elastic | The Search AI Company

# Open source observability z OpenTelemetry i Elasticsearch

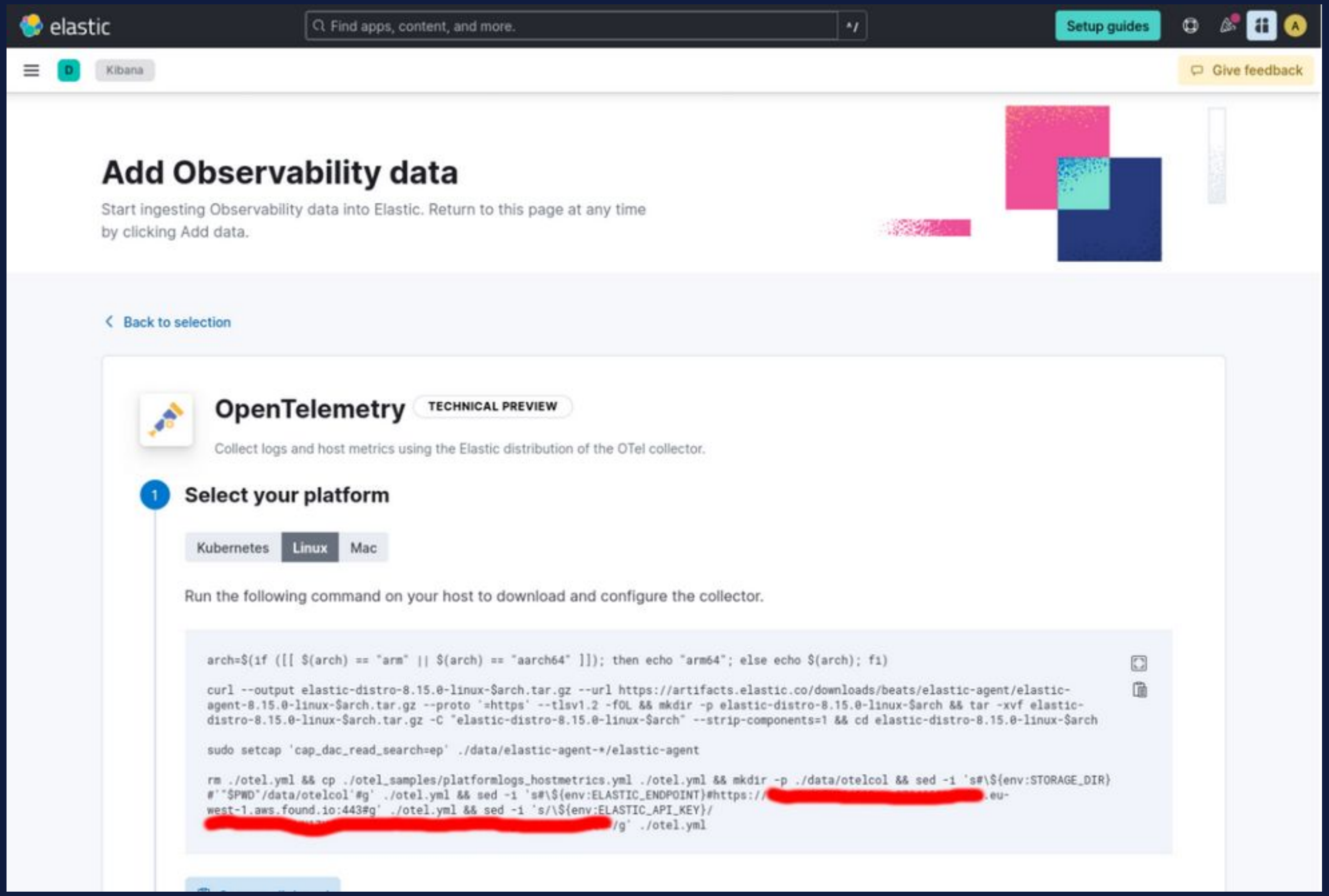
Andrzej Stencel

SysOps/DevOps Meetup

Poznań, 21 listopada 2024

# DEMO:

## Infrastructure monitoring with OpenTelemetry and Elasticsearch



### Add Observability data

Start ingesting Observability data into Elastic. Return to this page at any time by clicking Add data.

### OpenTelemetry

Collect logs and host metrics using the Elastic distribution of the OTel collector.

