Observability Day

NORTH AMERICA

Unlocking Advanced Processing Capabilities with OpenTelemetry

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Salt Lake City

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Agenda

- Challenges: Increasing costs and complexity of Observability
- OpenTelemetry
  - Why OTel?
  - Pipelines
- Best practices
  - Filtering
  - Sampling
  - Routing
  - Transformation
- End user story

Increasing costs and complexity of Observability

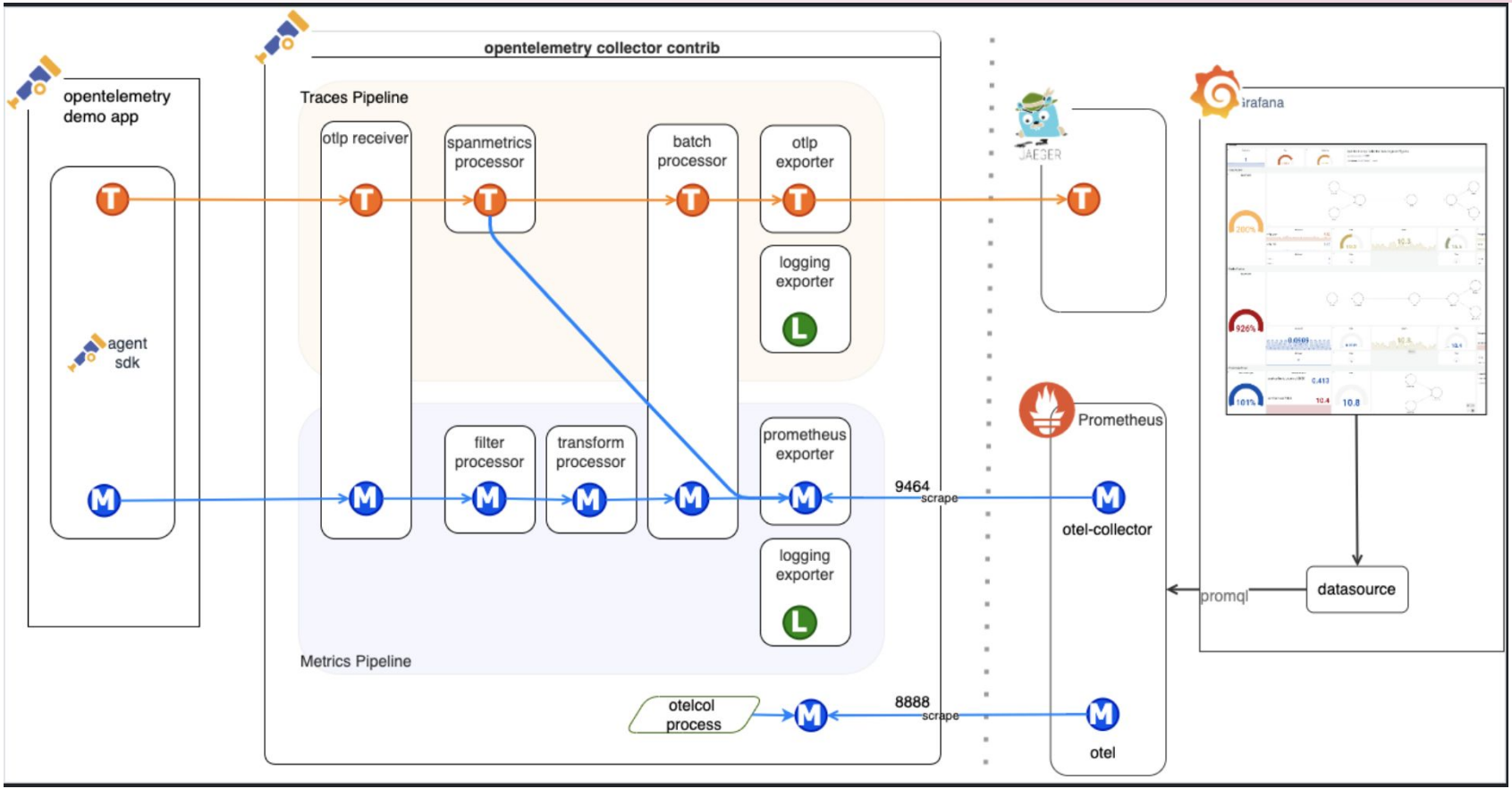
Modern workloads generate petabytes of telemetry. The cost and complexity associated with managing this data can be more than **$10 million/year** in large enterprises.

- Gartner, July 2023

Why is it a good choice as an Observability strategy?

