

PERFORMANCE ANALYSIS OF CONTAINER-BASED ARCHITECTURES



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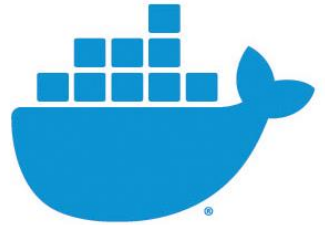


Agenda

- Introduction
- Trace viewers for containers architecture
- New method with Grafana
- Future work
- Conclusion

Introduction

- No specific tools for performance analysis of container-based architecture
- Lack of flexibility in trace viewers to make efficient analysis for these architectures



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Part 1 : Trace viewers for containers architectures

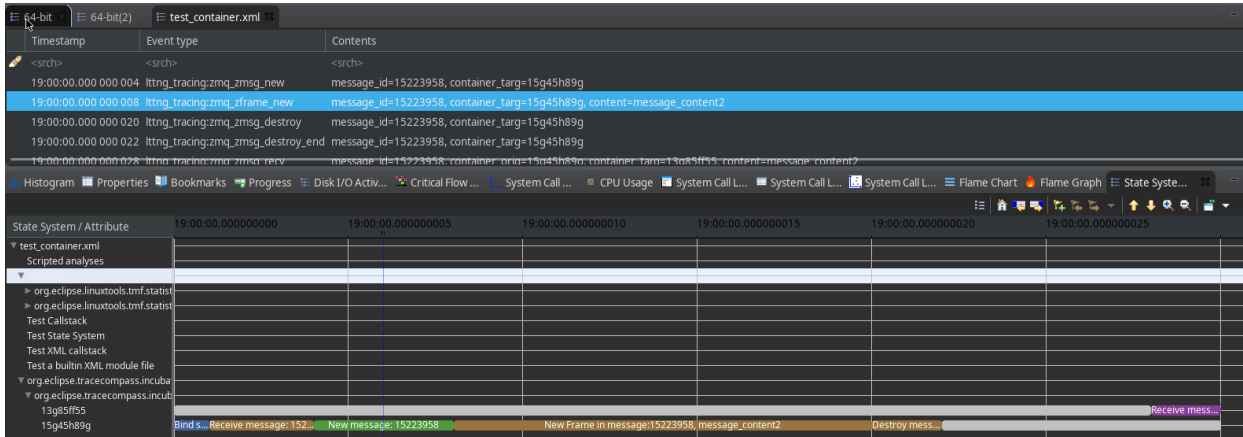
“ How to display the result of tracing sessions on container messaging ?



Trace Compass as a viewer



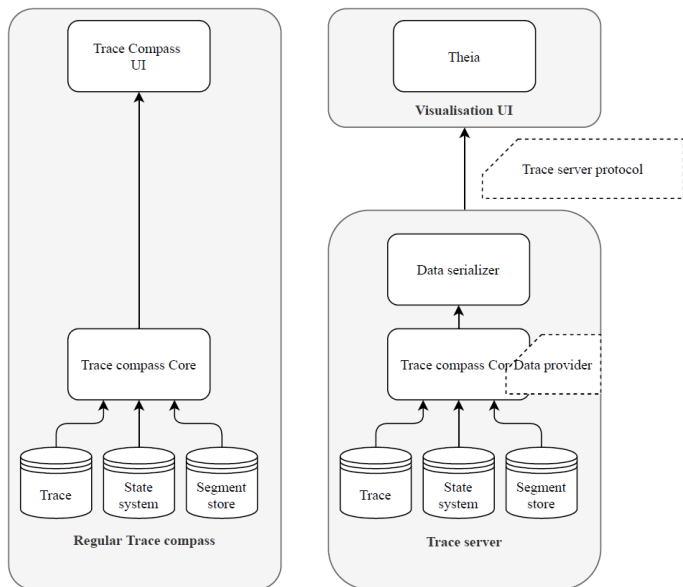
- Trace compass is used to display traces for the moment : ZMQ events associated with the message (new message, new frame, send on sockets) on the sender and on the receiver.



- Lack of flexibility in the views
- Difficulty of customization by the end user without re-compiling Trace Compass



Possibilities with the trace server of Theia



- With the new architecture of Trace Compass implemented for Theia :
- A lot of possibilities with the REST API of trace server (Trace server Protocol)
- Use the Trace server as a backend for other data viewers



Let's look at Grafana

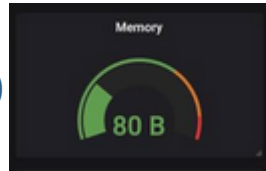


- Grafana is an open source data viewer widely use in companies
- Online solution
- Easy to use and lots of customization in the web interface
- Dynamic graphs, with links and redirections
- Grafana is designed for metrics analysis

Grafana components

- **Dashboard** : a view, a page with several panels

- **Panel** : part of a dashboard (a graph, a gage...)

