



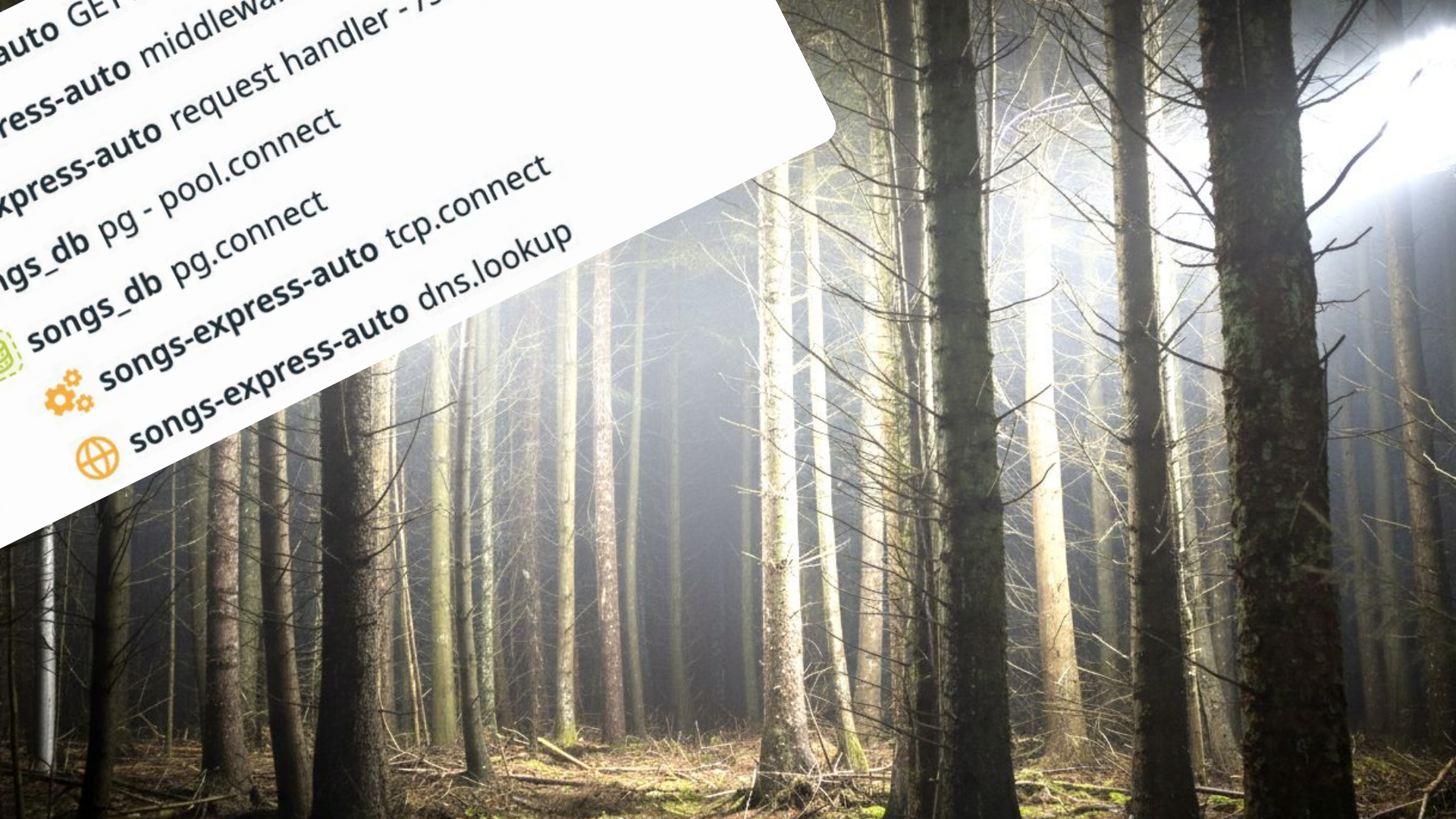
Photo by [Rosie Sun](#) on [Unsplash](#)







auto GET
ress-auto middleware
ress-auto request handler - 75
ongs_db pg - pool.connect
ongs_db pg.connect
ongs-express-auto tcp.connect
ongs-express-auto dns.lookup



auto GET
ress-auto middleware
press-auto request handle
gs_db pg - pool.connect
songs_db pg.connect
songs-express-
songs-express-

- ✓ songs-spring-auto SongRepository.findByTitleAndArtistIgnoreCase
 - 2 songs-spring-auto SELECT com.slct.demo.Song
 - songs_db SELECT ?
 - songs_db select s1_0.id, s1_0.album, s1_0.artist, s1_0.duration_ms, s1_0.genre
 - musicbrainz.org GET
- ✓ 3 songs-spring-auto SongRepository.save
 - ✓ 1 songs-spring-auto Session.persist com.slct.demo.Song
 - songs_db insert into songs (album, artist, duration_ms, genre, title, year) value
 - songs-spring-auto Transaction.commit



auto GET
ress-auto middlewa
ress-auto request handle
pool.connect

2 songs-spring-auto SongRepository.findByTitleAndArtistIgnoreCase
songs_db SELECT com.slct.demo.Song
songs_db SELECT ?
songs_db select s1_0.id, s1_0.album, s1_0.artist, s1_0.duration
musicbrainz org GET

```
process {  
  command      /app/server.js  
  command_args ["/nodejs/bin/node", "--require=./Instrumentation.js", "/app/server.js"]  
  executable {  
    name  /nodejs/bin/node  
    path  /nodejs/bin/node  
  }  
}
```

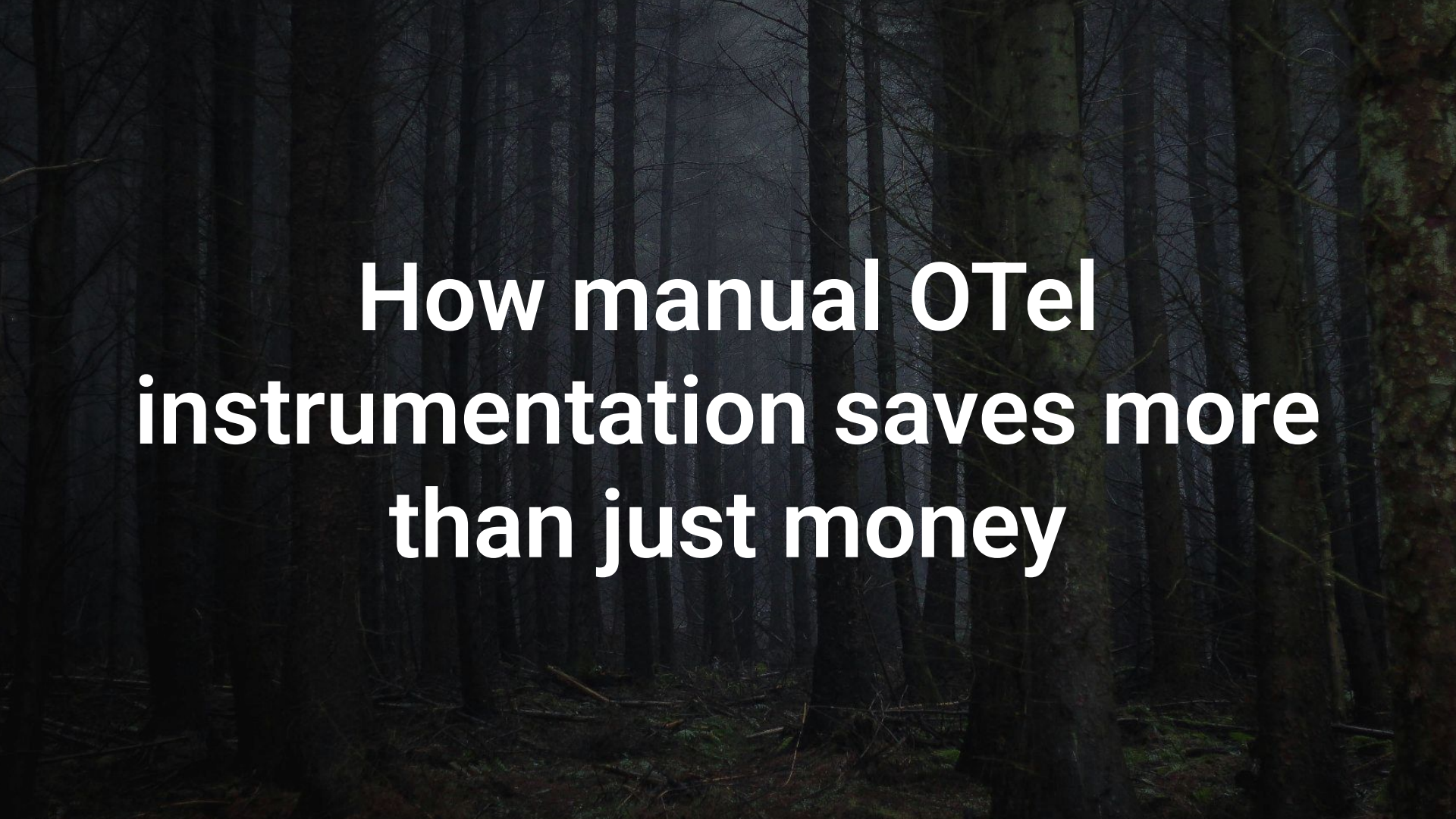


auto GE
ress-auto middlewa
ress-auto request handle
nect

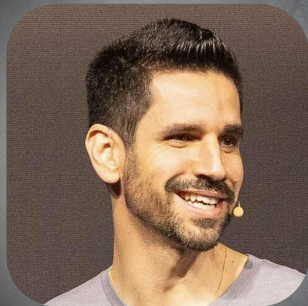
2 songs-spring-auto SongRepository.findByTitleAndArtistIgnoreCase
SELECT com.slct.demo.Song
songs_db SELECT ?

```
process {  
  command_args  ["/opt/java/openjdk/bin/java", "-jar", "app.jar"]  
  executable {  
    path  /opt/java/openjdk/bin/java  
  }  
  pid  1  
  runtime {  
    description  Eclipse Adoptium OpenJDK 64-Bit Server VM 25.0.2+10-LTS  
    name          OpenJDK Runtime Environment  
    version       25.0.2+10-LTS  
  }  
}
```

r.js"]