1. Vendor Neutrality
2. Standardization
3. Flexibility
4. Community

Pipelines


opentelemetry collector contrib
opentelemetry demo app
agent sdk
Traces Pipeline
otlp receiver
spanmetrics processor
batch processor
otlp exporter
logging exporter
filter processor
transform processor
prometheus exporter
logging exporter
Metrics Pipeline
otelcol process
9464
scrape
8888
scrape
JAEGER
Prometheus
otel-collector
otel
irafana
promql
datasource

Best practices

Reduce volume and costs of observability data while retaining valuable insights

Filtering

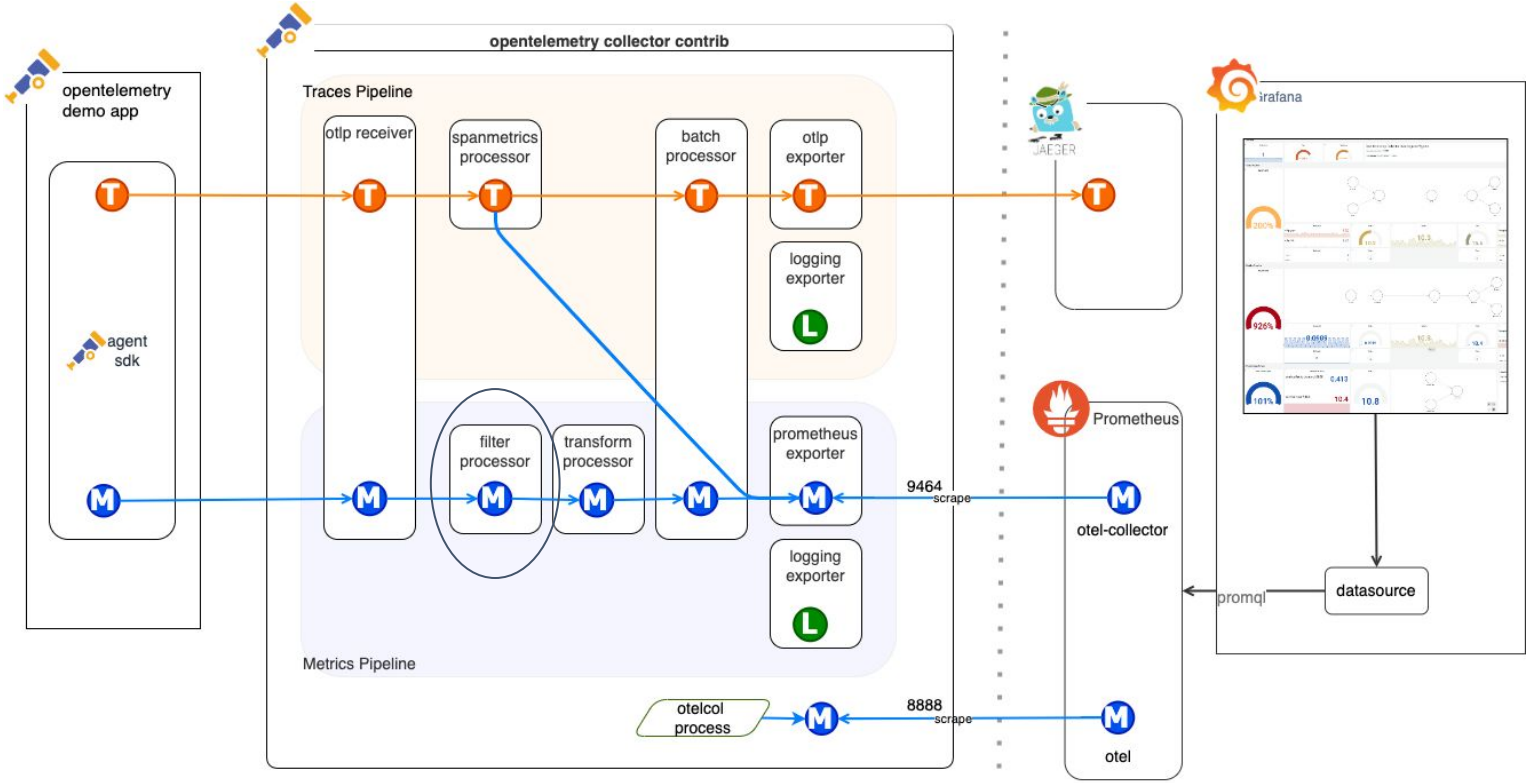
What: Exclude specific telemetry based on predefined conditions

When: What are some common use cases?

