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When OTTL Goes Off the Rails: Debugging Transformations with Confidence

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Assumptions



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- You know the basics of **OpenTelemetry**
- Is familiar with the **OTel Collector**
- Used **OTTL** before

Agenda



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- Understand the telemetry data model
- How OTTL really sees your data
- The debugging toolkit
- Live debugging walkthrough

Telemetry Data Model



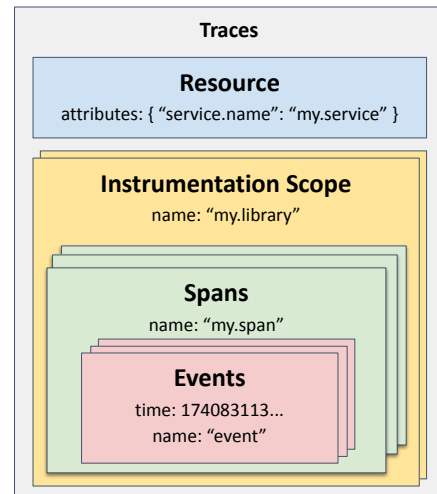
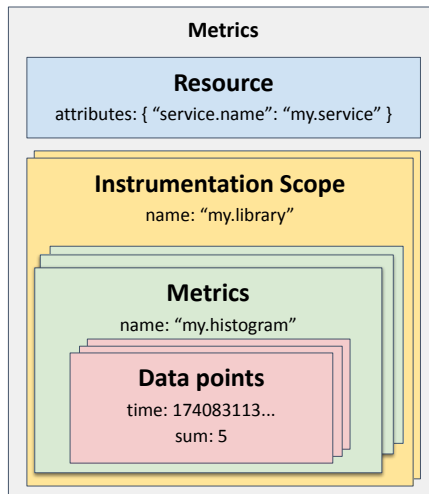
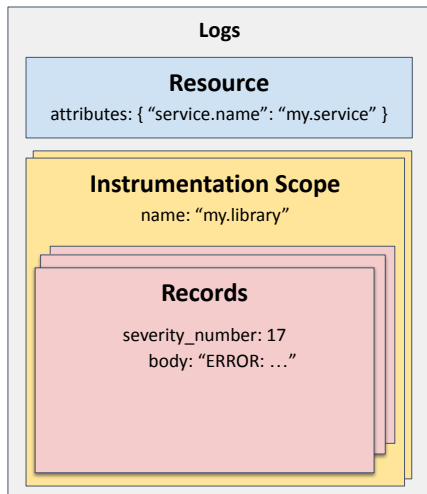
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- Consistent structure for representing observability data.
- Describes what data should exist and what it means.



Pipeline Data (a.k.a. pdata)



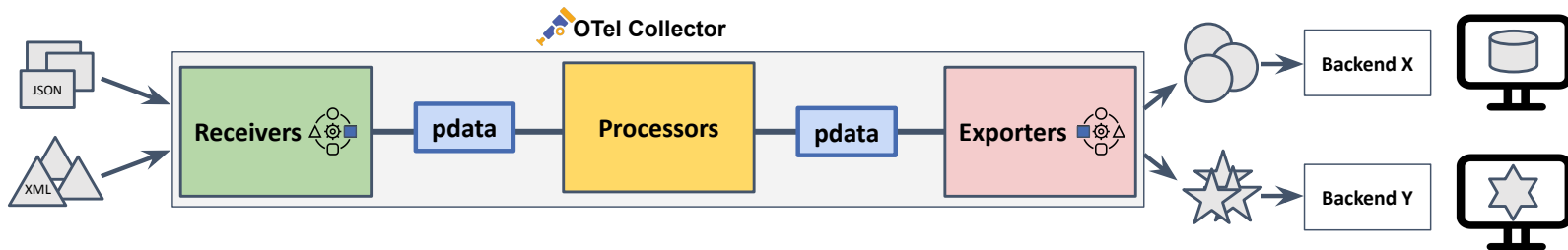
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- In-memory representation of the telemetry data model.
- The working format inside the OTel Collector pipeline.
- OTTL works on pdata, not raw payloads or backend data.



Quick Recap: OTTL Contexts



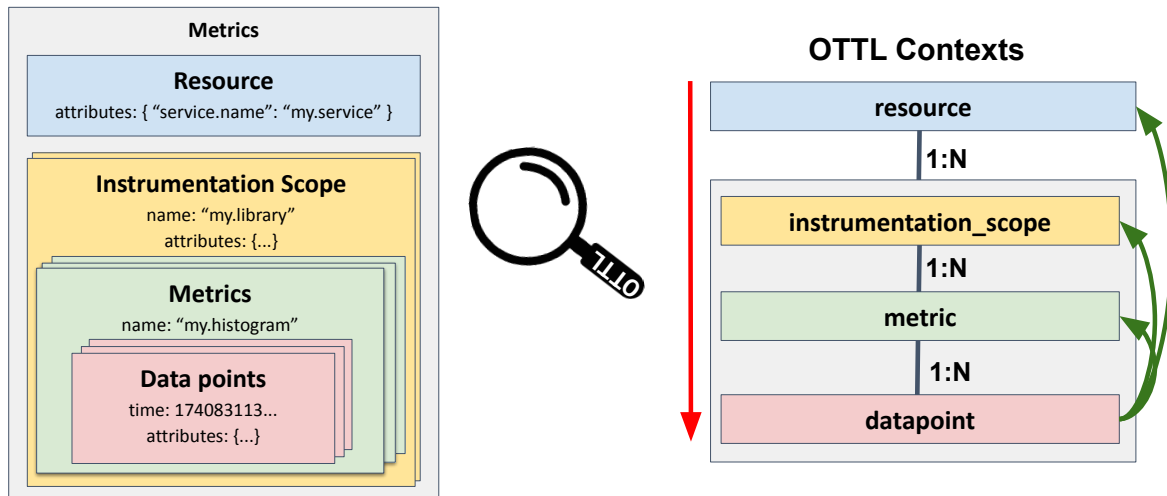
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- Contexts defines which part of the pipeline data (pdata) OTTL operates on
- Bridge between exposed data paths to the underlying pdata
- Manipulates what's inside the Collector, not raw receivers payloads



