



# meetup

**IMDA @ Pasir Panjang Road**

Singapore

February 25, 2025 at 6:00 PM SGT



# Thank you to our host!



**INFOCOMM  
MEDIA  
DEVELOPMENT  
AUTHORITY**

# Tech Talks



## Using ClickHouse for AI

Maruthi Lokanathan, Solution Architect @ ClickHouse



## Real-Time Data Intelligence for Real Estate Analytics

Yi Sam Lee, Data Lead @ Real Estate Analytics (REA)



## From SQL to AI: Building Intelligent Applications with ClickHouse and LangDB

Matteo Pelati, Co-Founder of LangDB



## BONUS TRACK - DeepSeek data breach: What Could Have Prevented It?

San Tran, all-around security due @ ClickHouse



# ClickHouse Cloud AI/ML

Powering Enterprise AI at Scale

2025

||||· ClickHouse

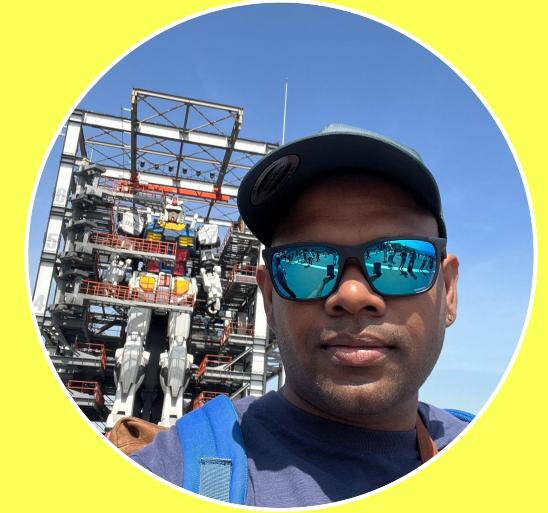
# **Maruthi Prithivirajan**

## **Solution Architect @ ClickHouse**

**Say hi!**



**Read my blogs!**



# Agenda

**01**

Intro to ClickHouse

**02**

Uniqueness of ClickHouse

**03**

AI/ML with ClickHouse

# ClickHouse

A Quick Overview

Feb 2025

||||· ClickHouse

# ClickHouse

2009  
*Prototype*

2012  
*Production*

2016  
*Open Source*

2021  
*ClickHouse Inc.*

2022  
*ClickHouse Cloud*

**The Most Popular Analytics Database on the Planet**

#1  
*Analytics DB on DB-Engines*

Over  
39,000  
*GitHub Stars*

Over  
200,000  
*Community Members*

# ClickHouse, Inc.

Founded

**2021**

*by leaders from Elastic, GCP,  
Netflix and Salesforce*

Raised

**\$300M+**

*from Tier 1 venture capital firms:  
Benchmark, Index, Lightspeed*

Onboarded

**1000+**

*customers since launching  
ClickHouse Cloud in 2022*

**230+**

*employees*

**Mountain View, CA**  
**Amsterdam, NL**  
*Dual Headquarters*

**AWS GCP Azure**  
*Strong partnership with  
all major cloud providers*

# What is ClickHouse ?

ClickHouse is an **Open-Source**, columnar **OLAP** database  
Designed for **Blazing fast** analytics of massive volumes of data

