Ericsson Trace Compass update

Matthew Khouzam

Agenda

- Recap of Ericsson's involvement with the project
- The team
- The tracing ecosystem
  - Trace Compass
  - VSCode Extension
  - CDT-Cloud!
- How do we fit into Ericsson?
- Future work
  - Roadmap
  - Where can you help?
- Thank you
- Cool story, time permitting.

No Change!

The goal of this talk is STILL to explain where we are coming from to explain our decision making process

Ericsson has been an industrial partner in the research project for over 15 years

We develop and use tools such as LTTng and Trace Compass in the company to solve timing issues and hard to debug problems

Ericsson contributes to and maintains Trace Compass

The Montreal Team has been closely collaborating with the academic and industrial partners. Including US (Texas) and Sweden)

We are working towards having the entire team working at their peak efficiency.

About The Team (May 2024) No Change

Bernd Hufmann – Technical Lead
Patrick Tasse – Employee (Internal Lead)
Marc Dumais - Devops
Elena Giovannetti – Director
Georges Bourret – Line Manager
Steve Crisafulli – Strategic Product Manager
Anh Nguyen – Intern
Kaveh Shahedi – Intern Emiratus
Matthew Khouzam – Product Owner
Austin +Sweden teams – Developing internal use cases in open-source way

The Ericsson Tracing Ecosystem (no change)

- At Ericsson we have very intricate products offered to the public
- At a high level we trace many individual components
- One of the goals of Trace Compass is to provide a unified troubleshooting experience
- **This did not change, there are just more users and more use cases.**

Traces

- LTTng
- Other Linux Tracers
- CTF Hardware
- Chromium style
- Open Telemetry

Logs

- HTTPD
- SSH
- Java (GC)

Trace Compass

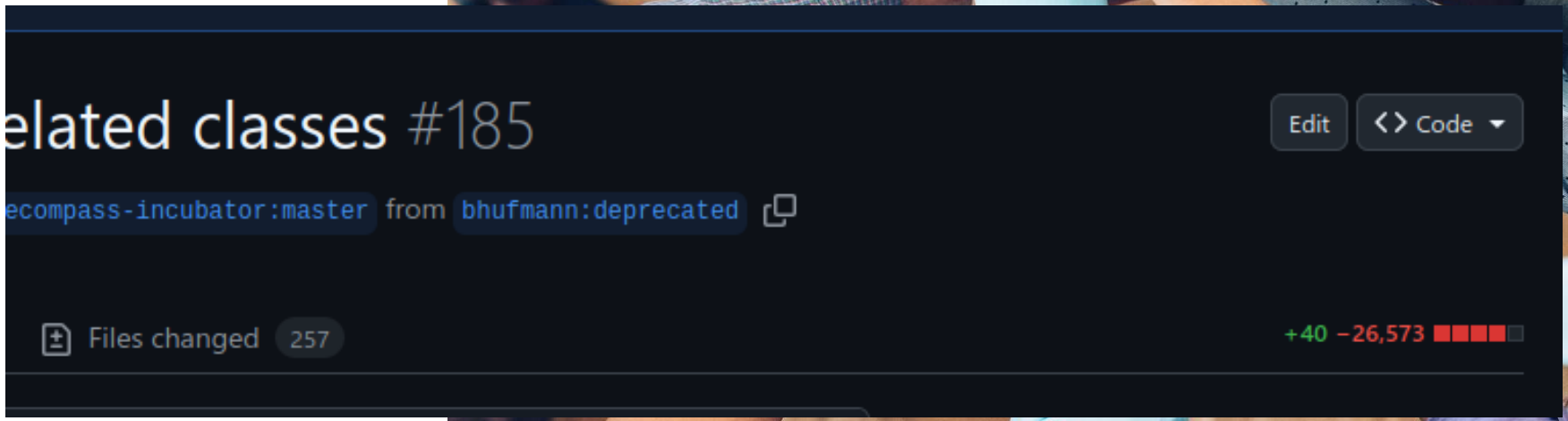
- 10.2, 10.3, 11 Soon to be Released
- Customization of Trace Compass analyses
- Using external trace-event-logger library
- Removed incubator callstack
- Minor fixes
- Prep work for Execution Comparison

Trace Compass Incubator

- DPDK
- Perfetto on it's way, thanks AMD
- JIFA traces (GC)
- Seems to be stabilizing as a repo for trace types now.

