

# AI-driven DevOps CI/CD Pipelines

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# The Speakers



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# Who are WE?



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# Agenda

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Why monitor  
CI/CD  
pipelines?

2

CI/CD

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Observability &  
OpenTelemetry

4

AI-driven  
Approach

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Demo

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Conclusion &  
Takeaways



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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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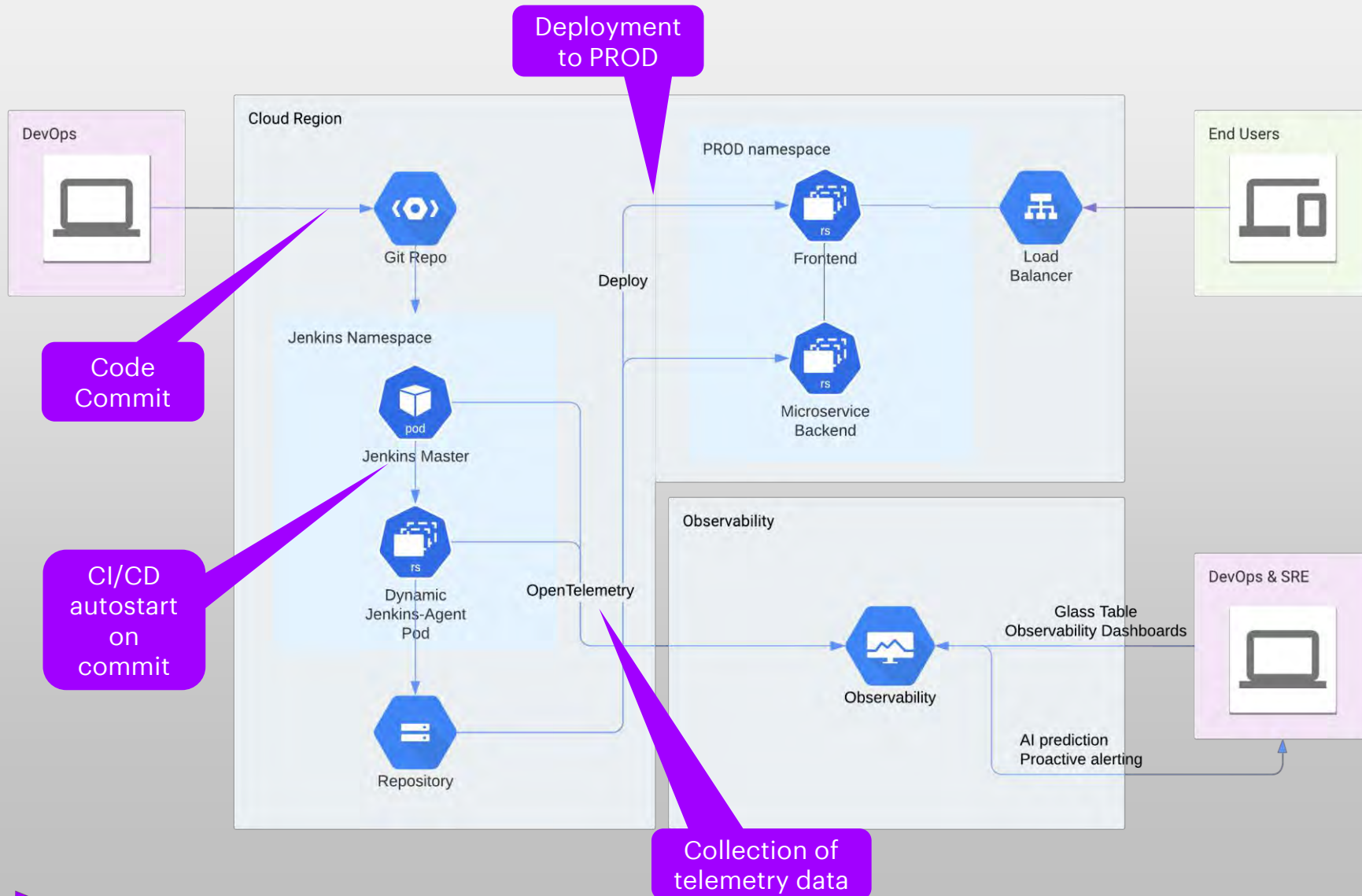
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# CI/CD

