# Introduction to Distributed Tracing

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# What are we doing here?

- Intro!
  - Jaeger Getting Started
  - OpenTracing:  What is Tracing
  - OpenTracing Examples
- Open Source
- Demo
  - Jaeger All In One + Instrumentation
  - Grafana + Jaeger Integrations

# Why?

# Monitoring tools

## Metrics

## Logs



Images: Prometheus, Influx, Loki, Elastic

# Metrics - Aggregatable

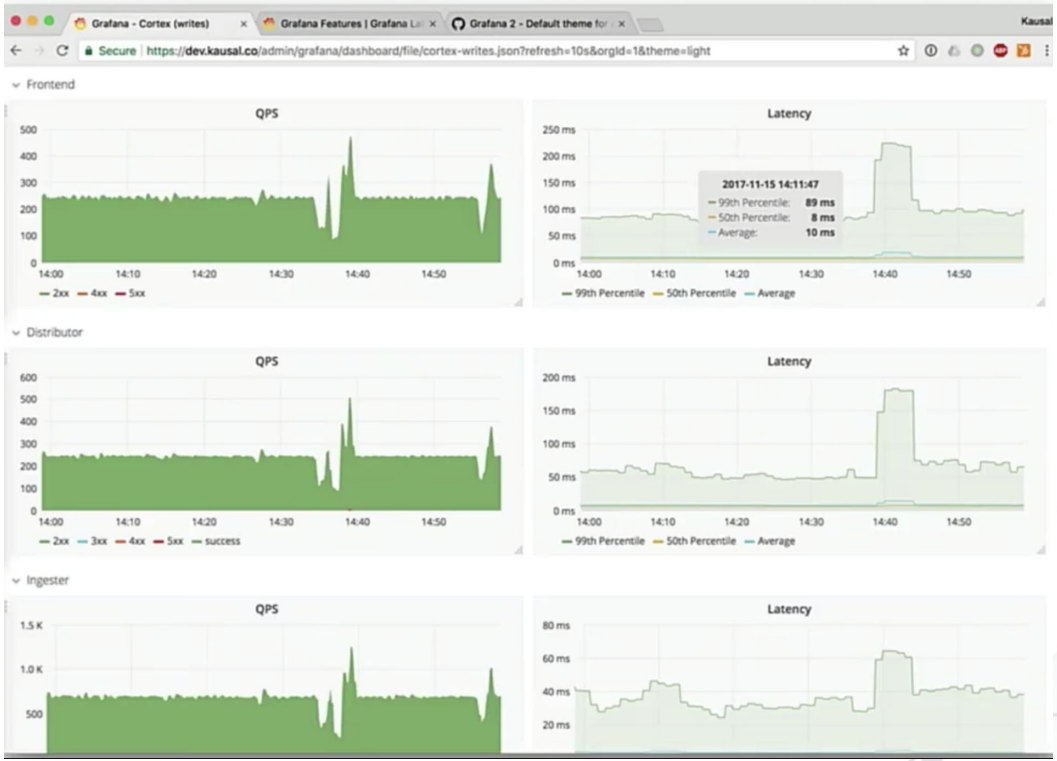
RED Method

Requests Error Duration

USE Method

Utilization Saturation Errors

....






https://grafana.com/blog/2018/08/02/the-red-method-how-to-instrument-your-services/

# Metrics - Cardinality

```
http_request_duration_sec{“app=ice-cream-shop”} 10s
```

# Metrics - Cardinality

```
http_request_duration_sec{“app=ice-cream-shop”
datacenter=”us-central”, env=”production”,
service=”cart-manager”, path=”/api/order”,
func_name=”my-func”, cust_name=”annanay”} 10s
```