**How manual OTel
instrumentation saves more
than just money**



Juliano Costa

Developer Advocate



DATADOG



Yuri Oliveira Sá

Co-founder



OllyGarden

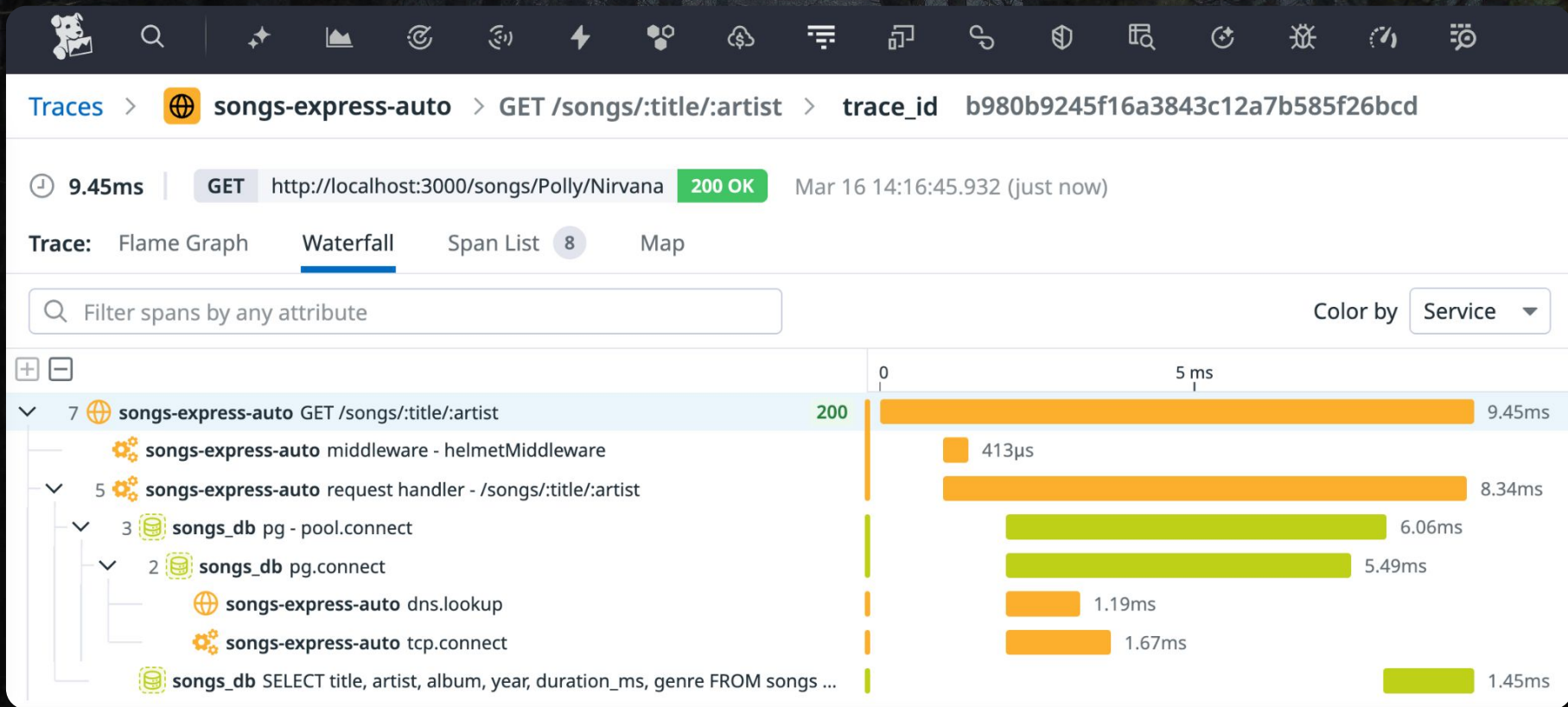


DISCLAIMER

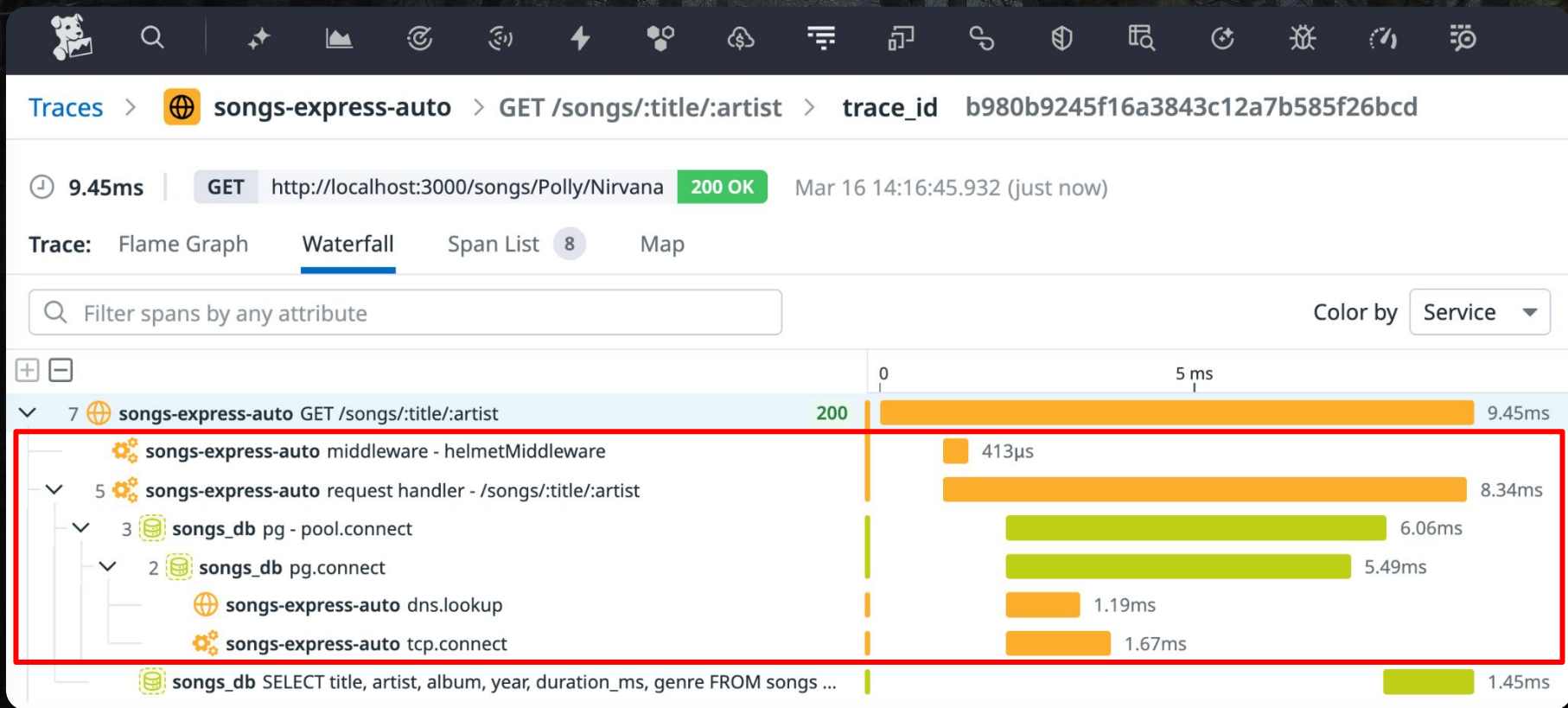
A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious feel. The trees are mostly bare, suggesting a late autumn or winter setting. The ground is covered in fallen leaves and some low-lying vegetation.