1 Select your platform

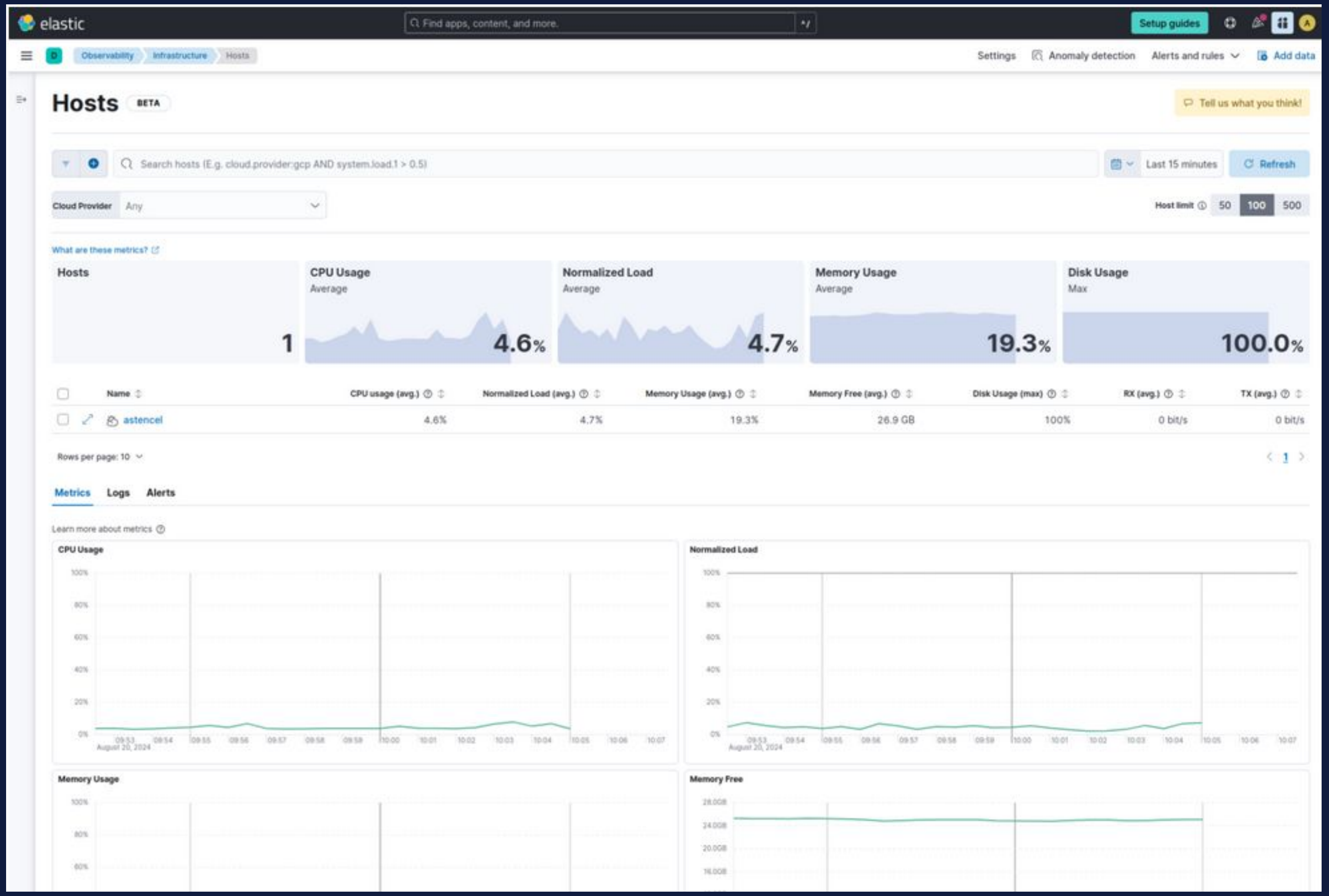
Run the following command on your host to download and configure the collector.

```
arch=$(if ([[ $(arch) == "arm" || $(arch) == "aarch64" ]]); then echo "arm64"; else echo $(arch); fi)

curl --output elastic-distro-8.15.0-linux-$arch.tar.gz --url https://artifacts.elastic.co/downloads/beats/elastic-agent/elastic-
agent-8.15.0-linux-$arch.tar.gz --proto '=https' --tlsv1.2 -fOL && mkdir -p elastic-distro-8.15.0-linux-$arch && tar -xvf elastic-
distro-8.15.0-linux-$arch.tar.gz -C "elastic-distro-8.15.0-linux-$arch" --strip-components=1 && cd elastic-distro-8.15.0-linux-$arch

sudo setcap 'cap_dac_read_search=ep' ./data/elastic-agent-*/elastic-agent

rm ./otel.yml && cp ./otel_samples/platformlogs_hostmetrics.yml ./otel.yml && mkdir -p ./data/otelcol && sed -i 's#\${env:STORAGE_DIR}
#'"$PWD"/data/otelcol'#g' ./otel.yml && sed -i 's#\${env:ELASTIC_ENDPOINT}#https://[redacted].eu-
west-1.aws.found.io:443#g' ./otel.yml && sed -i 's/\${env:ELASTIC_API_KEY}/
[redacted]/g' ./otel.yml
```