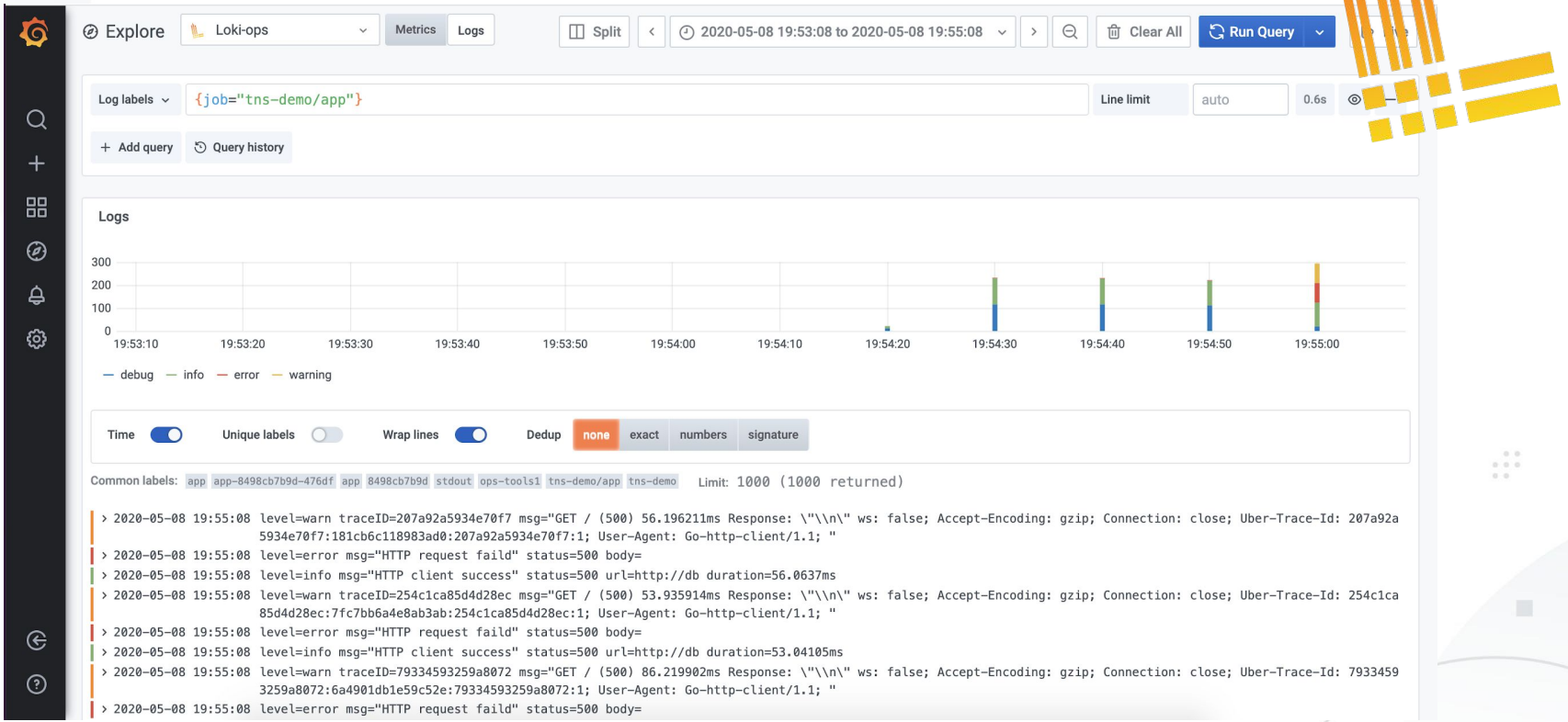
# Metrics - Cardinality

```
http_request_duration_sec{“app=ice-cream-shop”
datacenter=”us-central”, env=”prod ion”,
service=”cart-manager”, path=”/a /rd ”,
func_name=”my-func”, cust_name=”a hay”} 1
```



