



AI-driven DevOps CI/CD Pipelines

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The Speakers



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Who are WE?



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Agenda

1

**Why monitor
CI/CD
pipelines?**

2

CI/CD

3

**Observability &
OpenTelemetry**

4

**AI-driven
Approach**

5

Demo

6

**Conclusion &
Takeaways**

Agenda

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Why Monitor CI/CD Pipelines?

CI/CD pipelines are becoming more and more critical



Key Challenges



Achieving **high reliability** and **predictable** failures



Data-driven approach to run proactive **capacity management**



Deploy, hotfix and bugfix CI/CD pipelines during **outages**



CI/CD is often a **black box** process

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5

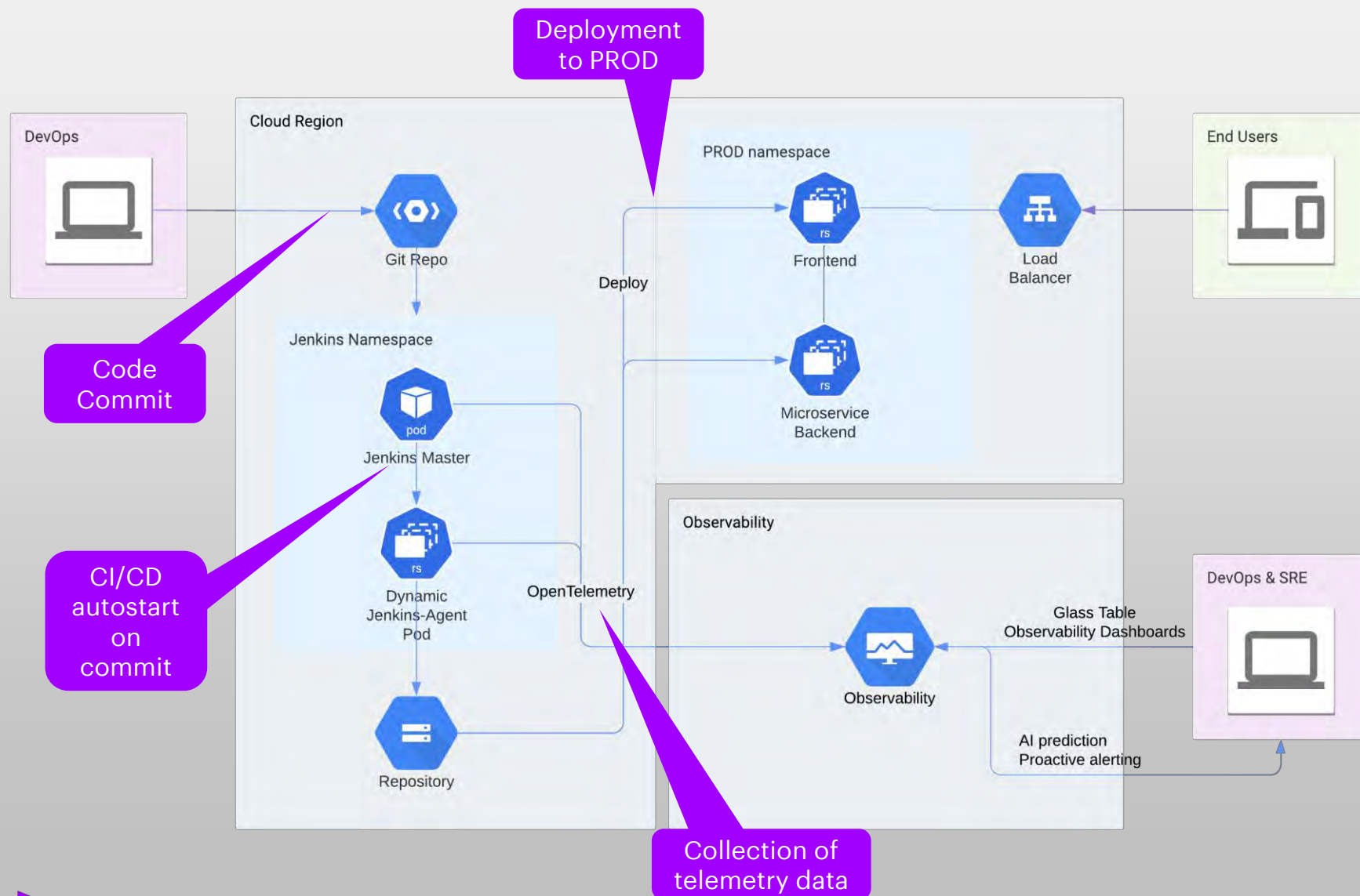
Demo

6

Conclusion &
Takeaways

CI/CD

Architecture



KPIS CI/CD PLATFORM

- Speed of the CD pipeline
- Hotfix/Bugfix deployment speed
- Build/Test success rate
- Deployments per months per pipeline / application
- Lead time for change or deployments
- Change success rate (ratio of success build/deployments and total number of builds/deployments)
- Availability CI/CD platform

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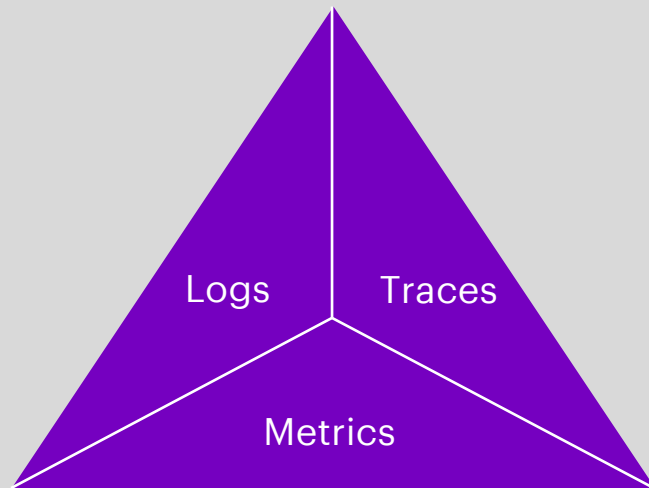
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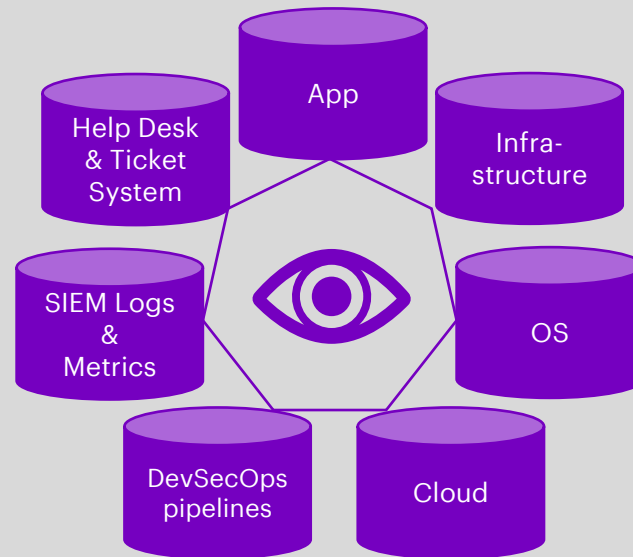
Conclusion &
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Observability

