

GSOC 2025

LIGHTNING TALK

presented by Shubham Vishwakarma



scalacenter



Who Am I?

- 🖐 Hi, I'm Shubham Vishwakarma from Mumbai, India.
- Final-year CSE student at SPIT, with a Management minor at SPJIMR.
- Open Source Contributor with Scala Center (GSoC 2025).
- My Scala journey began with Rock the JVM courses, which sparked my passion and connected me to this welcoming community.



Shubham
Vishwakarma
India IN

Discovering GSoC & Scala Center

- Came across GSoC with Scala Center and found LLM4S, the perfect blend of Scala and AI.
- Mentorship from Kannupriya Kalra & Rory Graves made the journey real and guided my direction.
- The challenge was clear: LLM apps are hard to debug, observe, and scale.
- Our mission: Make Scala a first-class citizen in AI tooling, built on type safety and FP principles.



Rory Graves



Kannupriya Kalra

From First Trace to Full Demo: My Contributions

- **Tracing Support (PR #77, #119):**
Added execution flow tracking, spans, and timing.
Integrated Langfuse for developer-friendly traces.
- **Type-Safe Tracing (PR #165):**
Rebuilt with sealed traits & composable backends.
Ensured reliability and backward compatibility.
- **Demo & Multi-Backend (PR #184):**
Built a calculator agent for sequential tool-use.
Showcased tracing with Console, Lang fuse, and NoOp.

Total PRs Raised	PRs Closed Merged
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Why It Matters : The Impact

- **Visibility Unlocked** : Developers can now trace every LLM call
- **Type-Safe Reliability** : Sealed traits & composable backends remove fragile logging
- **Real-World Proof** : Demo agent + multi-backend tracing shows it works in practice.
- **Future-Ready** : Establishes the base for memory, multi-agent orchestration, and Scala-first AI systems.

```
=====
LLM COMPLETION
=====
Timestamp: 2025-06-19T06:44:44.454993600Z

Model: openai/gpt-4o-mini
Completion ID: gen-1750315479-FQF7Gs9uL5iA7bAIj7x
Created: 1750315479

--- Response ---
Content: Arrr, trainin' a parrot be a fine adventure, matey! Here be some tips to help ye on yer quest:

1. **Start with Simple Words**: Begin with easy words or phrases, like "Ahoy!" or "Polly wants a cracker!" Repeat 'em oft

2. **Use Positive Reinforcement**: Reward yer feathered friend with treats or ...

--- Token Usage ---
Prompt Tokens: 64
Completion Tokens: 294
Total Tokens: 358
Estimated Cost: $0.009460 USD (approx.)
```