Soon:

- Raw trace events?
- JFR Jifa traces



Eclipse CDT Cloud (repeat)

- Place where contributions are welcome:
  - Full tracing example, like tracevizlab but for an IDE.
  - Expected flow for CDT Cloud Blueprint:
    - Write code
    - Launch with tracing
    - Visualize trace
- PS: for new members, have you done tracevizlab's tutorials? 100% worth it!

https://github.com/dorsal-lab/Tracevizlab

TC Cloud Frontend

- Most improvements are UX related as VSCode or Theia is a UI shim over Trace Compass's core logic.
- Features:
  - Filtering , Column headers in gantt.
  - BE/FE URL split to allow running in kubernetes
- Other:
  - **v0.7.3**: Updated for Theia v1.58.5, bumped dependencies (axios, @babel/runtime), and refactored tooltip. JSONBigInt harmonized improved support.
  - **v0.7.0**: Modernized method binding, added sorting/filtering to timegraph, and updated CI to Node 20.
  - **v0.6.0**: Updated to Theia 1.55.0, added ADR for output descriptors, and bumped key dependencies.
  - **v0.5.0**: Improved type safety in SignalManager and added basic issue/pull-request templates.
  - Community is contributing, thanks Blackberry!

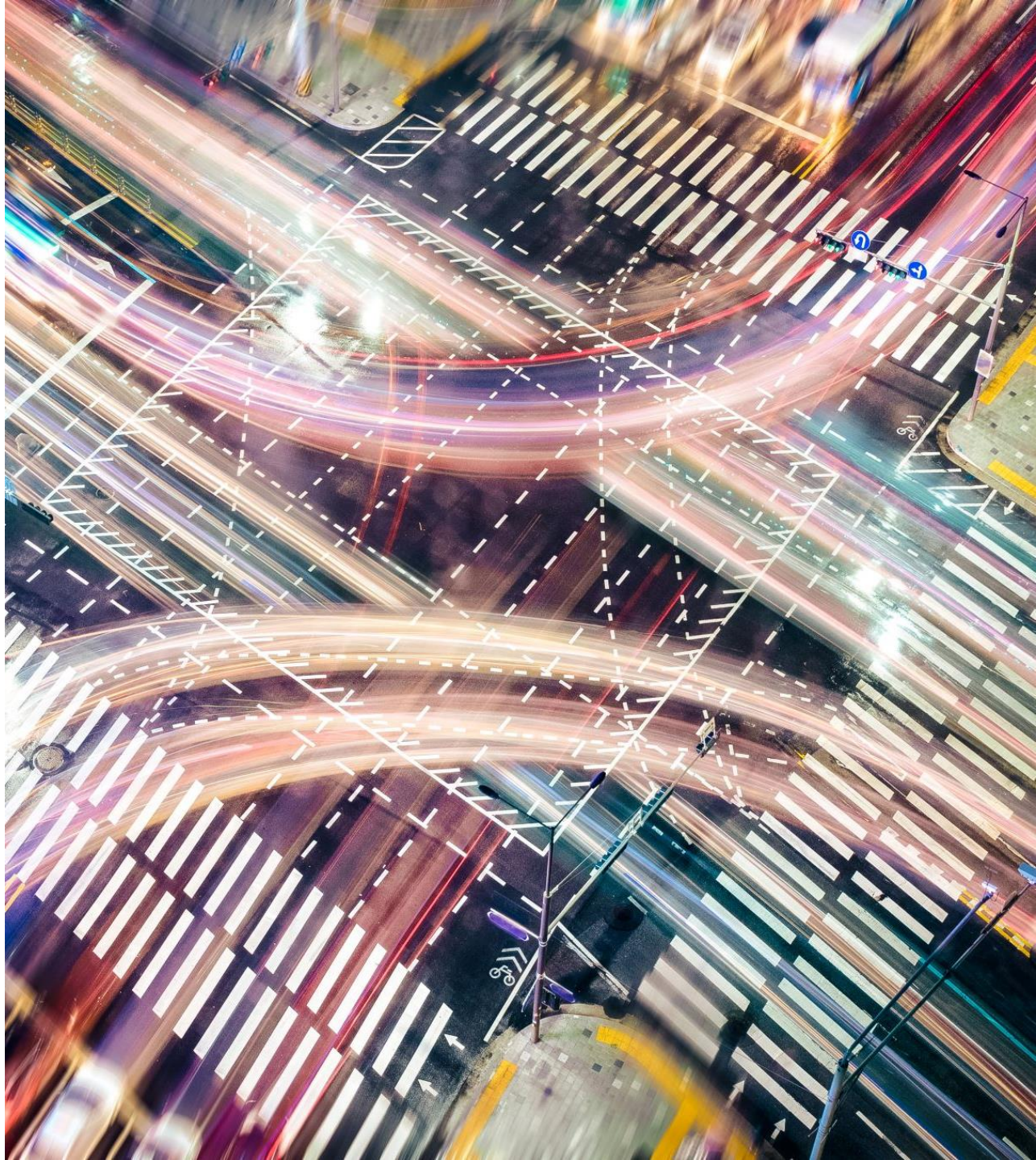
Trace Event Logger

- High Speed simple java logger.
- Generates Trace Even Traces
- Uses JUL
  - ~75 ns/event instrumentation only
  - ~1 us/event write to disk
- Using plain JUL
  - ~45 us/event write to disk
- If you're instrumenting a java application, use it instead of hand crafting event.

Where do we fit into Ericsson?

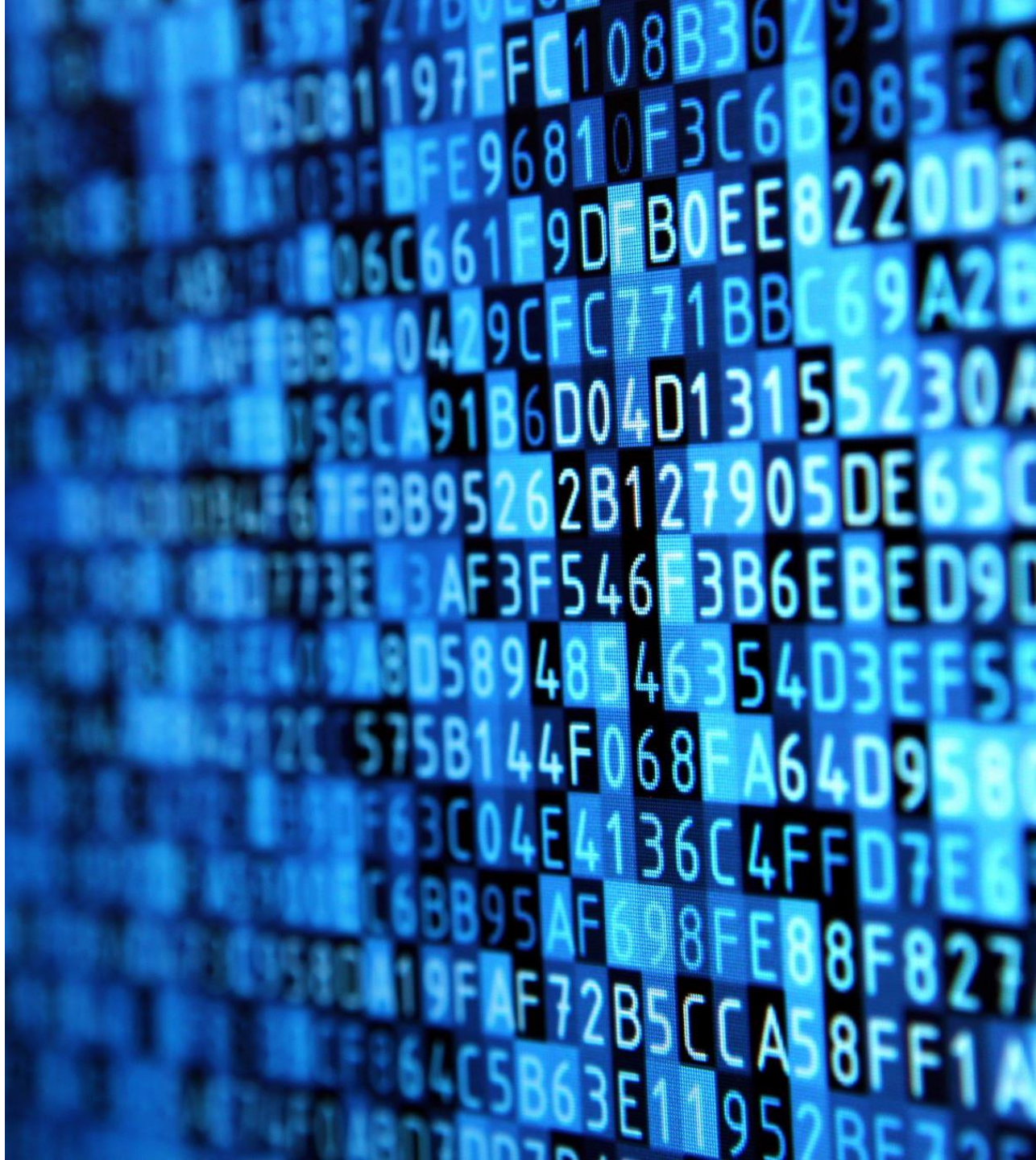
- We make a tool that's used by tools to support developers and users.
- Most of our users don't know what trace compass is.
- 3 main use cases:
  - Antenna
    - Software layer (Many KPI and aggregates)
    - Hardware layer (Gantt charts)
  - Backplane: Trace Compass with LTTng
  - Support: Trace Compass with custom logs