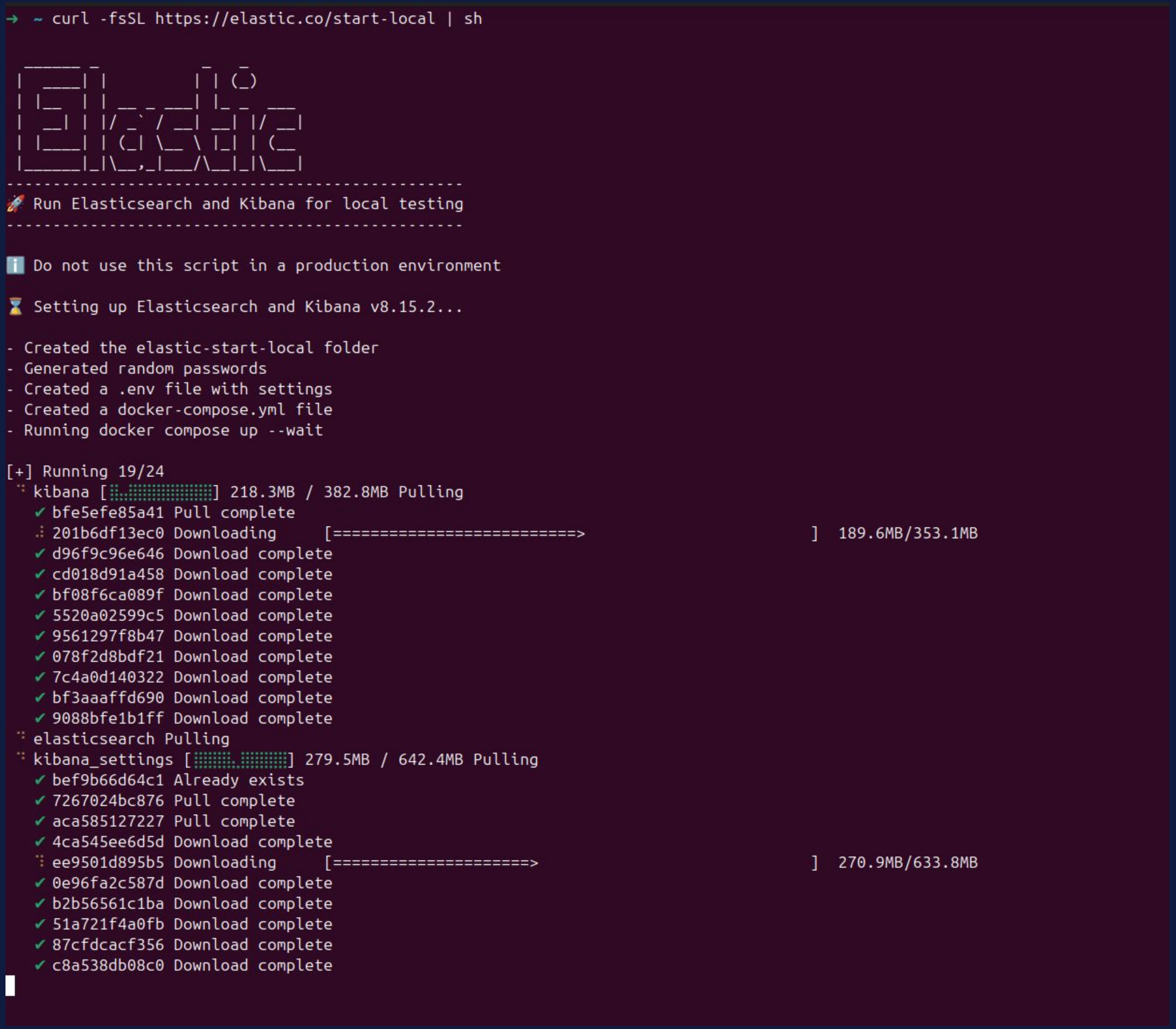
| Name | CPU usage (avg.) | Normalized Load (avg.) | Memory Usage (avg.) | Memory Free (avg.) | Disk Usage (max) | RX (avg.) | TX (avg.) |
|---|---|---|---|---|---|---|---|
| astencel | 4.6% | 4.7% | 19.3% | 26.9 GB | 100% | 0 bit/s | 0 bit/s |

