Instrument Python code with OpenTelemetry

Frédéric Collonval

Développeur full-stack freelance @WebScIT
Mission actuelle @Datalayer

Contributeur open-source
JupyterLab SSC rep 2023 — Jupyter distinguish contributor 2021

in http://ow.ly/ZYuB30eITef   fcollonval

Do I need telemetry ?

- You produce logs

  - Then you have telemetry already

- You have performance objectives
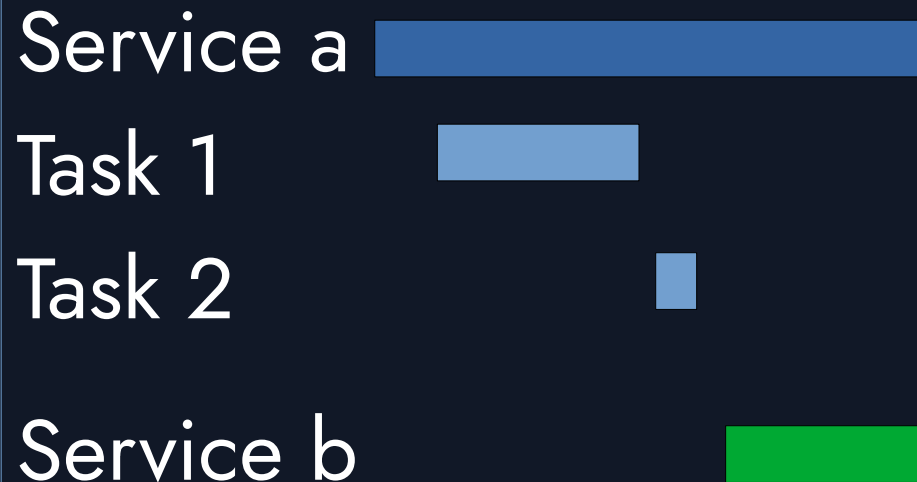
- You need to analyse outliner events

Telemetry signals

- There are 3 main signals

  - Traces

  - Metrics

  - Logs

- OpenTelemetry has a 4th one :

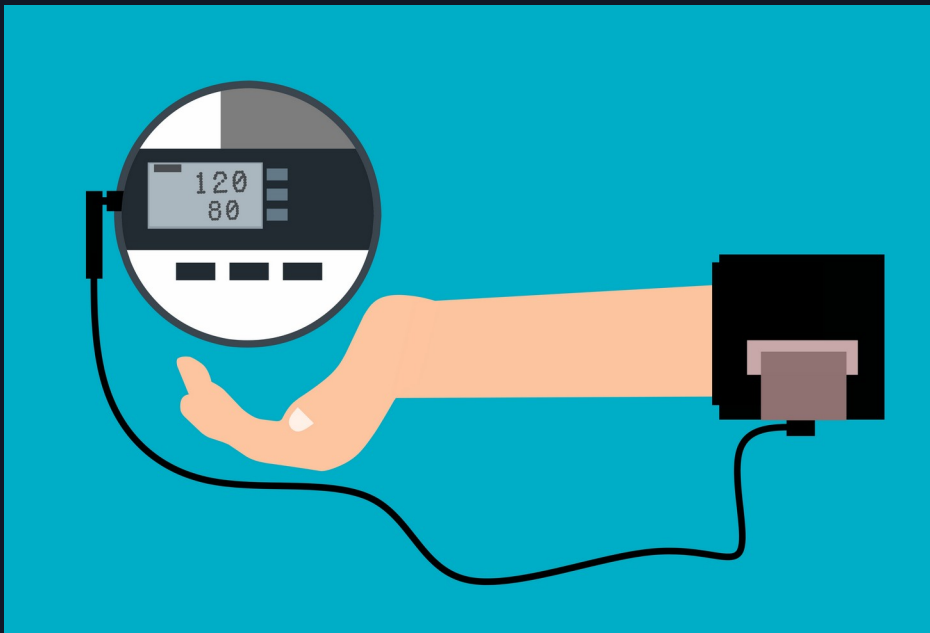 - Bagage — key/value store send accross processes