Future Work



VSCode extension

- Customization
- Support for reports (progress!)
  - Generic XY
  - Flame Graph
  - Pie Charts
  - Roofline Models
- Hardware specific views, will help AMD?
- Special plots, better TMLL integration:
  - Bubble
  - Sankey
- Collaborative investigations when tech is there



Road Map

Be a good Ericsson Citizen – Ongoing

Software Compliance – We want to use FOSS in Ericsson!

Expand community – Poly committers?

Expand internal community

Open-Source Activity and Leadership (General) - Ongoing

Trace Compass Releases (Eclipse) - Ongoing

Open-Source Features to support internal implementation of trace viewer (Theia) - Ongoing

Continue to support internal hardware team

Continue to support internal Linux teams

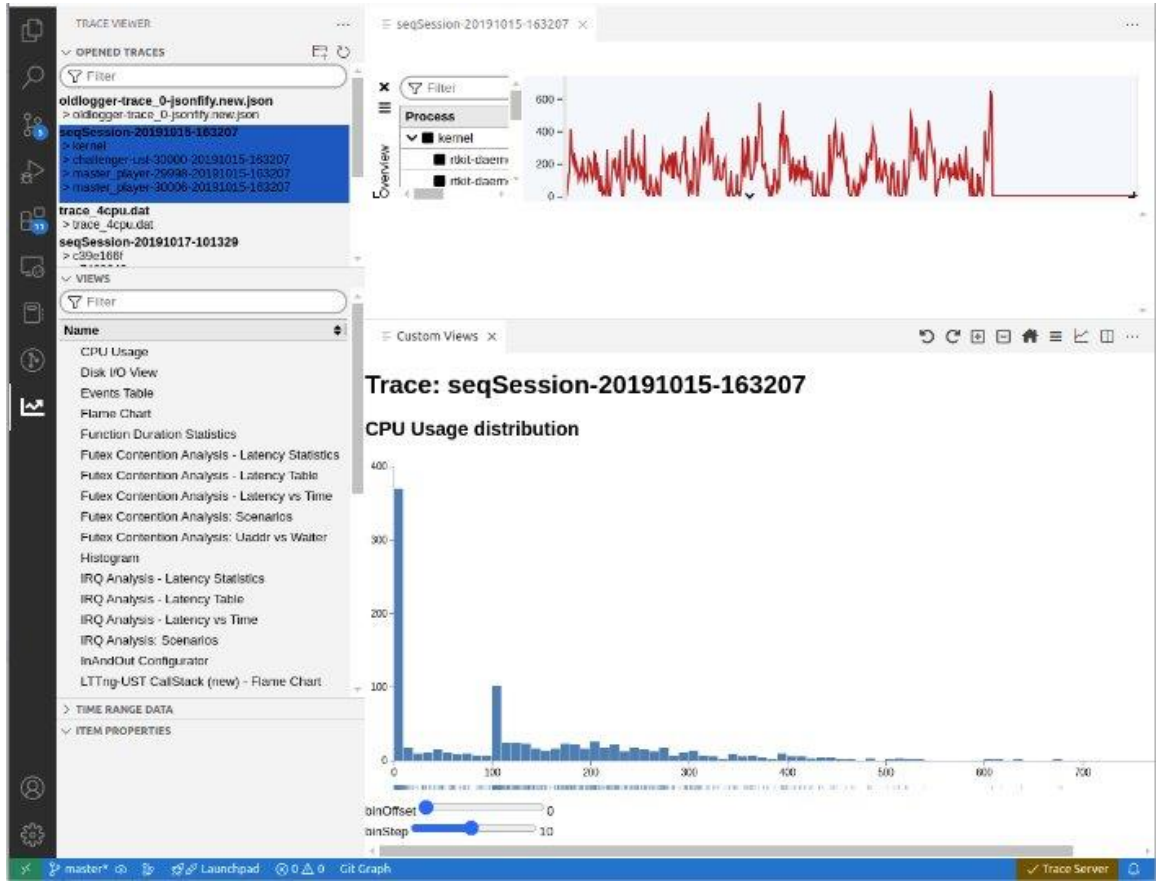
Trace Compass

- Internal Support – Ongoing
- Additional tracer support:
  - CTF2
  - DPDK
  - SQLite DB
  - Perf (intel PT)
  - Perfetto (Thanks AMD!)
  - ~~Protobuf?~~
- Support Poly's efforts re: Partial State system
- Support Poly's efforts re: Diff Flamegraph/stats/critical path
- **Performance improvement – On demand**

