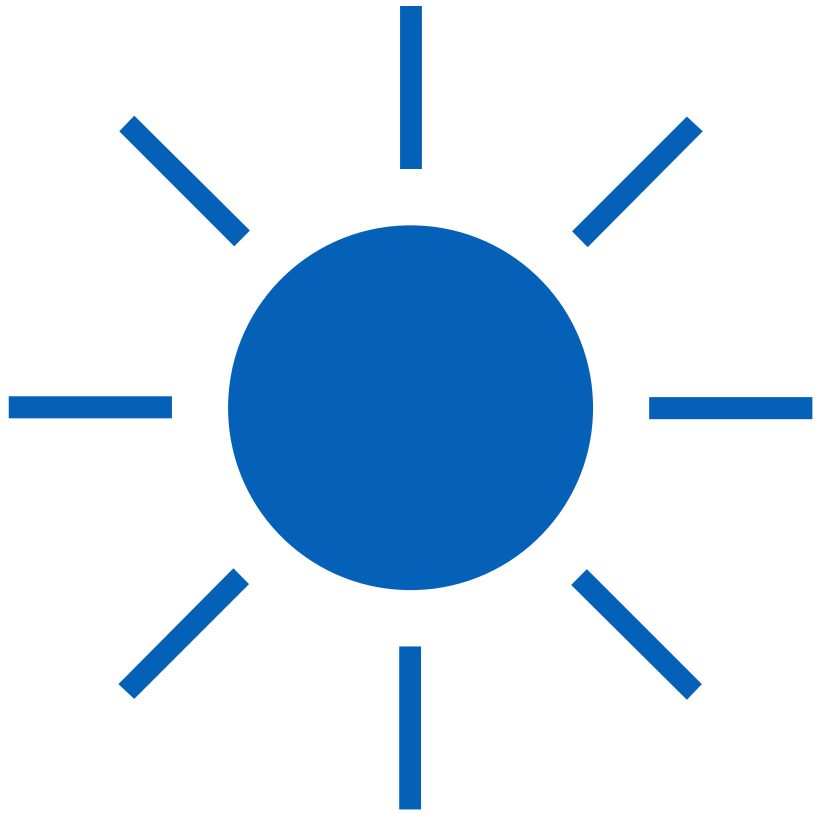
Reduce cloud / infrastructure costs



Improve application / system performance



Enhance operational efficiency



Reduce carbon emissions

## Business outcomes using DBtune

**50%**

*Cost saving*

**>10x**

*Faster*

**25%**

*Increase in productivity*

**50%**

*Reduction in CO2*

Source: DBtune benchmark testing. Details shared later in presentation.

