NABENIK

OpenTelemetry: A língua franca da observabilidade

Você não pode melhorar o que não pode medir

Nabenik

10 de junho de 2025

Observabilidade e monitoramento

Sistema de TI 

- Aplicações
- Serviços de terceiros
- Processos intermédios
- Hosts

Fontes de informação 

- Eventos
- Logs
- Métricas
- Traces

Teoria: Coletamos dados, processamos para identificar KPIs (golden signals) e criamos alarmes

Observabilidade e monitoramento

Sistema de TI 

- Aplicações: Binario (Go, GraalVM Native), minified (JS), jar, war (Java), K8s (containers), FaaS
- Serviços de terceiros (PaaS especializados)
- Processos intermédios (Banco de dados, message queue)
- Hosts (LSB, Alpine, openrc, Windows, etc.)
- ElasticSearch, Grafana, Datadog, New Relic, Cloudwatch, etc.

Fontes de informação 

- Logs: Arquivos (/var/log), Systemd, FluentD
- Metrics: Hosts, JMX, Prometheus endpoints (Spring Actuator, Microprofile Metrics)
- Traces: Jaeger, Zipkin

Precisamos dados de **fontes e formatos diversos**, os quais podem ser **enviados ou coletados** para ser analisados em **plataformas de observabilidade** com diversas capacidades e riscos -e.g. Vendor lock in, tecnologias muito especificas, incompatibilidade entre versões-

Precisamos ...
data pipelines de observabilidade baseados numa **especificação** padrão

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Tecnología para tu éxito

OpenTelemetry

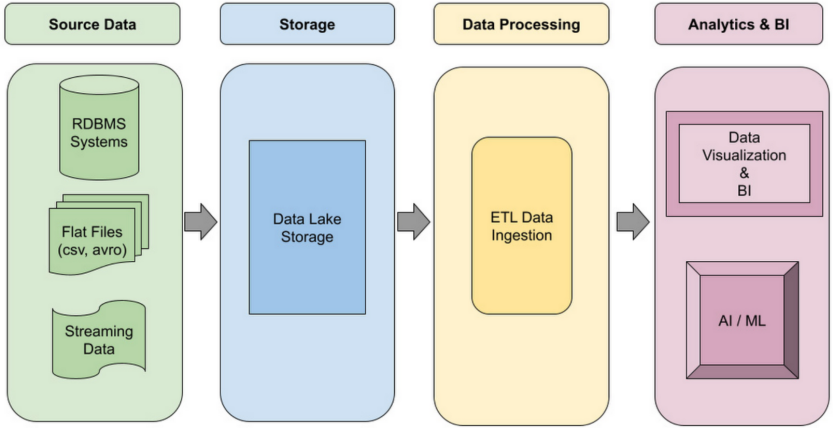
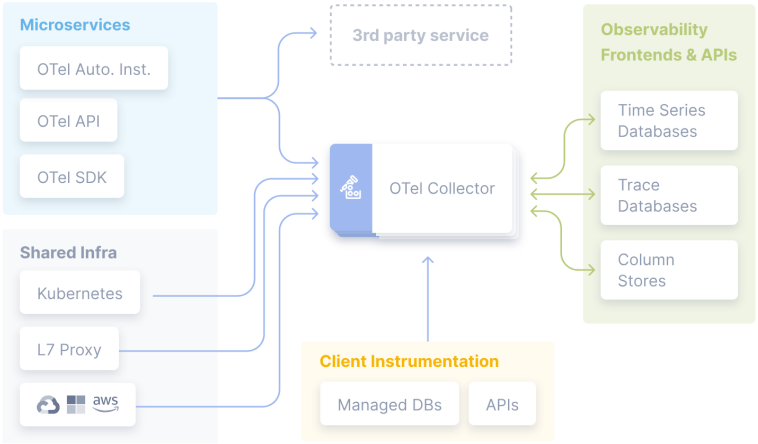
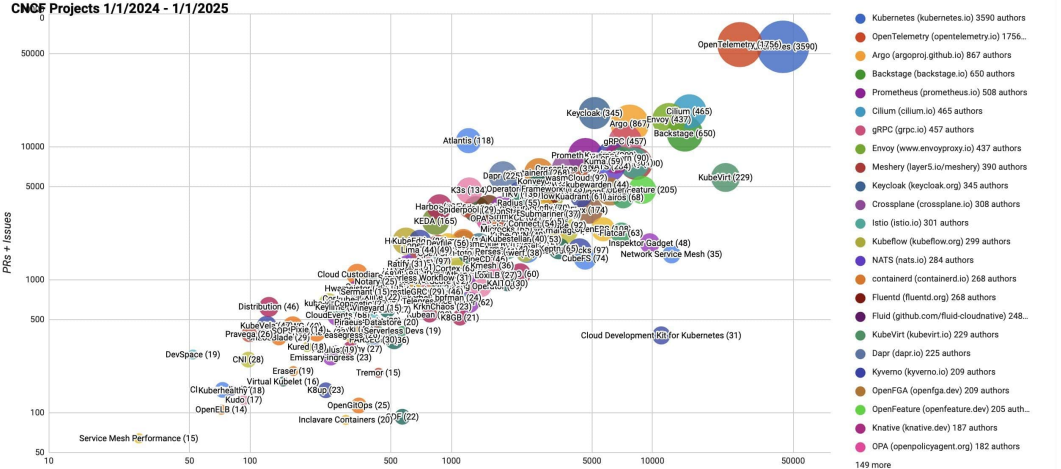