## 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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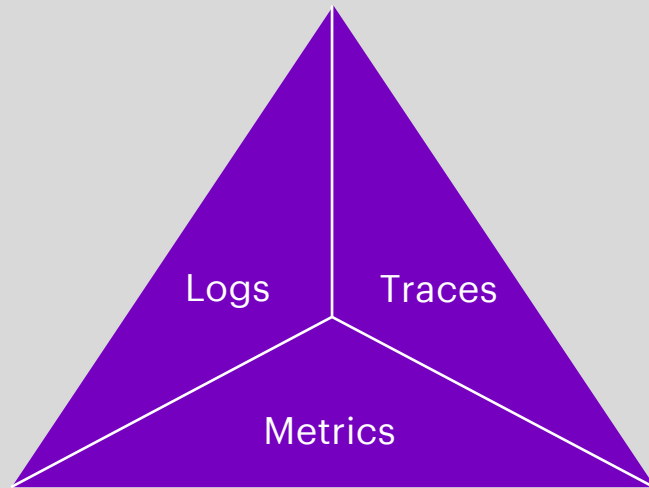
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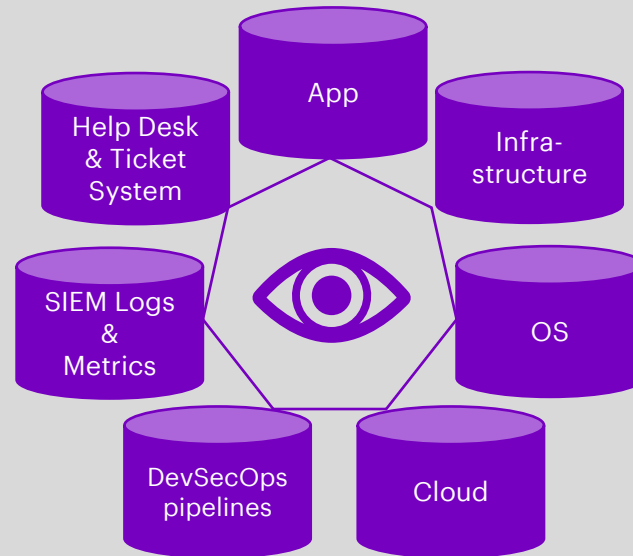
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# Observability