The Motivation

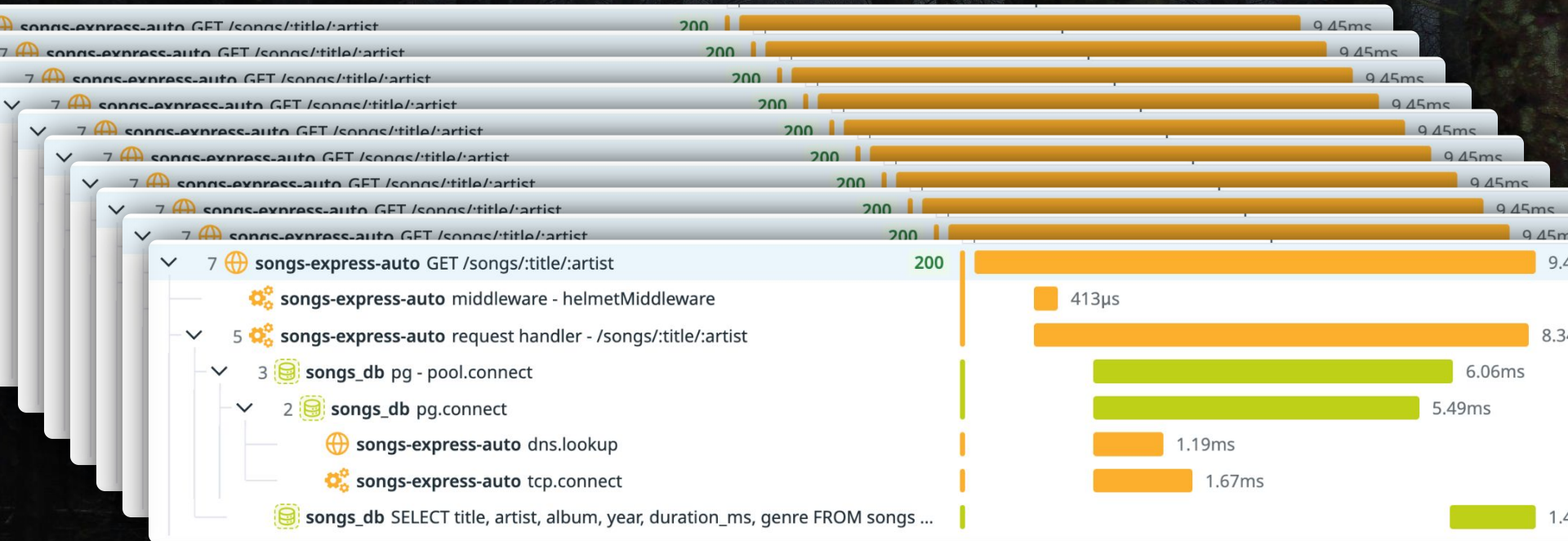
The Motivation

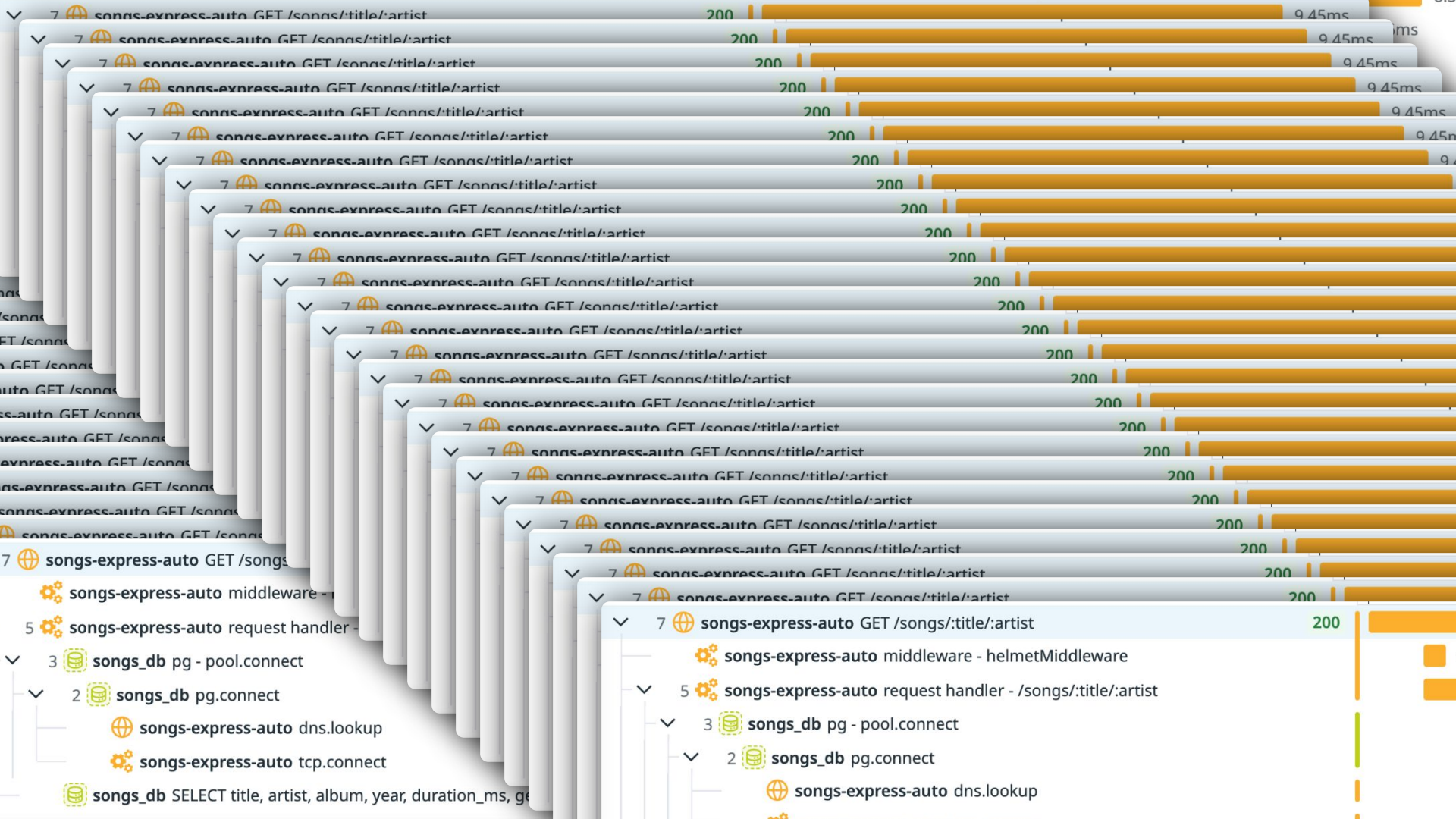


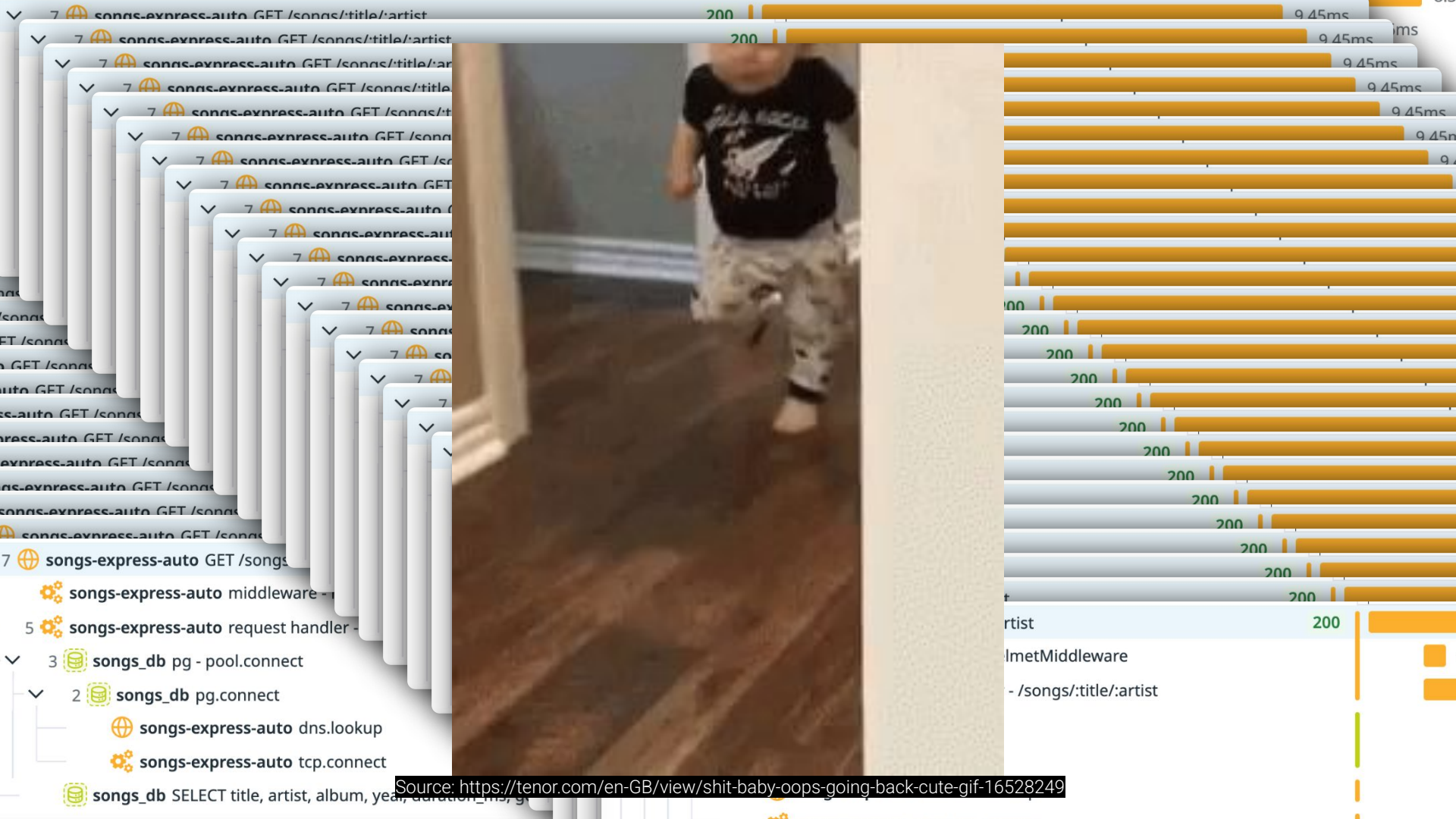
The Motivation



The Motivation

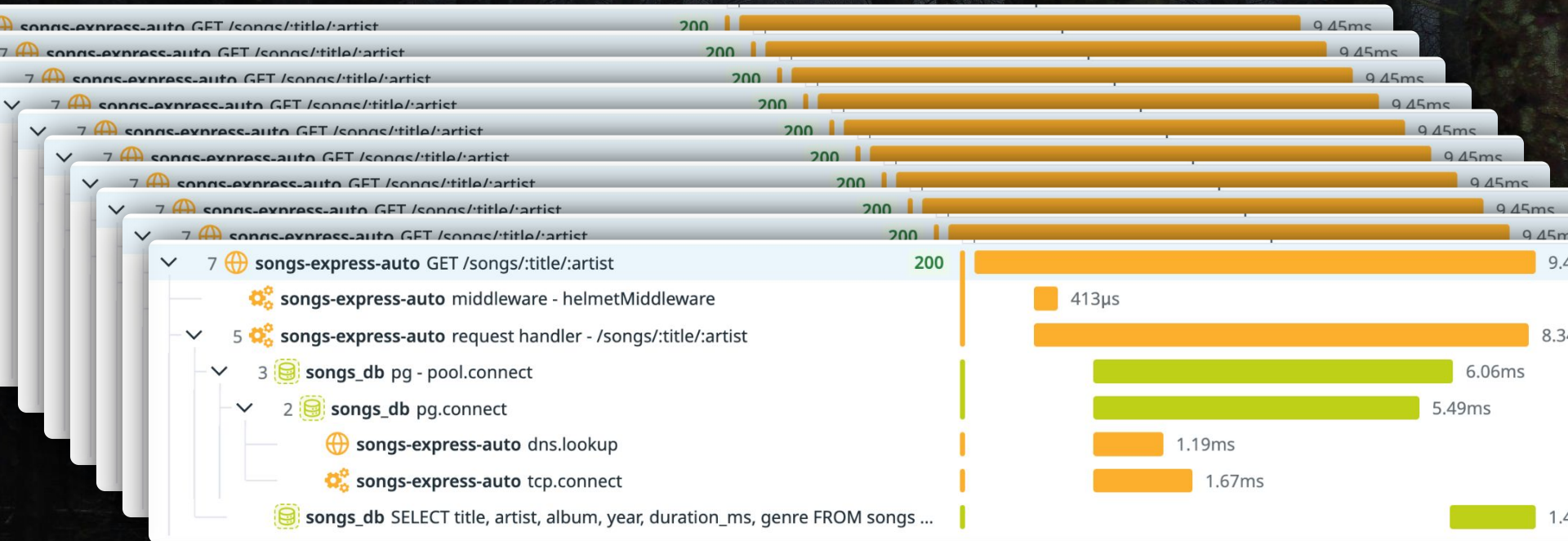




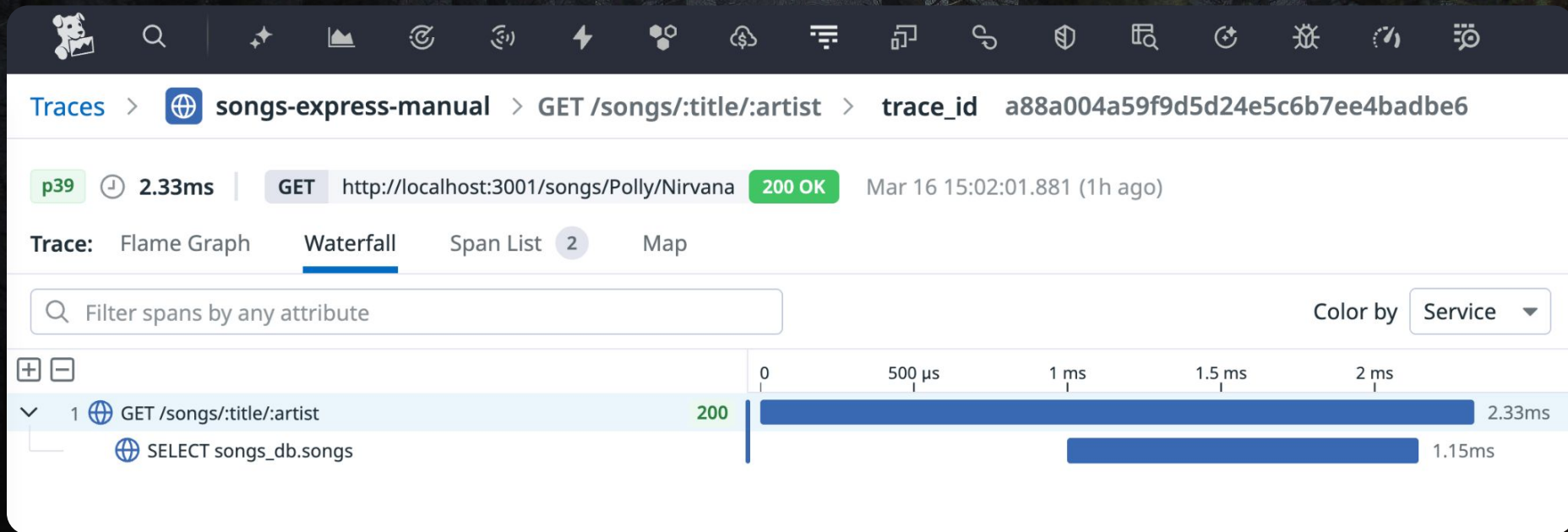


Source: <https://tenor.com/en-GB/view/shit-baby-oops-going-back-cute-gif-16528249>

The Motivation



The Motivation





The Research

The Research



The Research / Applications

spring java

The Research / Applications

spring java

express
javascript

The Research / Applications

uninstrumented

spring java

express
javascript

The Research / Applications

uninstrumented

manually
instrumented

spring java

express
javascript

The Research / Applications

uninstrumented

manually
instrumented

auto
instrumented

spring java

express
javascript

Images size

	uninstrumented	manually instrumented	auto instrumented
spring java	338MB		
express javascript	166MB		

Images size

	uninstrumented	manually instrumented	auto instrumented
spring java	338MB	346MB +8MB	
express javascript	166MB	207MB +41MB	

Images size

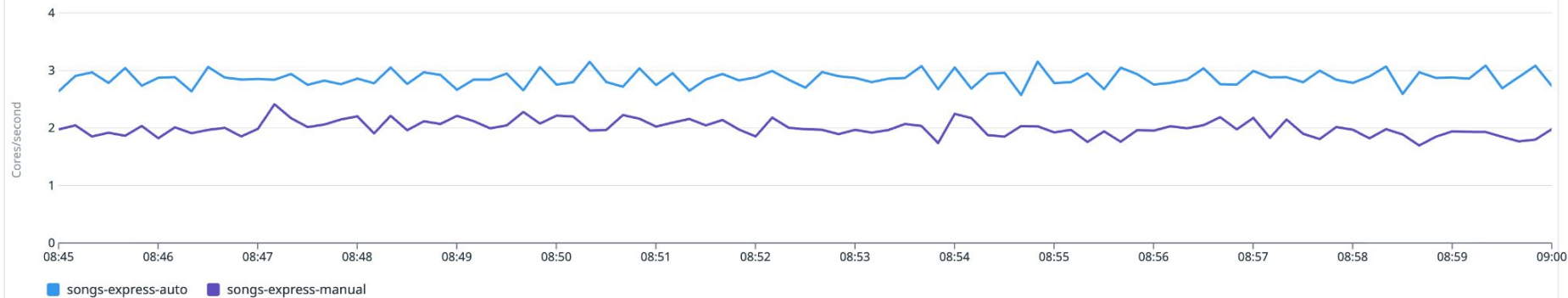
	uninstrumented	manually instrumented	auto instrumented
spring java	338MB	346MB +8MB	362MB +16MB
express javascript	166MB	207MB +41MB	241MB +34MB



The Cost of Lighting the Forest

Express (CPU usage)

sum(container.cpu.usage{container_name:*express*} by {container_name}.as_rate()



Express Manual

CPU Usage (AVG)



Express Auto

CPU Usage (AVG)



Express Manual

CPU Usage (AVG)



Express Auto

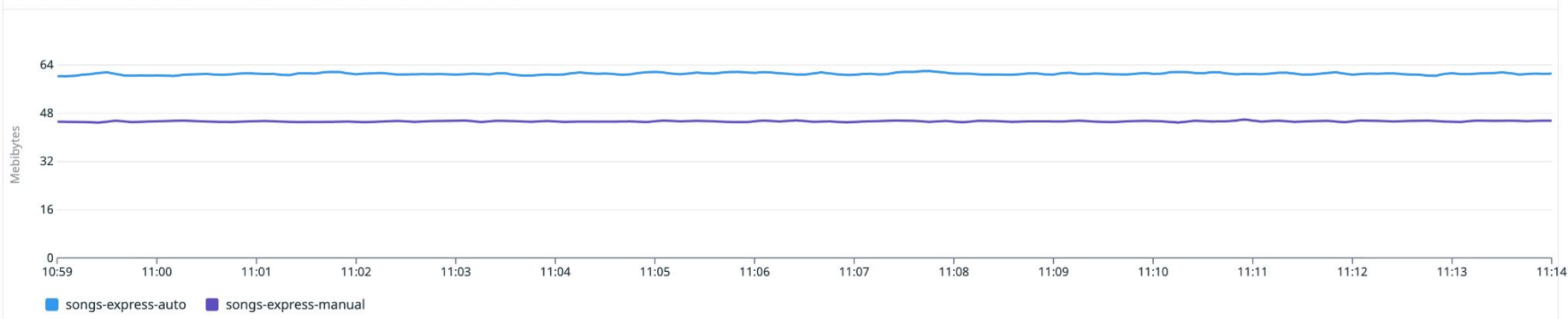
CPU Usage (AVG)



~40% increase

Express (Memory usage)

avg:container.memory.usage(container_name:*express*) by {container_name}



Express Manual

Memory Usage (AVG)

d0fc2881e137af23bf7642ad60b75cb6f7b56c6b22e711765230...

46.4 MiB



535aa3d0e8597be95ed9e732db6fe20447a8de498f460c66cd6c...

46.4 MiB



866b1ee3581e77d8e30e81f31321ee87e2b0775e3021e9648dbc...

46 MiB



Express Auto

Memory Usage (AVG)

f137facb2bedfcf59636431e0f4eca40435464eb2794ac95fad921...

63.4 MiB



8fba0d0e764ff80174d617ff76f7b77e2ded5e53e647e28d1c7b9f...

62.5 MiB



c7801f759fd589c9f6a828e9b37777a83ec87d75d35c73bdb4f57...

62.1 MiB



Express Manual

Memory Usage (AVG)

d0fc2881e137af23bf7642ad60b75cb6f7b56c6b22e711765230...

46.4 MiB



535aa3d0e8597be95ed9e732db6fe20447a8de498f460c66cd6c...

46.4 MiB



866b1ee3581e77d8e30e81f31321ee87e2b0775e3021e9648dbc...

46 MiB



Express Auto

Memory Usage (AVG)

f137facb2bedfcf59636431e0f4eca40435464eb2794ac95fad921...

63.4 MiB



8fba0d0e764ff80174d617ff76f7b77e2ded5e53e647e28d1c7b9f...

62.5 MiB



c7801f759fd589c9f6a828e9b37777a83ec87d75d35c73bdb4f57...

