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Jaeger
SIG Deep Dive Session

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Agenda

- Demo
- Architecture, data model
- Configuration
- Zipkin drop-in replacement
- Roadmap
  - Path based dependency diagrams
  - Adaptive sampling
- Project governance, public meetings, contributions
- Discussion

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Let's look at some traces

demo time: http://bit.do/jaeger-hotrod

Distributed Tracing Systems

distributed transaction monitoring

performance and latency optimization

root cause analysis

service dependency analysis

distributed context propagation

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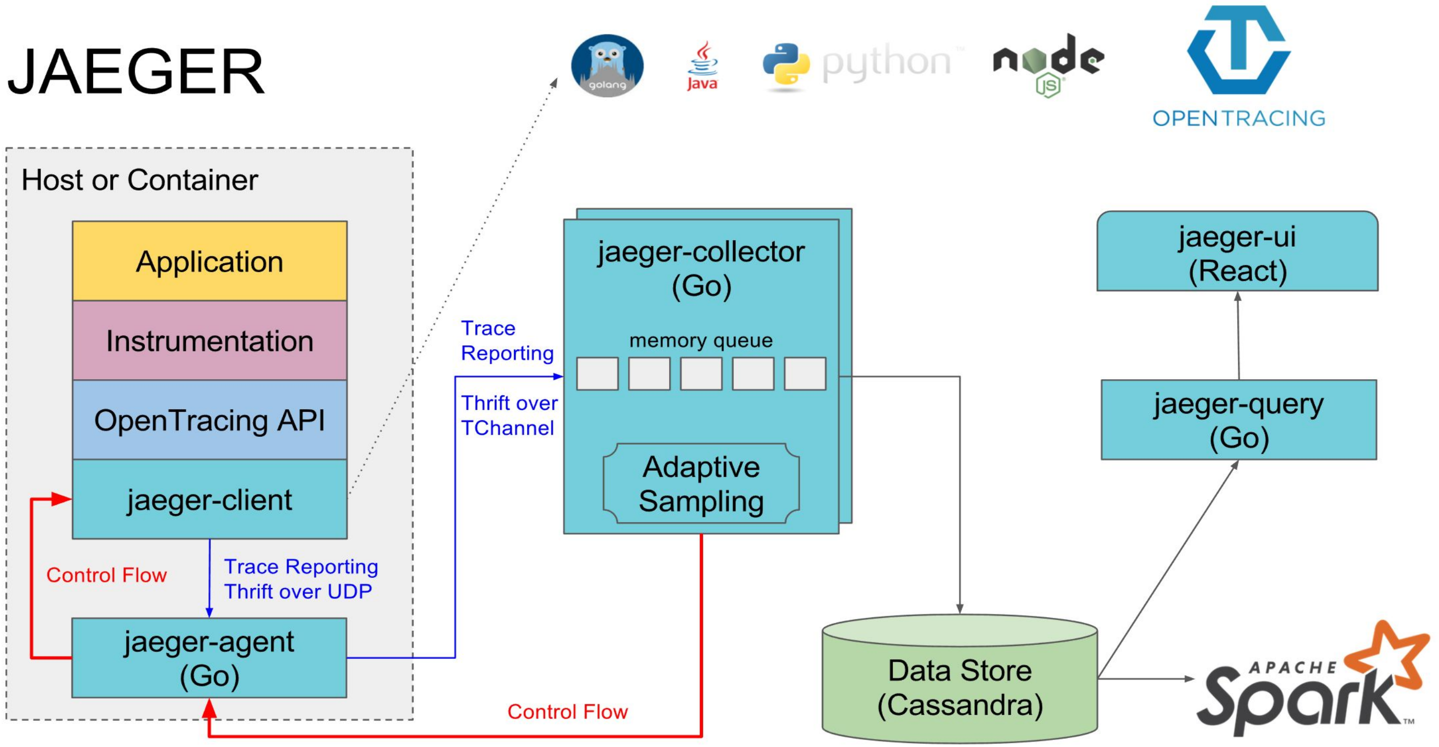
Under the hood

Architecture, etc.

