

# Distributed tracing

# Agenda

- Spring Cloud Sleuth
- Log enhancement and correlation with Slf4J/Logback/Graylog
- Request visualization and latency analysis with Zipkin

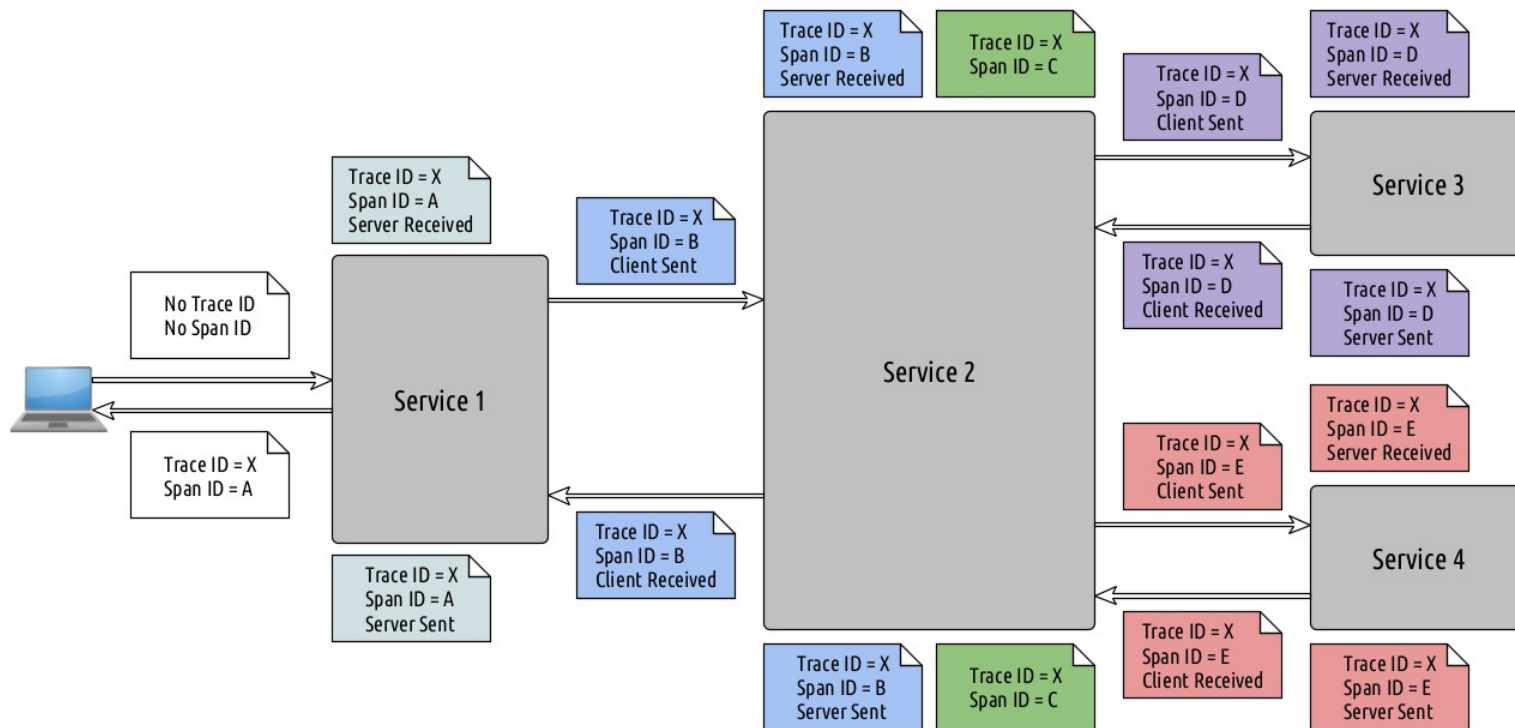
# Spring Cloud Sleuth

- Distributed tracing tool for Spring Boot applications
- Debugging request flow through multiple microservices
  - Where was time spent?
  - Where did an error occur?
- “sleuth”: “a person who investigates crimes; a detective”
- Builds on top of OpenZipkin Brave tracing library
- Adds trace and span IDs to the logging context
- Records timing information to aid in latency analysis and sends it to Zipkin
- Instruments common ingress and egress points (RPC, HTTP, messaging)