Cool Story

Trace Compass.ai

Custom Charting

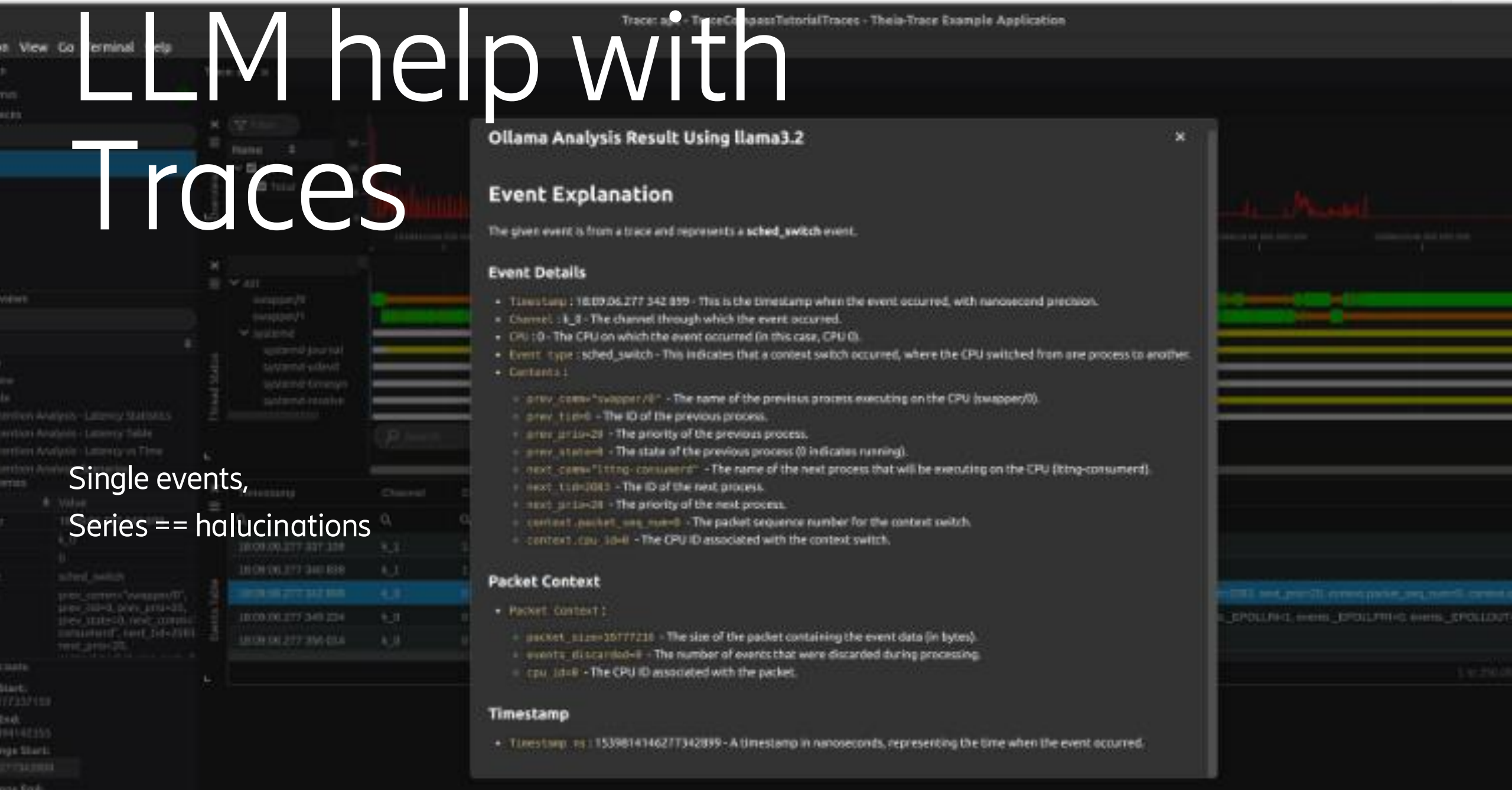


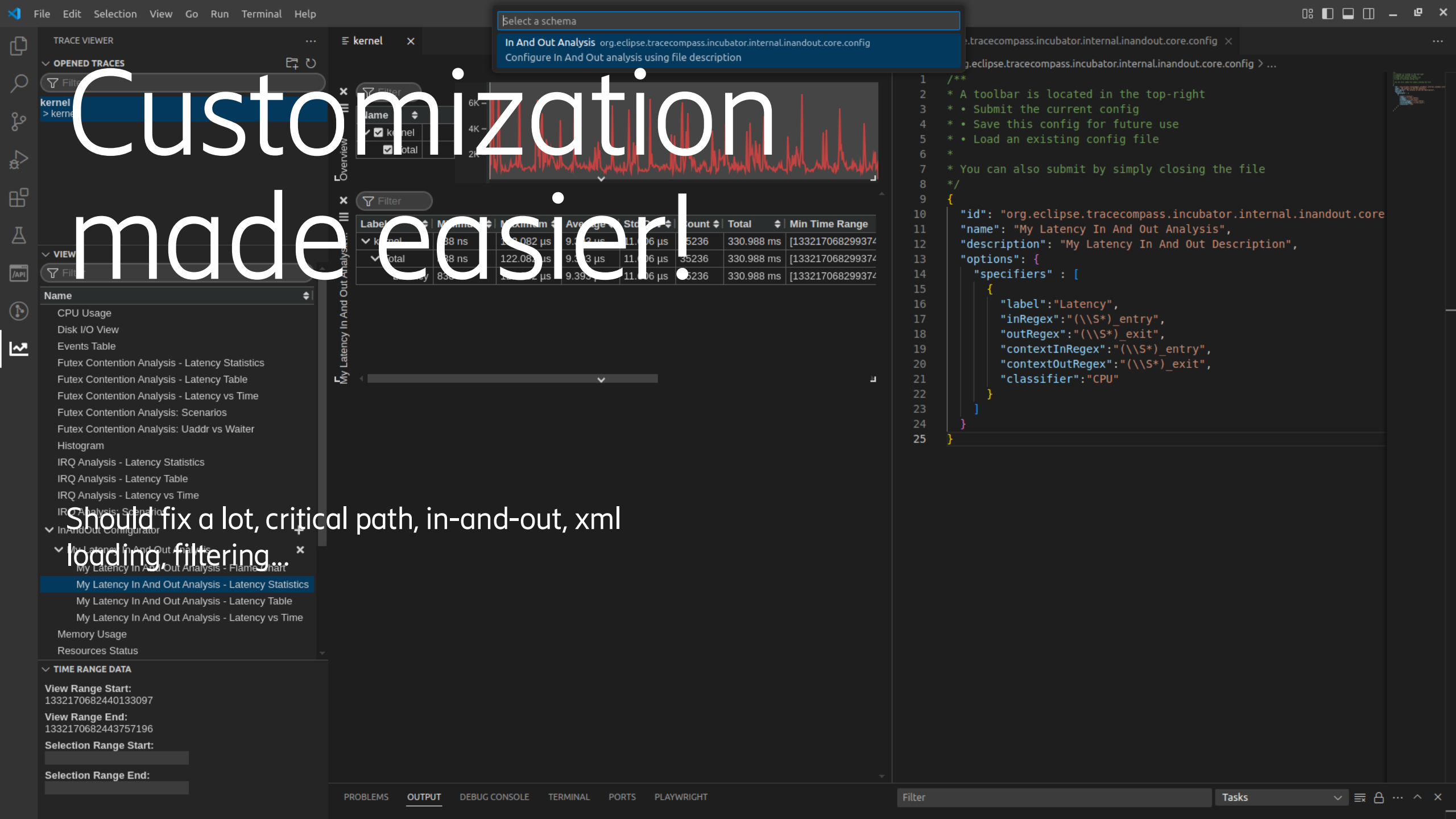
- Testing using VEGA
- Able to get a density chart out of XY
- Able to plot arbitrary columns
- INVESTIGATION, not delivered

LLM help with Traces

Single events,

Series == halucinations




Customization made easier!
Should fix a lot, critical path, in-and-out, xml loading, filtering...
File Edit Selection View Go Run Terminal Help
Select a schema
In And Out Analysis org.eclipse.tracecompass.incubator.internal.inandout.core.config
Configure In And Out analysis using file description