**1**

**Speaks SQL fluently**



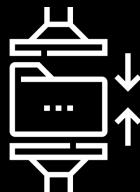
**2**

**Processes data very fast**



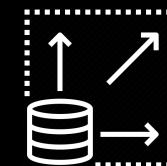
**3**

**Highly efficient storage**



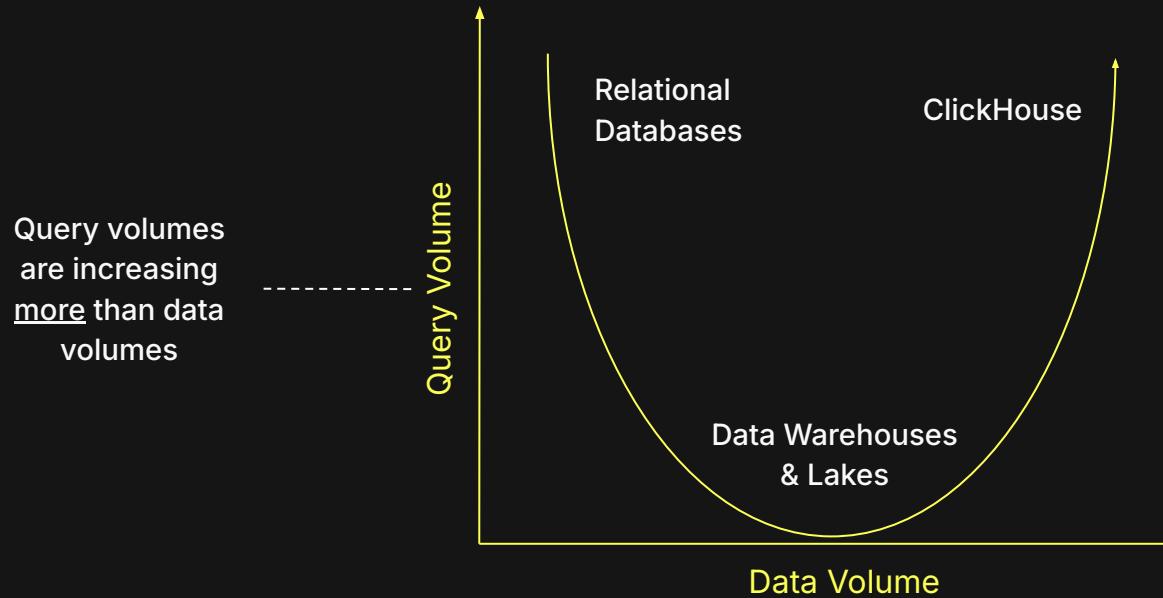
**4**

**Easily scalable to any size**



# Build for the future

Skating to where the puck is going



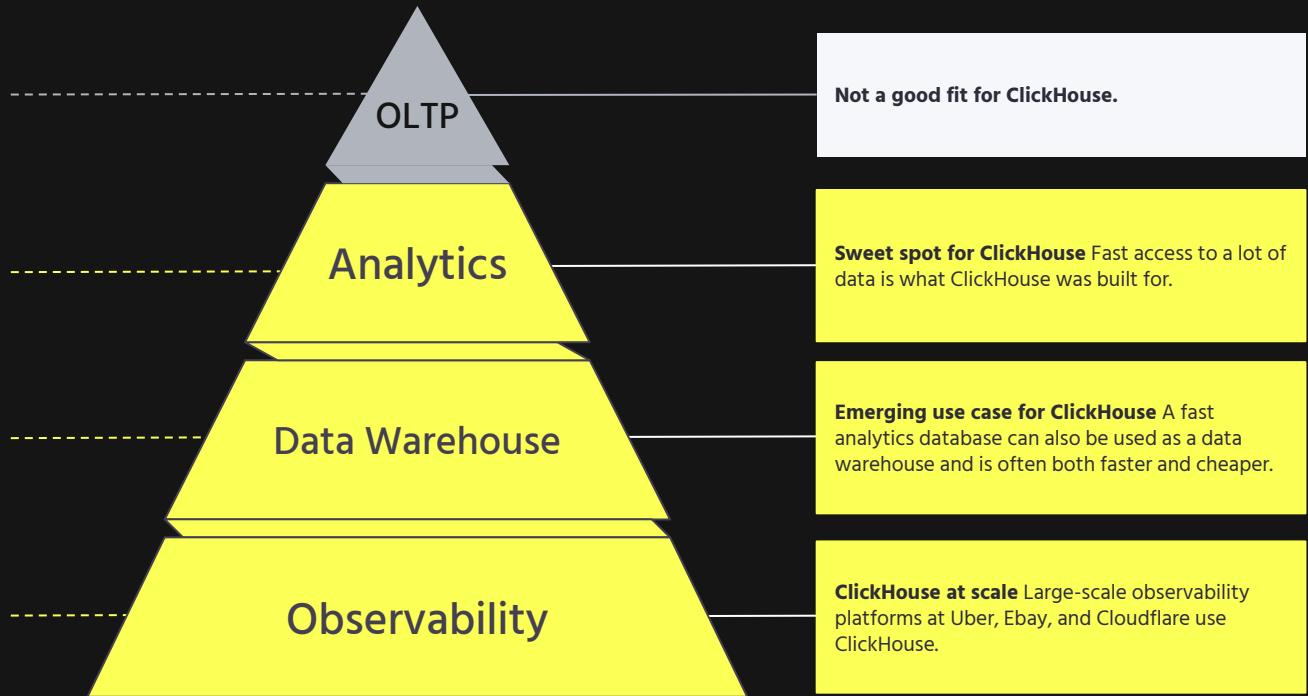
# Hierarchy of Data

This is where your most important data lives. Customer names and addresses, payment info, open orders, etc.