Img src: https://www.dictionary.com/e/emoji/heavy-dollar-sign-emoji/

# Logs


Explore
Loki-ops
Metrics
Logs
Split
2020-05-08 19:53:08 to 2020-05-08 19:55:08
Clear All
Run Query
Log labels
{job="tns-demo/app"}
Line limit
auto
0.6s
Add query
Query history
Logs
300
200
100
0
19:53:10
19:53:20
19:53:30
19:53:40
19:53:50
19:54:00
19:54:10
19:54:20
19:54:30
19:54:40
19:54:50
19:55:00
debug
info
error
warning
Time
Unique labels
Wrap lines
Dedup
none
exact
numbers
signature
Common labels:
app
app-8498cb7b9d-476df
app
8498cb7b9d
stdout
ops-tools1
tns-demo/app
tns-demo
Limit: 1000 (1000 returned)
› 2020-05-08 19:55:08 level=warn traceID=207a92a5934e70f7 msg="GET / (500) 56.196211ms Response: \"\\n\\" ws: false; Accept-Encoding: gzip; Connection: close; Uber-Trace-Id: 207a92a5934e70f7:181cb6c118983ad0:207a92a5934e70f7:1; User-Agent: Go-http-client/1.1; "
› 2020-05-08 19:55:08 level=error msg="HTTP request faild" status=500 body=
› 2020-05-08 19:55:08 level=info msg="HTTP client success" status=500 url=http://db duration=56.0637ms
› 2020-05-08 19:55:08 level=warn traceID=254c1ca85d4d28ec msg="GET / (500) 53.935914ms Response: \"\\n\\" ws: false; Accept-Encoding: gzip; Connection: close; Uber-Trace-Id: 254c1ca85d4d28ec:7fc7bb6a4e8ab3ab:254c1ca85d4d28ec:1; User-Agent: Go-http-client/1.1; "
› 2020-05-08 19:55:08 level=error msg="HTTP request faild" status=500 body=
› 2020-05-08 19:55:08 level=info msg="HTTP client success" status=500 url=http://db duration=53.04105ms
› 2020-05-08 19:55:08 level=warn traceID=79334593259a8072 msg="GET / (500) 86.219902ms Response: \"\\n\\" ws: false; Accept-Encoding: gzip; Connection: close; Uber-Trace-Id: 79334593259a8072:6a4901db1e59c52e:79334593259a8072:1; User-Agent: Go-http-client/1.1; "
› 2020-05-08 19:55:08 level=error msg="HTTP request faild" status=500 body=

# Logs

Useful to check health of a particular service.

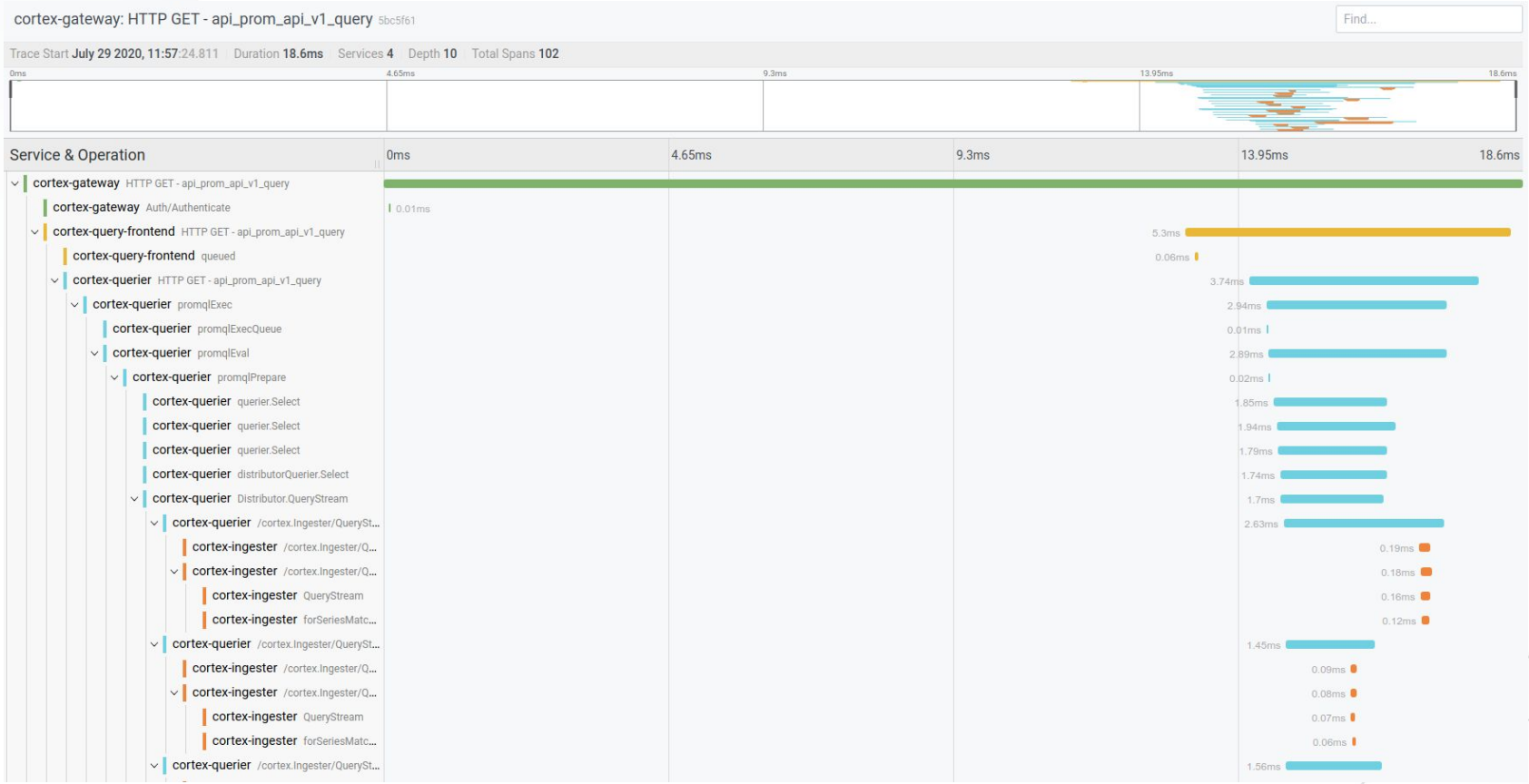
“Events” in a service.

```
"rpc error: code = Code(400) desc = user = xyz:
series={__name__=\"process_virtual_memory_bytes\", cluster=\"us-central\",
instance=\"consul-5sqwxccxvq\", timestamp=2020-01-04T14:12:59.102Z: out of order
sample}"
.
.
level=error ts=2020-05-08T09:46:43.11193994Z caller=a_file_from_my_codebase:16
msg="error processing requests" err="rpc error: Code(400) desc = expected string
but got null"
```