# What is database tuning?

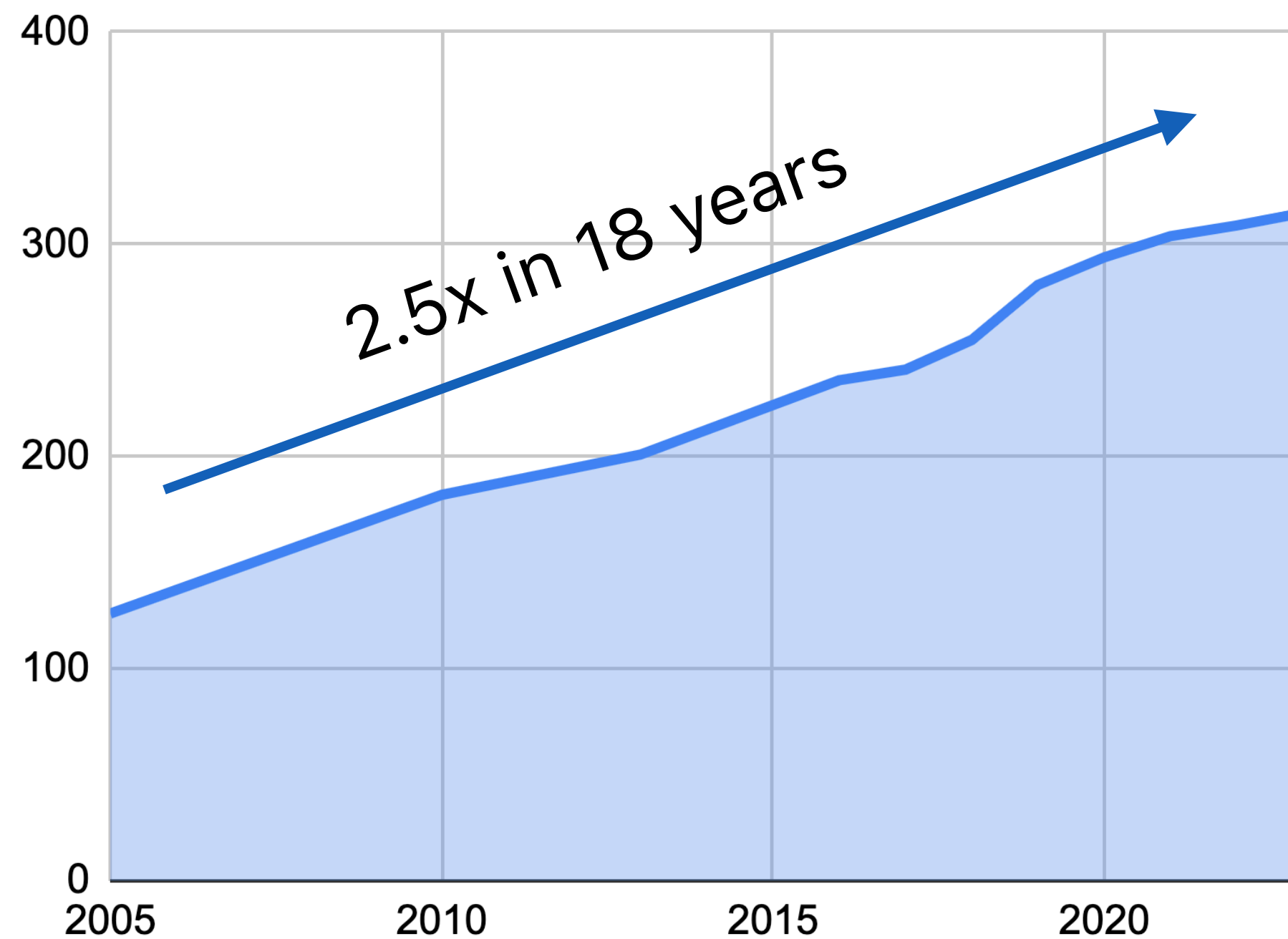
Keeping the database fit and responsive

- ✔ Databases change, grow and slow down
- ✔ Not all workloads and machines are the same
- ✔ **Tuning adapts a database to its current use-case, load and machine**
- ✔ It is a 'dark-art' yet an integral part of any DBA and developer's job
- ✔ Tuning can include: query, **DBMS parameters\***, indexes, OS parameters

