What can you do to reduce CO² emissions in your software?

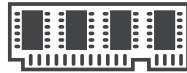Denis Angeletta
RETIT GmbH

Software drives Hardware Consumption

Software

Hardware
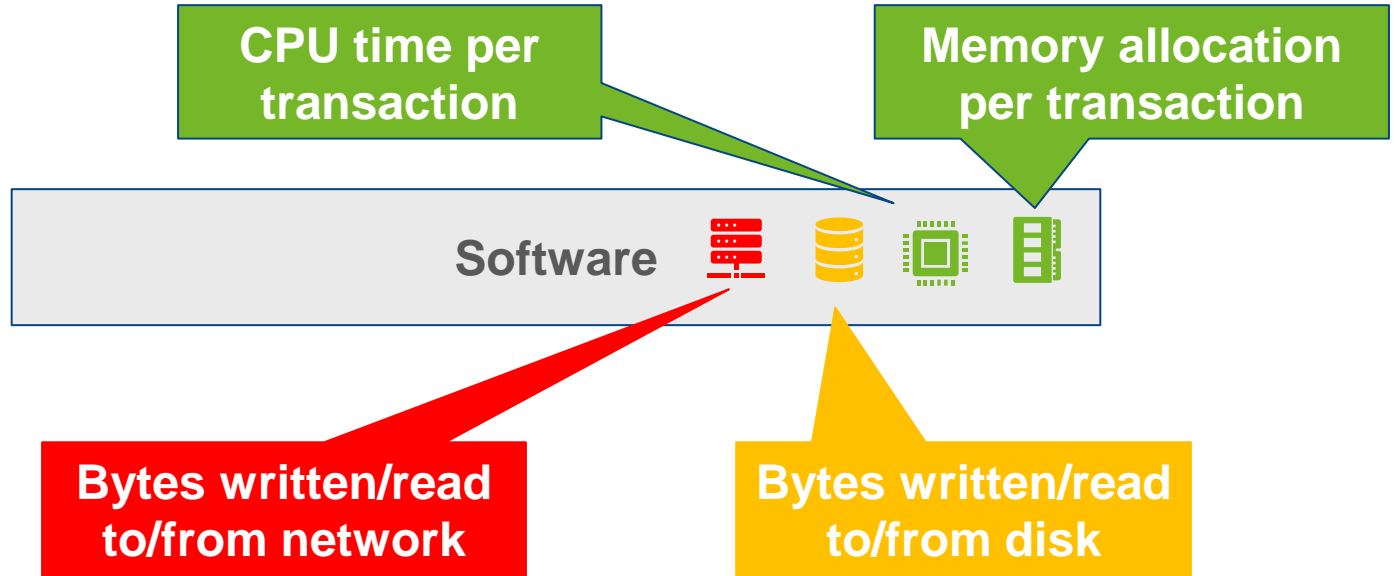
CPU

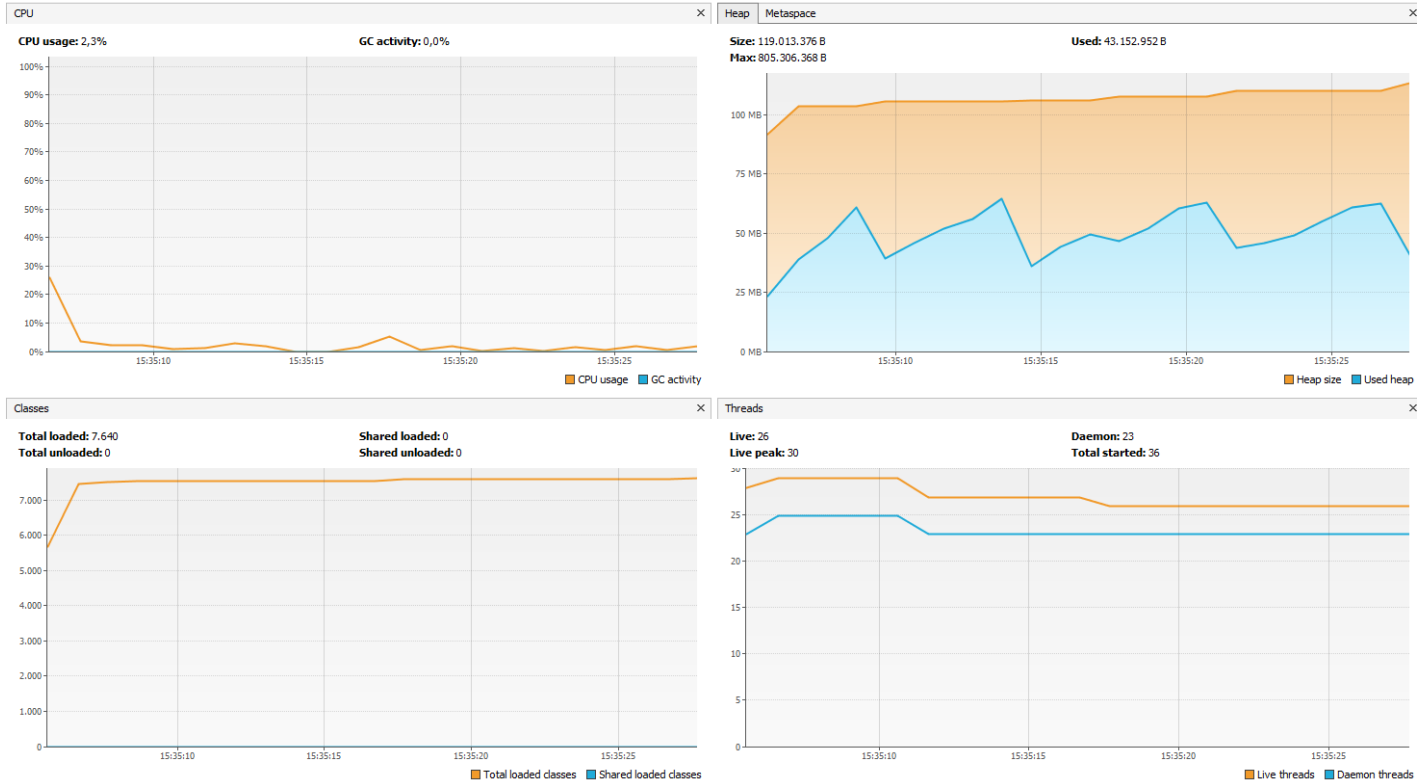Memory

Network

Storage

Energy Consumption

Resource Demand Metrics

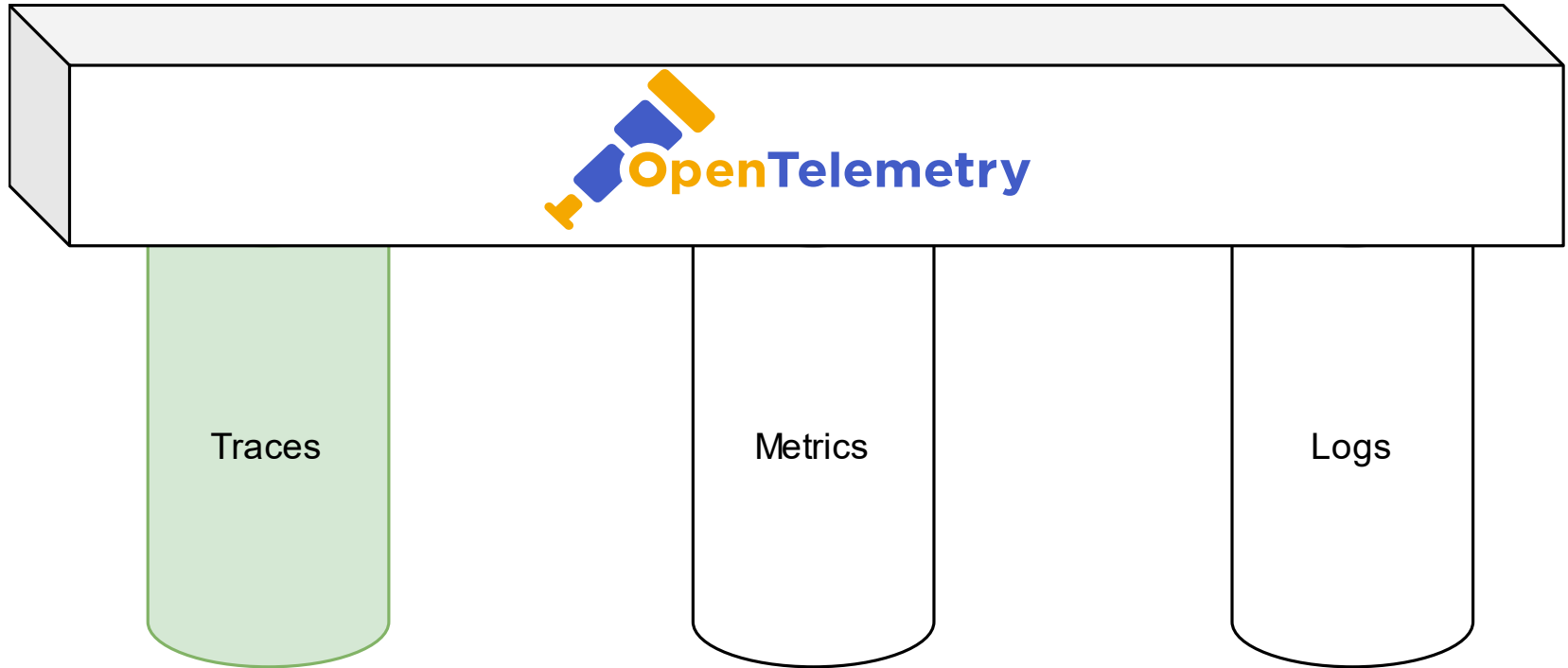**CPU time per transaction**

Memory allocation per transaction

Software

Bytes written/read to/from network

Bytes written/read to/from disk

Tools

Tools

OpenTelemetry

Traces

Metrics

Logs

OpenTelemetry Jaeger Trace

INSERT orders_db.items

⌄ **Tags**

db.sql.table	items