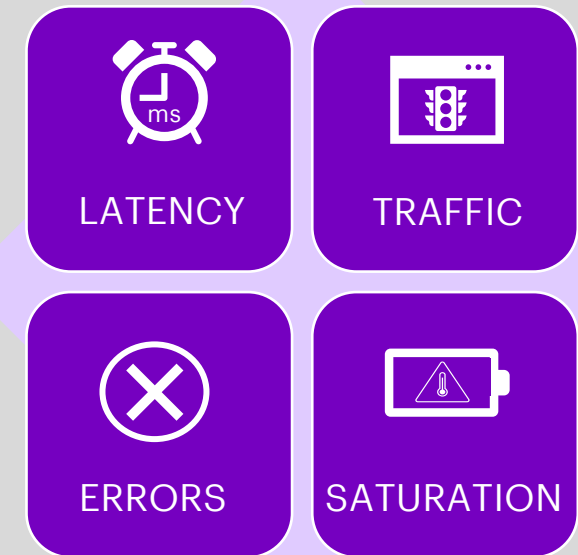
OpenTelemetry - Data Collection



Golden Triangle



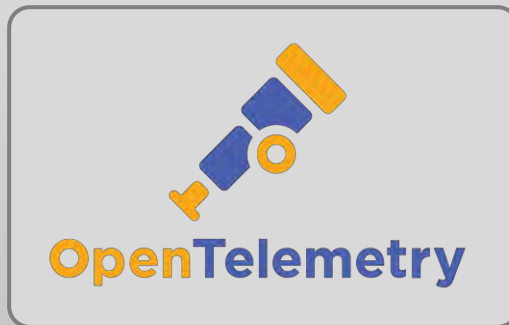
Data Sources



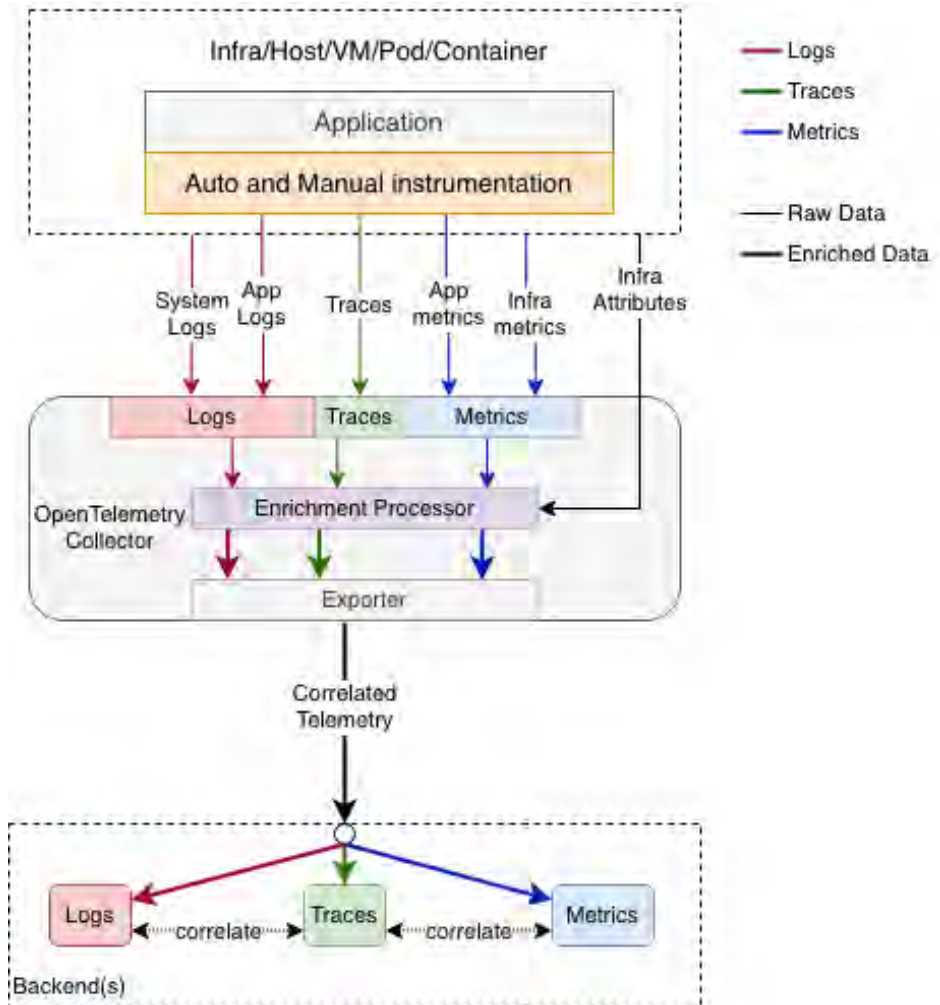
Golden Signals

OpenTelemetry

OpenTelemetry is an **observability** framework and an open-source standard used for collecting **telemetry data** (traces, metrics, logs) from **cloud-native** applications.



OpenTelemetry Collection Process



Source: <https://opentelemetry.io/docs/reference/specification/logs/>

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Demo

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AI-driven Approach

Observe

Engage

Act

CI/CD PIPELINE

Stage View



OpenTelemetry Collector Agent

Service Health KPI : CI/CD Pipeline Reliability

Service Health KPI : CI/CD Pipeline E2E (smoke-test)



Machine Learning



Correlate



Predict



Zero touch Automation



Analysis



Predictive Alerting

Use Case Technologies

- Splunk OpenTelemetry Collector

- Splunk ITSI
- Splunk Observability Cloud

- Splunk Machine Learning (by Splunk ITSI)

- Splunk ITSI, Automation

AI-driven CI/CD pipeline

Use Case Flow

Pipelines use the Open Telemetry agent to send:

- **Logs**
- **Traces**
- **Metrics**

The same data could be collected in an automated way by leveraging the Splunk **Observability** Cloud platform.