62.1 MiB



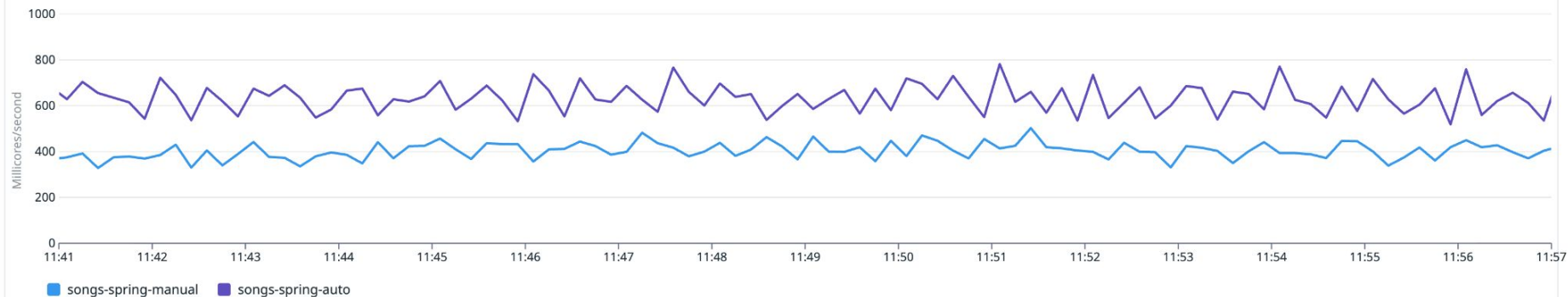
~34% increase

A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious scene. The trees are mostly bare, suggesting a late autumn or winter setting. The ground is covered in fallen leaves and some low-lying vegetation.

What about Java?

Spring (CPU usage)

container.cpu.usage, container.cpu.usage



Spring Manual

CPU Usage (AVG)

9669b5d095c11f95ab4829fb774a35dbf8ef36edafd1b063ba269...

38.6 cores/s

758.57 mcores/s

536.4 mcores/s

3f8fa58cd7187a8142faeacd1d2240ed1fc2dd6a2d384031726fbc...

33.4 cores/s

639.34 mcores/s

507.5 mcores/s

a1753fb0b4f313bcac1ae777b5e9aa6ecafca6c0bd006a5418af4b...

26.4 cores/s

468.01 mcores/s

380.4 mcores/s

Spring Auto

CPU Usage (AVG)

fcdec98a360fd0e2301f1064ea21d73166b9b50002b89f0033dc7...

44.3 cores/s

952.46 mcores/s

655.7 mcores/s

aacd16dac0901767aa8a3b90dc23f8932bb6f4baf846a47bcfcb2...

40 cores/s

830.31 mcores/s

667.2 mcores/s

e6d43ac005ebe40f1be91a9b067213c52331eb4c174b812a002c...

36.6 cores/s

741.75 mcores/s

556.3 mcores/s

Spring Manual

CPU Usage (AVG)

9669b5d095c11f95ab4829fb774a35dbf8ef36edafd1b063ba269...

38.6 cores/s

758.57 mcores/s

536.4 mcores/s

3f8fa58cd7187a8142faeacd1d2240ed1fc2dd6a2d384031726fbc...

33.4 cores/s

639.34 mcores/s

507.5 mcores/s

a1753fb0b4f313bcac1ae777b5e9aa6ecafca6c0bd006a5418af4b...

26.4 cores/s

468.01 mcores/s

380.4 mcores/s

Spring Auto

CPU Usage (AVG)

fcdec98a360fd0e2301f1064ea21d73166b9b50002b89f0033dc7...

44.3 cores/s

952.46 mcores/s

655.7 mcores/s

aacd16dac0901767aa8a3b90dc23f8932bb6f4baf846a47bcfcb2...

40 cores/s

830.31 mcores/s

667.2 mcores/s

e6d43ac005ebe40f1be91a9b067213c52331eb4c174b812a002c...

36.6 cores/s

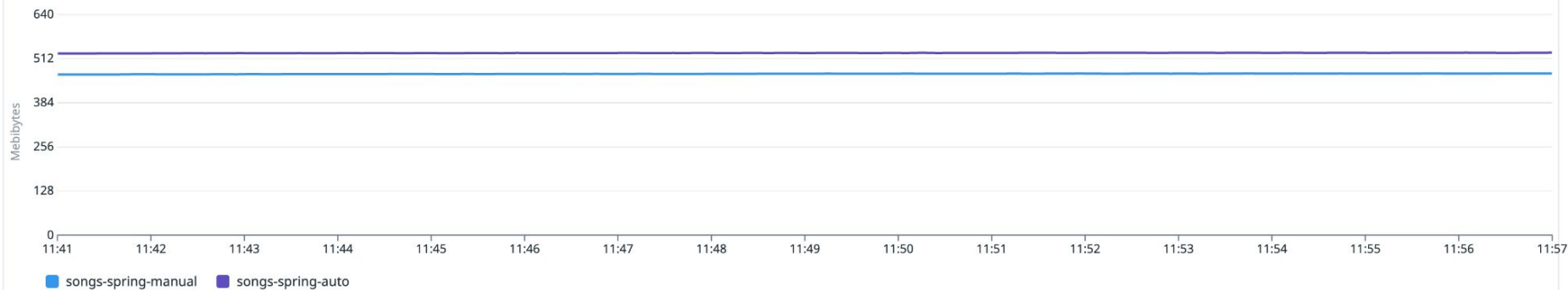
741.75 mcores/s

556.3 mcores/s

~37% increase

Spring (Memory usage)

container.memory.usage, container.memory.usage



Spring Manual

Memory Usage (AVG)

ae24503f485bdb3bfeec9c2f8082d1cd1c70cc8c748a20936f5fb...

471.3 MiB

470.05 MiB

468.1 MiB

ce11f8aeb2ab35b25313cf3166c339f79f160a94d5ff538ee22490...

470.5 MiB

469.42 MiB

467.4 MiB

b6c019ed429bb52d3577ae0639bc0aecc928717ac5e0a2942bd6...

467.3 MiB

466.2 MiB

464.3 MiB

Spring Auto

Memory Usage (AVG)

d69d62aad0d8619131b322d63cae875c3fd97bd53891e3f8ee93...

527.9 MiB

526.83 MiB

524.6 MiB

2da4bc3d35193165888a2e41d79516630937e095927ffa4706ef7...

527.5 MiB

526.57 MiB

524.4 MiB

f9973f2d4815723e430010b88d74ff56373d592282f4eb78b0be7...

524.5 MiB

523.71 MiB

521.7 MiB

Spring Manual

Memory Usage (AVG)

ae24503f485bdb3bfeec9c2f8082d1cd1c70cc8c748a20936f5fb...

471.3 MiB

470.05 MiB

468.1 MiB

ce11f8aeb2ab35b25313cf3166c339f79f160a94d5ff538ee22490...

470.5 MiB

469.42 MiB

467.4 MiB

b6c019ed429bb52d3577ae0639bc0aecc928717ac5e0a2942bd6...

467.3 MiB

466.2 MiB

464.3 MiB

Spring Auto

Memory Usage (AVG)

d69d62aad0d8619131b322d63cae875c3fd97bd53891e3f8ee93...

527.9 MiB

526.83 MiB

524.6 MiB

2da4bc3d35193165888a2e41d79516630937e095927ffa4706ef7...

527.5 MiB

526.57 MiB

524.4 MiB

f9973f2d4815723e430010b88d74ff56373d592282f4eb78b0be7...

524.5 MiB

523.71 MiB

521.7 MiB

~12% increase

A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious scene. The text "What else?" is centered in the middle of the image.

What else?

Trace Ingestion Rate - Express

Trace Ingestion Rate by service

Per second

10.4k

songs-express-manual

10.4k

songs-express-auto

Ingested Bytes - Express

Total amount of ingested bytes per Service and Env

Total

7.14 GiB

service: songs-express-auto

5.64 GiB

service: songs-express-manual

1.5 GiB

express-auto
5.64 GiB

express-manual
1.5 GiB

Ingested Bytes - Express

Total amount of ingested bytes per Service and Env

Total

7.14 GiB

service: songs-express-auto

5.64 GiB

service: songs-express-manual

1.5 GiB

express-auto
5.64 GiB

express-manual
1.5 GiB

4.14 GiB difference

Trace Ingestion Rate - Spring

Trace Ingestion Rate by service

Per second

10.4k

songs-spring-auto

10.4k

songs-spring-manual

Ingested Bytes - Spring

Total amount of ingested bytes per Service and Env

Total

7.29 GiB

service: songs-spring-auto

5.9 GiB

service: songs-spring-manual

spring-auto
5.9 GiB

spring-manual
1.38 GiB

Ingested Bytes - Spring

Total amount of ingested bytes per Service and Env

Total

7.29 GiB

service: songs-spring-auto

5.9 GiB

service: songs-spring-manual

spring-auto
5.9 GiB

spring-manual
1.38 GiB

4.52 GiB difference

A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious scene. The trees are mostly bare, suggesting a late autumn or winter setting. The ground is covered in fallen leaves and some low-lying vegetation.

What about sampling?

