

Managing Advanced Kubernetes Logging and Tracing

WHY ARE LOGGING AND TRACING IMPORTANT?



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Overview



What are logs?

What are traces?

How they help with debugging

Differences between them



Logs



Permanent record of events



Provide an audit trail



Usually human readable



Example of Logs

INFO:werkzeug: * Running on http://0.0.0.0:8080/ (Press CTRL+C to quit)

INFO:werkzeug: * Restarting with stat

WARNING:werkzeug: * Debugger is active!

INFO:werkzeug: * Debugger PIN: XXX-XXX-XXX

DEBUG:main:Received request 4a61a7e0-f5b7-4557-bc42-060cdb9b3d67 to /

DEBUG:main:Request 4a61a7e0-f5b7-4557-bc42-060cdb9b3d67 positively validated

DEBUG:main:Processing workout f21d1ff9-268c-442b-859d-1ddd14a590ff in request 4a61a7e0-f5b7-4557-bc42-060cdb9b3d67



Traces



Specialized form of logging



Provide low-level information



Allow event reproduction



Usually not human readable



Distributed Tracing

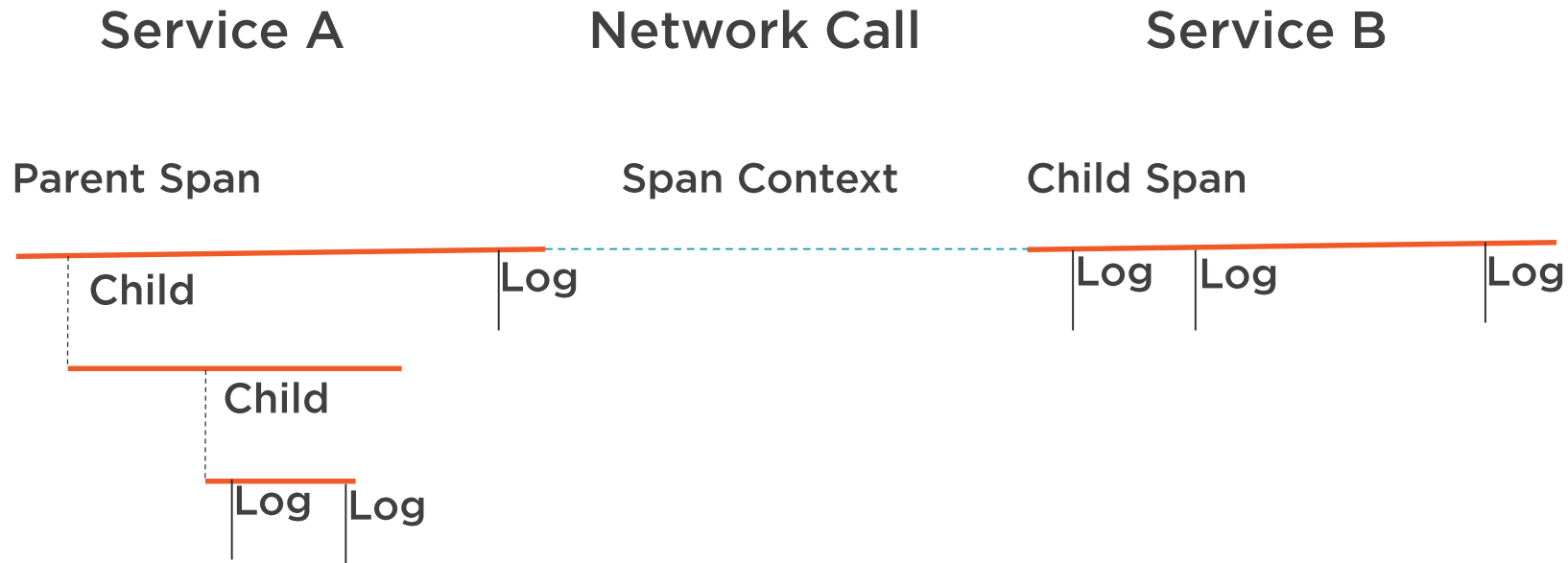
**Allows correlation
of events from
different parts of
the system**