\*DBtune focuses solely on automating database parameter tuning

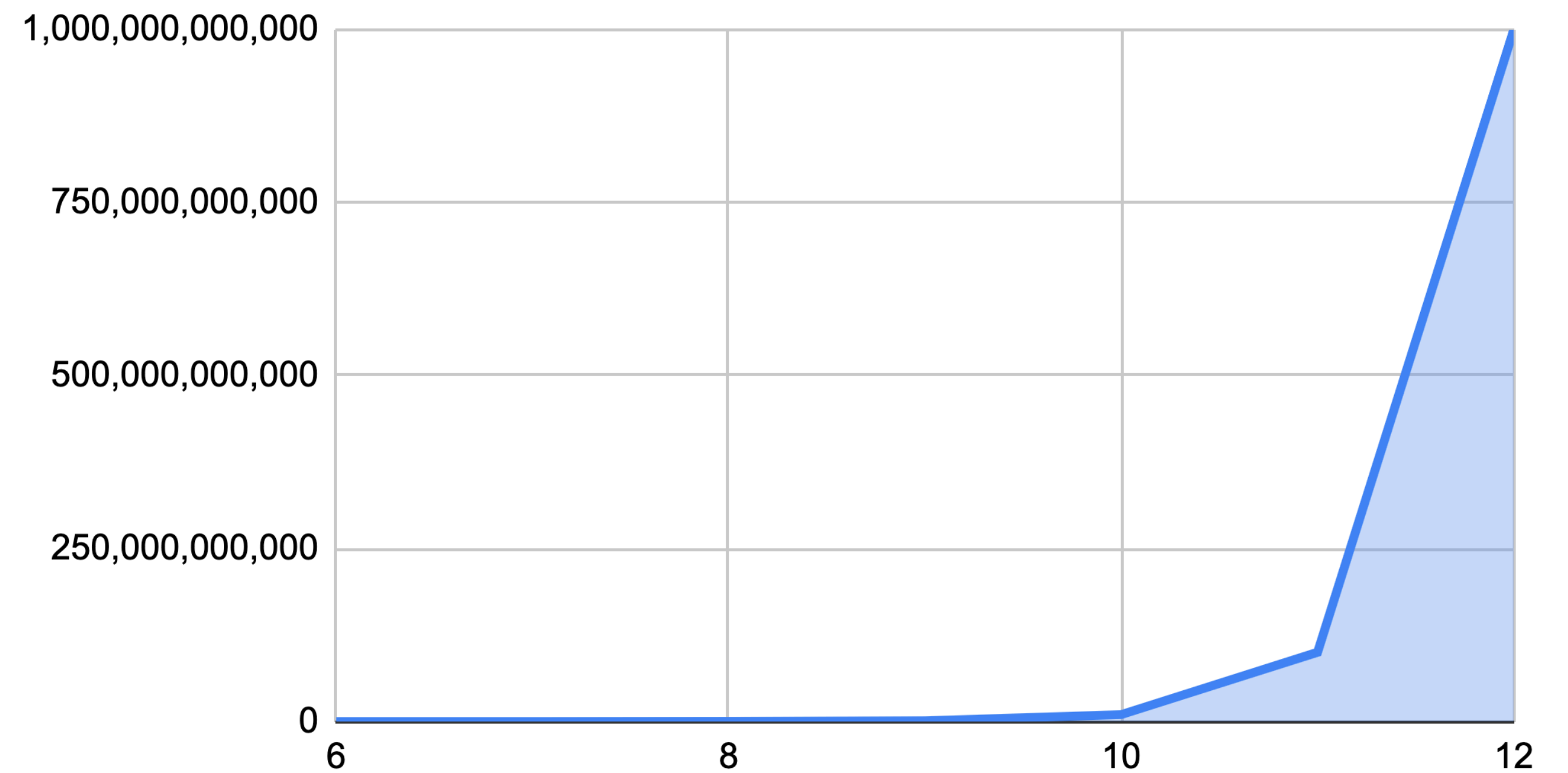
# Database complexity is growing over time

The number of parameters is growing **linearly**



PostgreSQL number of parameters

The number of configurations is growing **exponentially**



Example of complexity with 12 parameters

With just 12 variable parameters, there are 1 trillion possible database configurations

