MY AGENT KAFKA

by Model Context Protocol
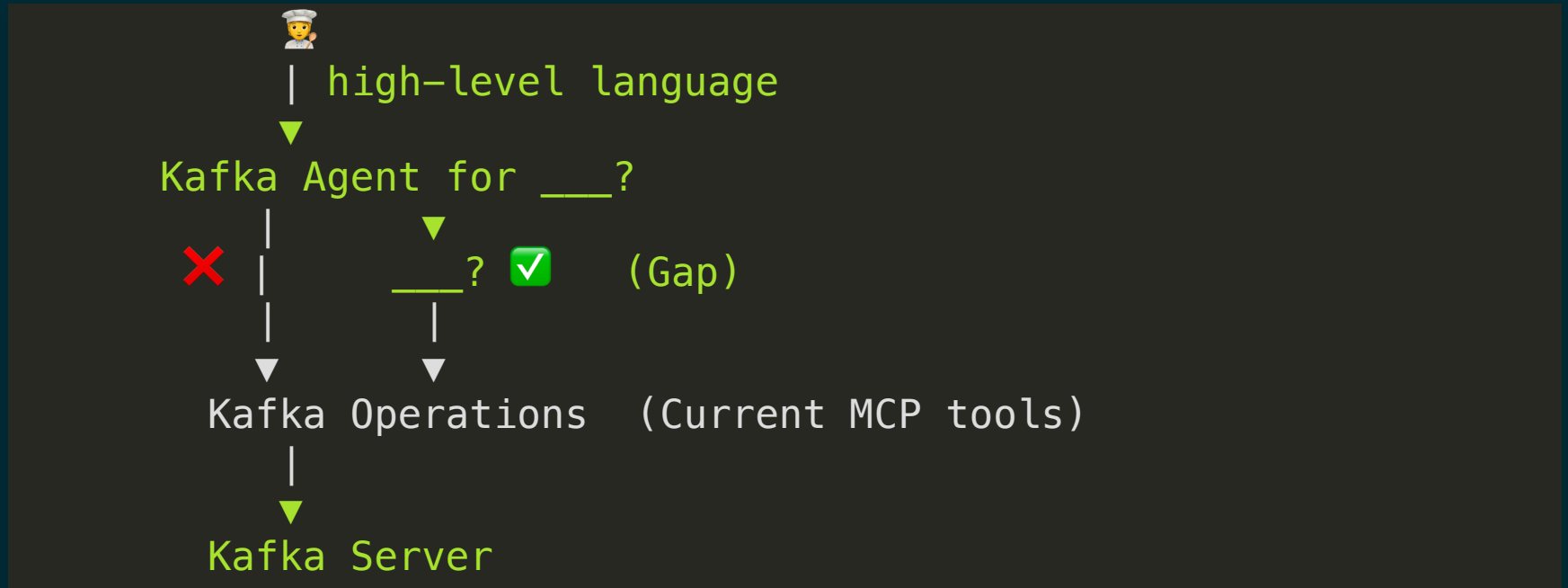
Guang Zhao

AGENTIC ____?

E.g. Housing agents, car mechanics, doctors

- Interact with high-level language
- Master domain-specific tools
- Hide away domain complexity

KAFKA AGENTIC ____?

Problem: tools are too low-level

TOO LOW-LEVEL

```
        🧑‍🍳
         |  high-level language
         ▼
Kafka Agent for ___?
         |          ▼
    ❌   |         ___? ✅     (Gap)
         |          |
         ▼          ▼
    Kafka Operations   (Current MCP tools)
         |
         ▼
    Kafka Server
```

- ❌ "Can you produce X to the topic Y hashed by Z"

- ✅ "How are my sales doing today?"

HIGH-LEVEL PROBLEMS

My Kafka Agentic ____

- Real-time analytics
- Performance tuning

REAL-TIME ANALYTICS

CHEF ASKS...

What are my most popular entrees tonight?

How many do I need to prepare tomorrow?
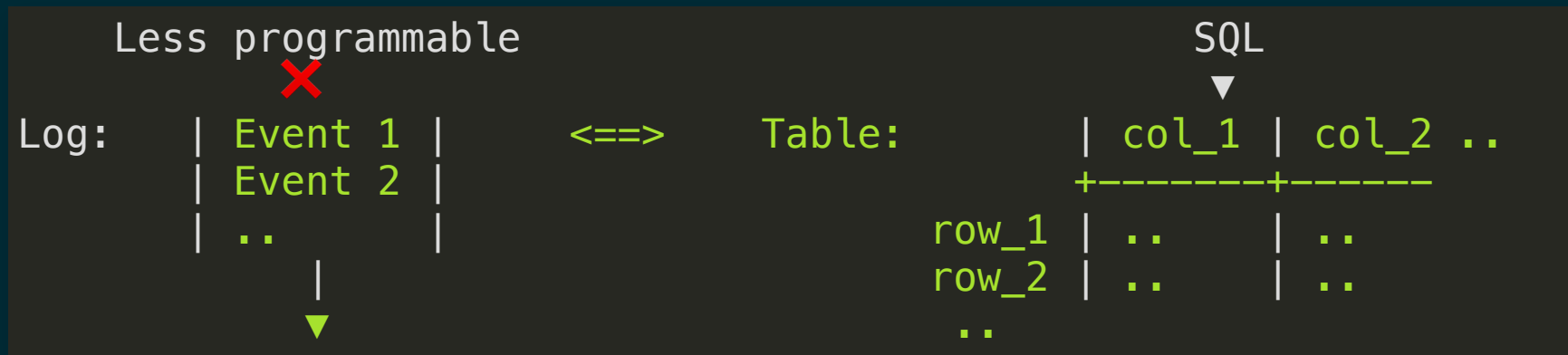
😩

Write SQL?

