GoGraz 2023.03

2023-02-20

What happened since January?

- Go 1.20

- FOSDEM 2023 in Brussels

- Go Telemetry is now opt-in!
  https://research.swtch.com/telemetry-opt-in

- Structured logging proposal has been accepted
  https://github.com/golang/go/issues/56345

OpenTelemetry for Tracing

Horst Gutmann // 2023-02-20

Disclaimer:
I'm slightly biased towards Grafana tooling 😅

Telemetry questions (for tracing)

- Do I have a performance problem with one of my backends?

- What services are used to handle a user request?

- What features are used?

- What server was generating those slow responses?

- What users were affected by those slow responses?

- Where did the error originate?

- …

What is (Distributed) Tracing?

- Tracing allows you to inspect function calls within an application

- A trace is initiated for instance by a user making a request

- Traces consist of "spans" (starting with a "root span"), which represent "units of work" (e.g. explicit function calls)

- Spans have a name, a start time and an end time which allows you to look for performance issues.

- You can also attach attributes to spans (e.g. parameters to function calls)
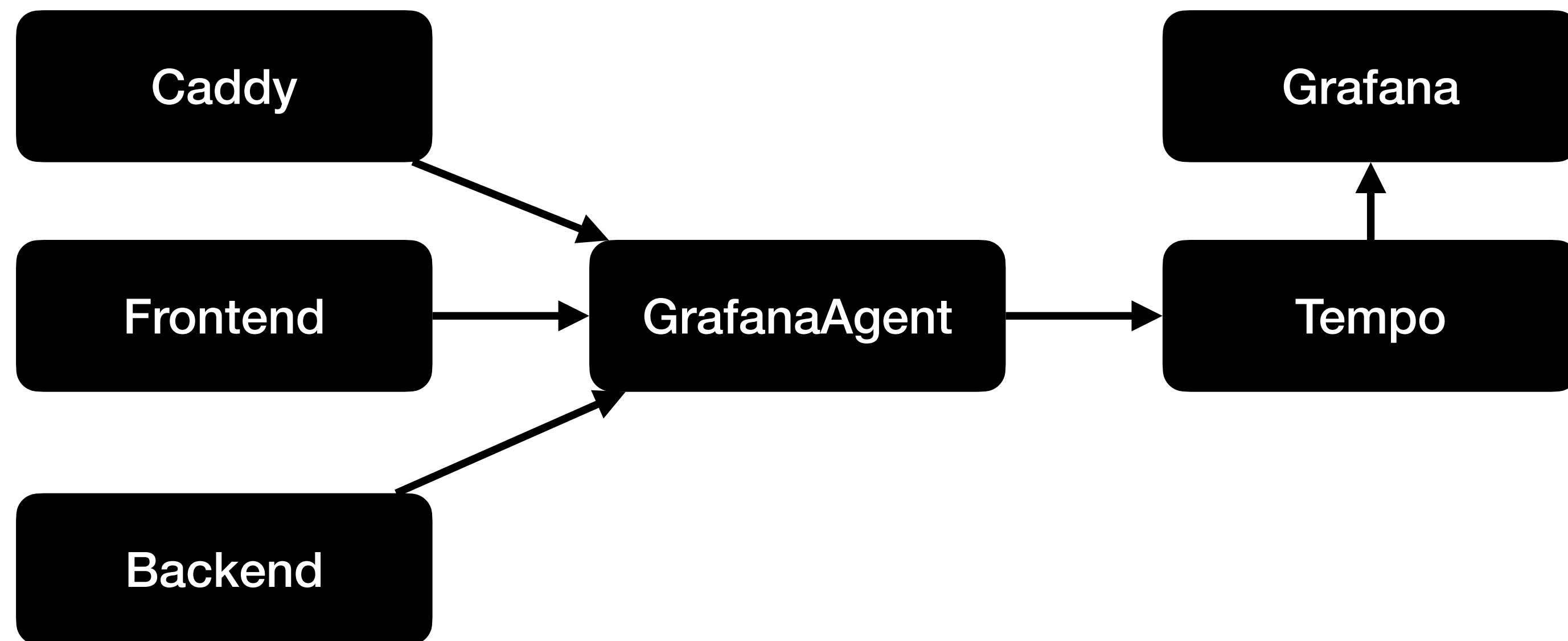
What is OpenTelemetry

- Vendor-neutral protocol + toolkit for implementing telemetry in applications

- Metrics, Tracing (and also Logs in the future)

- Grew out of OpenCensus and OpenTracing projects

- CNCF Incubating Project

- Exporters for various vendors including own protocol (OTLP)

OpenTelemetry in Go

- SDK for integrating OpenTelemetry in Go applications

- Creating a TracerProvider (which you can then use to generate traces)

- Register an exporter (e.g. for Jaeger or Grafana Tempo)

- Register a batcher to not send traces right away but collect them first

- Handle trace propagation so that traces can span multiple services in your application

Demo application

Propagation

- OTEL supports by default propagation through **W3C TraceContext** and **Baggage** headers

- Set a TextMapPropagator and **extract a parent span** from the HTTP request you received

- **Inject data** from the TextMapPropagator into the requests you create

- Propagation through environment variables (for subprocess calls) not yet standardised

Events & Errors

- Attach arbitrary events to spans similar to log lines

- Errors allow you to mark a span as failed and attach details as event

And so much more…

- https://opentelemetry.io

- https://github.com/open-telemetry/opentelemetry-go

- https://grafana.com/oss/tempo/

Thank you! Any questions?

Upcoming stuff

- Next GoGraz meetup on 2023-04-17

- 2023-03-29: Golang Estonia has an online event with a talk about Uber fx https://www.meetup.com/golang-estonia/events/292229950/