Figura 1: Data pipeline



1. Instrumentação
2. Coleta
3. Envio


CNCF Projects 1/1/2024 - 1/1/2025
PRs + Issues
0
50000
10000
5000
1000
500
100
50
10
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100
500
1000
5000
10000
50000
OpenTelemetry (3756)
es (3590)
Keycloak (645)
Argo (867)
Cilium (465)
Envoy (437)
Backstage (650)
Atlantis (118)
gRPC (457)
KubeVirt (229)
Inspektor Gadget (48)
Network Service Mesh (35)
Cloud Development Kit for Kubernetes (31)
DevSpace (19)
Service Mesh Performance (15)
Kubernetes (kubernetes.io) 3590 authors
OpenTelemetry (opentelemetry.io) 1756...
Argo (argoproj.github.io) 867 authors
Backstage (backstage.io) 650 authors
Prometheus (prometheus.io) 508 authors
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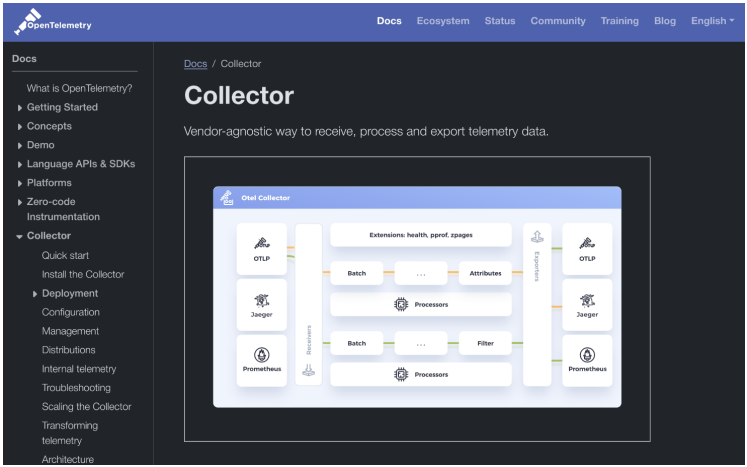
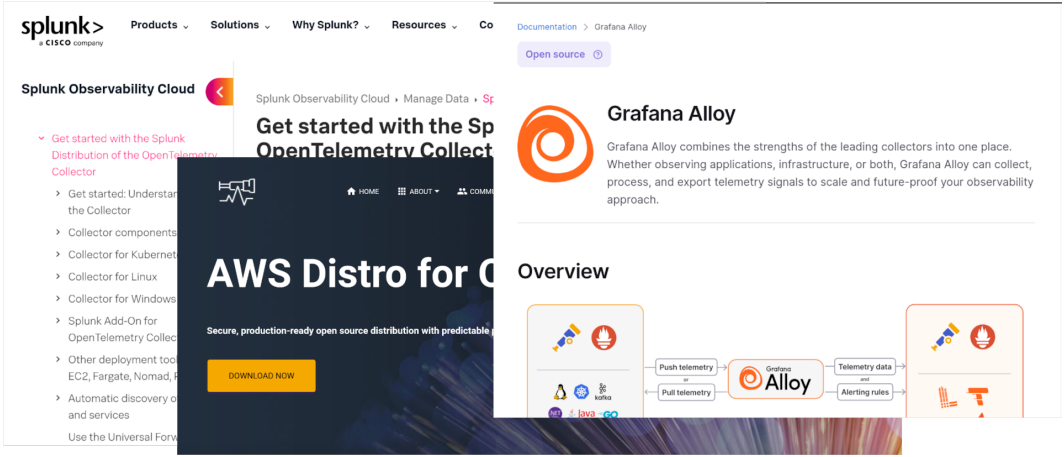
OpenFGA (openfga.dev) 209 authors
OpenFeature (openfeature.dev) 205 auth...
Knative (knative.dev) 187 authors
OPA (openpolicyagent.org) 182 authors
149 more