**Auto-instrument
100 services
with 1% of data
stored**

x

**Manually instrument
100 services
with 80% of data
stored**



imgflip.com

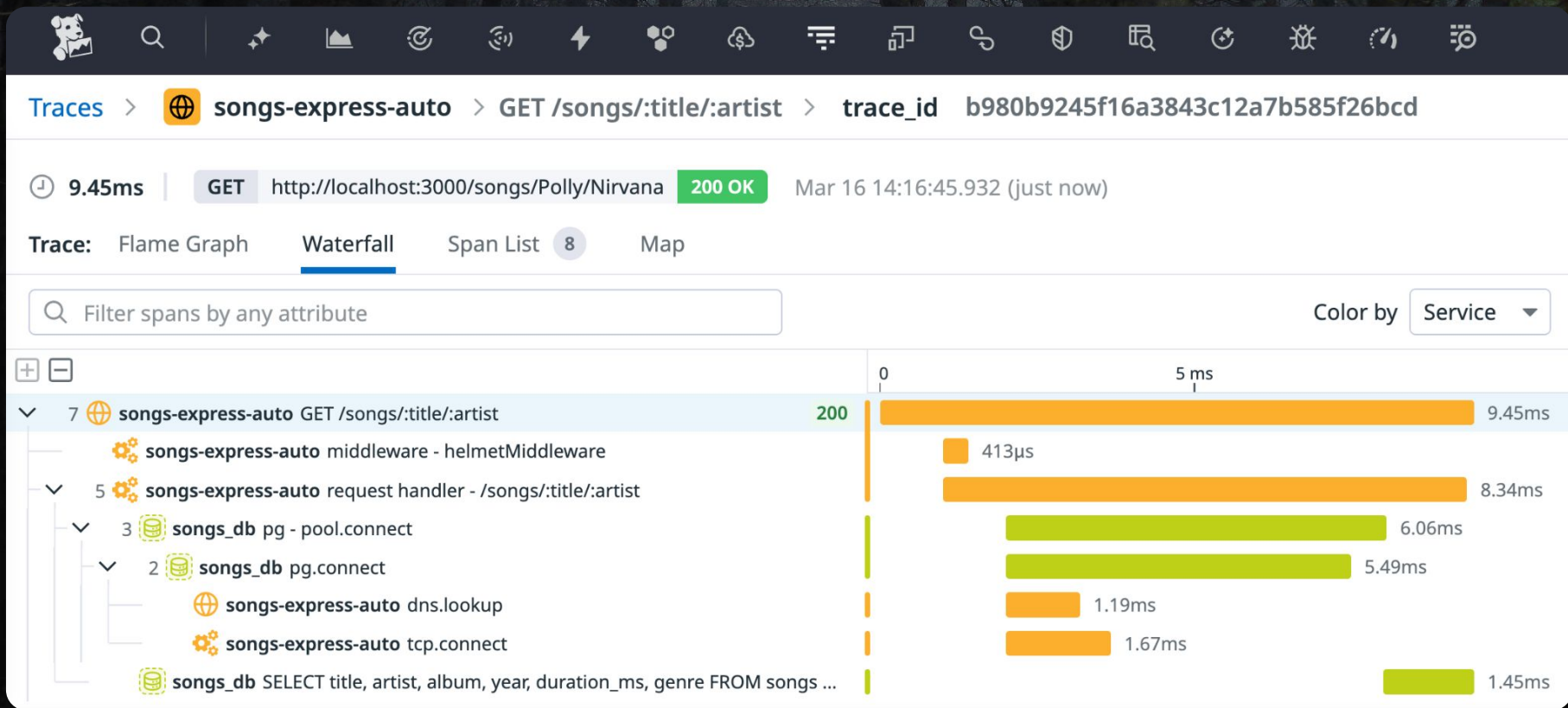
JAKE-CLARK.TUMBLR

Source: <https://imgflip.com/i/amxd4d>

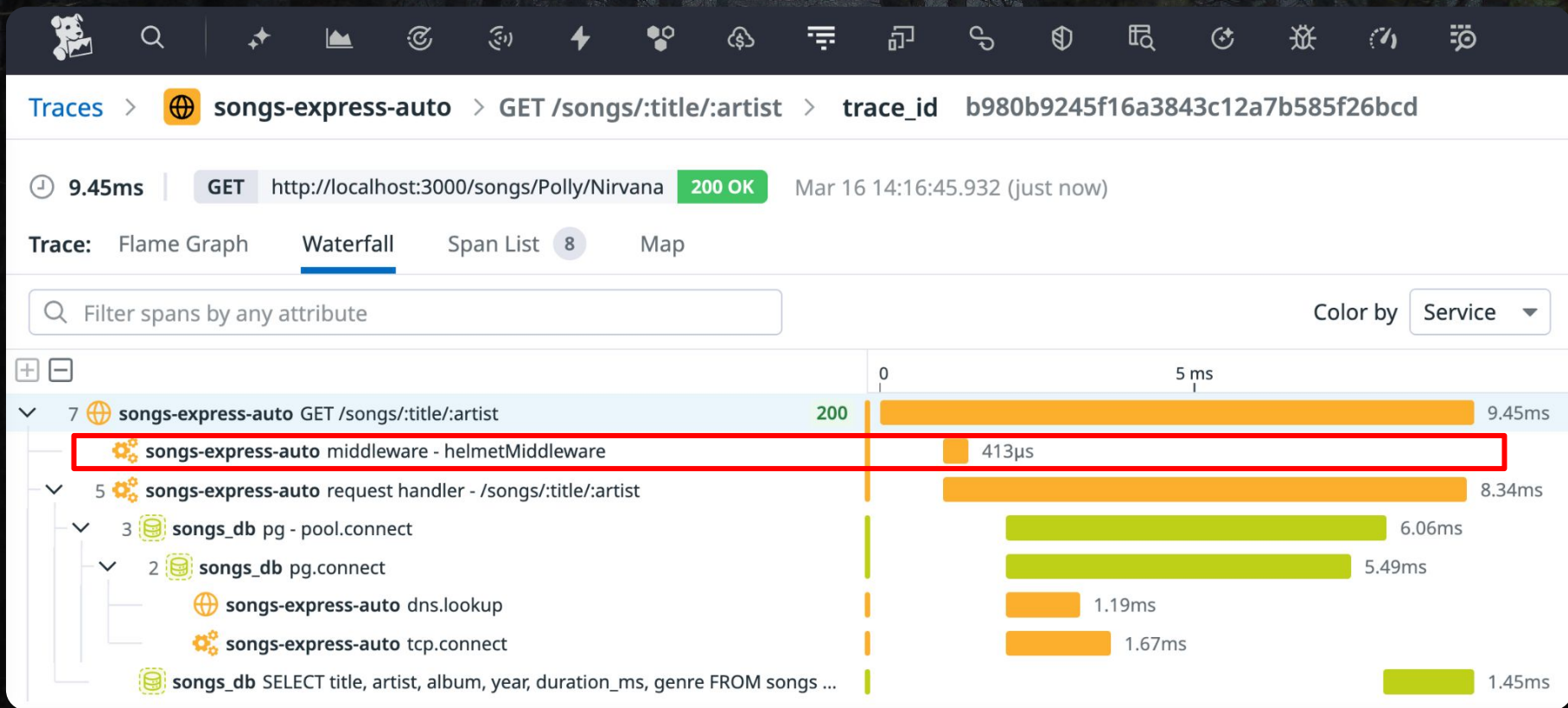


But wait, what will I miss?

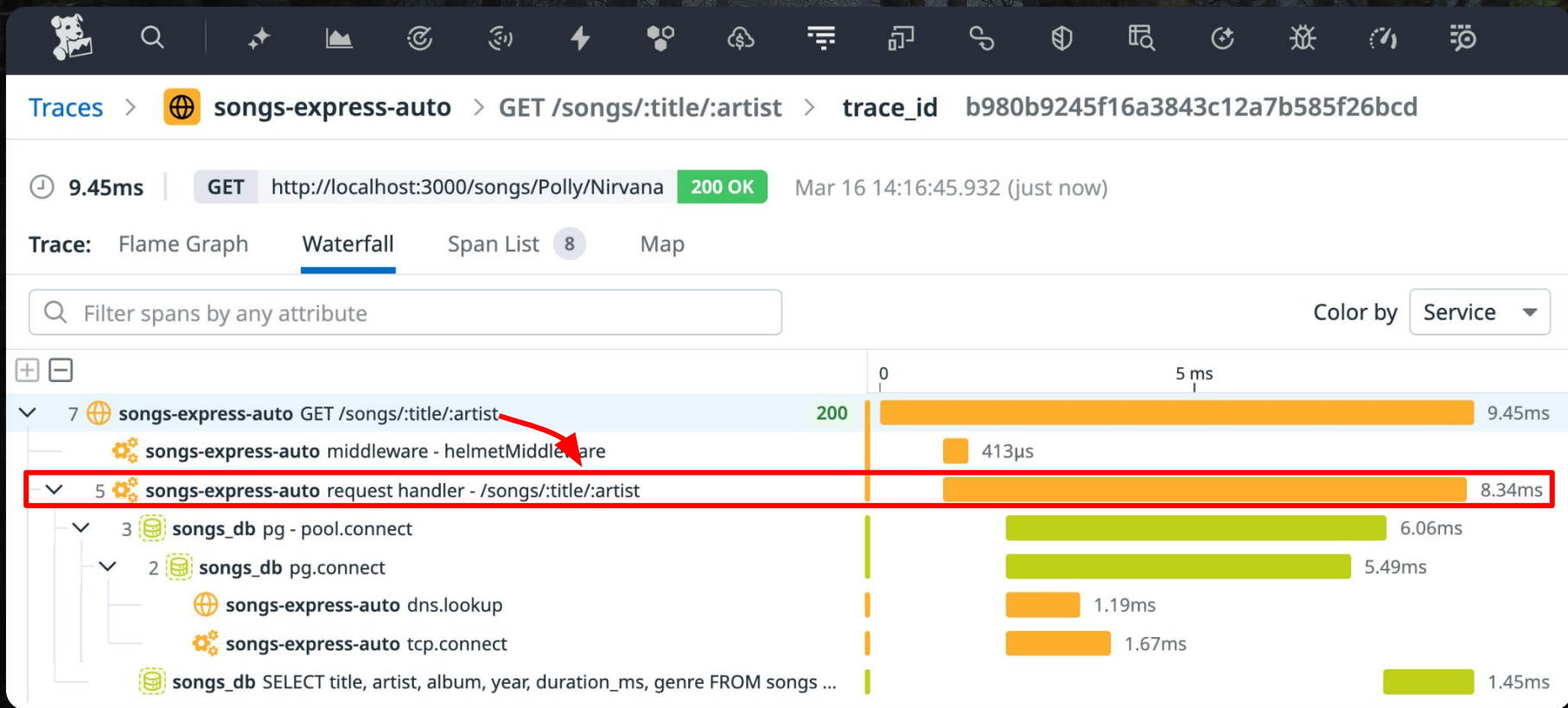
What am I missing?



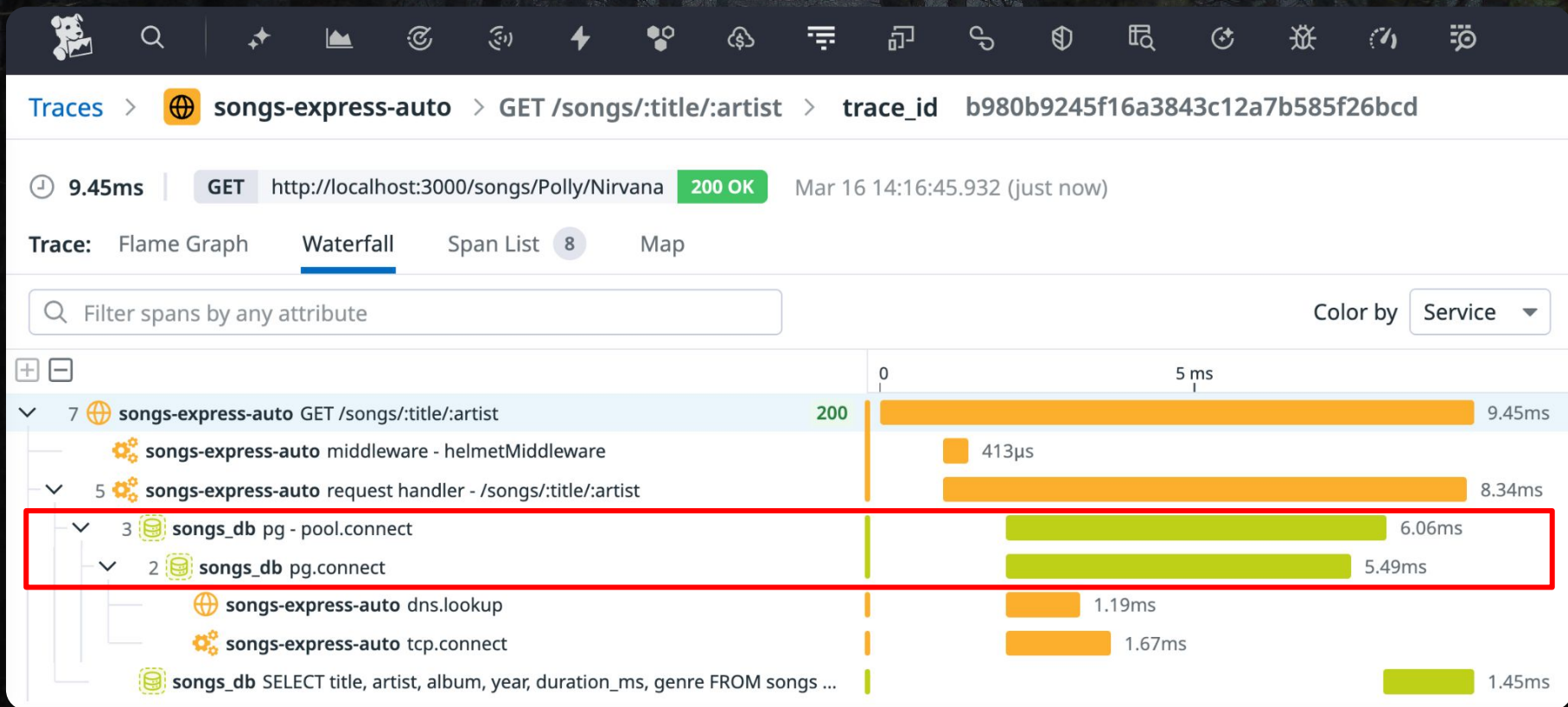
What am I missing?



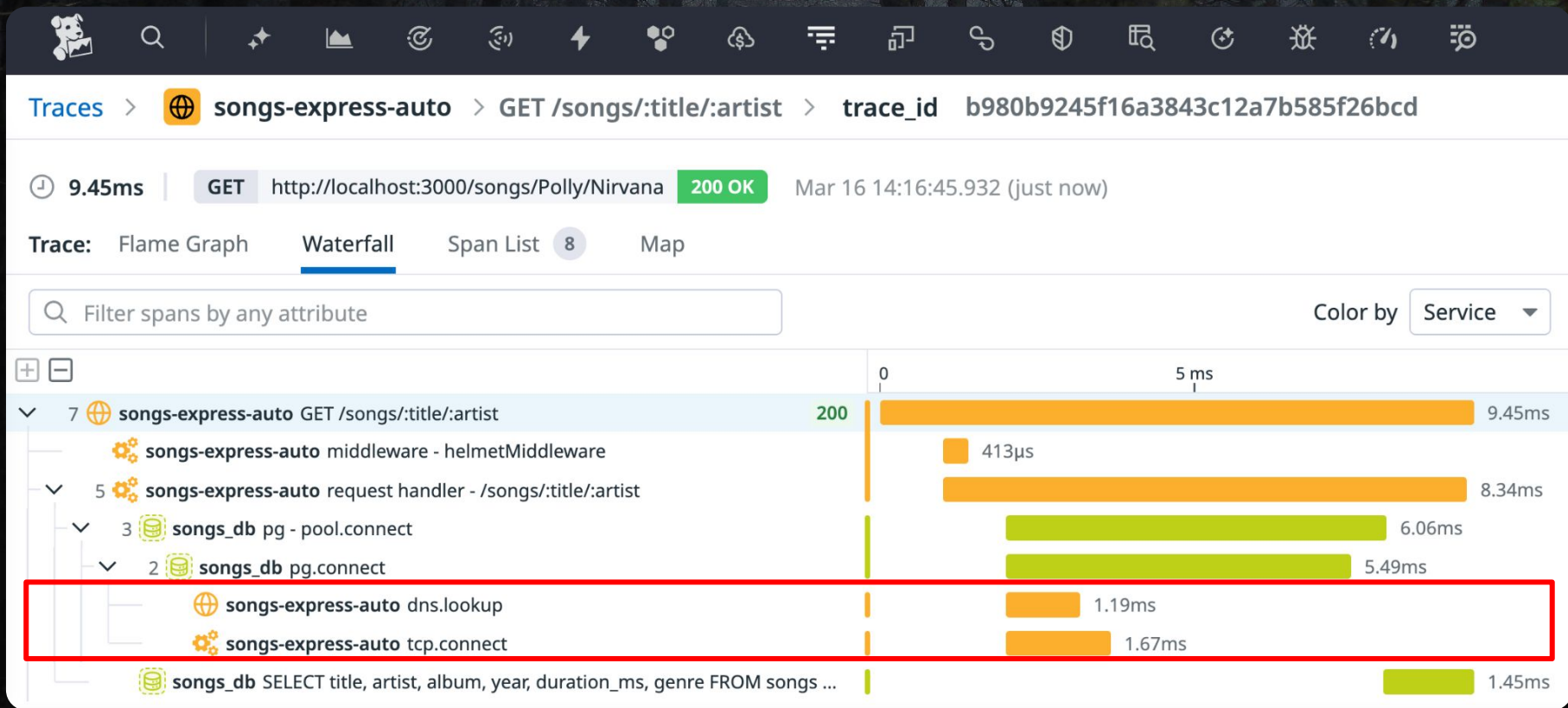
What am I missing?