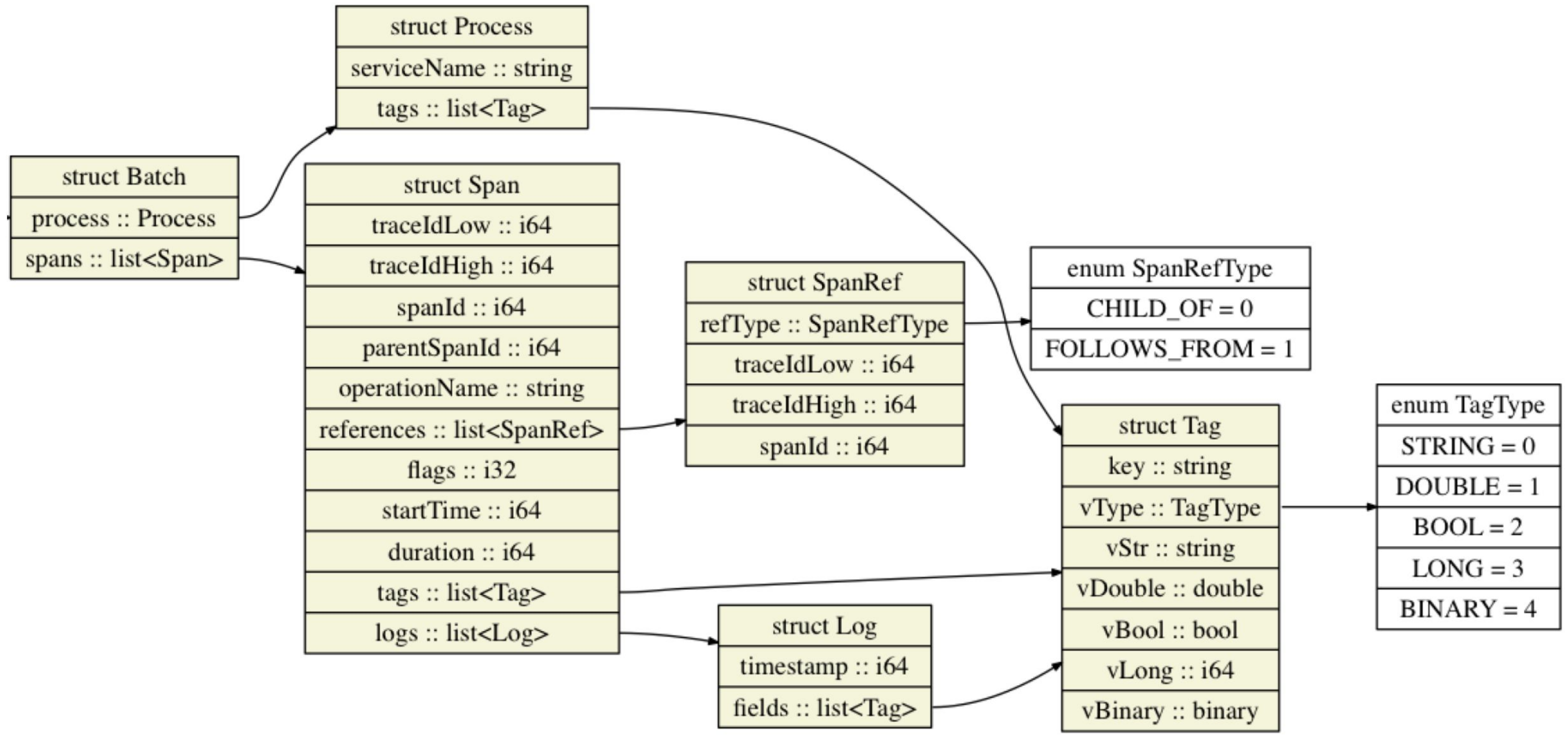
Technology Stack

- Go backend
- Pluggable storage
  - Cassandra, Elasticsearch, memory, ...
- React/Javascript frontend
- OpenTracing Instrumentation libraries

Architecture



Data model


struct Process
serviceName :: string
tags :: list<Tag>
struct Batch
process :: Process
spans :: list<Span>
struct Span
traceIdLow :: i64
traceIdHigh :: i64
spanId :: i64
parentSpanId :: i64
operationName :: string
references :: list<SpanRef>
flags :: i32
startTime :: i64
duration :: i64
tags :: list<Tag>
logs :: list<Log>
struct SpanRef
refType :: SpanRefType
traceIdLow :: i64
traceIdHigh :: i64
spanId :: i64
enum SpanRefType
CHILD_OF = 0
FOLLOWS_FROM = 1
struct Tag
key :: string
vType :: TagType
vStr :: string
vDouble :: double
vBool :: bool
vLong :: i64
vBinary :: binary
enum TagType
STRING = 0
DOUBLE = 1
BOOL = 2
LONG = 3
BINARY = 4
struct Log
timestamp :: i64
fields :: list<Tag>

Zipkin drop-in replacement

Collector:

- JSON v1/v2 and Thrift over HTTP
- Kafka transport not supported

Clients:

- B3 propagation
- Jaeger clients in Zipkin environment

Configuration

- Viper/Cobra
  - `Flag: --span-storage.type=memory`
  - `Env:  SPAN_STORAGE_TYPE=memory`
- k8s ConfigMaps
- UI configuration
  - Control the top menu
  - Google Analytics token
  - Other parameters in the future

Performance Settings

- Collector
  - `--collector.num-workers`
  - `--collector.queue-size`
- Agent
  - `--processor.jaeger-compact.server-queue-size`
  - `--processor.jaeger-compact.workers`

Monitoring

- Metrics
  - `--metrics-backend`
    - `prometheus (default), expvar`
  - `--metrics-http-route`
    - `/metrics (default)`
- Scraping Endpoints
  - Query service - API port 16686
  - Collector - HTTP API port 14268
  - Agent - sampler port 5778

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Roadmap

Things we are working on

Adaptive Sampling

- APIs have endpoints with different QPS
- Service owners do not know the full impact of sampling probability

Adaptive Sampling is per service + endpoint, decided by Jaeger backend based on traffic

Data Pipeline

- Based on Kafka and Apache Flink
- Support aggregations and data mining
- Examples:
  - Pairwise dependencies diagram
  - Path-based dependencies diagram
  - Latency histograms

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Project & Community

Contributors are welcome

Contributing

- make, glide
- 100% test coverage
- Agree to the Certificate of Origin
- Sign commits (-s)
- Backend, client libraries, k8s, data pipeline

Community

- GitHub: https://github.com/jaegertracing
- Chat: https://gitter.im/jaegertracing/
- Mailing List - jaeger-tracing@googlegroups.com
- Blog: https://medium.com/jaegertracing
- Twitter: https://twitter.com/JaegerTracing
- Bi-Weekly Community Meetings

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Q & A

Open Discussion