Announcement: https://www.elastic.co/blog/whats-new-elastic-observability-8-15-0#introducing-the-elastic-distro-for-opentelemetry-collector

Walkthrough: https://andrzej-stencel.github.io/2024/08/28/elastic-distro-with-elastic-cloud.html

# Start Elasticsearch and Kibana locally

$ curl -fsSL https://elastic.co/start-local | sh



```
➜  ~ curl -fsSL https://elastic.co/start-local | sh

  ______ _           _   _
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 |______|_|\__,_|___/\__|_|\___|
-------------------------------------------------
🚀 Run Elasticsearch and Kibana for local testing
-------------------------------------------------

ℹ️ Do not use this script in a production environment

⌛ Setting up Elasticsearch and Kibana v8.15.2...

- Created the elastic-start-local folder
- Generated random passwords
- Created a .env file with settings
- Created a docker-compose.yml file
- Running docker compose up --wait

[+] Running 19/24
 ⠹ kibana [⣿⣀⣿⣿⣿⣿⣿⣿⣿⣿⣿] 218.3MB / 382.8MB Pulling
   ✔ bfe5efe85a41 Pull complete
   ⠼ 201b6df13ec0 Downloading     [==========================>                         ]  189.6MB/353.1MB
   ✔ d96f9c96e646 Download complete
   ✔ cd018d91a458 Download complete
   ✔ bf08f6ca089f Download complete
   ✔ 5520a02599c5 Download complete
   ✔ 9561297f8b47 Download complete
   ✔ 078f2d8bdf21 Download complete
   ✔ 7c4a0d140322 Download complete
   ✔ bf3aaaffd690 Download complete
   ✔ 9088bfe1b1ff Download complete
 ⠹ elasticsearch Pulling
 ⠹ kibana_settings [⣿⣿⣿⣿⣀⣿⣿⣿⣿⣿] 279.5MB / 642.4MB Pulling
   ✔ bef9b66d64c1 Already exists
   ✔ 7267024bc876 Pull complete
   ✔ aca585127227 Pull complete
   ✔ 4ca545ee6d5d Download complete
   ⠹ ee9501d895b5 Downloading     [=====================>                              ]  270.9MB/633.8MB
   ✔ 0e96fa2c587d Download complete
   ✔ b2b56561c1ba Download complete
   ✔ 51a721f4a0fb Download complete
   ✔ 87cfdcacf356 Download complete
   ✔ c8a538db08c0 Download complete
█
```

Run Elasticsearch locally | Elasticsearch Guide

# Pozwólcie, że się przedstawię

## Andrzej Stencel

Senior Software Engineer at Elastic

Maintainer w projekcie OpenTelemetry Collector Contrib

Link do slajdów:

https://andrzej-stencel.github.io/2024/11/21/sysops-devops-meetup.html

# Ręce do góry:

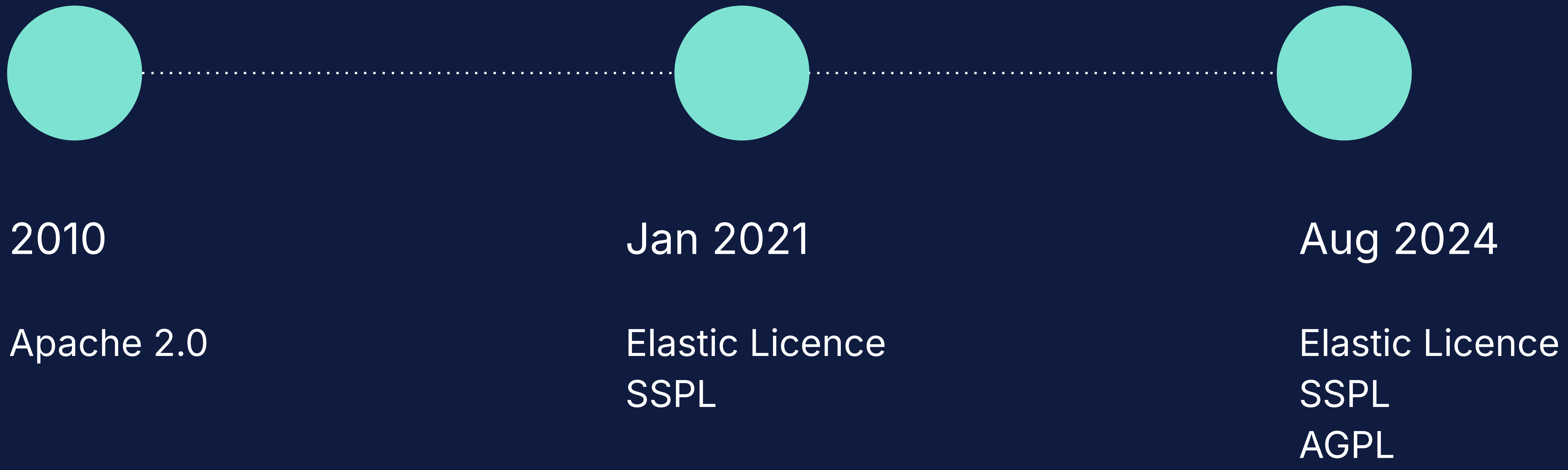
Czy słyszałeś o OpenTelemetry?

Czy używałeś OpenTelemetry w pracy?

Czy używałeś OpenTelemetry na produkcji?

# 🎉 Elasticsearch is open source again 🎉

https://www.elastic.co/blog/elasticsearch-is-open-source-again



2010

Apache 2.0

Jan 2021

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Aug 2024

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# Observability? Znaczy co?

> Observability is the ability to understand the internal state of a system by examining its outputs. In the context of software, this means being able to understand the internal state of a system by examining its telemetry data, which includes traces, metrics, and logs.

OpenTelemetry docs

# OpenTelemetry - dlaczego?

- Vendor neutral specification, implementation
- Interoperability thanks to a standard protocol - OTLP
- Vendor-neutral telemetry with OTel semantic conventions
- Already rich, growing ecosystem
  - (auto-)instrumentation libraries
  - OpenTelemetry Operator
  - OpenTelemetry Kube Stack
  -

https://opentelemetry.io/docs/what-is-opentelemetry/#why-opentelemetry

# OpenTelemetry Collector:
## File Log receiver

```
receivers:
  filelog:
    include:
      - /var/log/*.log
    exclude:
      - /var/log/kern.log
    start_at: beginning     # the default is “end”
    storage: file_storage
```

# OpenTelemetry Collector:
## Host Metrics receiver

```
receivers:
  hostmetrics:
    collection_interval: 10s
    scrapers:
      cpu:
        metrics:
          system.cpu.time:
            enabled: false
          system.cpu.utilization:
            enabled: true
```

# OpenTelemetry Collector: More receivers

- Core receivers: OTLP, Nop
- Contrib receivers

# OpenTelemetry Collector:
# Elasticsearch exporter

```
exporters:
  elasticsearch:
    endpoint: "http://localhost:9200"
    api_key: ${env:ES_API_KEY}
    flush:
      interval: 1s
    mapping:
      mode: ecs
    logs_dynamic_index:
      enabled: true
    metrics_dynamic_index:
      enabled: true
    traces_dynamic_index:
      enabled: true
```

# OpenTelemetry Collector:
# Debug exporter

```
exporters:
  debug:
    use_internal_logger: true
    verbosity: normal            # basic, detailed
```

Use `use_internal_logger: false` to:

- prevent sampling of exporter's output
- prevent output from disappearing when `service::telemetry::log::level` is set to `warn` or `error`
- separate output from collector logs and redirect to a file with `> debug-output.txt`