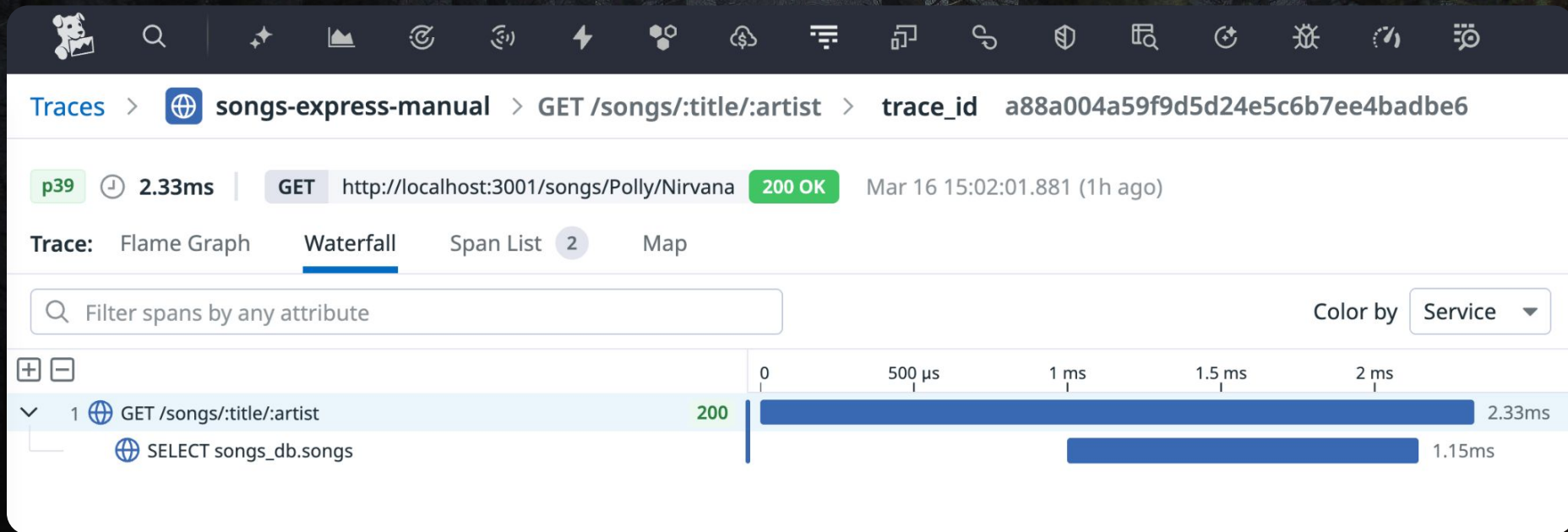
What am I missing?



What am I missing?



What am I missing?





Source: <https://tenor.com/en-GB/view/i-see-you-watch-out-balls-of-fury-karl-karl-wolfschtagg-provocation-gif-20246652>

```

  process {
    command      /app/app.js
    command_args  ["/usr/local/bin/node", "--require", "./instrumentation.js", "/app/app.js"]
    executable {
      name      node
      path      /usr/local/bin/node
    }
    owner      root
    pid        1
    runtime {
      description  Node.js
      name         nodejs
      version      24.14.0
    }
  }
}
```

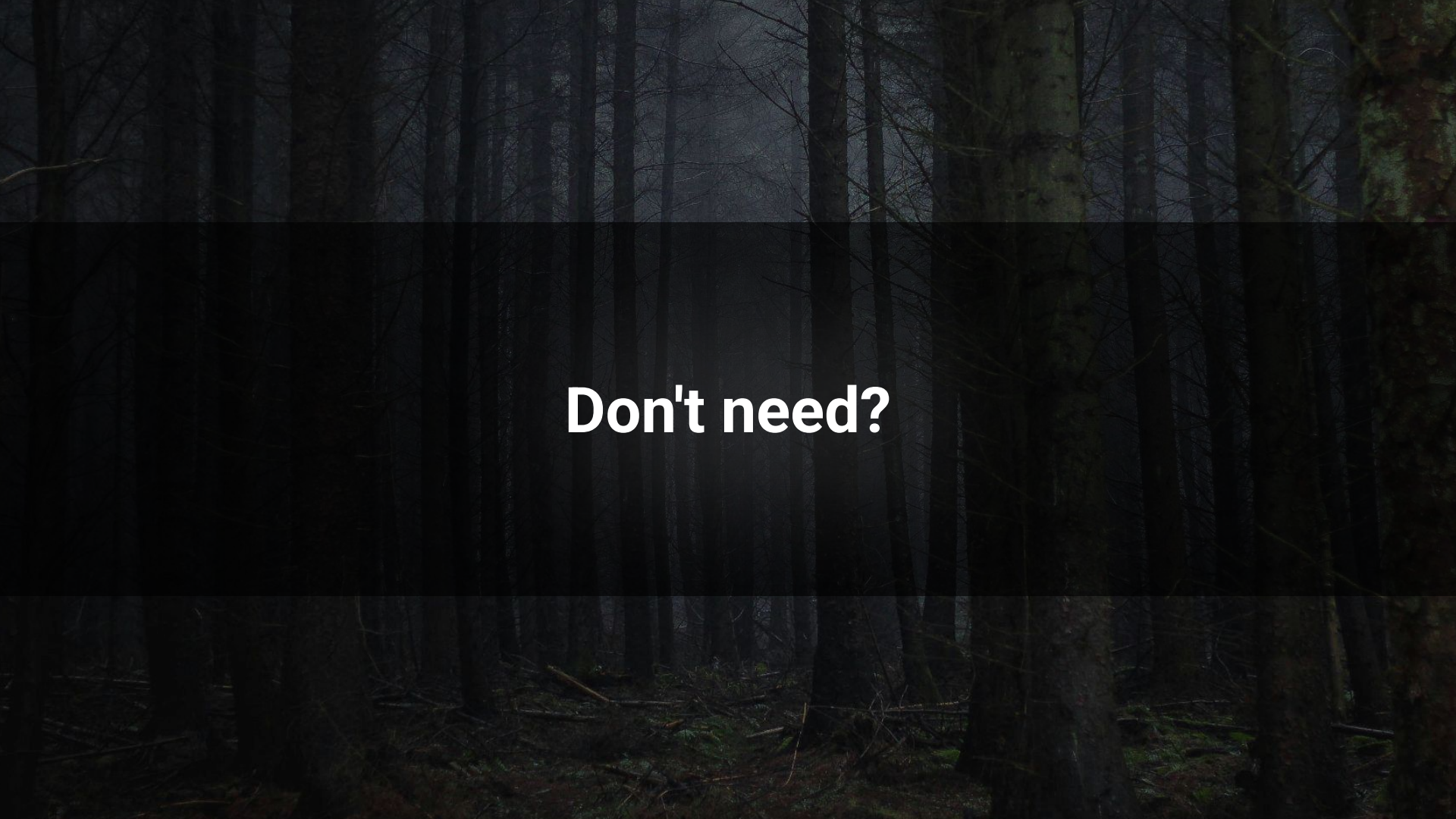
```

  process {
    command_args    ["/opt/java/openjdk/bin/java", "-jar", "app.jar"]

    executable {
      path    /opt/java/openjdk/bin/java
    }

    pid    1

    runtime {
      description    Eclipse Adoptium OpenJDK 64-Bit Server VM 25.0.2+10-LTS
      name            OpenJDK Runtime Environment
      version         25.0.2+10-LTS
    }
  }
}
```

A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious scene. The text "Don't need?" is centered in the middle of the image.

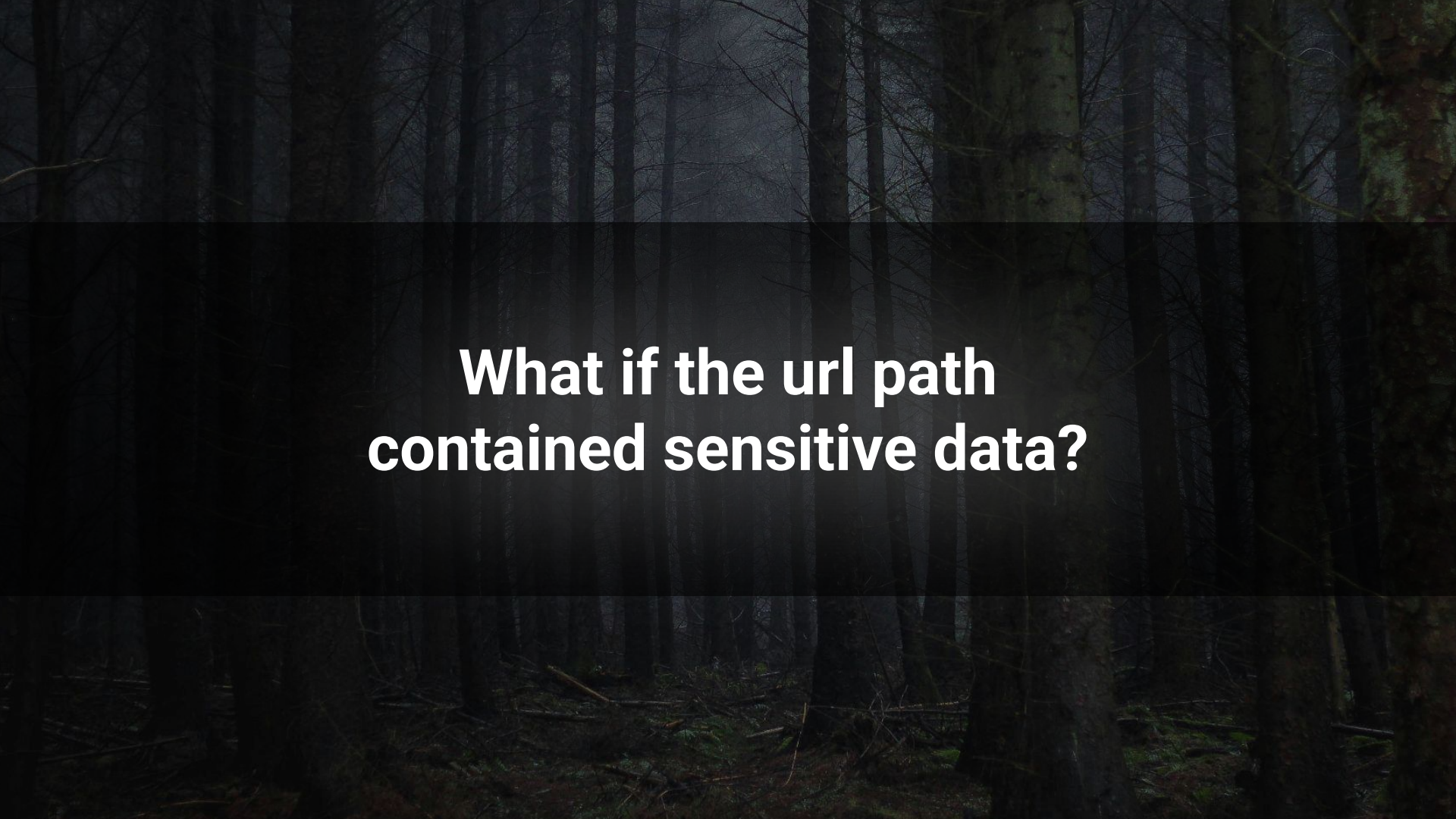
Don't need?