OTTL Paths

Not sure which OTTL path to use? Start here →



bit.ly/ottl-contexts

Debugging Toolkit



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- Debug Exporter 
- Debug Logs 
- OTTL Playground 

Debug Exporter



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```
RESOURCE
2025-10-08T17:55:52.928+0200      info
ResourceSpans #0
Resource SchemaURL:
Resource attributes:
  -> service.name: Str(http-server)
ScopeSpans #0
ScopeSpans SchemaURL:
InstrumentationScope my.library 1.0.0
InstrumentationScope attributes:
  -> binary.path: Str(/bin/my_app)
Span #0
  Trace ID      : 5b8efff798038103d269b633813fc60c
  Parent ID     : eee19b7ec3c1b173
  ID            : eee19b7ec3c1b174
  Name          : I'm a server span
  Kind          : Server
  Start time    : 2024-12-13 14:51:00 +0000 UTC
  End time      : 2024-12-13 14:51:01 +0000 UTC
  Status code   : Unset
  Status message:
Attributes:
  -> protocol: Str(http)
  -> operation: Str(get)
Events:
SpanEvent #0
  -> Name: event-1
  -> Attributes::
    -> source: Str(server)
Span #1
...
```

```
exporters:
  debug:
    verbosity: detailed

service:
  pipelines:
    traces:
      receivers: [...]
      processors: [...]
      exporters: [debug]
```

Debug Logs



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- Shows how OTTL executes statements
- Records before and after data for each statement
- Confirms whether the condition matched
- Useful for debugging tricky issues

```
service:
  telemetry:
    logs:
      level: debug
      # Emit internal logs to an OTLP backend
    processors:
      - batch:
          exporter:
            otlp:
              endpoint: <endpoint>
```

Inside the Logs



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transform:

log_statements:

- **set**(log.severity_number, 5) **where** **IsMatch**(log.body, "here")
- **set**(log.severity_text, "unknown") **where** log.severity_number == 0

```
2025-10-29T10:57:42.460+0100 DEBUG ottl@v0.138.0/parser.go:400  initial TransformContext before executing
{...}
```

```
2025-10-29T10:57:42.460+0100 DEBUG ottl@v0.138.0/parser.go:37   TransformContext after statement execution
{...}
```

```
2025-10-29T10:57:42.460+0100 DEBUG ottl@v0.138.0/parser.go:37   TransformContext after statement execution
{...}
```

Every Log Tells a Story



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```
DEBUG initial TransformContext before executing  
StatementSequence
```

```
{  
  "TransformContext": {  
    body: "Got here"  
    severity_number: 10  
    severity_text: ""  
    ...  
  }  
}
```

Every Log Tells a Story



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```
DEBUG TransformContext after statement execution
{
  "statement": set(severity_number, 5)
                where IsMatch(body, "here")

  "condition matched": true

  "TransformContext": {
    body: "Got here"
    severity_number: 5 10
    severity_text: ""
    ...
  }
}
```

Every Log Tells a Story



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```
DEBUG TransformContext after statement execution
{
  "statement": set(severity text,"unknown")
               where severity_number == 0

  "condition matched": false

  "TransformContext": {
    body: "Got here"
    severity_number: 5
    severity_text: ""
    ...
  }
}
```

OTTL Playground (a.k.a ottl.run)



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A powerful and user-friendly tool for experimenting with OTTL.

- No need to run a Collector
- Visual diffs and **debug logs** included
- WebAssembly-powered for near-live accuracy





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```
set(time, "demo")
```

Setting a field value



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```
set(log.severity_number, 17)  
where IsMatch(log.body, "ERROR")
```



ela.st/debug-otl-1

Proper cache access



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```
set(log.cache["body"], ParseJSON(log.body))  
set(log.body, log.cache["body"])
```



ela.st/debug-ottl-2

Promoting attributes



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```
set(resource.attributes["server.address"],  
    log.attributes["server.address"])
```



ela.st/debug-otl-4

It works... but something feels off



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```
set(metric.metadata["type"], "histogram")  
where metric.type == METRIC_DATA_TYPE_HISTOGRAM
```



ela.st/debug-otl-5

Key Takeaways



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- OTTL works on pdata - Understanding it is a must
- Inspecting your data first can help you spot simple issues
- Use debug logs to see what OTTL is actually doing
- Experiment safely, test edge cases and failures in the Playground before deploying

Want to Learn More?



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 OTTL Docs



bit.ly/docs-ottl

 Transform Processor



bit.ly/docs-tp

 OTTL Playground



bit.ly/ottl-playground



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Thank you!

Please leave feedback





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Questions?