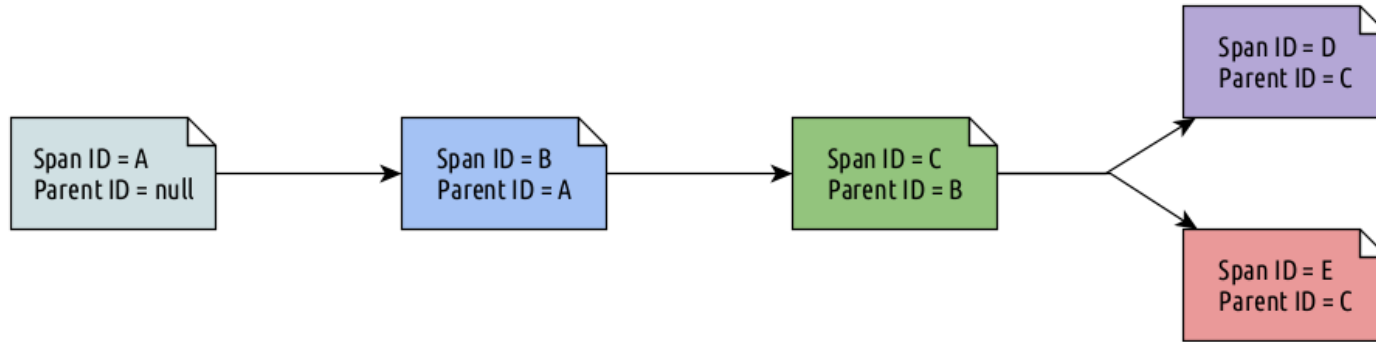
# Terminology

- **Span:** Basic unit of work that represents an operation; has events and tags; is started and stopped
- **Trace:** Set of spans that form a tree-like structure, one per request
- **Annotation/Event:**
  - (cs) client sent/start - Client made a request; start of a span
  - (sr) server received/start - Server got a request and started processing
  - (ss) server sent/finish - Server completed request processing
  - (cr) client received/finish - Client received response; end of a span
- **Baggage:** Additional fields to propagate across services within the tracing context
- **Tag:** Key-value pair that stores information corresponding to a span

# Example: Trace with multiple spans

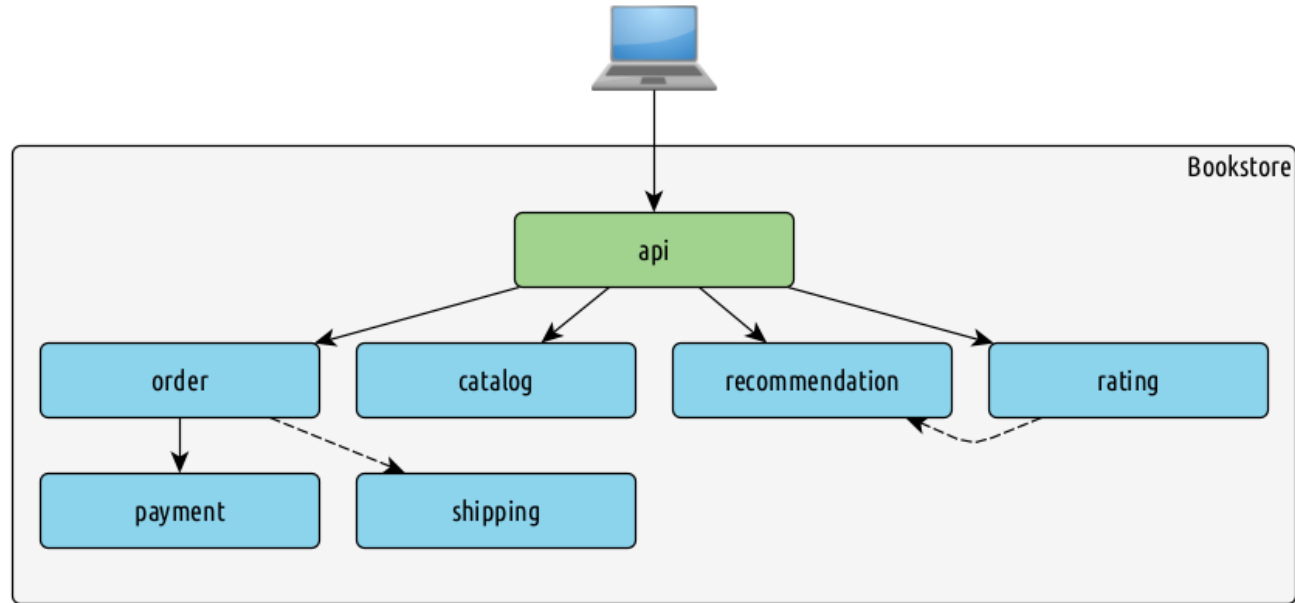


# Example: Parent-child relationship of spans



# Demo: Getting started with Spring Cloud Sleuth

# Demo: Bookstore





## However

- Zipkin is not a logging tool - not all requests get sent to Zipkin
  - `spring.sleuth.sampler.probability=0.5`
- Don't create too much baggage

# Distributed tracing landscape

## Open Source

- OpenZipkin
- OpenTracing
- OpenCensus
- OpenTelemetry
- Jaeger

## Enterprise

- Amazon X-Ray
- Datadog
- Dynatrace
- Google Cloud Trace
- Honeycomb
- Instana
- Lightstep
- New Relic
- Wavefront

# References

- <https://spring.io/projects/spring-cloud-sleuth>
- <https://zipkin.io>
- <https://www.graylog.org>
- <https://github.com/nikola-zivkov/2021-12-01-distributed-tracing-talk>

# Q&A

# Thanks!