Disable it

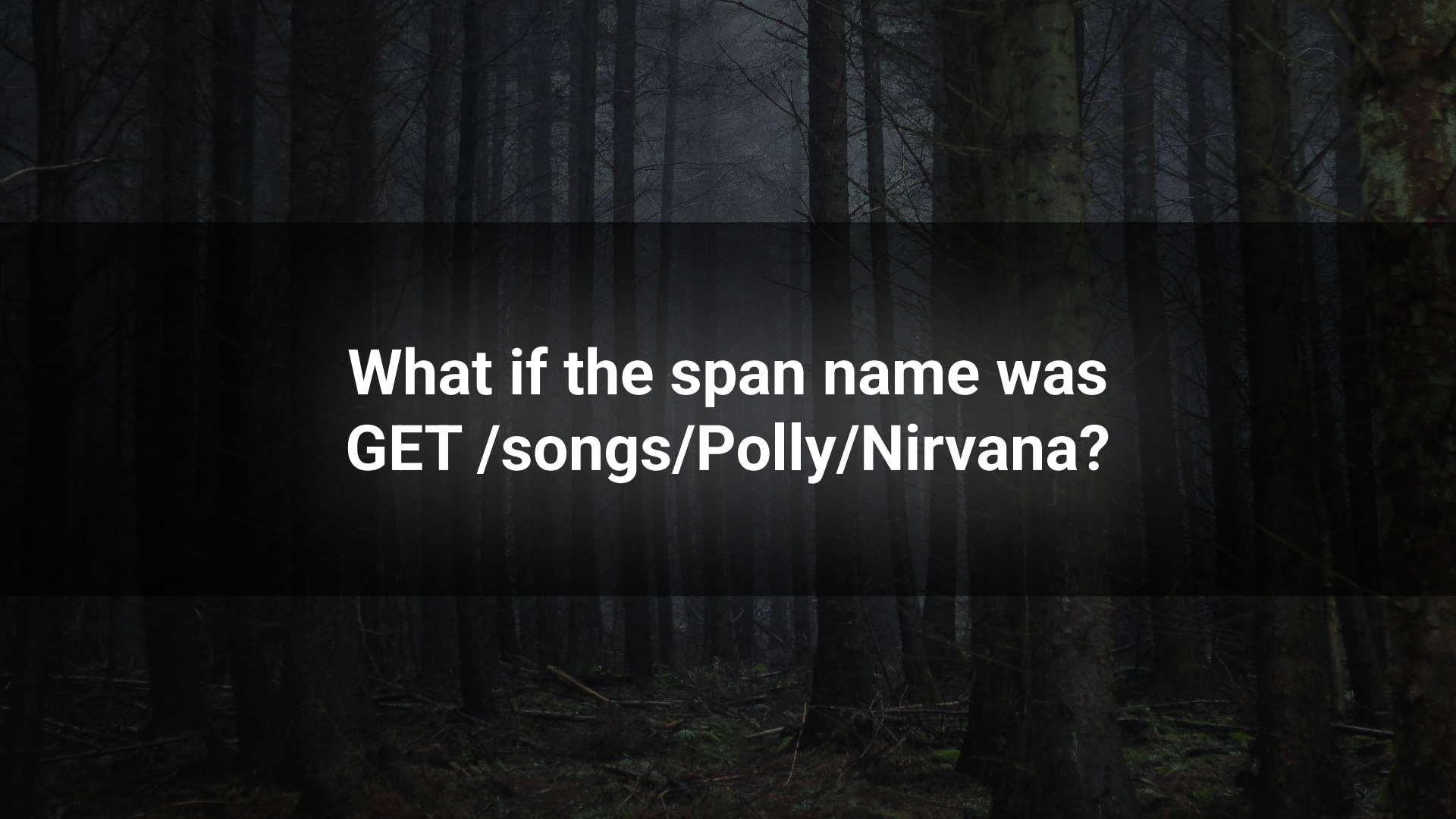
```
OTEL_NODE_RESOURCE_DETECTORS=env,host
```

<https://opentelemetry.io/docs/zero-code/js/configuration/#sdk-resource-detector-configuration>

```
✓ http {  
  flavor          1.1  
  host            localhost:3000  
  method          GET  
  route           /songs/:title/:artist  
  scheme          http  
  status_code     200  
  status_text     OK  
  target          /songs/Polly/Nirvana  
  url             http://localhost:3000/songs/Polly/Nirvana  
  user_agent      curl/8.7.1  
}
```

A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious scene. The trees are mostly bare, suggesting a late autumn or winter setting. The ground is covered in fallen leaves and some low-lying vegetation.

**What if the url path
contained sensitive data?**



**What if the span name was
GET /songs/Polly/Nirvana?**

A dark, atmospheric photograph of a forest with many thin, vertical tree trunks. The lighting is low, creating a moody and mysterious scene. The trees are mostly bare, suggesting a late autumn or winter setting. The ground is covered in fallen leaves and some low-lying vegetation.

The OTel Collector

Filtering out

```
processors:  
  filter/ottl:  
    error_mode: ignore  
    traces:  
      span:  
        - IsMatch(instrumentation_scope.name, "@opentelemetry/instrumentation-net")  
        - IsMatch(instrumentation_scope.name, "@opentelemetry/instrumentation-dns")
```

Transforming

```
processors:  
  transform:  
    error_mode: ignore  
    trace_statements:  
      - context: span  
        statements:  
          - replace_pattern(name, "\\?.*", "")  
          - replace_match(name, "GET /api/products/*", "GET /api/products/{productId}")
```

Collector CPU usage (AVG)

Total

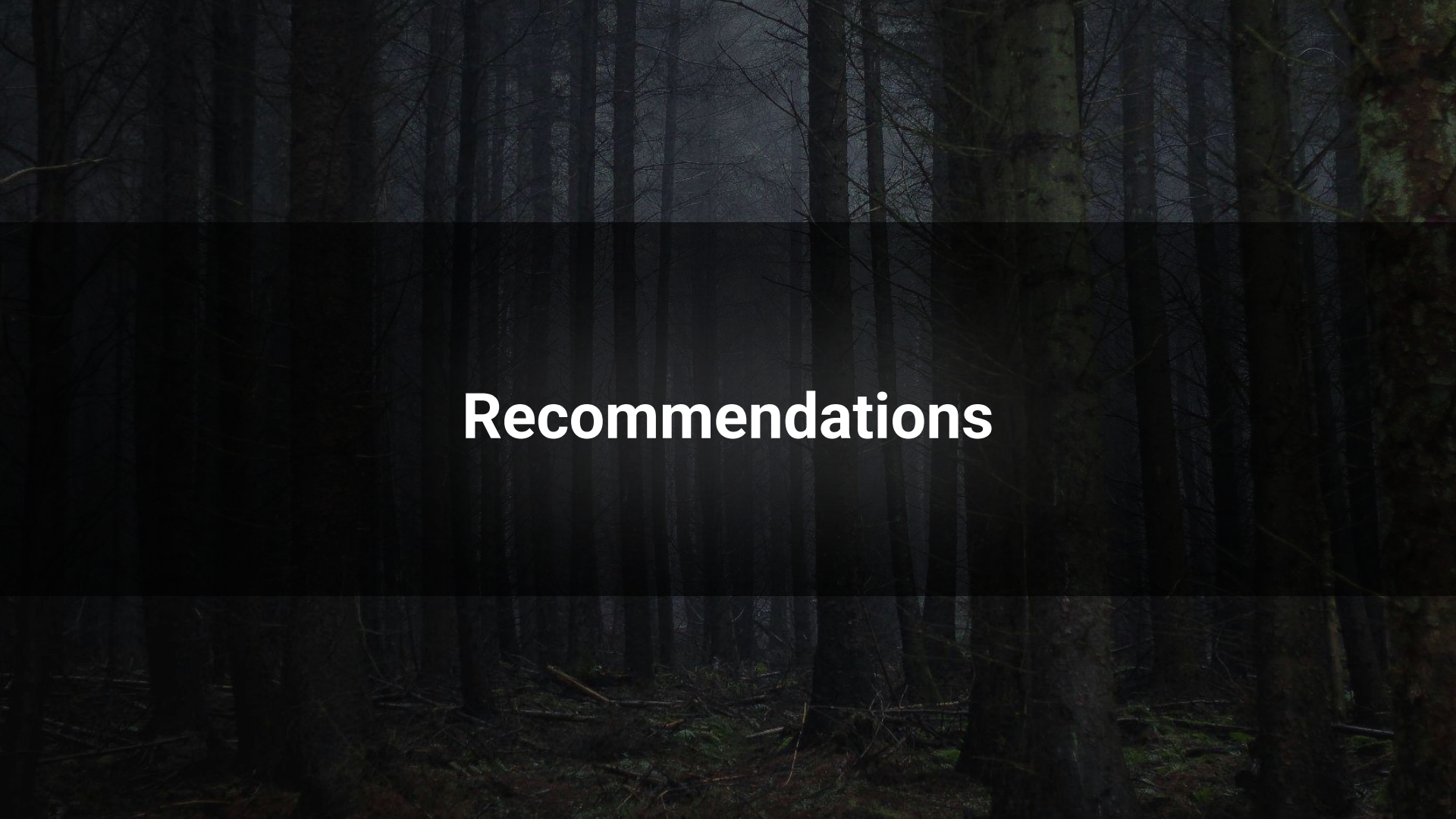
3.93 mcores/s

spring-auto

2.44 mcores/s

spring-manual

1.49 mcores/s

A dark, atmospheric photograph of a forest with tall, thin trees and a misty or foggy background. A solid black horizontal band runs across the middle of the image, serving as a background for the text.

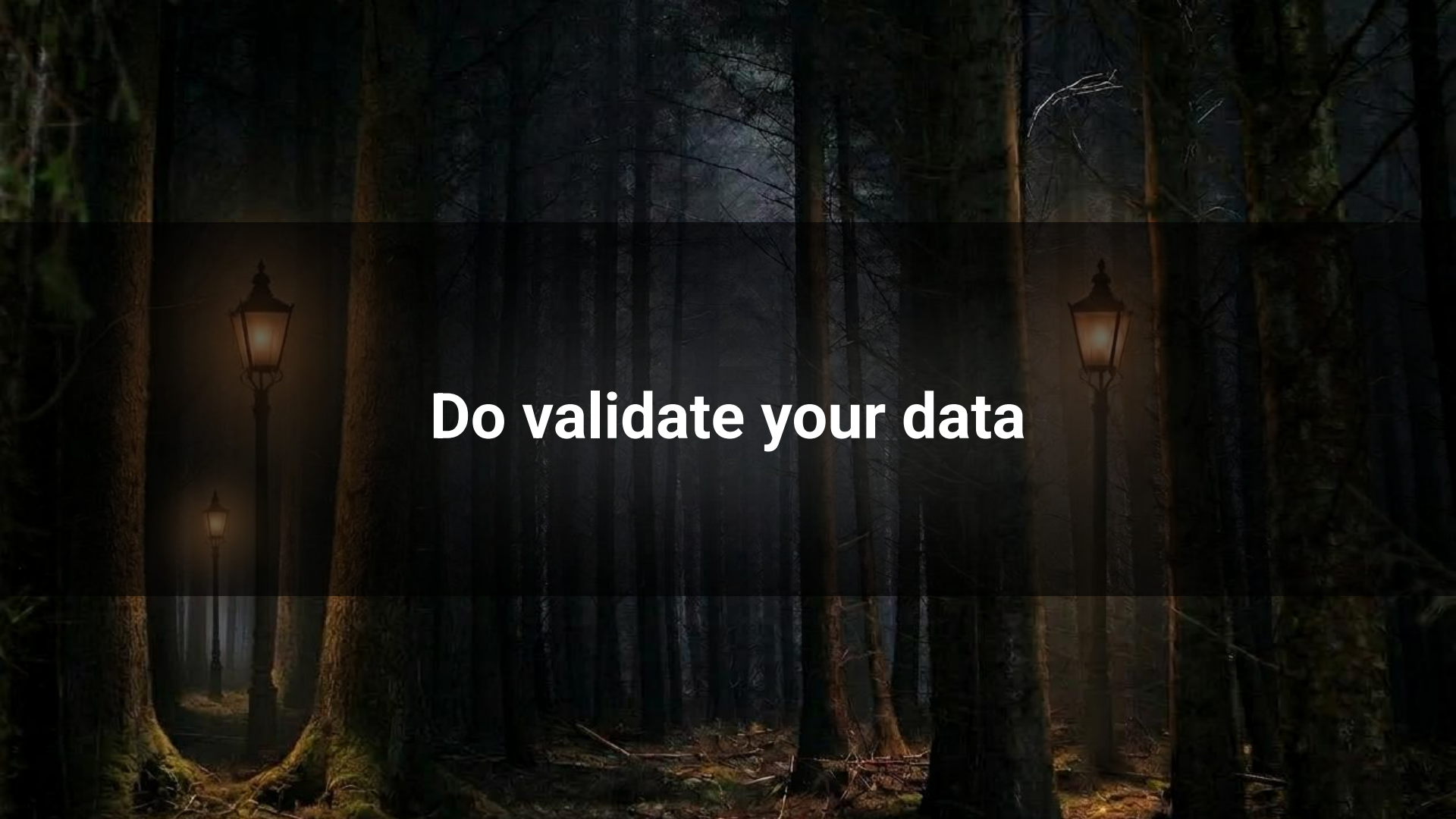
Recommendations

A dark, misty forest at night. Tall, thin trees are visible in the background, and a single lit street lamp stands on the right side, casting a warm glow. The text is centered in the middle of the image.

