OpenTelemetry Tracing for your DNS

Observability using standards

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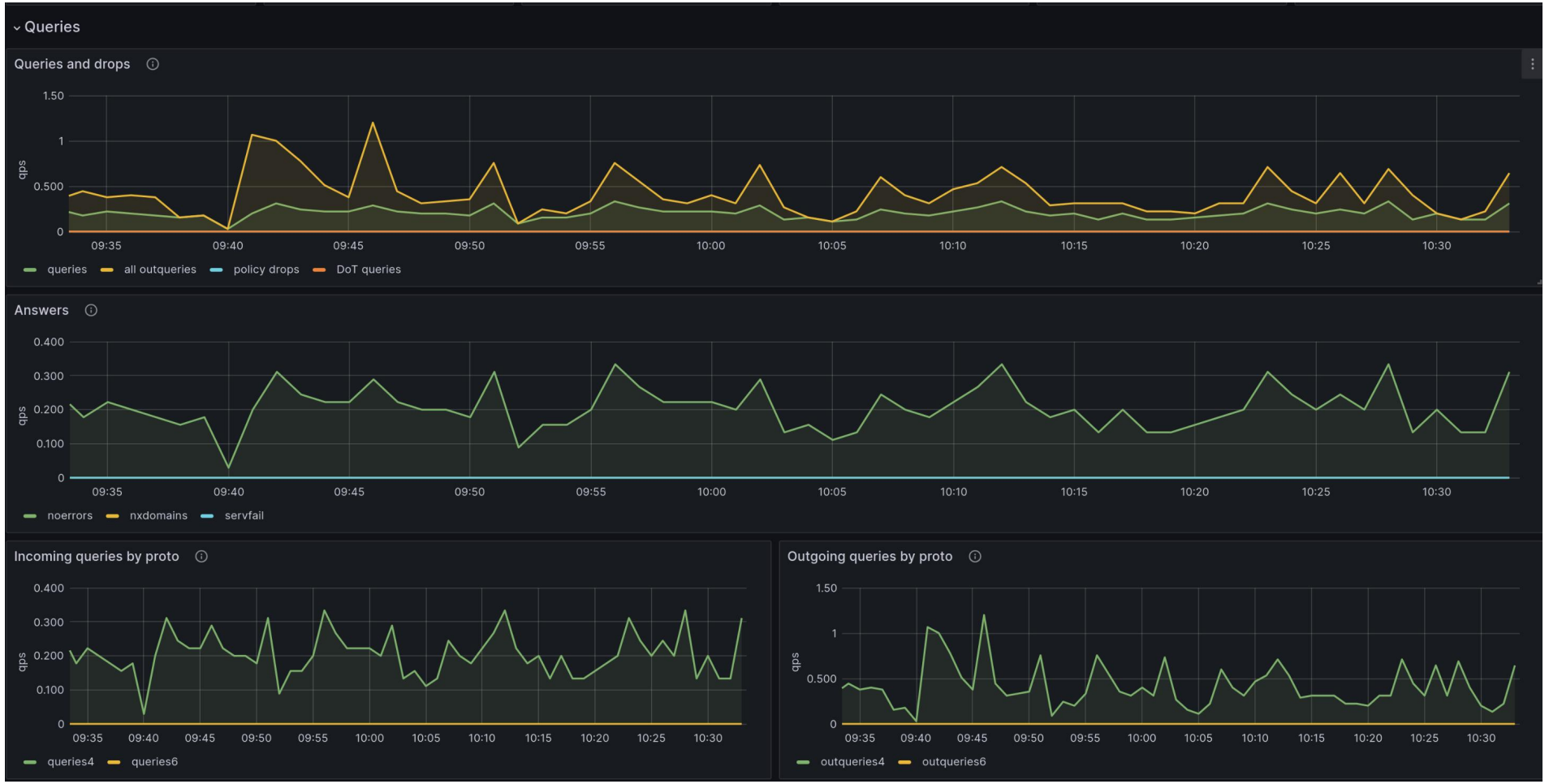
POWERDNS Stay Open. OX