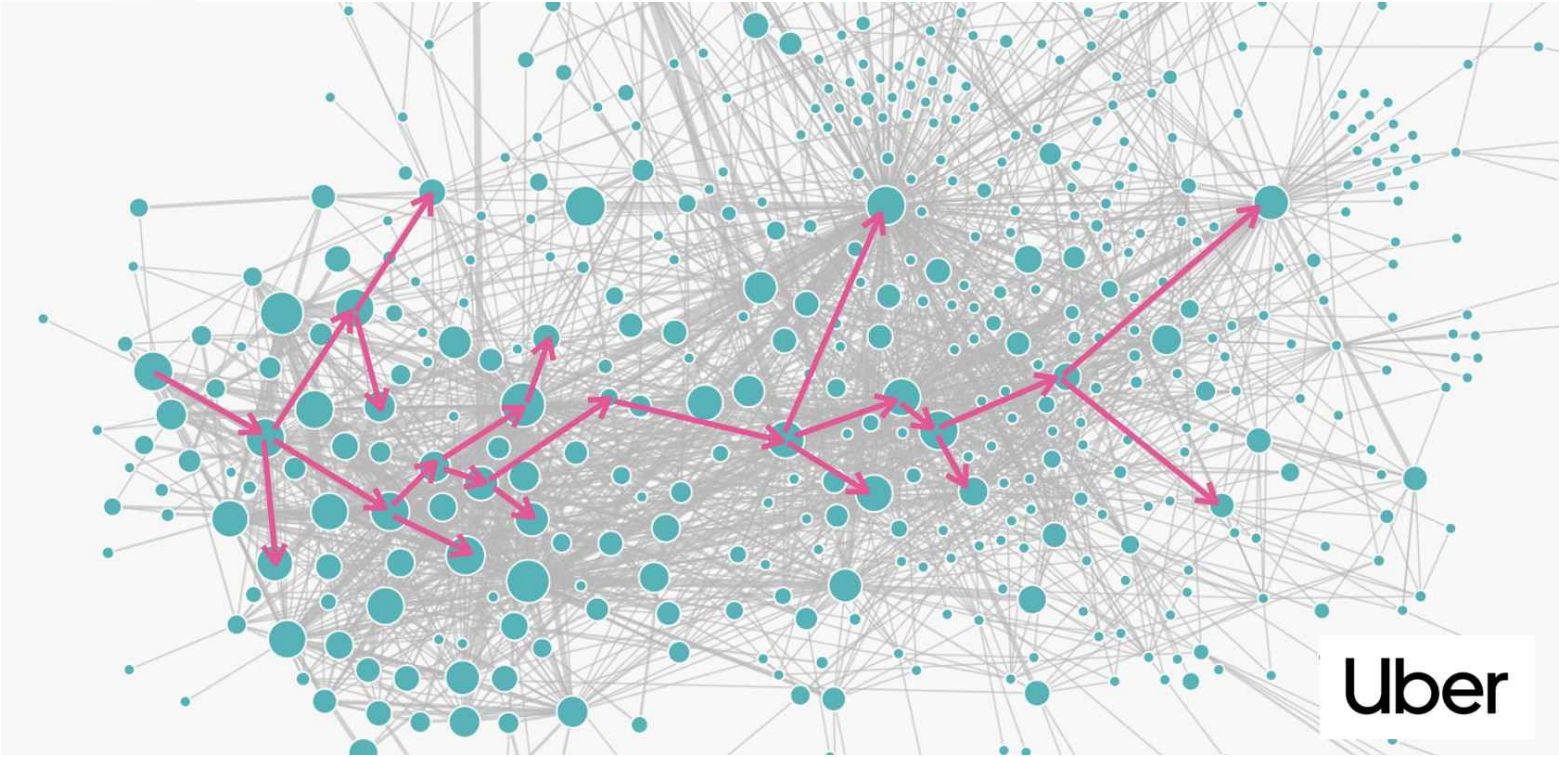
# TLDR;