# OpenTelemetry Collector: More exporters

- Core: OTLP, OTLP/HTTP, Nop

- Contrib exporters

# OpenTelemetry Collector:
## File Storage extension

```
extensions:
  file_storage:
    create_directory: true
    directory: ./otel-data
```

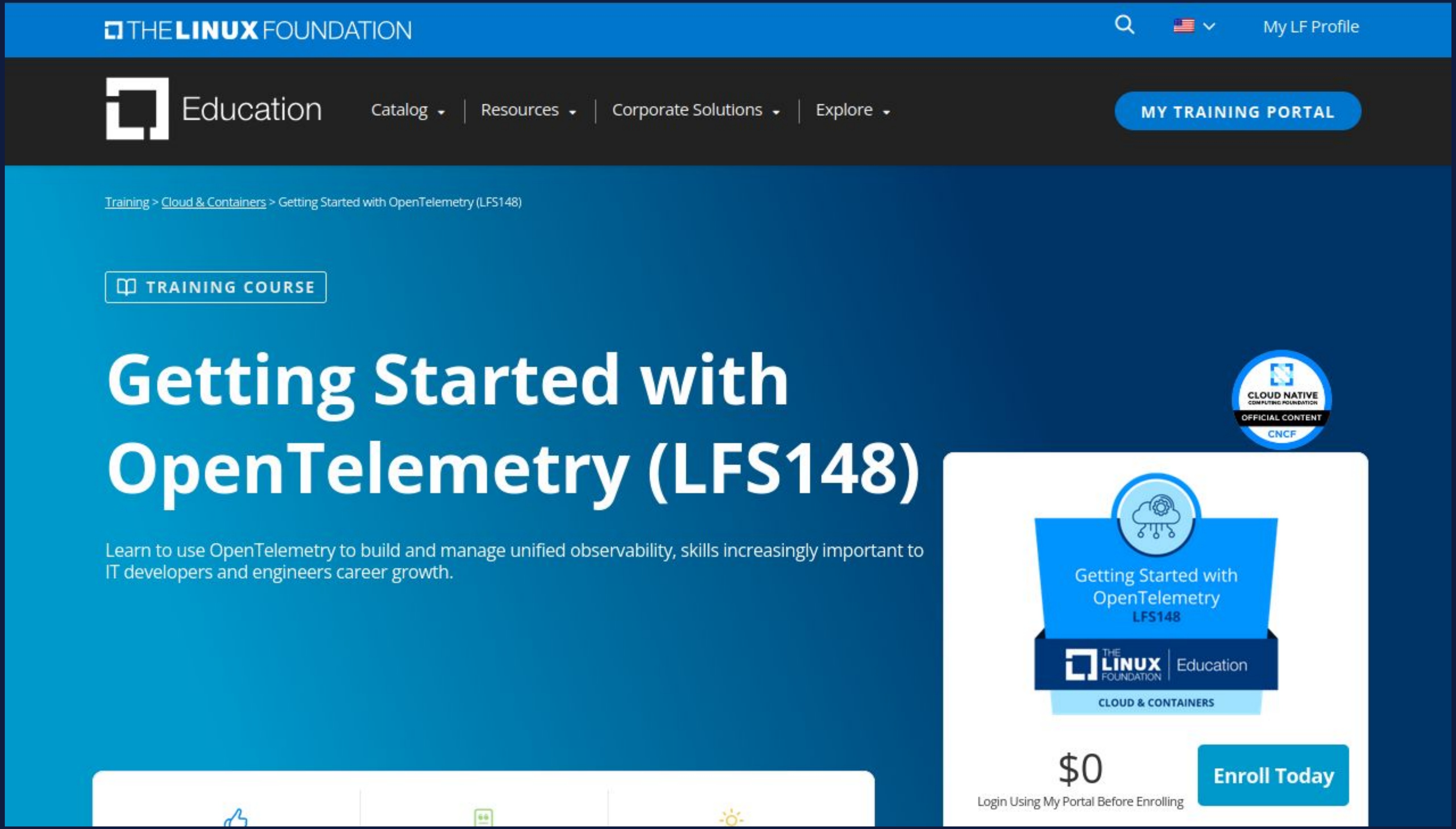
# OpenTelemetry Collector: More extensions

- Core: zPages

- Contrib extensions

# New: Free OpenTelemetry training from CNCF

https://training.linuxfoundation.org/training/getting-started-with-opentelemetry-lfs148/