Image: Print Trace Example

LLM4S Tracing Architecture – High-Level Detailed View

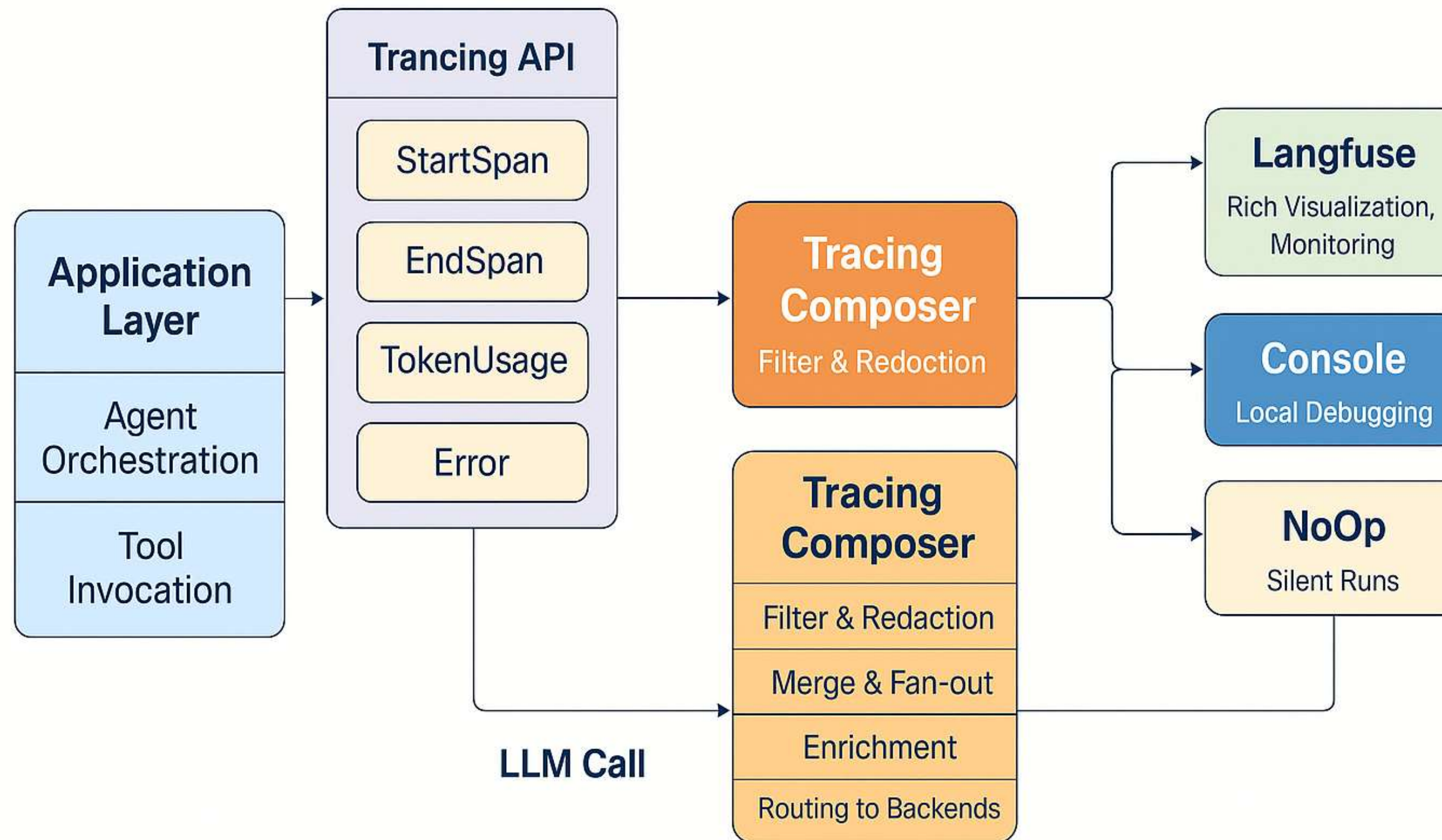


Image: LLM4S Tracing Architecture

Langfuse v3.96.2

Go to...

Home

Dashboards

Observability

Tracing

Sessions

Users

Prompt Management

Prompts

Playground

Evaluation

Scores

LLM-as-a-Judge

Human Annotation

Datasets

Star Langfuse

Shubham Vishw...
smsharma3121@gm...

scala-test Hobby / my-llm-test

Tracing

Traces Observations

Search... IDs / Names Past 1 month

	Timestamp	Name	Input
<input type="checkbox"/>	☆ 2025-08-09 00:32:17	LLM4S Agent Run	How c
<input type="checkbox"/>	☆ 2025-08-09 00:30:45	LLM4S Agent Run	Please
<input type="checkbox"/>	☆ 2025-08-09 00:26:31	LLM4S Agent Run	Please
<input type="checkbox"/>	☆ 2025-08-09 00:23:24	LLM4S Agent Run	Please
<input type="checkbox"/>	☆ 2025-08-09 00:18:38	LLM4S Agent Run	system
<input type="checkbox"/>	☆ 2025-08-09 00:15:12	UserMessage 3	{"cont
<input type="checkbox"/>	☆ 2025-08-09 00:15:12	AssistantMessage 4	{"cont
<input type="checkbox"/>	☆ 2025-08-09 00:15:12	AssistantMessage 2	{"cont
<input type="checkbox"/>	☆ 2025-08-09 00:15:12	UserMessage 1	{"cont
<input type="checkbox"/>	☆ 2025-08-09 00:15:12	SystemMessage 0	{"cont
<input type="checkbox"/>	☆ 2025-08-09 00:11:21	LLM4S Agent Run	Please
<input type="checkbox"/>	☆ 2025-08-09 00:05:00	LLM4S Agent Run	Please
<input type="checkbox"/>	☆ 2025-08-09 00:05:00	LLM4S Agent Run	{"stat
<input type="checkbox"/>	☆ 2025-08-08 23:50:15	System Message	You a

Trace d1fbe86e-0353-446c-ba9b-72d31e713003

Search (ty) Timeline

LLM4S Agent Run

0.00s

System Message 0

User Input 1

User Input 3

LLM Generation 4

LLM Generation 2

LLM Generation 4 ID

2025-08-09 00:30:45.363

Env: default

Preview


Formatted JSON

role"assistant"

Output

Path	Value
	"Ahoy, matey! Trainin' a parrot be a fine adventure! Here be some tips fer ya:
content	<div>1. Be Consistent: Use the same words and phrases every time ye interact with yer feathered friend. Consistency be key!</div> <div>2. Positive Reinforcement: Reward the parrot with treats, praise, or affection when it does somethin' ye want it to do. This'll encourage good behavior!</div> <div>3. Short Sessions: Keep yer trainin' sessions short and sweet. Parrots have short attention spans, so 5 to 10 minutes be ideal!</div> <div>4. Patience, Aye: Remember, training a parrot takes time. Be patient and don't get frustrated if they don't catch on right away.</div> <div>5. Use a Variety of Sounds: Parrots love to mimic sounds. Use different tones and sounds to keep 'em engaged and interested.</div> <div>6. Social Interaction: Spend time with yer parrot. They</div>

Image : Langfuse Tracing Example



Beyond Tracing: The Next Chapter for LLM4S

- **Multi-Agent Systems :↻ In Progress**
DAG-based planner with retries & fallbacks.
Pub-sub signals for safe agent coordination.
Scala-native, type-safe orchestration.
- **Typed Prompt DSL : □ Planned**
Scala DSL for chaining LLMs, retrievers, tools.
Cats-effect & typed streams for composability.
Compile-time safety, no “stringly-typed” prompts.



A Real Use Case : Meeting Minutes Generator ☐ Planned

- Input : Zoom / Google Meet transcript (*raw text*).
- Output:
 - Concise summary of discussion
 - Action items with owners & deadlines
 - Sentiment analysis of conversation flow
- Why LLM4S?
 - Streaming summaries (real-time insights as the meeting runs)
 - Guardrails via JSON schema → `{summary: String, actions: [Action]}`
 - Full traceability → every step tracked with spans/events



THANK YOU

- From learner to contributor → grateful for this journey with Scala.
- Heartfelt thanks to my mentors
Kannupriya Kalra, Rory Graves & Dmitry Mamonov, and the Scala Center.
- ❤️ To the Scala community for being supportive, curious, and inspiring.



Connect with me :)