| Telemetry | Primary use case | What we want in addition |
| --- | --- | --- |
| Metrics | Aggregations | Fine grained information |
| Logs | Events | Cross process tracing |

# Distributed Tracing



# Diagnosing the Long Tail



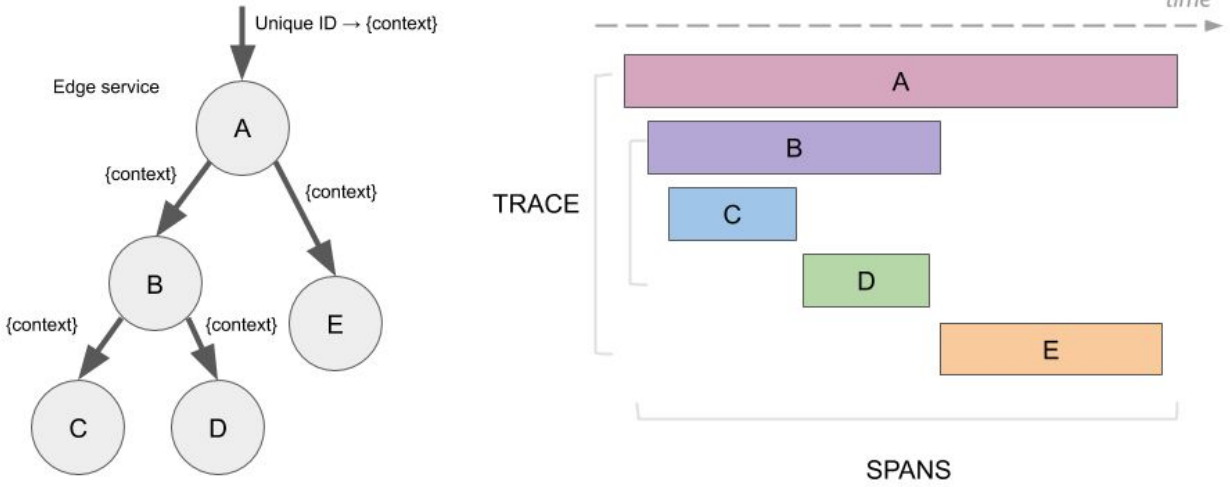
# Distributed Tracing!

JAEGER



Inspired from - Would You Like Some Tracing With Your Monitoring? - Yuri Shkuro, Uber Technologies - KCCNA 2017