db.statement	INSERT INTO items(item_id, name, quantity, unitPrice) VALUES (?, ?, ?, ?)
db.system	postgresql
db.user	postgres
de.retit.endcputime	745591400
de.retit.enddiskreaddemand	0
de.retit.enddiskwritedemand	0
de.retit.endheapbyteallocation	192510720
de.retit.endsystemtime	0
de.retit.logquadraticcpudemand	false
de.retit.logsystemtime	1631783998866
de.retit.startcputime	745305200
de.retit.startdiskreaddemand	0
de.retit.startdiskwritedemand	0
de.retit.startheapbyteallocation	192506120
de.retit.startsystemtime	0

OpenTelemetry Extension

```
java -javaagent:path/to/opentelemetry-javaagent.jar \
        -Dotel.javaagent.extensions=path/to/retit-extension.jar \
        -Dotel.traces.exporter=otlp \
        -Dotel.exporter.otlp.traces.endpoint=http://otel-collector:4317 \
        -Dotel.resource.attributes=service.name=cargo_application_server \
        -Dotel.metrics.exporter=none \
        -jar cargo_application.jar
```

RETIT

RETIT PAS
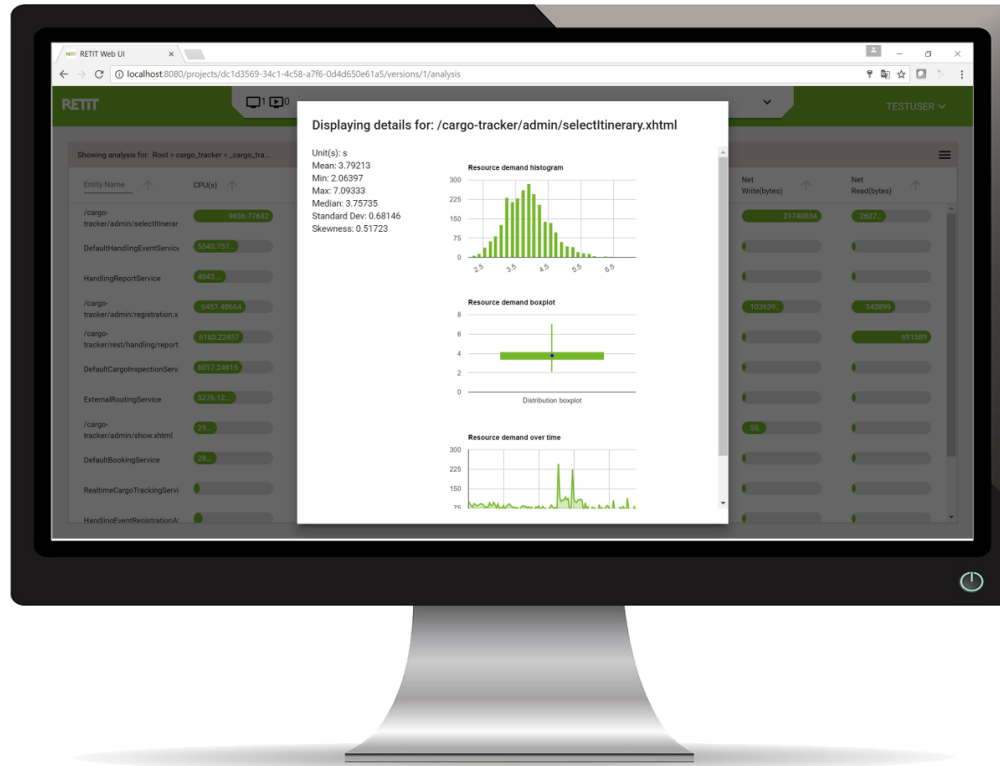
RETIT

Conclusion

- Collecting resource demand values can be easy!

- Ideally collect them on transactional level

- RETIT can provide the necessary tools to get you started fast!

- Start reducing resource consumption!

- Save money and the environment (☺)

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Thank you!

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Resource Efficient Technologies & IT Systems