TRACE VIEWER
OPENED TRACES
kernel
VIEWS
Name
CPU Usage
Disk I/O View
Events Table
Futex Contention Analysis - Latency Statistics
Futex Contention Analysis - Latency Table
Futex Contention Analysis - Latency vs Time
Futex Contention Analysis: Scenarios
Futex Contention Analysis: Uaddr vs Waiter
Histogram
IRQ Analysis - Latency Statistics
IRQ Analysis - Latency Table
IRQ Analysis - Latency vs Time
InAndOut Configurator
My Latency In And Out Analysis - Latency Statistics
My Latency In And Out Analysis - Latency Table
My Latency In And Out Analysis - Latency vs Time
Memory Usage
Resources Status
TIME RANGE DATA
View Range Start:
1332170682440133097
View Range End:
1332170682443757196
Selection Range Start:
Selection Range End:
kernel
Overview
My Latency In And Out Analysis
Label
Minimum
Maximum
Average
Count
Total
Min Time Range
330.988 ms
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
PLAYWRIGHT
Filter
Tasks

Where can you help?

Drop a review, a bug or a feature request
Fix a bug, especially if it helps you and is not in our interest
Share use cases
We have limited bandwidth, we would appreciate code contributions

Thank You

- Code Contributors
- Issue Reporters
- Designers
- Community Maintainers
- Enthusiasts
- Steak Holders