- Too many prometheus metrics to begin with!
- Low value endpoints such as health checks
- Data from testing environments
- Low severity logs

Filter processor

OTTL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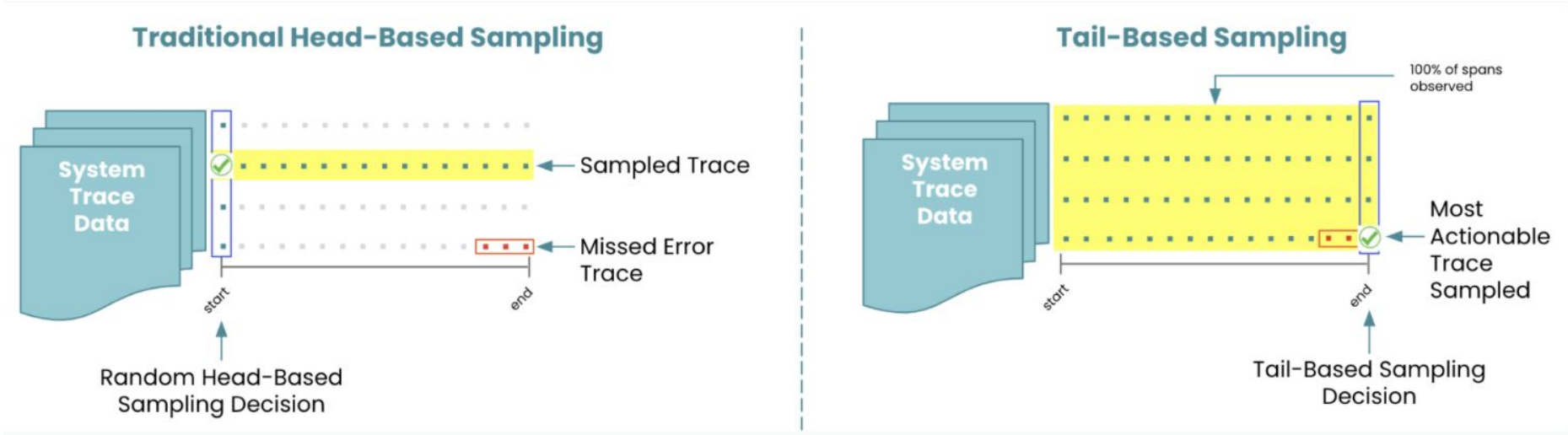
Sampling

Representativeness is crucial when performing in-depth analysis of application or system behavior

Sampling

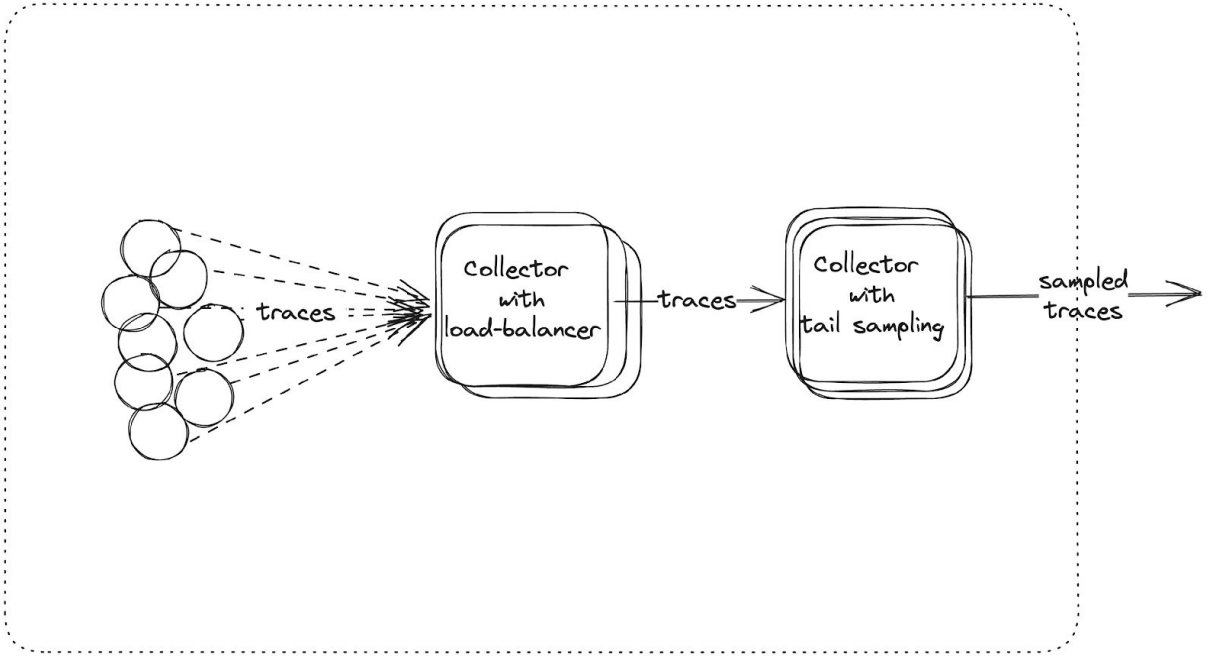
To sample is to choose a representative - you sample the ones you keep, not the ones you drop