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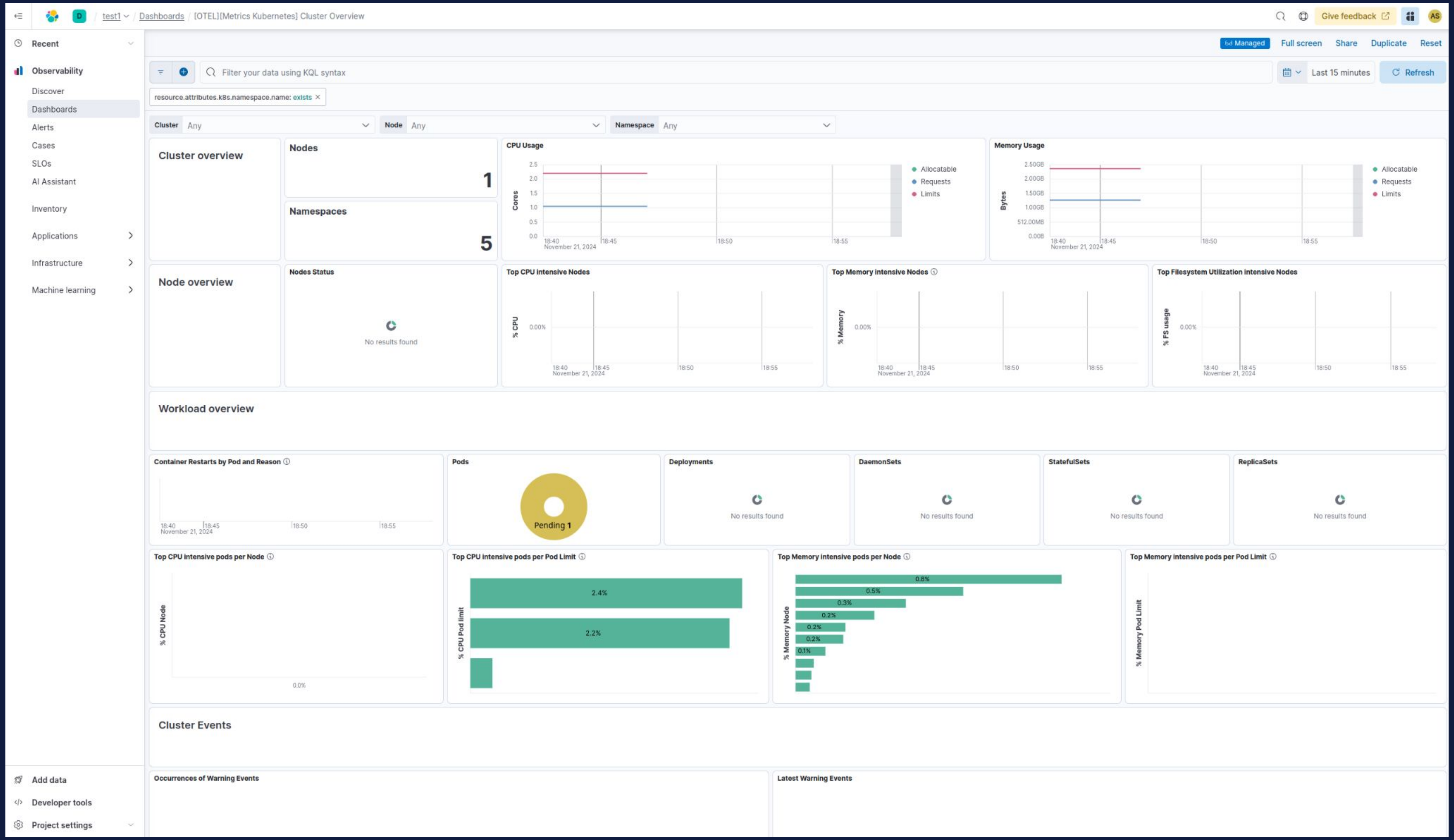
# Bonus DEMO

## Collecting telemetry from workloads in Kubernetes with OpenTelemetry Operator

https://www.elastic.co/observability-labs/blog/elastic-opentelemetry-otel-operator



# Pytania?

Slides: https://andrzej-stencel.github.io/2024/11/21/sysops-devops-meetup.html

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Feedback: https://freesuggestionbox.com/pub/whqnnke