Customer facing and internal analytics: Your real-time interactive dashboards and APIs on top of customer transactions and activity, order history, etc.

Where all business data goes, anything that is useful today or maybe will be at some point in the future: All orders, transactions, random datasets, etc.

The “digital exhaust” of all your applications and infrastructure: Logs, metrics, traces. Used for real-time monitoring and debugging.



# Who uses ClickHouse?



Bloomberg



coinbase



# Who uses ClickHouse?

ramp ↗

checkout.com

NETFLIX

Singtel  
paddle



UBER

eBay



JUSPAY

Nansen

ROKT



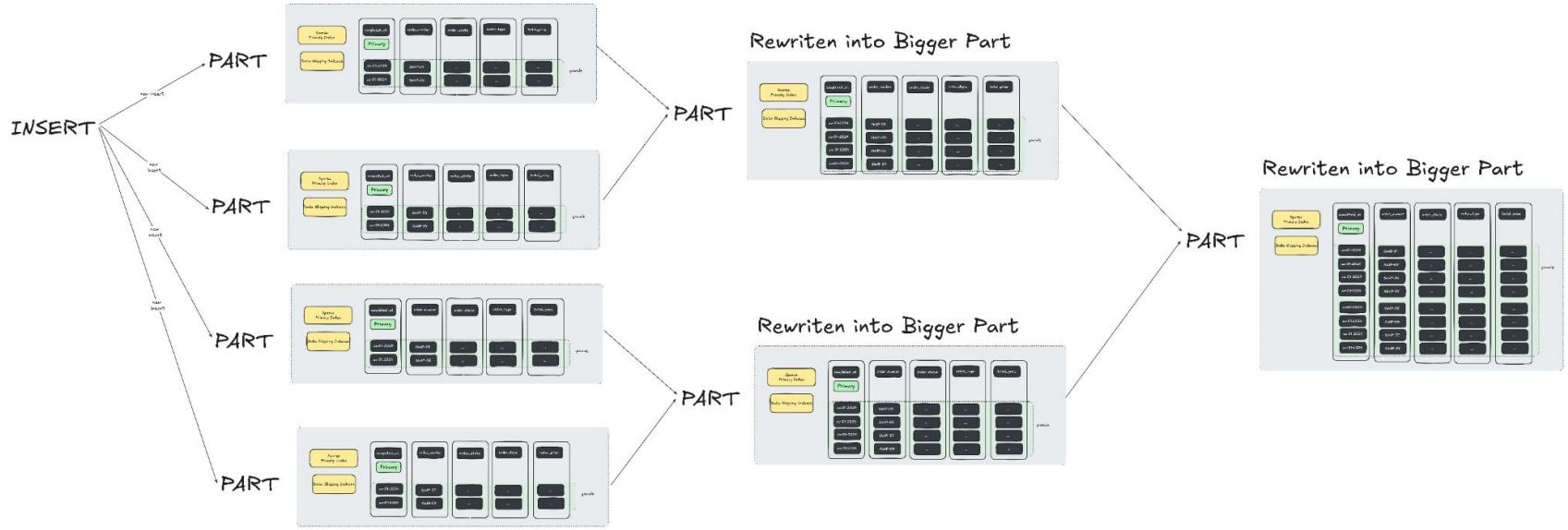
Walmart

LangChain



# What Makes ClickHouse Unique?

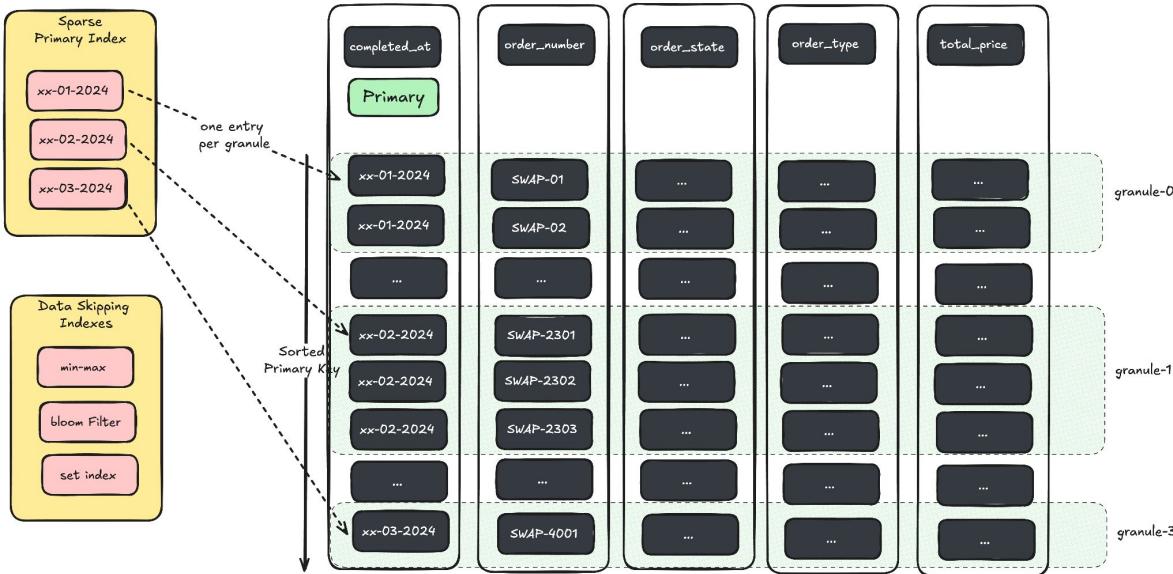
# Why: Efficient Merging



**Parts:** Each time data is inserted, a new part is created. Multiple parts can accumulate over time, which can slow down query performance.

To improve performance and reduce the number of parts, **ClickHouse** periodically runs merging operations.

# Why: Multiple Layers of Indexes



- **Granules** are chunks of rows, and **ClickHouse** groups rows into granules based on the index\_granularity setting.
- **Sparse Primary Index:** **ClickHouse** uses the sparse primary index to quickly jump to the relevant granules, skipping over large portions of the data that don't need to be read.
- **Skip Indexes:** These allow **ClickHouse** to skip entire granules if it can determine from the index that no rows in the granule satisfy the query's filter.

# AI/ML with ClickHouse

||||· ClickHouse

# Use cases



## Logs, events, traces

Monitor with confidence your logs, events, and traces. Detect anomalies, fraud, network or infrastructure issues, and more.



**zomato**

**ebay**

**resmo**

**runreveal**



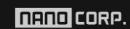
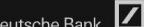