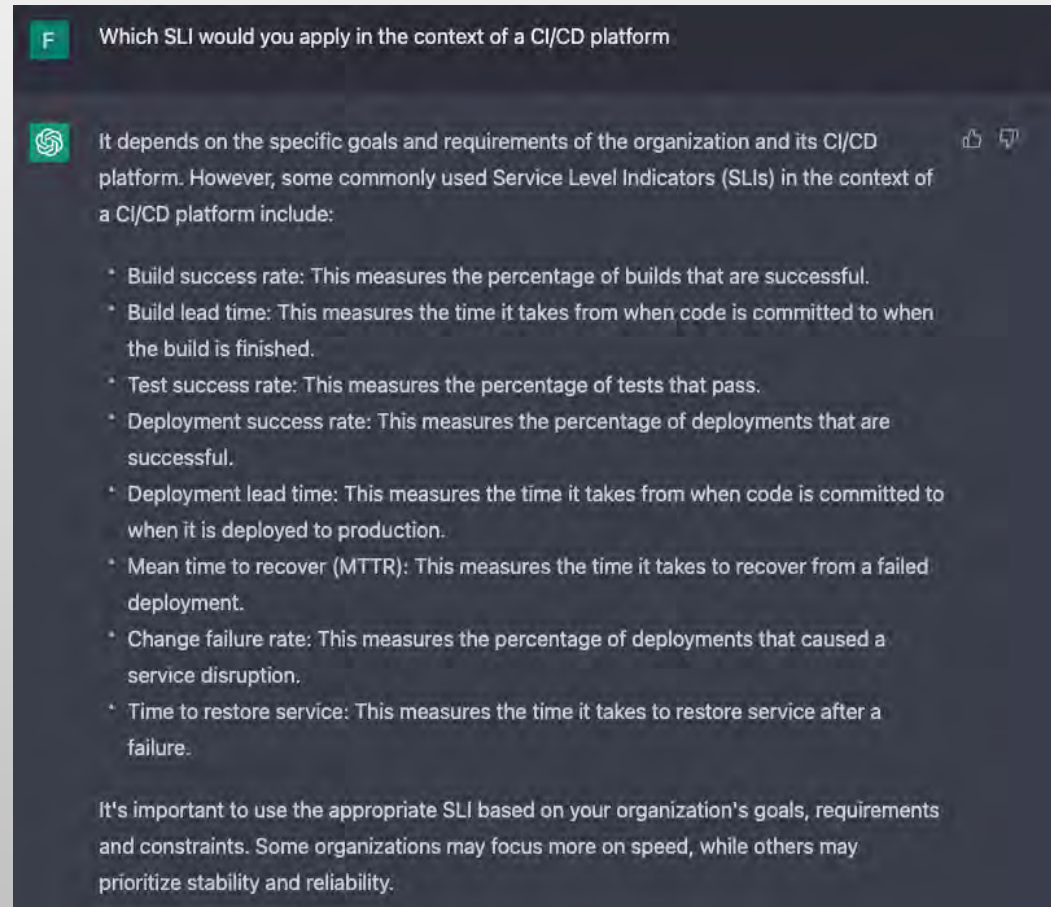
SRE teams could visualize this data through automatic and **customizable dashboard**

SRE teams leverage on ITSI to train a **Machine Learning Engine** to analyze the collected data and anticipate failure.

SRE teams leverage on ITSI to generate custom alerts (due to **pre-defined thresholds** applied to real-time or forecasting analysis) in order to warn the right teams.

We asked ChatGPT...

To identify some SLIs for a CI/CD platform



source: <https://chat.openai.com/>

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DEMO

Starting in 3.... 2.... 1....



Photo by [Alex Kondratiev](#) on [Unsplash](#)

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Conclusion and Takeaways

- CI/CD is a **critical** platform that requires **end-to-end monitoring**
- Use **OpenTelemetry** to ensure **reliability** in the context of CI/CD pipelines
- Define simple KPIs (e.g. build on SLIs)
- Enable **AI** for **capacity management** and **failure prediction**
- Start simple and scale fast



Thank you!