Instrumentação

- **</> Biblioteca (Library)**
  - Instrumentação manual usando APIs do OpenTelemetry diretamente no código
- **Framework**
  - Integração com frameworks que já oferecem suporte oficial
  - Ex: Spring Boot, Quarkus, ASP.NET Core
- **Manipulação de artefato**
  - Instrumentação automática por meio de interceptores, agentes ou manipulação de bytecode
  - Ex: Java Agent (javaagent), AWS Lambda layer, JavaScript Zero code instrumentation

Otel Collector - Upstream

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Resources
Co
Splunk Observability Cloud
Get started with the Splunk Distribution of the OpenTelemetry Collector
Get started: Understar the Collector
Collector components
Collector for Kubernet
Collector for Linux
Collector for Windows
Splunk Add-On for OpenTelemetry Collec
Other deployment too EC2, Fargate, Nomad, F
Automatic discovery o and services
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Splunk Observability Cloud › Manage Data › Sp
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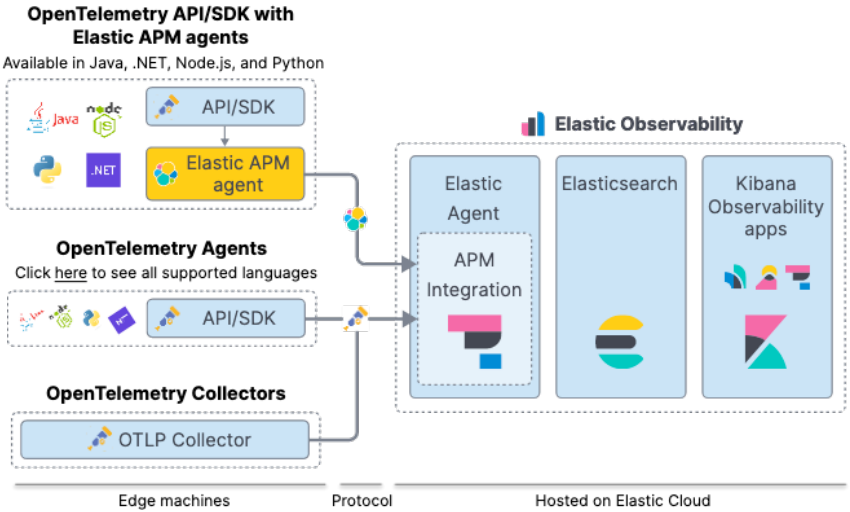
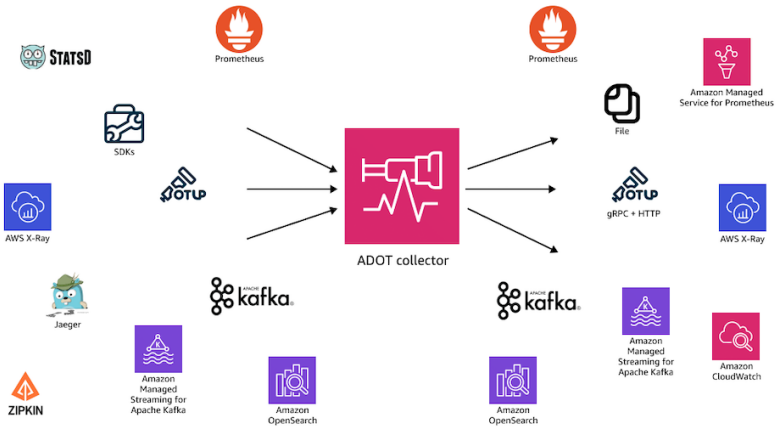
Grafana Alloy
Grafana Alloy combines the strengths of the leading collectors into one place. Whether observing applications, infrastructure, or both, Grafana Alloy can collect, process, and export telemetry signals to scale and future-proof your observability approach.
Overview
Push telemetry
or
Pull telemetry
Grafana
Alloy
Telemetry data
and
Alerting rules
kafka
java
Introduction
AWS Distro for OpenTelemetry is a secure, production-ready, AWS-supported distribution of the OpenTelemetry project. Part of the Cloud Native Computing Foundation, OpenTelemetry provides open source APIs, libraries, and agents to collect distributed traces and metrics for application monitoring. With AWS Distro for OpenTelemetry, you can instrument your applications just once to send correlated metrics and traces to multiple AWS and Partner monitoring