# How is parameter tuning tackled today by DBAs and developers?



Tuning  
guru

## Manual

Slow

Takes days

Painstaking

Needs high expertise

Ineffective

Tune again in a week

Inadequate

Seasonal workload

## Heuristics

One-size-fits-all

Uses generic rules

Workload agnostic

Not bespoke

Ineffective

Tune again in a week

Inadequate

Seasonal workload



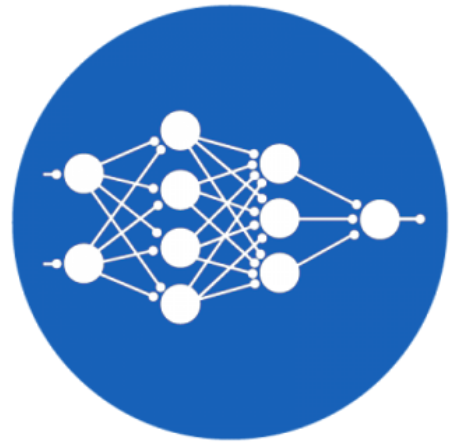
## New approach

Ideally a solution that **learns** by **observation** and **autotunes**

A solution that **adapts** to changing workloads

# We introduce DBtune

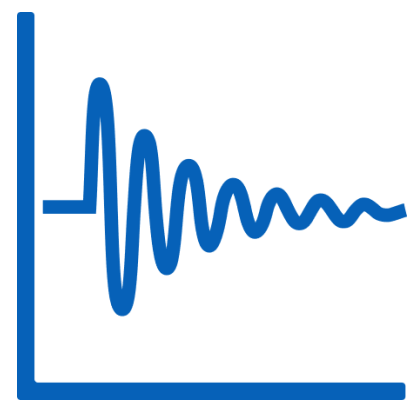
A unique AI-powered automated database parameter tuning service



**Machine learning approach**



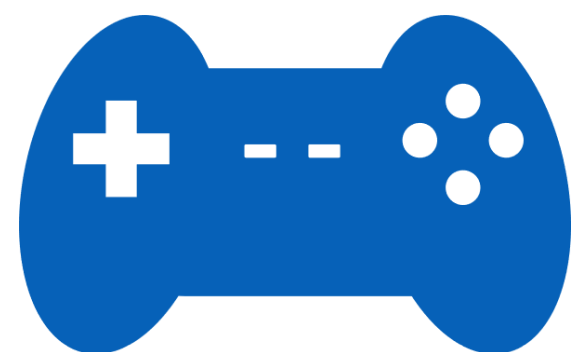
DBtune learns how to solve optimization challenges



**Dynamic adaptation**



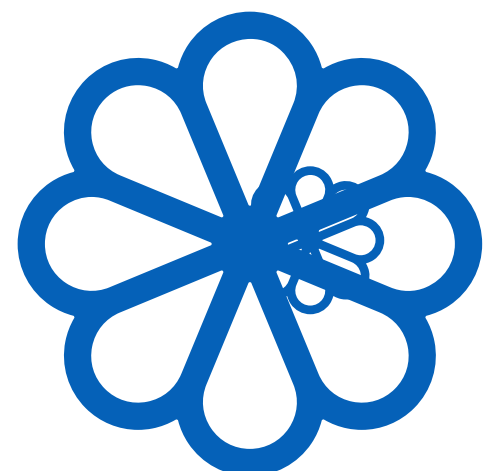
DBtune can tune a database irrespective of its size and complexity