(Distributed) traces

- Similar to a stack trace accross app and libraries

- One trace is splitted in spans

- Spans have a name, attributes, a parent id

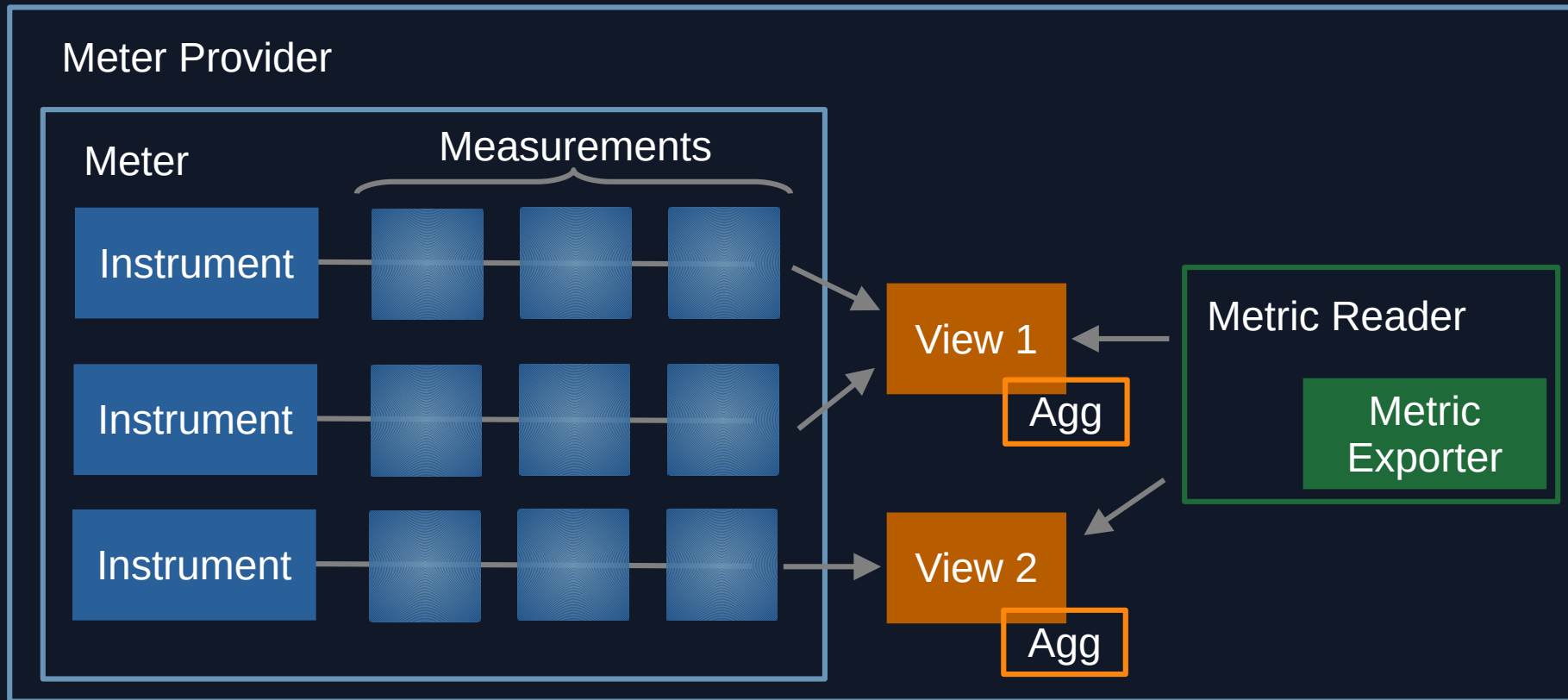|	
Service a	
Task 1	
Task 2	
Service b	

Metrics

- Numerical values to track

- Predefined types :