**Traces form spans
representing an
entire transaction**

**Preserves context
between different
services**



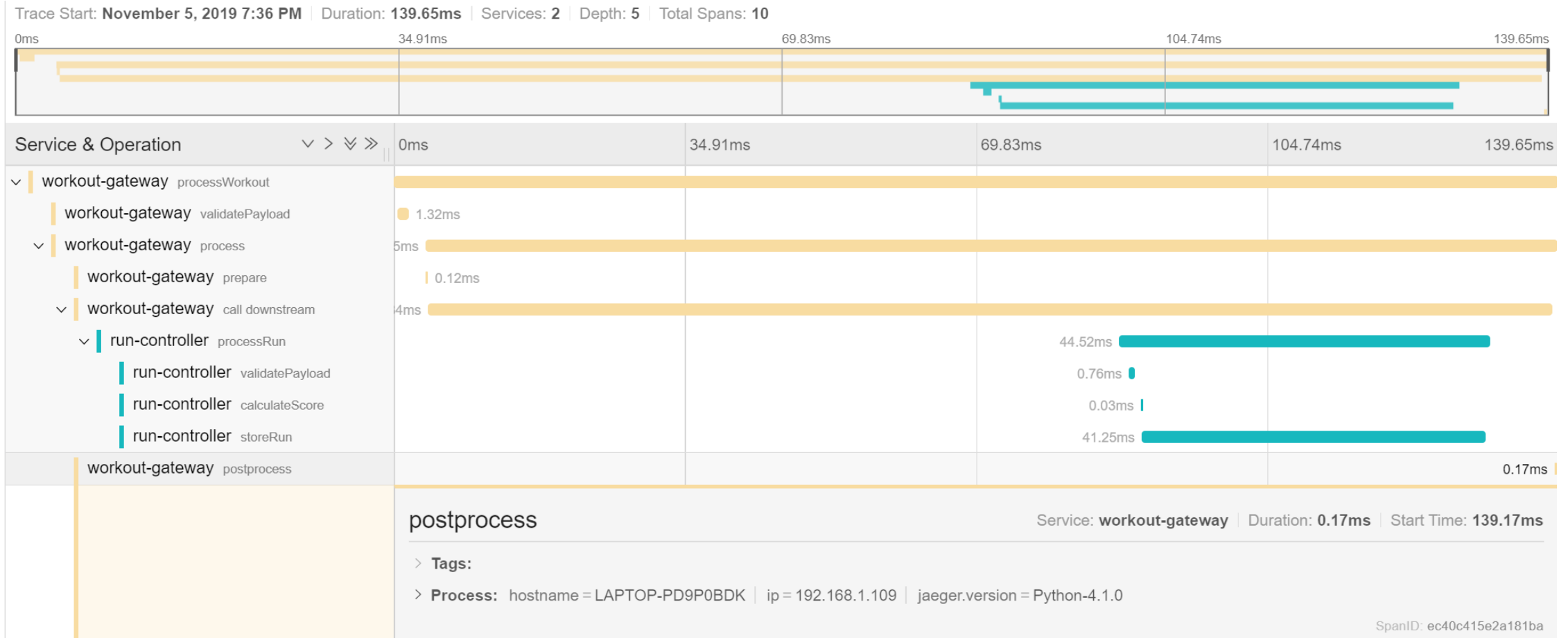
Distributed Tracing Model



Source: <https://opentracing.io/docs/overview/>



Example of Distributed Tracing



Demo



Use the Carved Rock Fitness application

Check how each action provides logs and traces



Differences between Logs and Traces

Logging

Shows the state from the system's point of view

Shows events and their meaning

Helps with system administration

Readable by humans

Distributed Tracing

Shows the state from user action's point of view

Shows execution path and performance

Helps with software debugging

Processed by specialized software



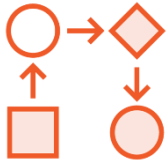
Debugging with Logs and Traces



Logging shows the state of the system without the need to connect the debugger



Storing logs off-site keeps the information about a system even if a component is down



Distributed tracing stores the workflow details



Distributed tracing aids in analysing performance



Demo



Deploy the Carved Rock Fitness application

Debug the application manually

Add logging

Redeploy the application

Check the logs



Summary



Why are logging and tracing helpful

Their use cases

How to debug a distributed system

