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Timeplus Proton: The Lightning-Fast SQL Engine for Real-Time Streams

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Real-time data is a mess. If you've ever tried building a streaming pipeline, you know the chaos. Kafka for streams, Flink or ksqlDB for processing, ClickHouse for analytics, connectors for… everything else.

Before long, you're knee-deep in YAML and microservices, wondering if this was meant to be *fun*.

Then I discovered **Timeplus Proton**. It's essentially: *"What if stream processing was just SQL — and it ran like a rocket?"*

Fastest SQL pipeline engine for stream processing, analytics, observability and AI

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So, What's Proton?

Proton is a single binary — written in C++ — that performs stream processing, analytics, observability, and even a touch of AI magic.

No JVM.
No ZooKeeper.
No massive cluster setup.

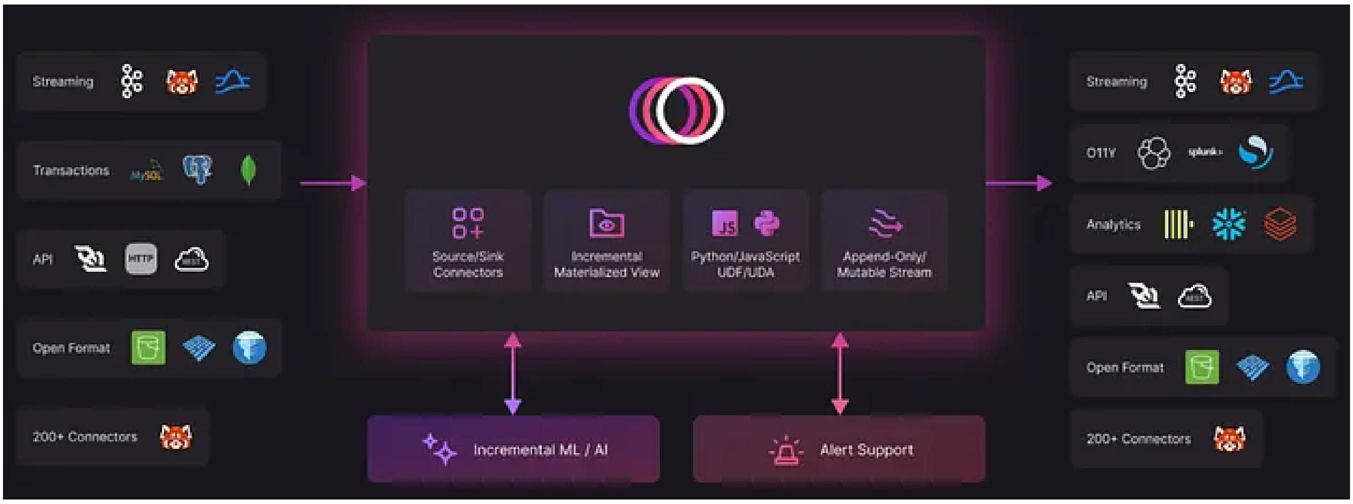
You just run:

```
curl https://install.timeplus.com/oss | sh
```

And you're live. Literally.

Behind the scenes, it uses the **ClickHouse engine**, which is already one of the fastest databases available. However, Proton adds all the streaming features that ClickHouse doesn't offer — joins, windows, materialised views, watermarks, and more.

It's like ClickHouse has learned to listen to data as it occurs.



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The Cool Part — It's Actually Fast

I'm not talking "marketing fast."
I mean, "90 million events per second on a MacBook" fast.

Proton's written in C++ and uses SIMD optimisation (which basically means it squeezes more work out of your CPU).
And because it's a single binary under 500MB, it doesn't chew through memory or spin up ten background services to say "hello."

You can even run it on an AWS t2.nano — that's one vCPU and 0.5GB memory. Try doing that with Flink.

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ClickHouse vs Proton (in simple terms)

Here's how I see it:

- **ClickHouse** is for *big historical analytics*. It's a data warehouse.
- **Proton** is for *real-time decisions*. It's a stream engine.

ClickHouse can read from Kafka, sure, but it doesn't *think in streams*. It thinks in tables. Proton lives in both worlds — it unifies real-time and historical data. You can detect something now and query it later, without juggling two systems.

It's similar to ClickHouse and Flink merging into a small binary.

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Getting Hands-On

Once installed, open Proton's SQL client and begin writing SQL—no new language to learn.
Example — reading from Kafka and writing to ClickHouse:

```
CREATE EXTERNAL STREAM aws_msk_stream (
  device string,
  temperature float
)
SETTINGS
  type='kafka',
  brokers='prefix.kafka.us-west-2.amazonaws.com:9098',
  topic='topic',
  security_protocol='SASL_SSL',
  sasl_mechanism='AWS_MSK_IAM';
```

Then send the results to ClickHouse:

```
CREATE EXTERNAL TABLE ch_aiven
SETTINGS type='clickhouse',
  address='abc.aivencloud.com:28851',
  user='avnadmin',
  password='..',
  secure=true,
  table='events';
```

And finally, create a view that aggregates data every 10 seconds:

```
CREATE MATERIALIZED VIEW mv_msk2ch INTO ch_aiven AS
SELECT window_start AS timestamp, device, avg(temperature) AS avg_temperature
FROM tumble(aws_msk_stream, 10s)
GROUP BY window_start, device;
```

That’s real-time ETL — no frameworks, no YAML, just SQL.

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Don’t Have Kafka? No Problem.

You can generate random data for testing.

```
CREATE RANDOM STREAM devices(
  device string default 'device'||to_string(rand()%4),
  temperature float default rand()%1000/10);

SELECT device, count(*), min(temperature), max(temperature)
FROM devices GROUP BY device;
```

You’ll see a live stream of fake IoT data passing by. It’s oddly satisfying.

```
┌─device───┬─count()─┬─min(temperature)─┬─max(temperature)─┐
│ device0 │ 2256 │ 0 │ 99.6 │
│ device1 │ 2260 │ 0.1 │ 99.7 │
│ device3 │ 2259 │ 0.3 │ 99.9 │
│ device2 │ 2225 │ 0.2 │ 99.8 │
└──────────┴─────────┴──────────────────┴──────────────────┘
```

Feels like magic.

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Why It Matters

You can use Proton for:

- Real-time dashboards
- Streaming ETL and data prep
- Alerts and anomaly detection
- IoT and sensor data
- Log analytics and observability

It replaces a *stack* of tools with a single binary and a single language: SQL.

You can deploy it anywhere — Docker, Homebrew, cloud — or simply run it locally to experiment.

```
docker run -d -p 8123:8123 -p 8463:8463 \
  --name proton d.timeplus.com/timeplus-io/proton:latest
```

. . .

My Take

Proton seems like a tool you try out of curiosity… and then realize it quietly replaces three things in your stack.

It's fast. It's clean. It doesn't yell at you for not setting a JVM flag, and it speaks the most universal language in data: SQL.

If you work with live data streams — or have ever wished Flink were easier — give this a try:

```
curl https://install.timeplus.com/oss | sh
```

You'll have a streaming SQL engine up and running before your coffee cools.

Sql Sql Server Live Streaming AI Data

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