Head sampling: Sample as early as possible
Tail sampling: Sample after considering all or most of the spans in trace

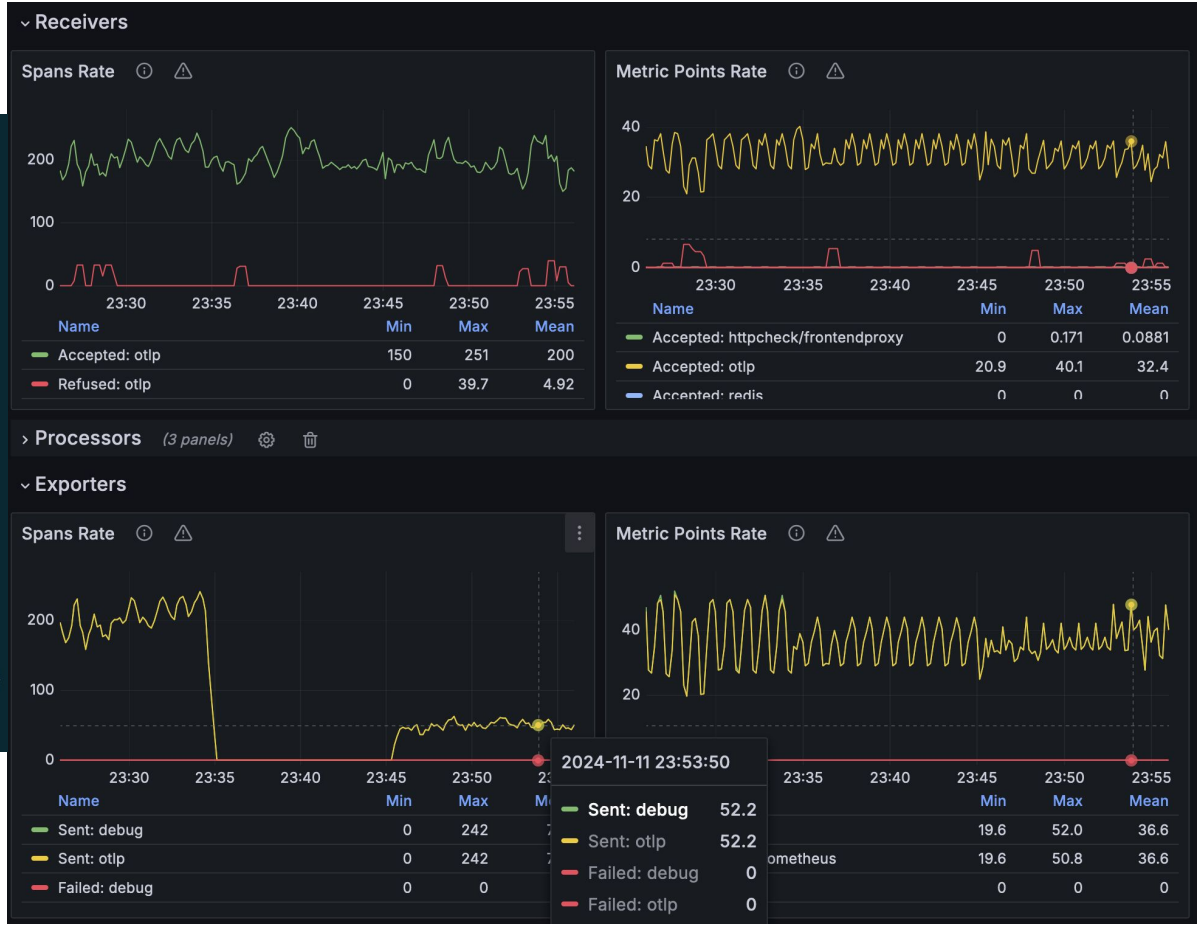


Sampling

When scaling a tail sampling setup ensuring spans from the same trace get to the same collector instance is key



```yaml
tail_sampling:
  decision_wait: 10s
  num_traces: 3000
  expected_new_traces_per_sec: 10
  policies:
    [
      {
        name: keep-errors,
        type: status_code,
        status_code: {status_codes: [ERROR]}
      },
      {
        name: keep-slow-traces,
        type: latency,
        latency: {threshold_ms: 500}
      },
      {
        name: randomized-policy,
        type: probabilistic,
        probabilistic: {sampling_percentage: 10}
      }
    ]
```