**Easy to use**



No need for background in AI or database tuning



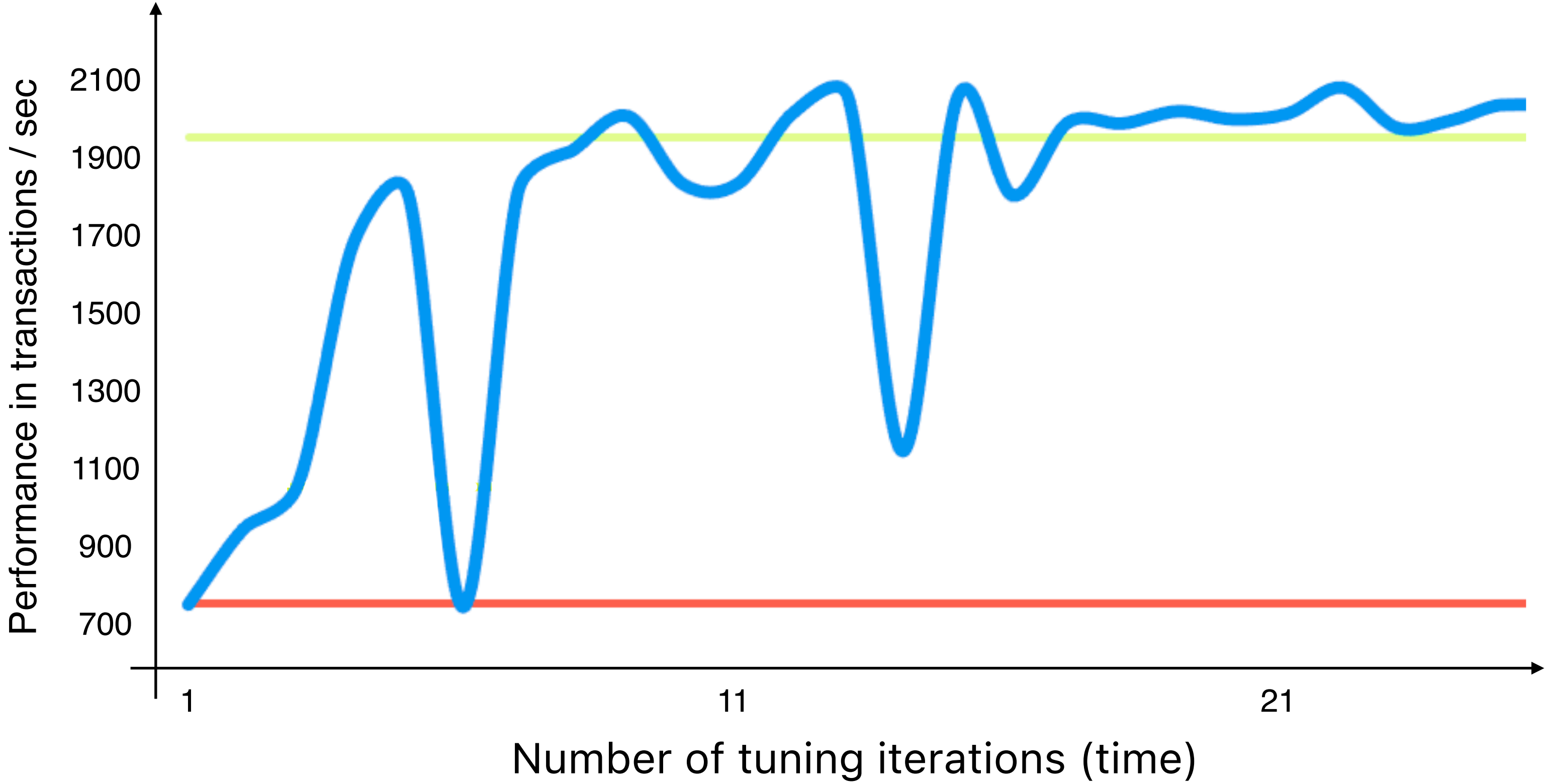
**Highly scalable**






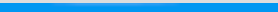
DBtune can tune multiple databases in heterogeneous environments

# Proof of savings: Comprehensive test results

Performance impact of tuning AWS RDS PostgreSQL m5.2xLarge cloud instance on TPCCC benchmark



 **Key**

-  m5.2xLarge
-  m5.4xLarge
-  m5.2xLarge with **DBtune**

***Key takeaway***

*DBtune **doubles** the performance of the smaller RDS instance*

***DBtune reduces costs by 50%***

← **< 3 hours** →




# Proof of savings: Detailed economic analysis

DBtune achieves better performance on a m5.2xlarge than running an m5.4xlarge

AWS RDS Instance Type	Hardware			Cost / Year		
	Cores	RAM	IOPS	Instance	EBS	Total
db.m5.4xlarge	8	64 GBs	4000	\$12,475	\$4,800	<b>US \$17,275</b>
db.m5.2xlarge	4	32 GBs	2000	\$6,237	\$2,400	<b>US \$8,637</b>

