Observability

Oberservability:

- The ability to understand, measure how internal systems work in order to ensure questions regarding application.
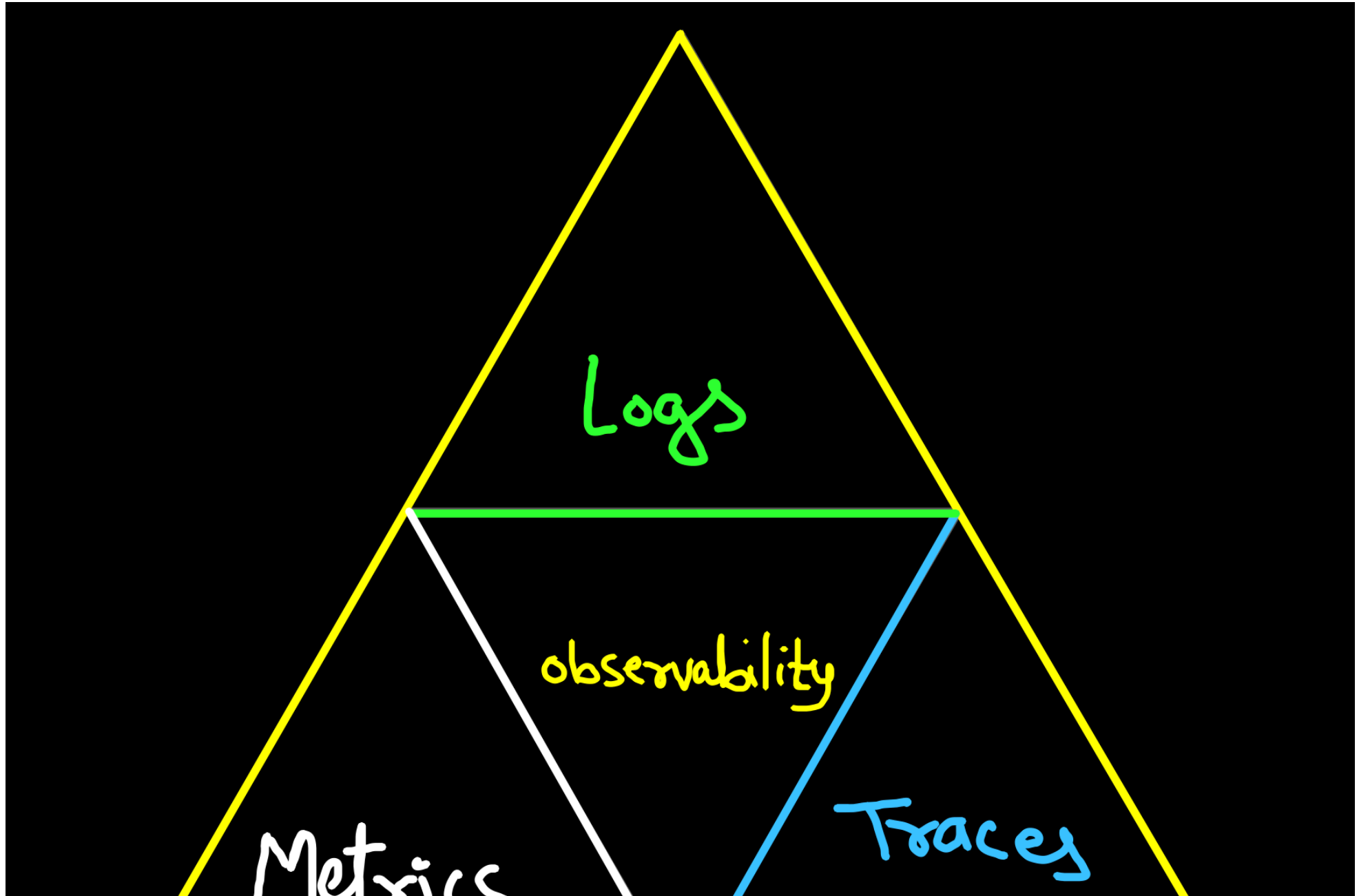- To obtain obervability, you need to use *Metrics, Logs, and Traces*

Metrics:

A number that is measured over period of time

Logs:

A text file, containing event data about what happened at certain time

Traces:

A history of requests that it travels through multiple apps/services so we get pin-point performance

OpenTelemetry - Instrumentation

- OpenTelemetry is standardize the way telemetry data (metrics, logs & traces) are generated and collected
- Wire Protocol: A wire protocol referes to a way of getting data from point-to-point
- Instrumentation: it is act of embedding a monitoring library into your existing application in order to capture monitoring data such as: metrics, traces or logs
- OpenTelemetry collector is a agent installed on the target machine, as a dedicate server and is **vender-agnostic** way to receive, process and export telemetry data
- The local collector agent is the default location to which instrumentation libraries export their telemetry data