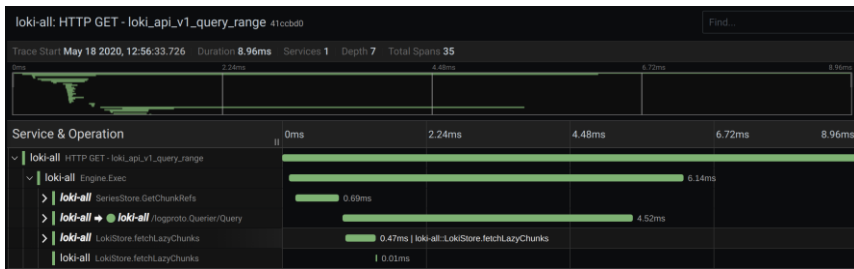


- **Panel plugin** : convert Dataframes to visualization (web canvas)
- **Dataframes** : columnar oriented (based on Apache arrows) standardized format of data for views
- **Datasource plugin** : convert the data of the backend datasource (API, BDD) into Dataframes



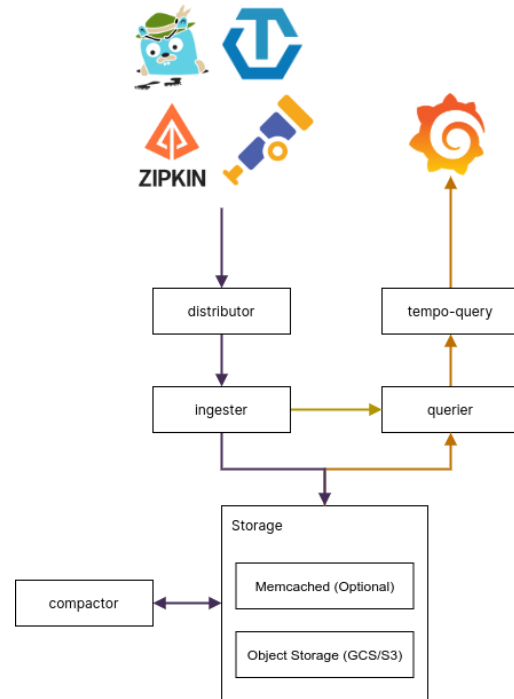
State of the art

- No panel plugins specific for traces exploration
- Strong interest of Grafana developers team
- New project, Grafana « explore » (integration of Jaeger UI)



- New project (October 2020) « Tempo » to propose a traces backend

Grafana Tempo





My work

Why not integrate directly in « explore view »:

- Available view is an integration of another tool UI
- Main purpose is data query debug

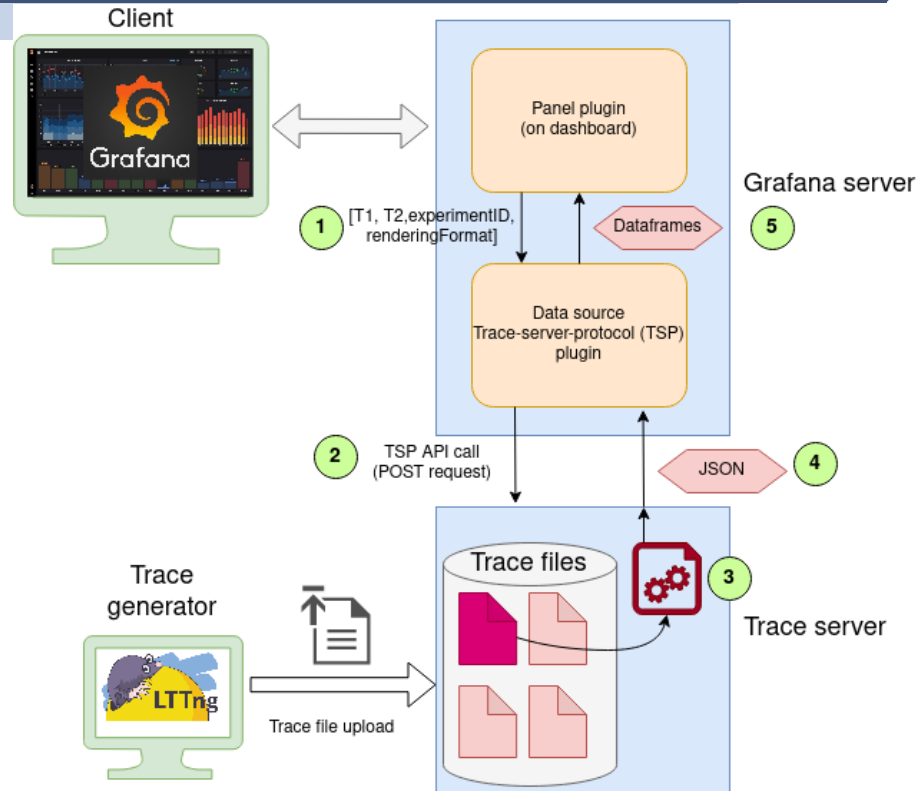
What I propose :

- A method to exploit traces data directly in Grafana panels with two new plugins :
- A data source plugin compatible with Trace server protocol
- A TimeGraph panel plugin for traces visualisation

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Part 2 : Tracing with Grafana

Visualization process





Tracing with Grafana

5 min démo vidéo (voir lien youtube mail)

I want to contribute !

- Really new project

- More informations about the project :

<https://synedtech.com/en/data-visualization/>

- Contact me :

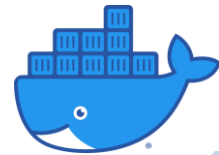
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Future work

- Improve the new trace opening process

(list of available experiments)

- Release a method to visualize inter-container messaging with Grafana and the new plugins
- Publish a method to visualize container lifecycle with Grafana and the new plugins



Conclusion

- Trace analysis with Grafana
 - ▷ Offer an alternative to Theia and Trace Compass
- Improve tools for container messaging analysis



**Thank you for
listening !**