  – Counter

  – Up/down counter

  – Gauge

  – Histogram

- Attributes

- Exemplars — needed due to aggregation

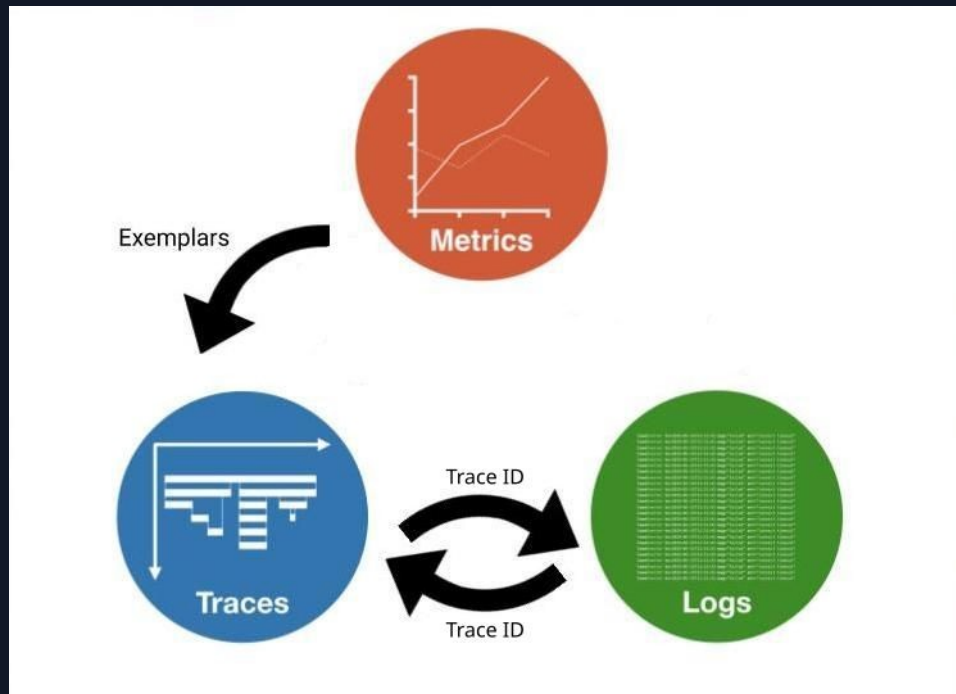Note : exemplars PR merged but not yet released

Diving Otel metrics

Logs

- I guess you know about this one ;-)

- Challenge adding attributes

  - e.g. trace ID/span ID to link with the traces

Links between telemetry

What is OpenTelemetry ?

- Collection of APIs and SDKs

- Telemetry data protocol

- Semantic conventions — naming scheme

- Tools

  - Collector — proxy to receive, process and export telemetry data

  - Zero-code instrumentation

What is not OpenTelemetry ?