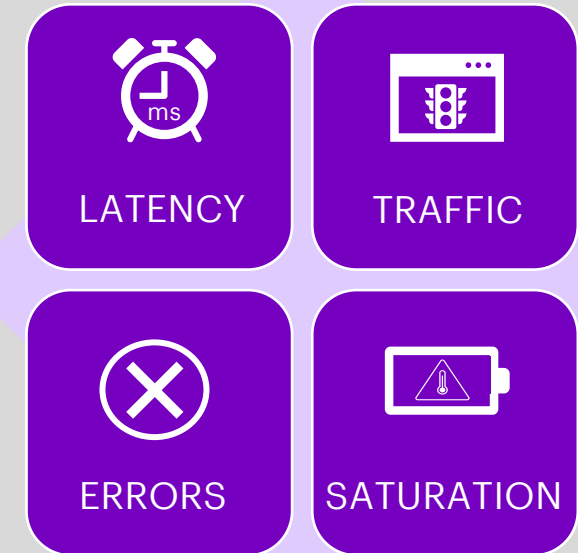
## OpenTelemetry - Data Collection



**Golden Triangle**



**Data Sources**

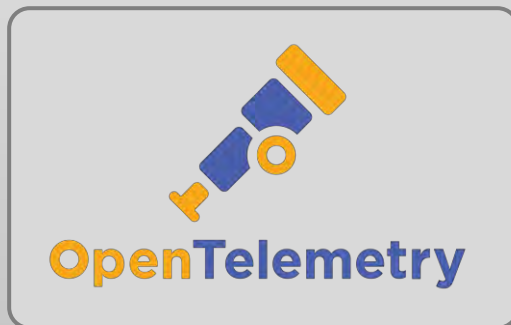


**Golden Signals**

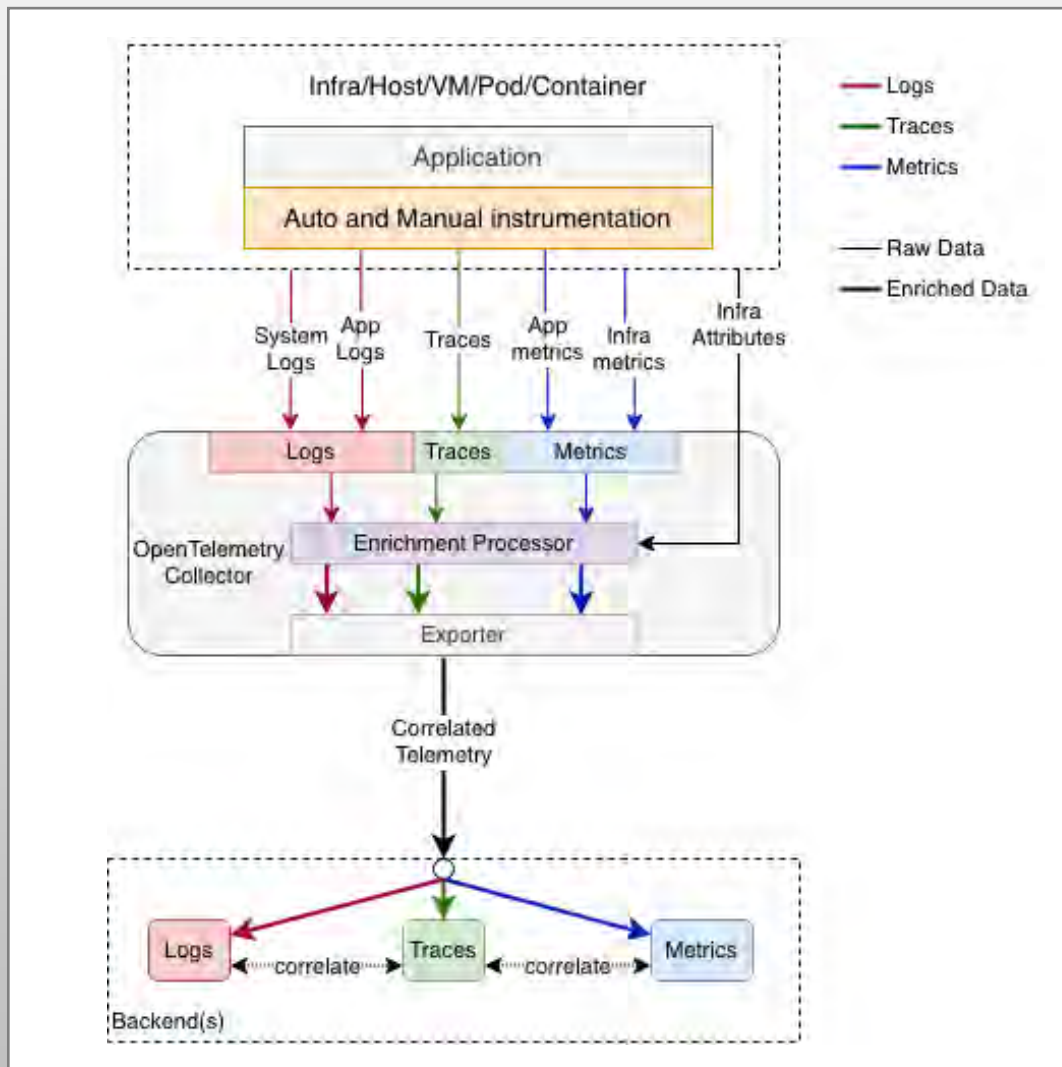


# OpenTelemetry

**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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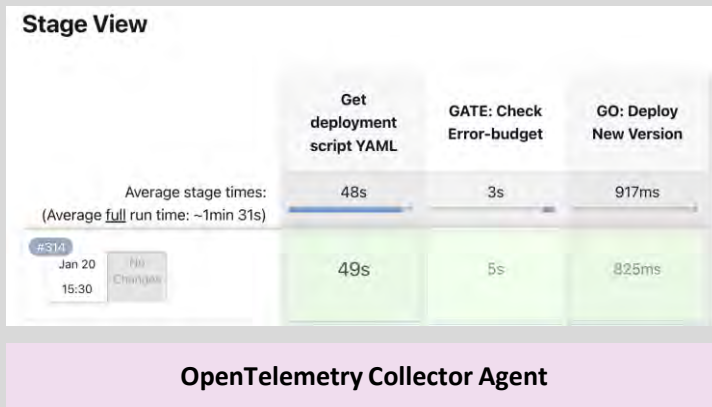