OpenTelemetry API/SDK with Elastic APM agents
Available in Java, .NET, Node.js, and Python
API/SDK
Elastic APM agent
OpenTelemetry Agents
Click here to see all supported languages
API/SDK
OpenTelemetry Collectors
OTLP Collector
Elastic Observability
Elastic Agent
APM Integration
Elasticsearch
Kibana Observability apps
Edge machines
Protocol
Hosted on Elastic Cloud


StatsD
Prometheus
Prometheus
Amazon Managed Service for Prometheus
SDKs
File
AWS X-Ray
gRPC + HTTP
AWS X-Ray
ADOT collector
Jaeger
kafka
kafka
Amazon Managed Streaming for Apache Kafka
Amazon CloudWatch
ZIPKIN
Amazon Managed Streaming for Apache Kafka
Amazon OpenSearch
Amazon OpenSearch
sources
destinations

Fatos aleatórios que eu aprendi

1. A instrumentação via *agent* é particularmente boa no Java, o problema que ele instrumenta demais
2. A instrumentação de framework tem um limite quando você pega bibliotecas não -opinionated- ... ela não funciona
3. A instrumentação via *agent* precisa fine-tunning em cargas de trabalho não permanentes -i.e. faz com que o Lambda fique (ainda mais) lento no boot-
4. As *distribuições* do collector facilitam o envio de dados
5. O barco da *padronização* já esta em alto mar, ele chama-se OpenTelemetry

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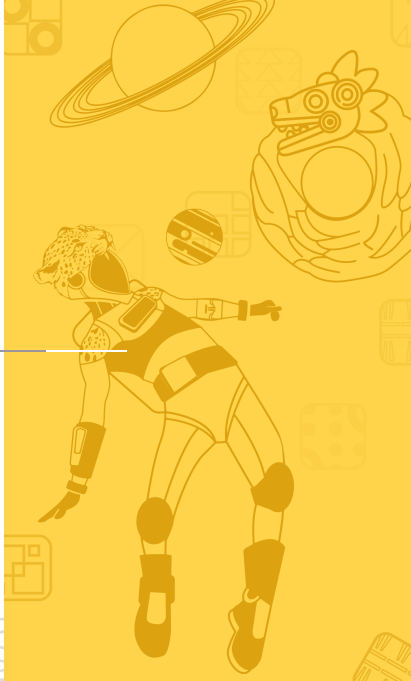
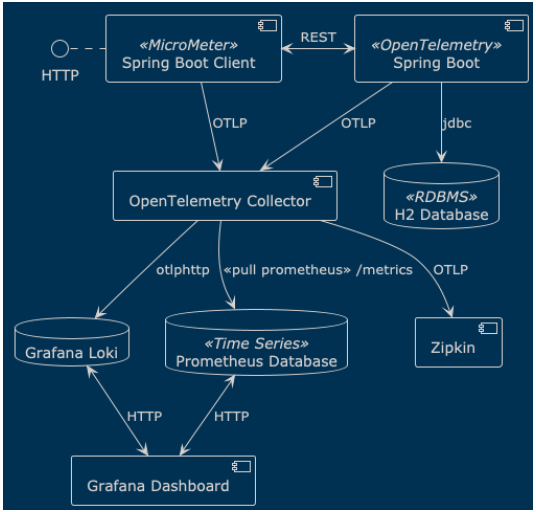
Exemplo





A Practical Guide to OpenTelemetry With Spring Boot Workloads

This tutorial demonstrates setting up OpenTelemetry with Spring Boot for observability, including metrics, traces, and logs, using tools like Grafana, Loki, and Tempo.

By Victor Orozco · Apr. 08, 25 · Tutorial

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In this tutorial, we consolidated some practical approaches regarding OpenTelemetry and how to use it with Spring Boot. This tutorial is composed of four primary sections:

1. OpenTelemetry practical concepts
2. Setting up an observability stack with OpenTelemetry Collector, Grafana, Loki, Tempo, and Podman
3. Instrumenting Spring Boot applications for OpenTelemetry

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