Prometheus

- Prometheus is an open-source systems monitoring and alerting tookit originally built at SoundCloud

- Prometheus is *time-series database*

- Prometheus values reliability

- You can always view that

- Prometheus is not correct choice if you want 100% accuracy
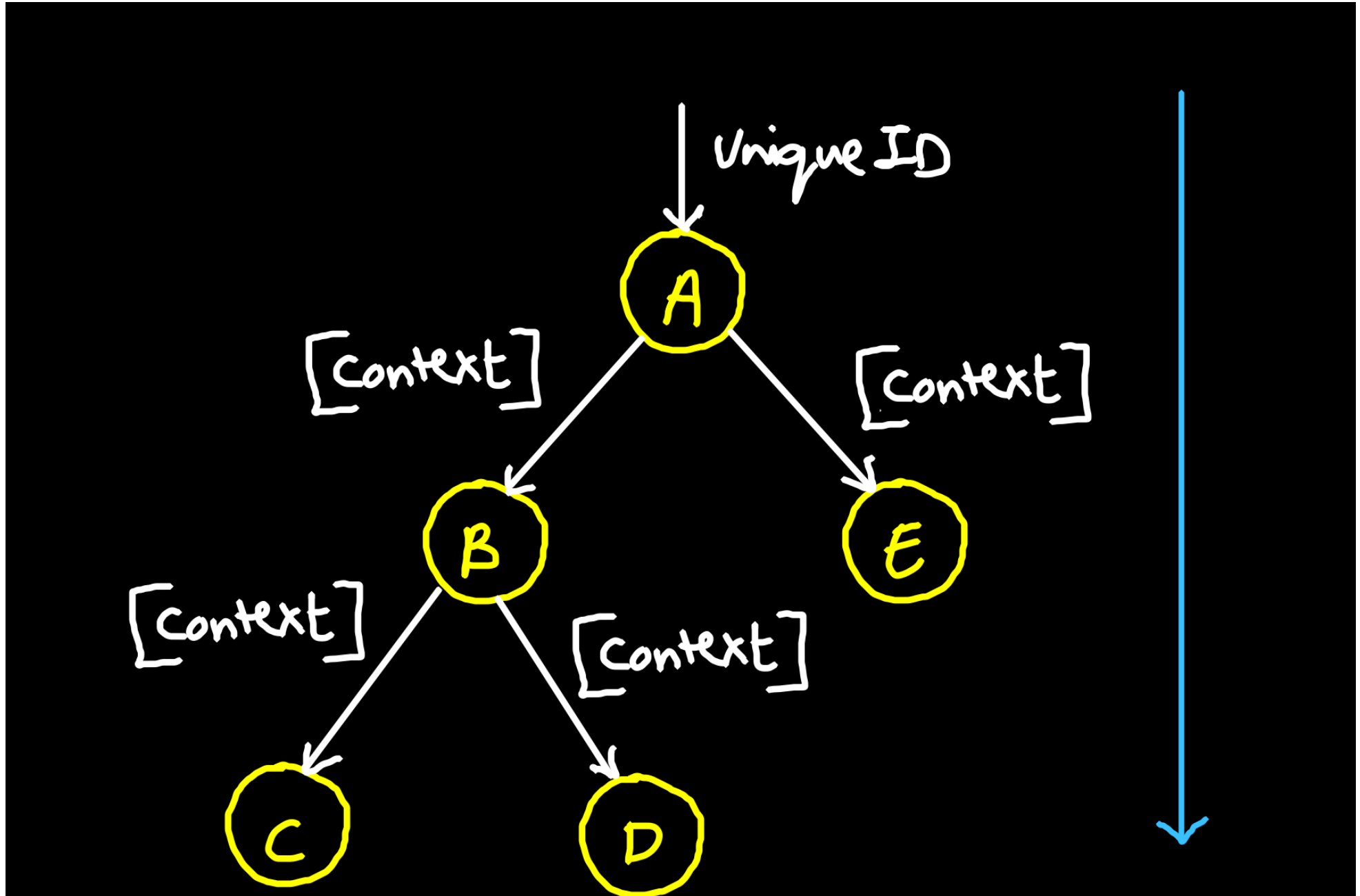
Grafana:

- Grafana is open source analytics and interactive visualization web application
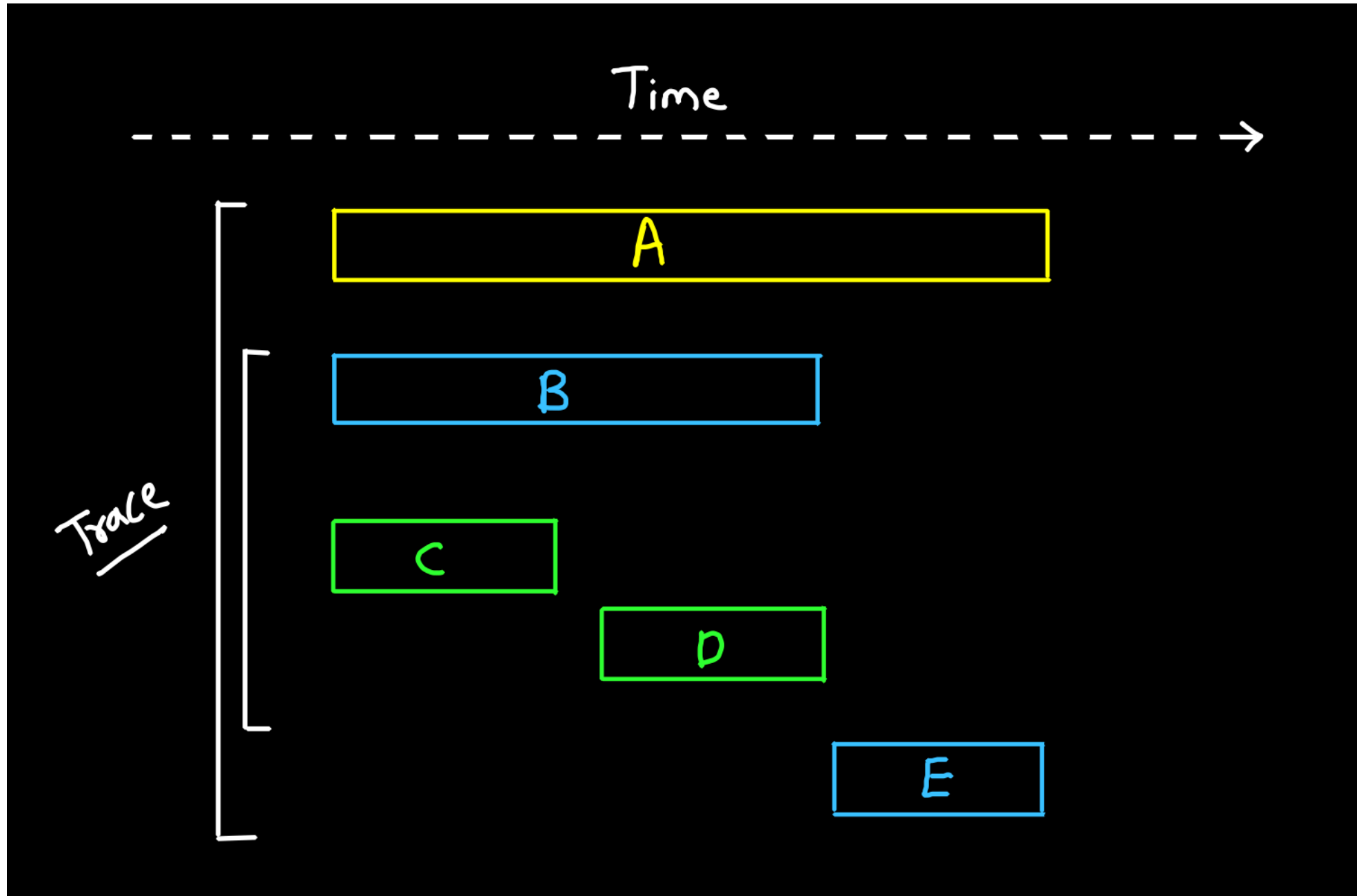- Grafana is commonly used along with a time series database like: influxDB, Prometheus or Graphite

[Grafana]

Traces & Spans

- A trace is a data/ execution path through the system, and can be thought of as directed acyslic graph (DAG) of spans

- A span represents a logical unit of work in Jaeger that has an operation name, start time of the operation and the duration

Kubernetes System logs & Klogs:

System Logs:

- HTTP access logs, pod state changes, controller action, or scheduler decision
- In `kubectl`` you can view logs with ` logs` command

```
kubectl logs nginx --all-containers=true
```

Klogs:

- Klogs is the Kubernetes logging library
- Klogs generates log messages for kubernetes system components

Testing:

Asserting the expectations of the input and output of the function

What is Chaos Testing?

Building system to withstand and tolerate any kind of failure by purposly introducing random failures in production systems

- ChaosKube
- TestKube
- ChaosMonkey