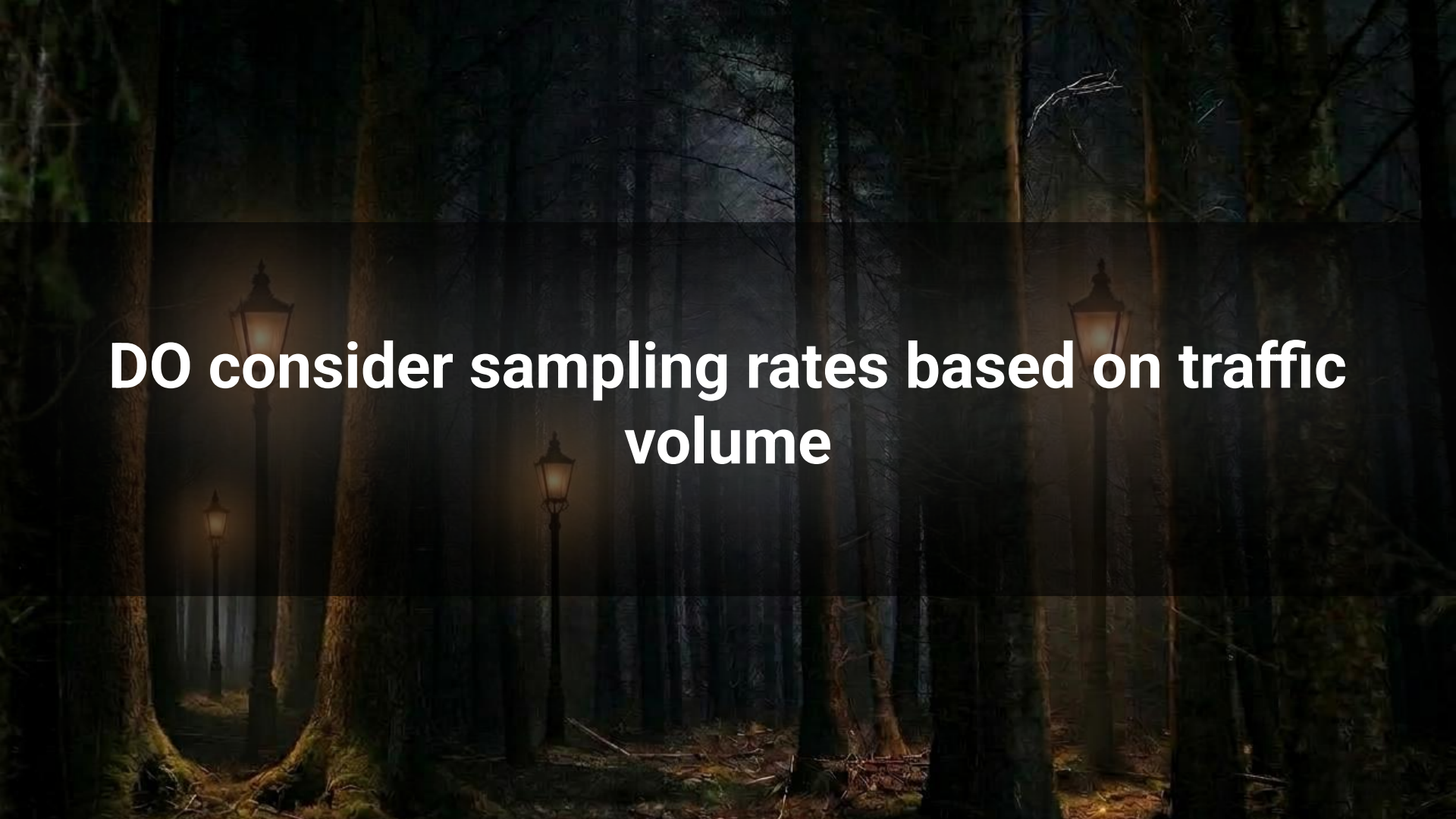
**DO define observability goals before
instrumenting**

A dark, misty forest at night. Two glowing street lamps are positioned on either side of the central text, casting a warm light on the surrounding trees and fog. The forest floor is covered in fallen leaves and branches, and the trees are tall and slender, their trunks illuminated by the ambient light.

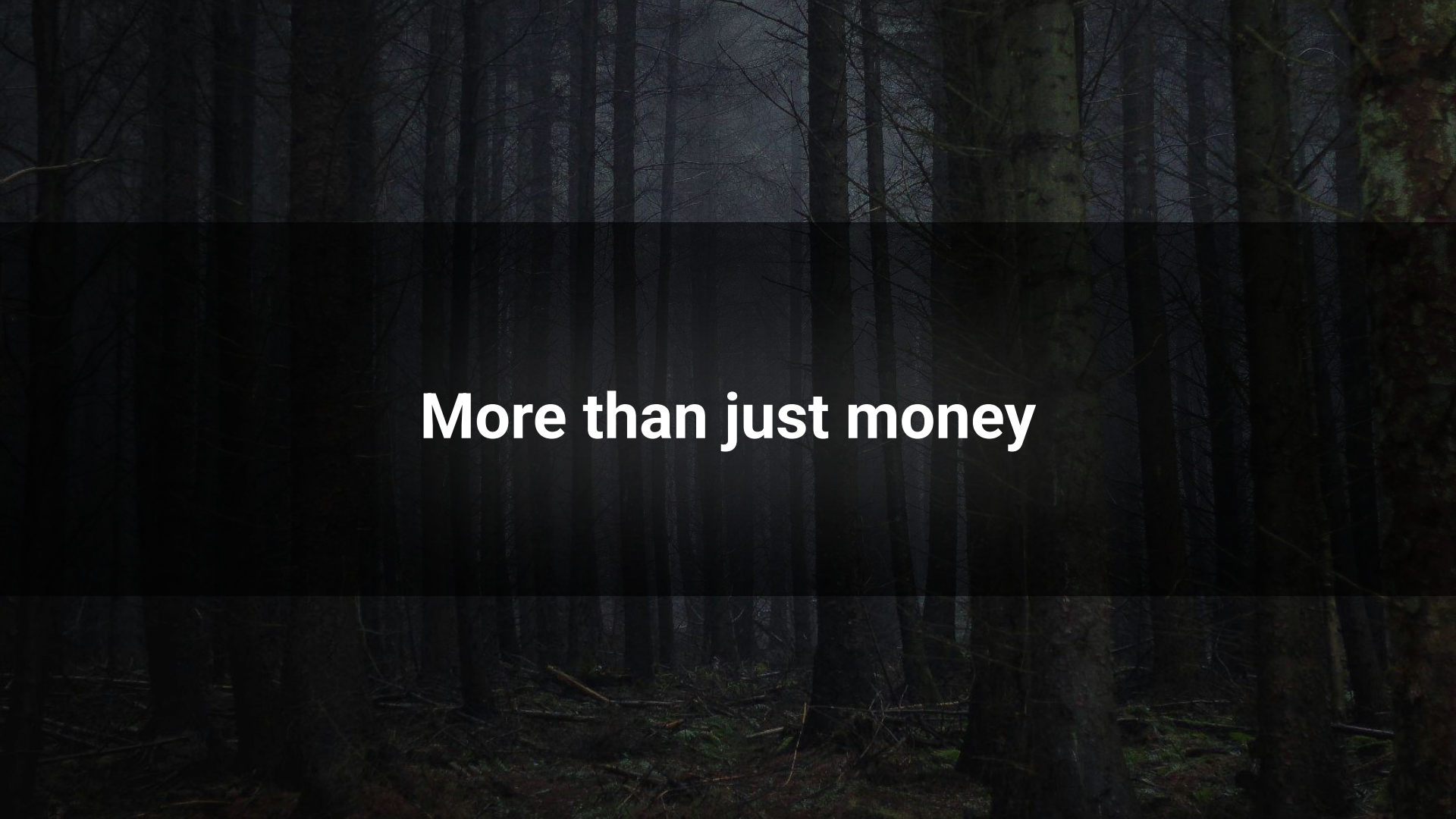
DO instrument with purpose

A dark, misty forest at night. Several tall, thin trees stand in the background. In the foreground, there are three glowing street lamps. The lamp on the left is partially obscured by a large tree trunk. The lamp in the center is the most prominent, and the lamp on the right is also visible. The ground is covered in fallen leaves and branches. The overall atmosphere is mysterious and eerie.

Do validate your data

A dark, misty forest at night. Several tall, thin trees stand in the background. In the foreground, there are several glowing street lamps on tall poles, casting a warm, yellow light. The ground is covered in fallen leaves and branches. The overall atmosphere is mysterious and eerie.

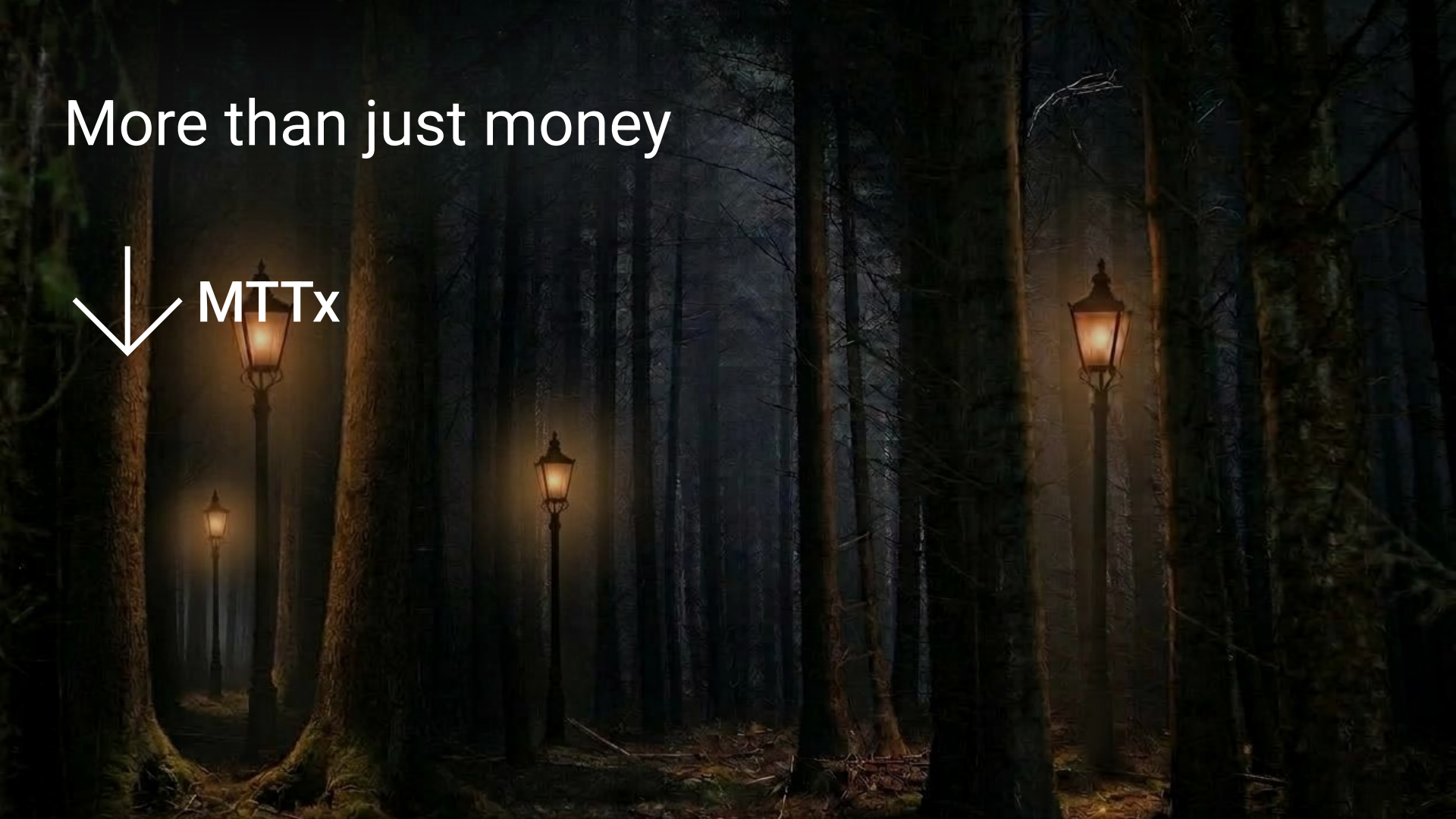
DO consider sampling rates based on traffic volume



More than just money

More than just money

↓ MTTx



More than just money



More than just money

↓ MTTx

⊙ Data

⌋ Efficient pipelines

More than just money



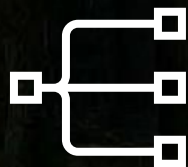
MTTx



Happier customers



Data



Efficient pipelines

More than just money



MTTx



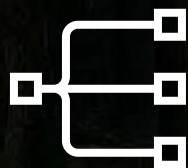
Happier customers



Data

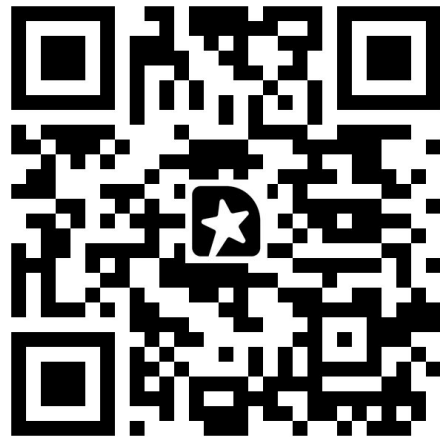


Team mental health



Efficient pipelines

Thank you



How manual OTel instrumentation saves more than just money

Share your feedback with us



Repository with all tests