- It is not a tool to visualize/analyze your telemetry

- It is not a storage solution for your telemetry

- It cannot tell you what data are useful in your case

Pros & Cons

- Auto-instrumentation

- Vendor neutral

- Incubating at CNCF

- Highly adopted

- Language SDKs varies

  - Each as its own team

- Standardization is slow

- Standards will not cover everything

Today's example

- Three identical micro-services using FastAPI

- Instrumentation with OpenTelemetry :
  - Manual instrumentation → Deep code changes
  - Programmatic instrumentation → Light changes
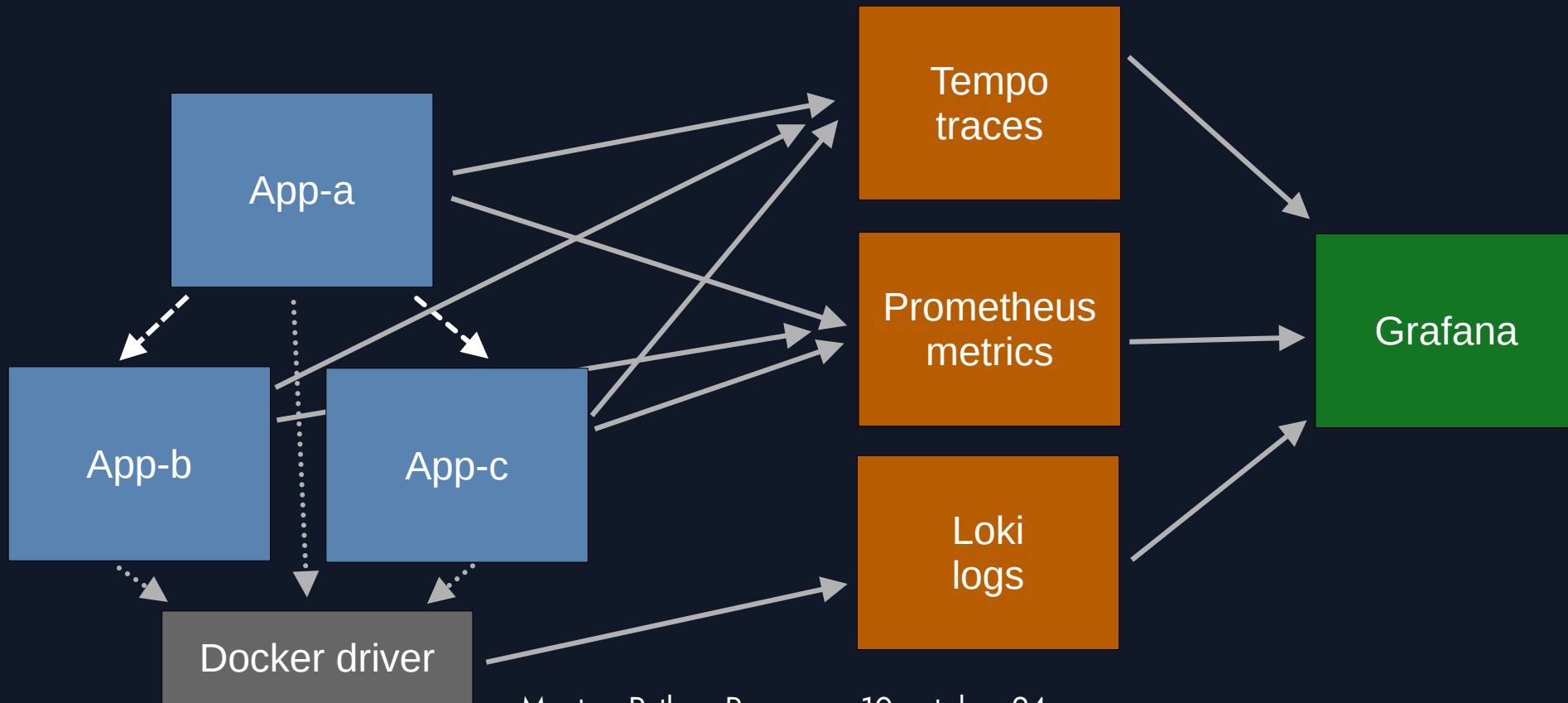 - Zero-code instrumentation → No changes

Time to show code

https://github.com/webscit/opentelemetry-demo-python

Meetup Python Rennes — 10 octobre 24

Structure demo

Meetup Python Rennes — 10 octobre 24

Generated with Dall·E 3 · April 17, 2024 at 7:14 PM

Resources

https://opentelemetry.io/

https://opentelemetry.io/docs/zero-code/python/

https://github.com/open-telemetry/opentelemetry-python-contrib

https://www.timescale.com/blog/a-deep-dive-into-open-telemetry-metrics/