Hire a Kafka programmer?

😐: Use my Kafka agent?

KAFKA UP FOR ANALYTICS?

"Need to bridge from the operational to the analytical"

-- Confluent engineer at Current'25

DATA MODEL GAP

```
    Less programmable                                    SQL
              ❌                                          ▼
Log:    | Event 1 |        <==>      Table:       | col_1 | col_2 ..
        | Event 2 |                                +-------+------
        | ..      |                        row_1 | ..    | ..
              |                            row_2 | ..    | ..
              ▼                                     ..
```

- Apache Flink   • TableFlow (Confluent)
- Kafka Streams   • Iceberg topic (Aiven)
- KSQL (retiring)   • Kafka table engine (ClickHouse)

😩: still not easy for chef

CLICKHOUSE = DATA WAREHOUSE + LLM

- Collects 2PB business data
- Analyst:
  - "Which onboarding steps correlate with high 90-day retention"

```
No longe writing SQLs by hand ... Huge productivity gain

      — Mihir Gokhale, PM, Open House'25
```

😐: Kafka = Streams + LLM?

PERFORMANCE TUNING

MY KAKFA-ONTAP CONNECTOR

```
Which ONTAP block size maximizes throughput?
a. 4KB      b. 4MB      c. 4GB
```

😐: Guess -> benchmark -> repeat

🤖: Orchestrate for me?

DEMO

- Analyze business data
- Tune cluster performance
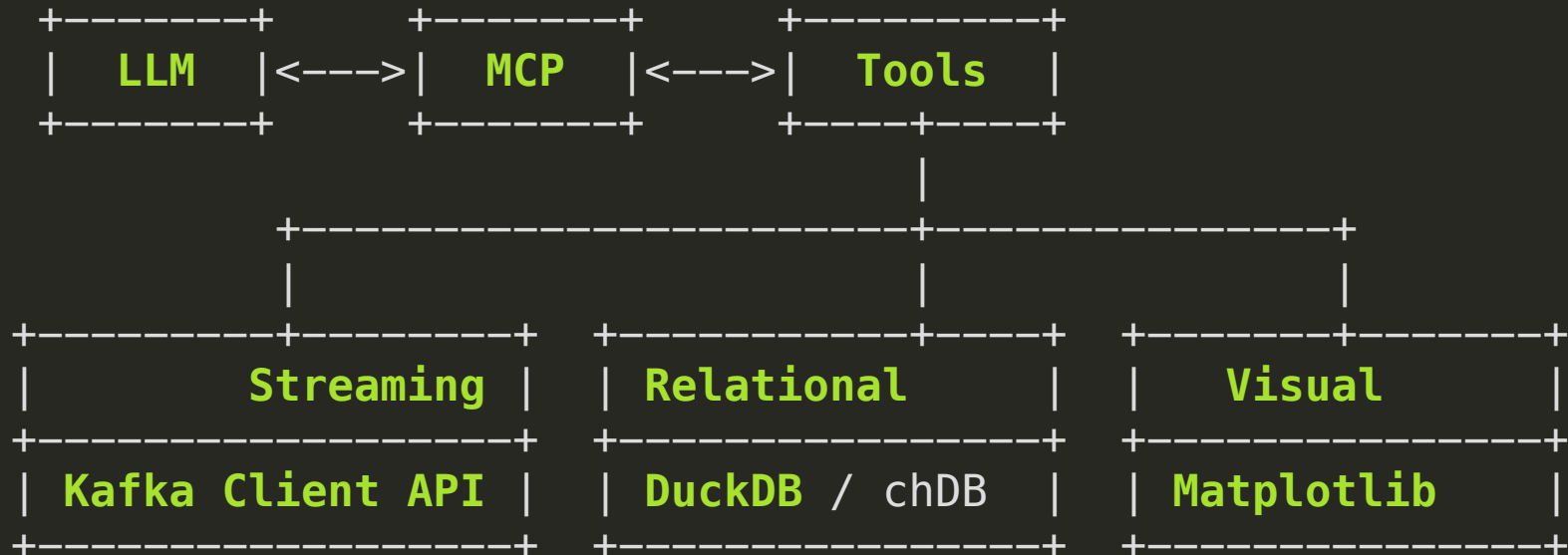
👻 Non-deterministic "bugs"?

HOW DOES IT WORK?

HOW COMPLICATED CAN IT BE?

- Input: question
- Compute: ...
  - Programs: models, machine code
  - CPU, storage, network
- Ouput: answer

How different from "trad coding"?

SYSTEM VIEW

😐: input

🤖:

```
    +--------+       +--------+       +----------+
    |  LLM   |<--->|  MCP   |<--->|  Tools   |
    +--------+       +--------+       +----------+
                                           |
            +------------------------------+------------------------+
            |                              |                        |
    +----------------+       +----------------+       +----------------+
    |   Streaming    |       | Relational     |       |    Visual      |
    +----------------+       +----------------+       +----------------+
    | Kafka Client API |     | DuckDB / chDB  |       | Matplotlib     |
    +----------------+       +----------------+       +----------------+
```

🤖: answer

TAKEAWAY

- Agent to solve high-level problems with Kafka
- High-level problems needs more complex tools
- Complexity of tools comes from chosen combination
- LLM is outside of your control*, but tools are within

THOUGHTS?

- https://github.com/instaclustr/agent-kafka
- guang@netapp.com
- #opensauce, #open-ai