- ✔ DBtune halves Amazon RDS costs (**50% saving**)
- ✔ Exceeds 4xLarge performance on a 2xLarge instance
- ✔ Medium and large companies use hundreds\* of RDS instances

  
Per instance saving  
**\$8,638**

\*A16z article: "The Cost of Cloud, a Trillion Dollar Paradox"

## How is DBtune different?

- ✔ DBtune doesn't measure cloud infrastructure spend — It **reduces** it
- ✔ Low risk, low effort and minimal resources required to prove the concept
- ✔ Yet the potential business benefit is significant (PoC takes 1 day)
- ✔ You haven't tried anything like this yet — Guaranteed results
- ✔ Start small and scale your savings / value on demand — Simple licensing
- ✔ Flexible deployments means there's always a way to realize business value

# Customer story: Airtel production system optimization

## Airtel partnered with DBtune to optimize their infrastructure spend

Airtel is one of the largest communication service providers, globally. Headquartered in India, they serve in excess of half a billion subscribers. Airtel sought a new technology to improve their PostgreSQL database performance.



*"DBtune seamlessly integrated into a production system of a mission critical Airtel application. We've been impressed by the reliability and robustness of the DBtune product, and the team has enjoyed evaluating the platform."*

Anant Kumar  
Airtel CIO digital

# Customer story: Helping Anteo to speed up their data operations

Norway-based company, Anteo, offer decision support for sustainable development in the aquaculture industry, as well as real-time monitoring and warning biosafety solutions.

**Anteo's infrastructure is data intensive. Anteo partnered with DBtune to speed up their PostgreSQL data platform.**



*"It only took 10 minutes to set up DBtune on our Google Cloud PostgreSQL data platform...The process was easy and pleasant."*

Peder Refsnes  
Anteo CTO

# Customer story: Integration study with the DbVisualizer platform

DbVisualizer is a leading universal database tool for universal database management systems. The company offers a database Integrated Development Environment (IDE) for developers, analysts, and DBAs.

**DbVisualizer partnered with DBtune to explore the technical integration with their development platform. The initial pilot validated the technical strength of the DBtune platform.**



*"We see a lot of potential in DBtune's ability to optimize our customers' workloads. This is a state-of-the-art optimizing service that is robust and flexible enough to integrate tightly with our platform. DbVisualizer, enhanced with DBtune's capabilities, would make for a more complete offering for our customers."*

Martin Engdahl  
DbVisualizer CEO

# DBtune technology endorsed by VMware



vRealize Network Insight (vRNI) is a network monitoring tool by VMware that helps build an optimized, highly available and secure network infrastructure across cloud environments. The key-value store FoundationDB database system is at the core of vRNI and its performance.

**vRNI's infrastructure is data intensive. VMware partnered with DBtune to speed up their FoundationDB data platform.**



*"We saw a 34% improvement in our FoundationDB testbed, while we were hoping for a 10% improvement...DBtune exceeded our team's expectations."*

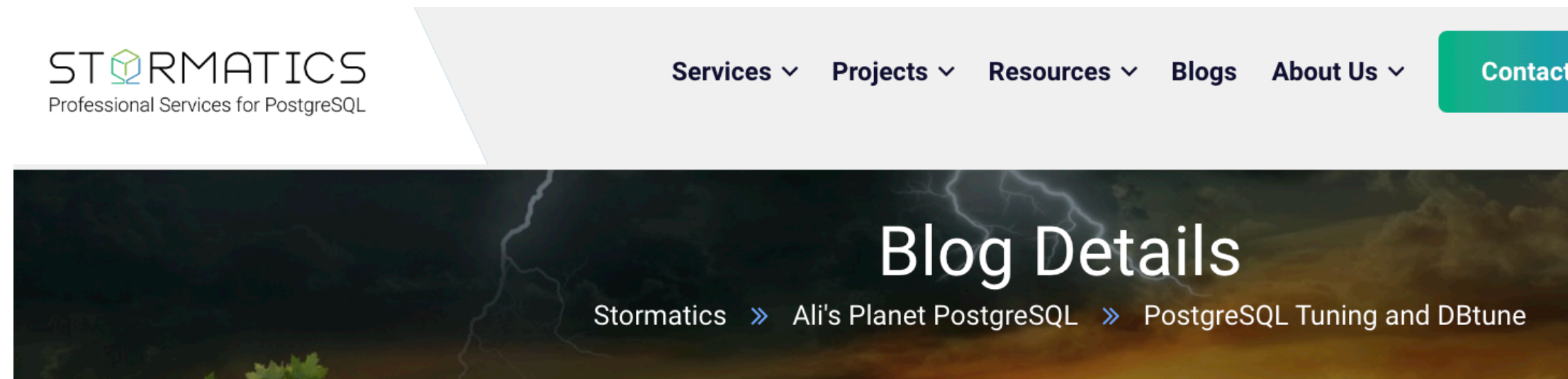
Clement Pang, Co-founder & Chief Architect at Wavefront by VMware