Statistics? We have statistics

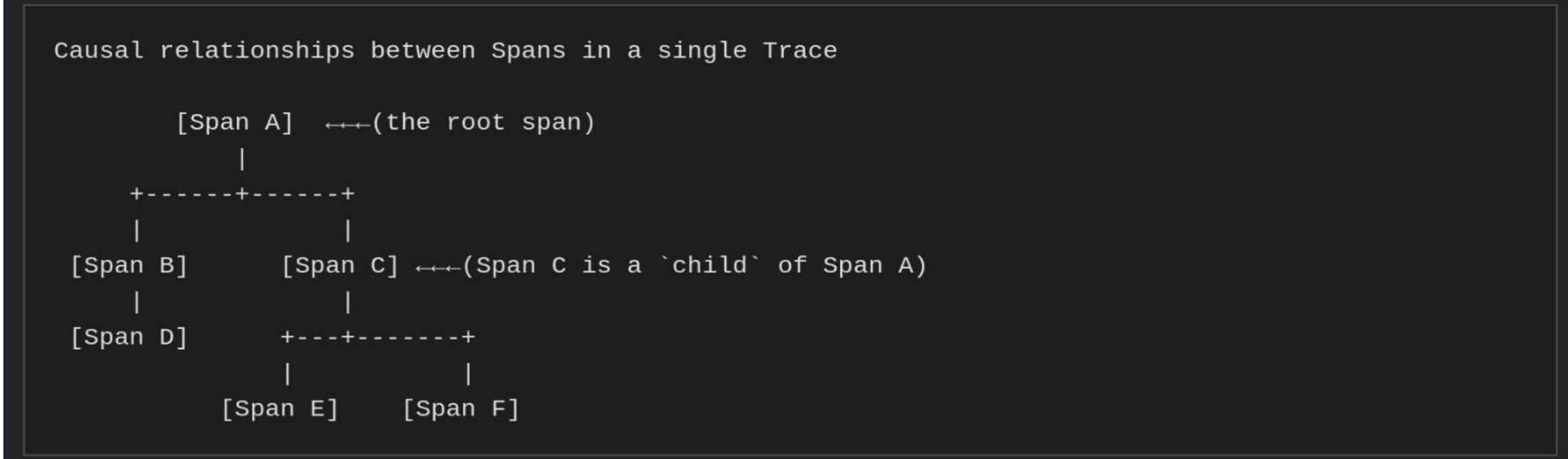


OpenTelemetry Trace Information

Structured using *Spans* and easy to correlate.

From https://opentelemetry.io/docs/specs/otel/overview/#traces:

For example, the following is an example **Trace** made up of 6 **Spans**:



OpenTelemetry Trace Information

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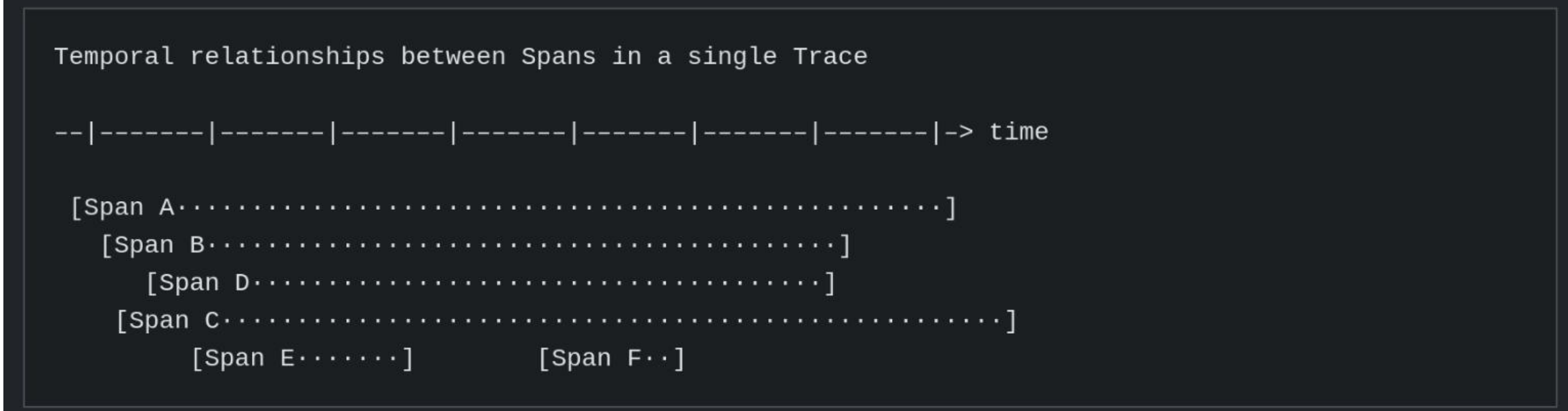
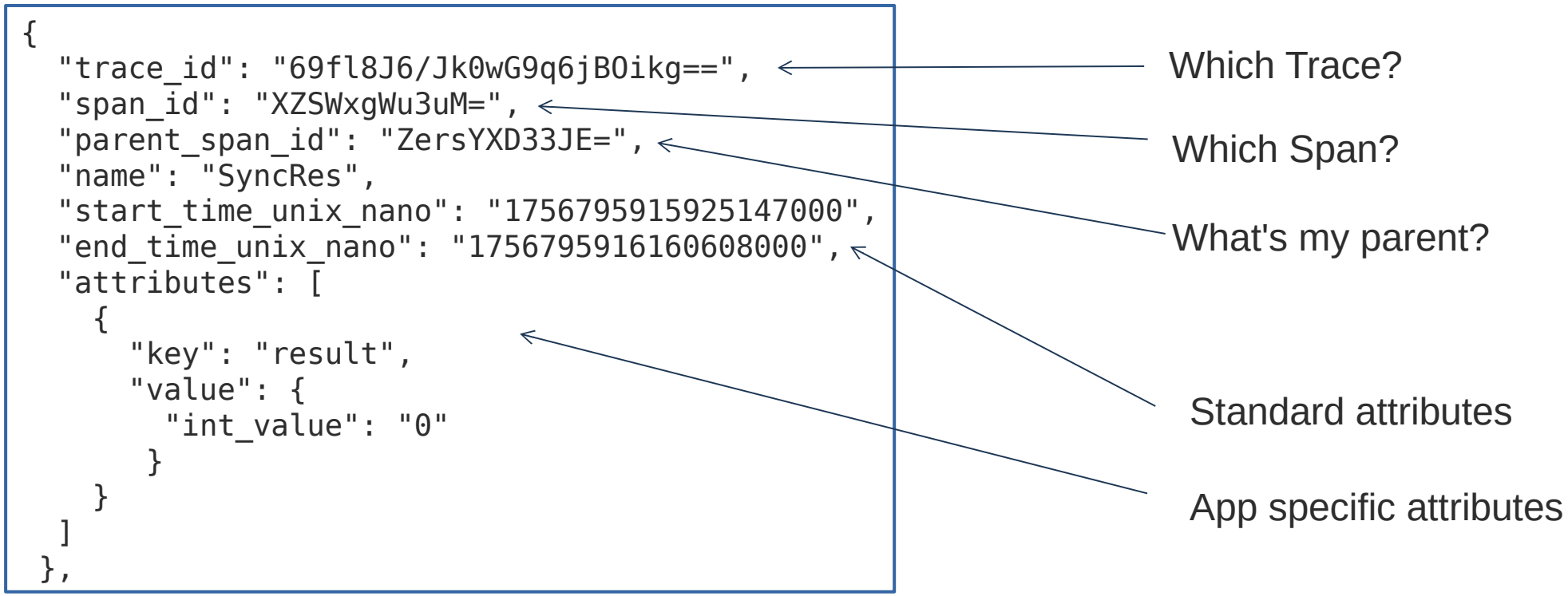
From https://opentelemetry.io/docs/specs/otel/overview/#traces:

Sometimes it's easier to visualize **Traces** with a time axis as in the diagram below:



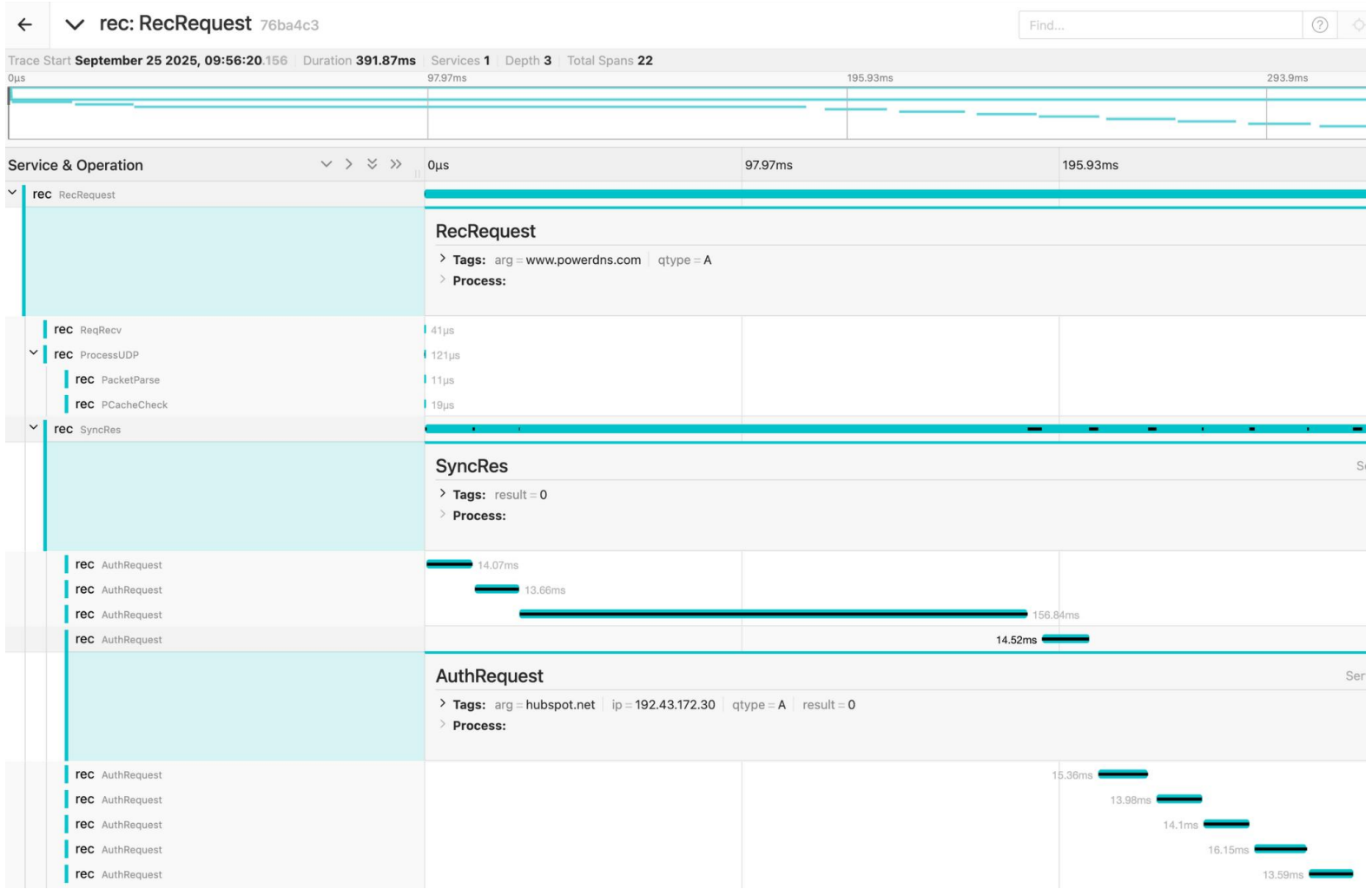
Example Span

In JSON representation



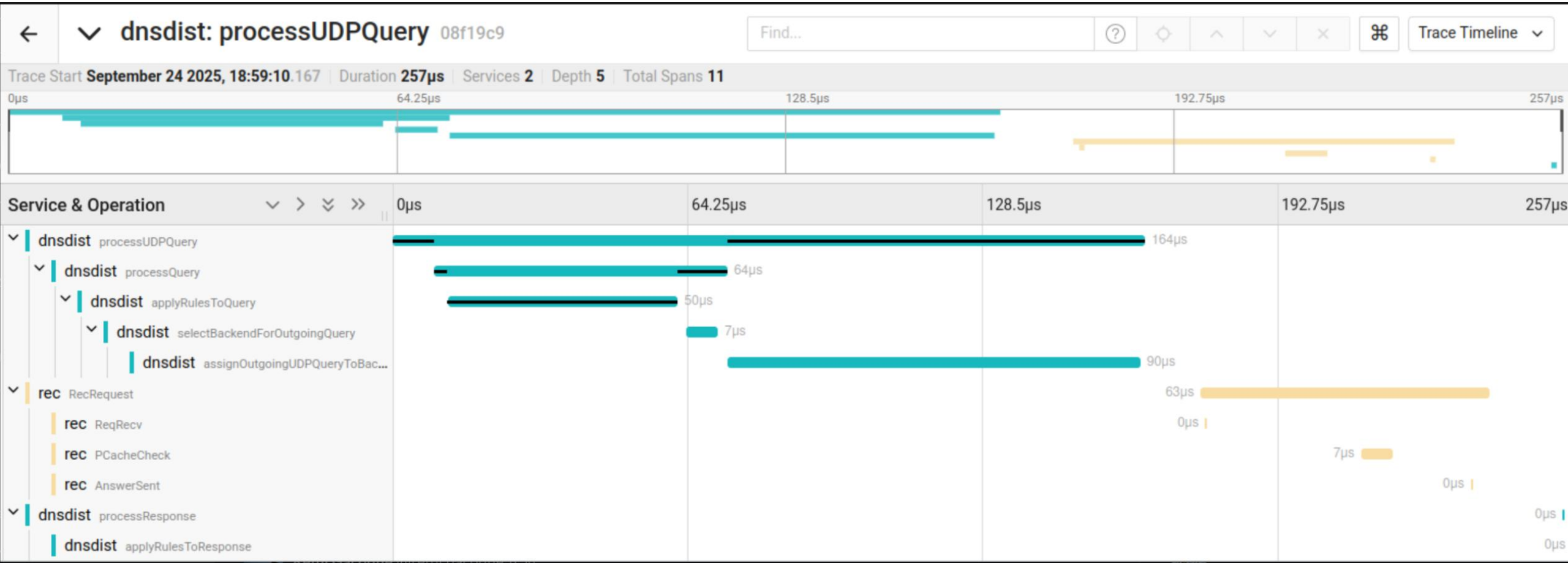
What does it look like: PowerDNS Recursor

Using off the shelf OT Trace collector and viewer: jaeger



dnsdist + Recursor

Structured using *Spans* and easy to correlate.



Protobuf logging

https://github.com/PowerDNS/dnsmessage/blob/master/dnsmessage.proto

```
187       optional HTTPVersion httpVersion = 24;        // HTTP version used for DNS over HTTP
188       optional uint64 workerId = 25;                // Thread id
189       optional bool packetCacheHit = 26;            // Was it a packet cache hit?
190       optional uint32 outgoingQueries = 27;         // Number of outgoing queries used to answer the query
191       optional uint32 headerFlags = 28;             // Flags field in wire format, 16 bits used
192       optional uint32 ednsVersion = 29;             // EDNS version and flags in wire format, see https://ww
193   +   optional bytes openTelemetryData = 30;       // Protobuf encoded Open Telemetry Data, see https://git
```

DNSTAP?