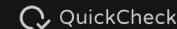
## Real-time Analytics

Power interactive applications and dashboards that analyze and aggregate large amounts of data on the fly. Run complex internal analytics in ms, not mins or hrs.



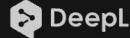
## Business intelligence

Interactively slice and dice your data for analysis, reporting, and building internal applications. Evaluate user behaviors, ad and media perf, market dynamics, and more.



## ML and Gen AI

Execute fast and efficient vector search. Plug-and-play Generative AI models from any provider. Use lightning-fast aggregations to power model training at petabyte scale.



# ClickHouse Cloud: powering enterprise AI/ML at scale

Build an unified data platform to operationalize AI. From real-time data ingestion to high-performance inference and robust observability, ClickHouse Cloud seamlessly delivers data and insights to both users and advanced AI workflows.



## Data Infrastructure

### Massive ingestion

Ingest billions of events per second using columnar storage and compression.

### Petabyte scale

Handle high-throughput data without sacrificing query speed.

### Native JSON support

Ingest and query semi-structured data at speed and scale.

### Cost-efficiency

Optimize compute and storage to reduce overall spend.



## Training and inference

### Vector search

Natively store and query high-dimensional embeddings for Semantic Search and RAG.

### Feature store

Accelerate model training and reduce development cycles.

### Agent support

Power AI Agents efficiently with real-time data.

### High-speed inference

Sub-second retrieval for real-time AI applications.



## Operations

### Live logging and tracing

Pinpoint performance issues instantly.

### Granular metrics

Monitor and debug AI models at scale.

### Continuous optimization

Ensure reliability and fast resolution of anomalies.