*"For us, performance is essential, DBtune has overcome the optimization complexity with an innovative solution; they made it simple."*

Uday Kurkure  
Staff Engineer at VMware

# Independent evaluation by Stormatics



🕒 February 14, 2024    👤 By Muhammad Ali    📄 Ali's Planet PostgreSQL, Blog

## PostgreSQL Tuning and DBtune

Parameter tuning in PostgreSQL involves the adjustment of various configuration settings inside `postgresql.conf` file which dictates how the database operates. These parameters affect many aspects of the database's operation which includes memory allocation, query planning, connection handling and disk I/O operations. Proper tuning ensures that PostgreSQL runs efficiently, making full use of the available hardware resources

- Across all tests cases DBtune delivered improvement in performance up to 13.6x
- Compared to manual tuning DBtune achieved 2.2x speedup

Blog: <https://stormatics.tech/alis-planet-postgresql/postgresql-tuning-and-dbtune>

# The DBtune team



dbtune

## Leadership



**Founder & CEO**  
Dr. Luigi Nardi  
Stanford & Lund



**Strategy Advisor**  
Moritz Zimmermann  
42Cap, Hybris, SAP



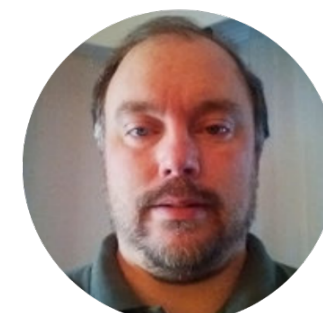
**Advisor**  
Dr. Kunle Olukotun  
Stanford & SambaNova



**Senior ML Engineer**  
Dr. Erik Hellsten  
Chalmers, DTU, LTH, Volvo



**Frontend Engineer**  
Aiman Mohsin  
Diya, Sia Smtech



**Special Consultant**  
Magnus Hagander  
Redpill, PG Core Team



**Strategy Advisor**  
Kingston Duffie  
Serial Entrepreneur



**Senior SW Engineer**  
Muhammad Umair  
Freie, Heidelberg, SAP



**Backend Engineer**  
Tahir Masood  
FAST, Ibex Global



**Senior DB Engineer**  
Dr. Curt Kolovson  
Berkeley, VMware, MariaDB



**Technology Advisor**  
Peter Zaitsev  
Co-founder & CTO Percona



**Tech Lead**  
Costa Alexoglou  
Co-founder VisualEyes, Neo4j



**Senior DevOps**  
Mohsin Ejaz  
EDB



**Senior ML Engineer**  
Raffaello Baluyot  
Volvo, Autoliv



**Technology Advisor**  
Johan Svensson  
Co-founder & CTO Neo4j

## M & S



**Marketing Coordinator**  
Ellyne Phneah  
LTH, ZDNet, Symantec



**Director of Sales**  
Tom Howcroft  
VoltDB



**Marketing Advisor**  
Mark Jennings  
Techstars, Notch



**Sales Advisor**  
Alan Facey  
B2B Sales Leader



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