https://github.com/dnstap/dnstap.pb/blob/main/dnstap.proto

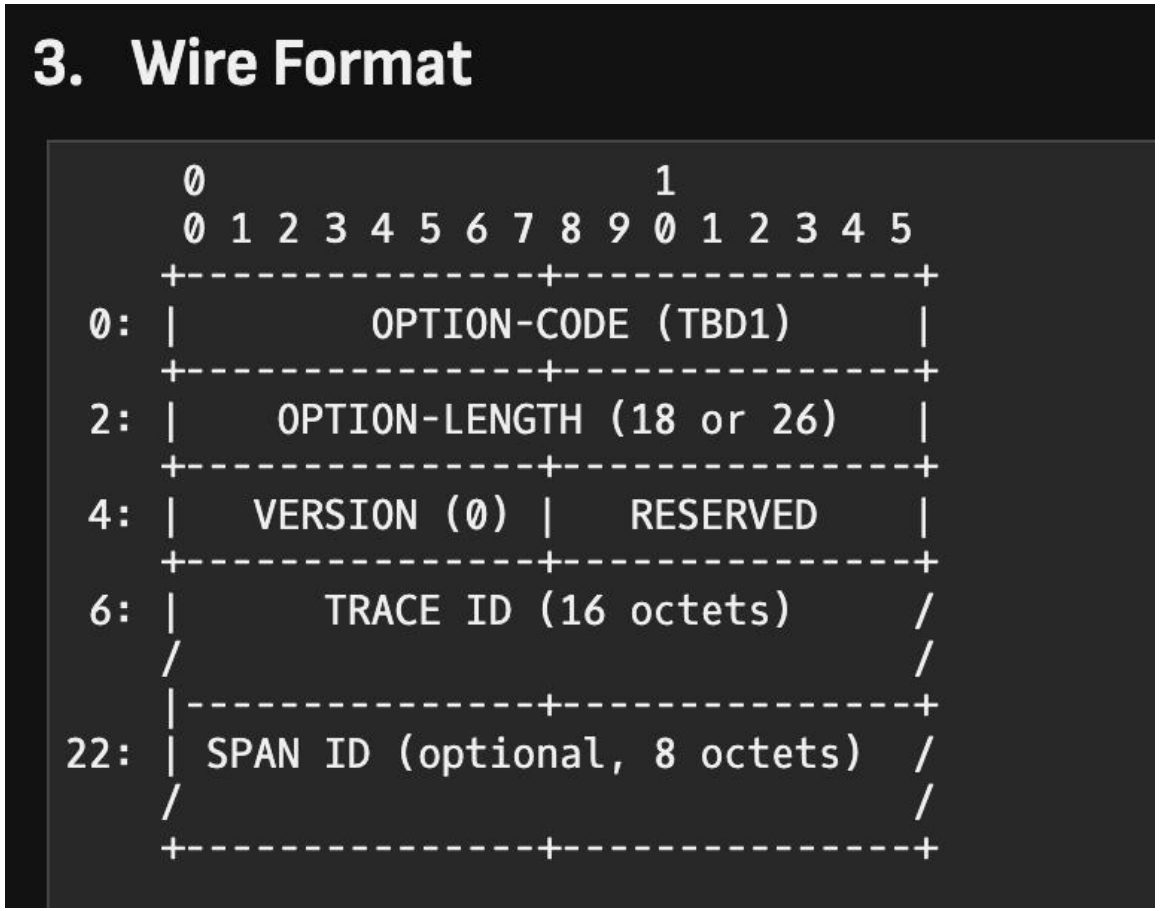
```
// Extra data for this payload.
// This field can be used for adding an arbitrary byte-string annotation to
// the payload. No encoding or interpretation is applied or enforced.
optional bytes       extra = 3;
```

Use "extra"? Or add a specific field?

Passing TraceID and SpanID in DNS packets

EDNS0 to the rescue to make correlation very easy

See very early draft: https://powerdns.github.io/draft-edns-otel-trace-ids/draft-edns-otel-trace-ids.html



Alternatively:

- PROXYv2 TLV
- HTTP header (where applicable)

Questions?