# How? Context propagation






https://www.jaegertracing.io/docs/1.17/architecture/

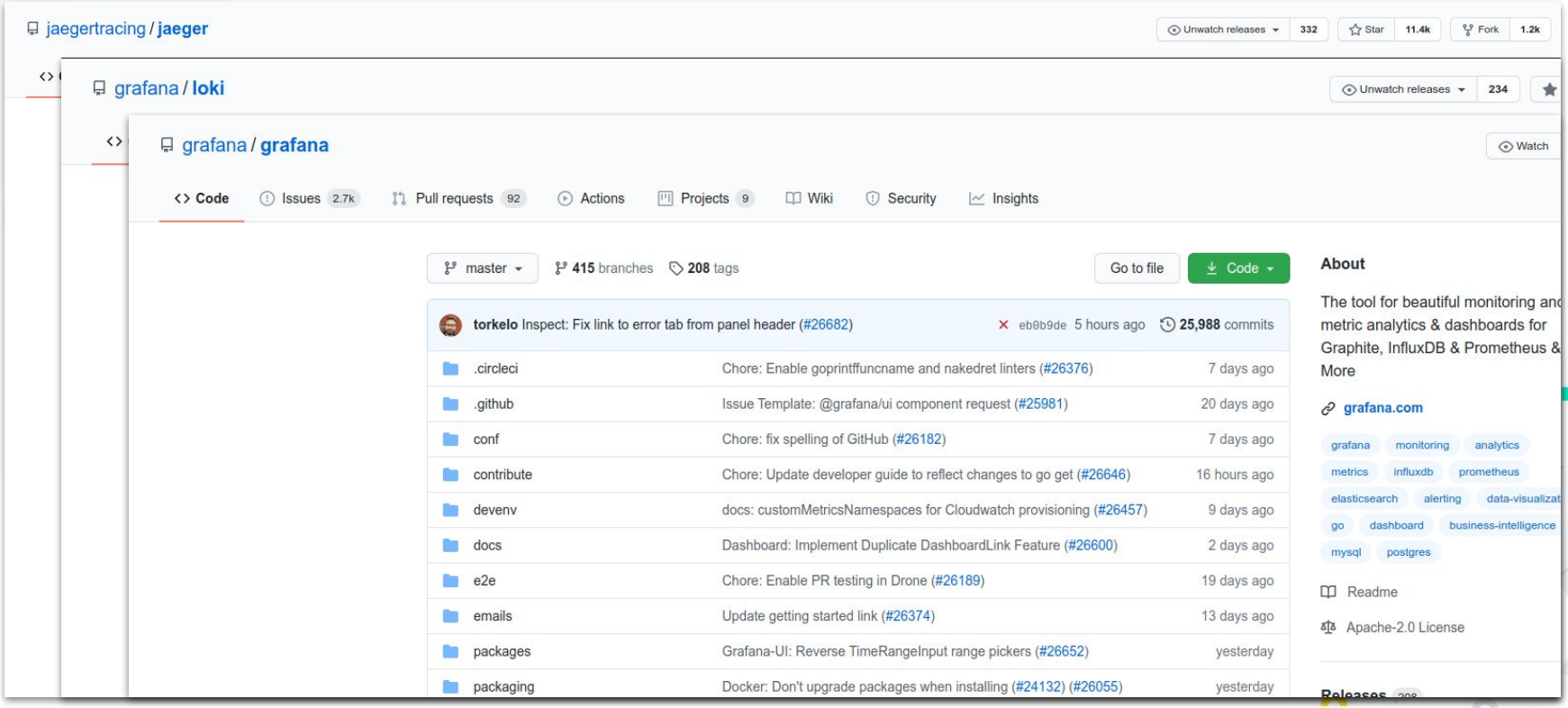
# Demo! (Jaeger + OpenTracing)

- Context Propagation (OpenTracing Nethttp)
  - In Process : Context
  - Cross Process : Headers
- Metadata
  - Logs, Span Tags, Process Tags
- Explore the Jaeger UI
- Grafana/Loki Trace Integration

https://github.com/joe-elliott/tracing-example

# Getting involved

# Open Source


jaegertracing / jaeger
Unwatch releases 332
Star 11.4k
Fork 1.2k
grafana / loki
Unwatch releases 234
grafana / grafana
Watch
Code
Issues 2.7k
Pull requests 92
Actions
Projects 9
Wiki
Security
Insights
master
415 branches
208 tags
Go to file
Code
torkelo Inspect: Fix link to error tab from panel header (#26682)
eb0b9de 5 hours ago
25,988 commits
.circleci Chore: Enable goprintffuncname and nakedret linters (#26376) 7 days ago
.github Issue Template: @grafana/ui component request (#25981) 20 days ago
conf Chore: fix spelling of GitHub (#26182) 7 days ago
contribute Chore: Update developer guide to reflect changes to go get (#26646) 16 hours ago
devenv docs: customMetricsNamespaces for Cloudwatch provisioning (#26457) 9 days ago
docs Dashboard: Implement Duplicate DashboardLink Feature (#26600) 2 days ago
e2e Chore: Enable PR testing in Drone (#26189) 19 days ago
emails Update getting started link (#26374) 13 days ago
packages Grafana-UI: Reverse TimeRangeInput range pickers (#26652) yesterday
packaging Docker: Don't upgrade packages when installing (#24132) (#26055) yesterday
About
The tool for beautiful monitoring and metric analytics & dashboards for Graphite, InfluxDB & Prometheus & More
grafana.com
grafana monitoring analytics
metrics influxdb prometheus
elasticsearch alerting data-visualizat
go dashboard business-intelligence
mysql postgres
Readme
Apache-2.0 License
Releases

# Thank you for watching!

Have more questions?

Join us at community.grafana.com.