Tradeoffs to consider

- Mostly healthy traffic with little variation in data
- Common criteria like errors or high latency
- > 1000 traces per second

- Cost of compute
- Engineering cost
- Networking cost

Routing

What: Directing telemetry to specific backends or destinations

When: What are some common use cases?

- Low cost archival, not for real time querying
- Unsampled traces
- Regulatory compliance: audit purposes
- High availability, failover

Routing processor

Failover connector

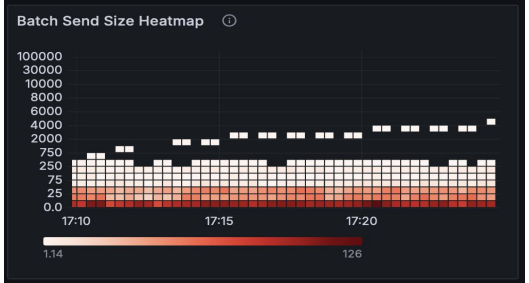
Transformation

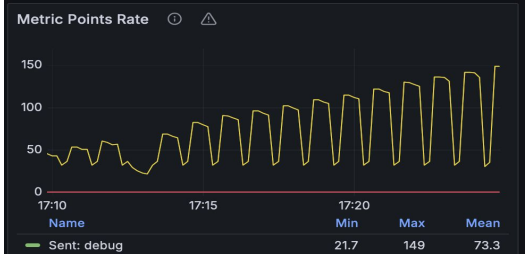
What: Modifying telemetry data to fit needs such as normalizing fields, aggregating data or enrichment

- Data normalization
- Telemetry transformation
- Aggregation
- Enrichment

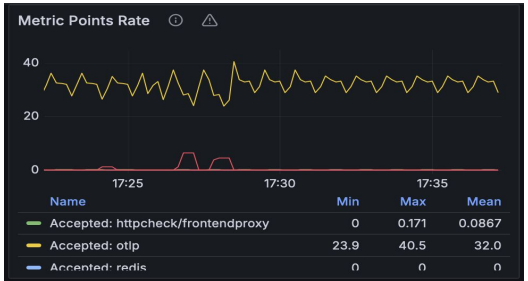
Transform processor

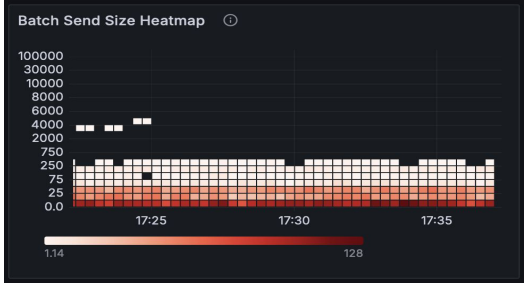
Span metrics connector

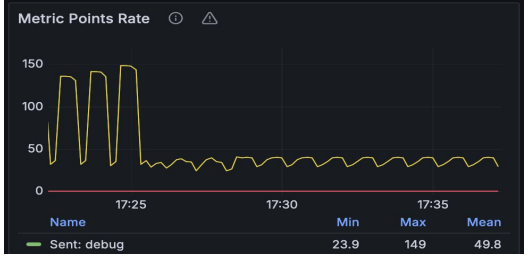





```
  - replace_pattern(name, "\\?.*", "")
  - replace_match(name, "GET
/api/products/*", "GET
/api/products/{productId}")
```







2.7M spans/second and ~105k traces/second

Cost attribution and budgets

Envoy spans -> HTTP/gRPC metrics

Tail sampling ~ 4% - 5%

Distributed tracing 90% ⇩ costs from logging

Tail sampling policies are centrally managed

- Limited control and cost attribution for service owners

Would love to learn more?

Observability Day
NORTH AMERICA

Stop by the
OTel
Observatory!

#B5

Take your
first step!

Contribfest
Fri Nov 15th
@ 4pm

Learn more
about OTTL!

The OTTL
Cookbook
Wed Nov 13th
@ 5:25pm

Thank You!