## Integrations and delivery

**Rich APIs and SDKs** Seamless integration into existing AI/ML workflows & data pipelines.

### Real-time dashboards

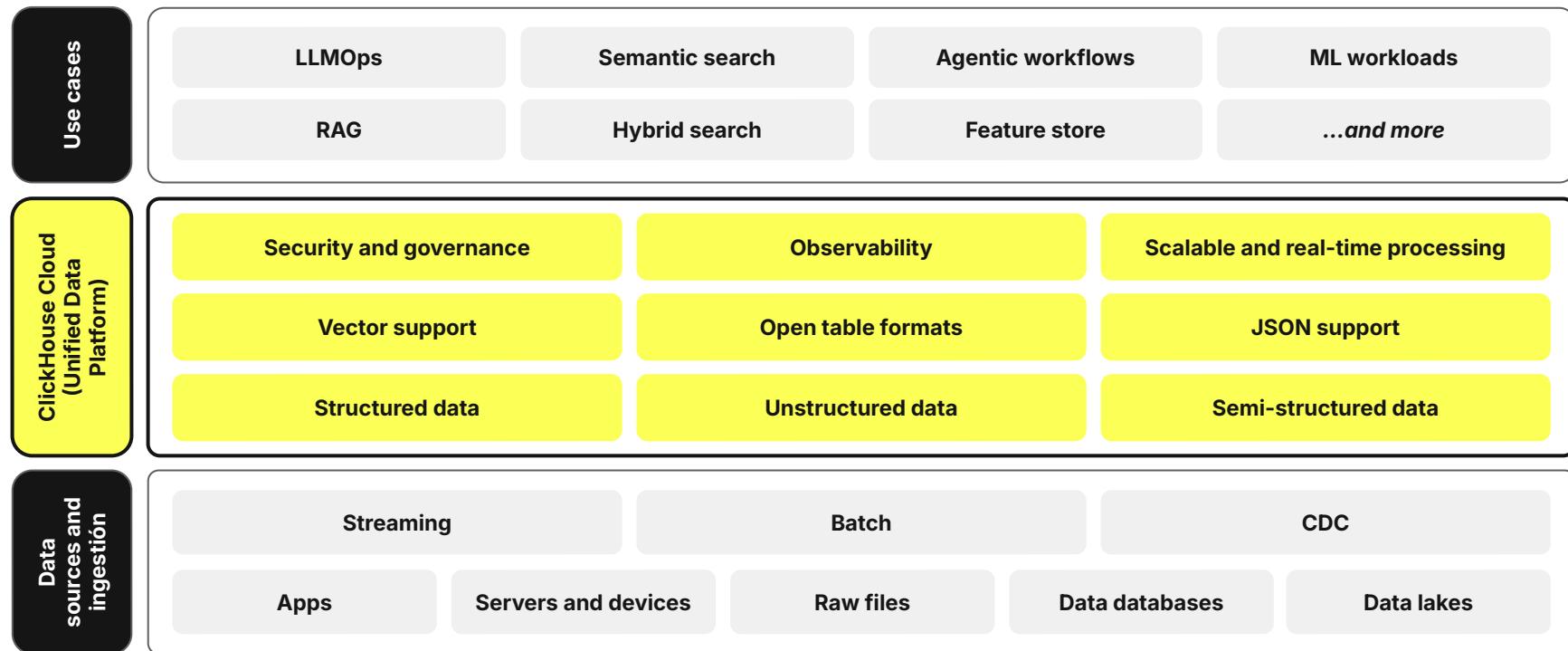
Transform analytics into business intelligence instantly.

### Third-party connectors

Support for popular BI, data transformation, and AI frameworks.

# Unified Data Platform for AI/ML services

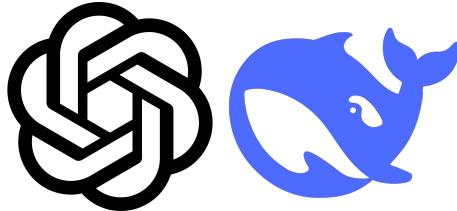
From real-time ingestion to advanced AI/ML outcomes with ClickHouse



# Scaling GenAI: The Evolution of Models, Infrastructure, and Data

Foundation models are bigger, inference is faster, and data must keep pace.

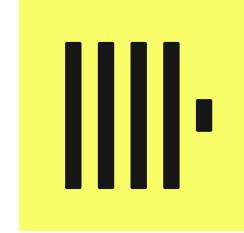
## Foundation Models



## Training & Inference Infrastructure



## Data Infrastructure



**Massive Growth:** Model sizes ballooning to trillions of parameters

**Specialized Domains:** Vertical-specific LLMs for precise outcomes

**On-Demand Results:** Low latency for seamless user experiences

**Accelerated Compute:** GPUs, LPUs, specialized chips for parallel processing

**Fast Token Generation:** Minimizing inference time for real-time AI apps

**Ultra-Low Latency:** Users expect near-instant results

**Scale Without Limits:** Manage petabytes of data with ease

**Continuous Streaming:** Real-time ingestion to keep models updated

**Instant Queries:** Millisecond-latency analytics for interactive AI



## Adopters



Weights & Biases

Langtrace

The braintrust logo is set against a purple background featuring faint, swirling white lines resembling neural activity or brain patterns.

helicone



Langfuse



Autoblocks

*...and more!*



# We're expanding our AI/ML Coverage



***Engage and learn with us and the community!***

**CHC Academy**



**CHC  
Community**



# Thank you!