# AI-driven Approach

Observe

Engage

Act

CI/CD PIPELINE



Service Health KPI : CI/CD Pipeline Reliability

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



## 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.

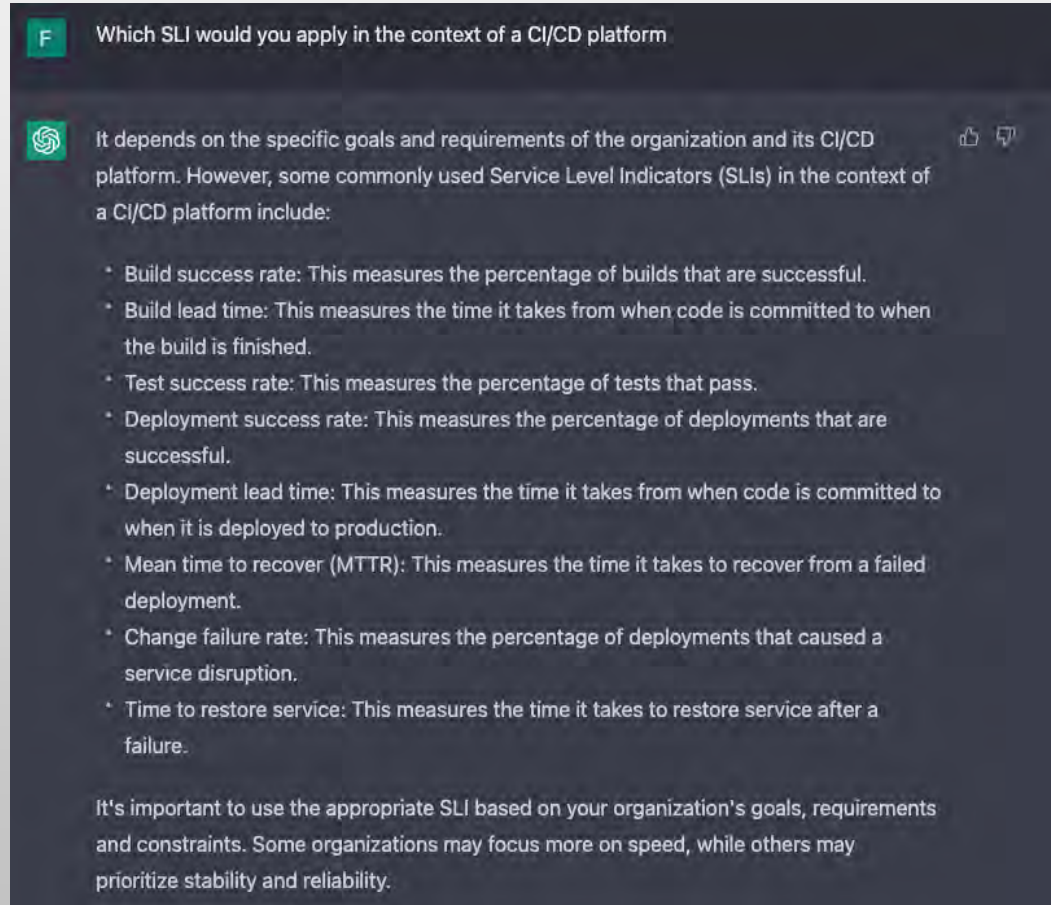
SRE teams leverage on ITSI to generate custom alerts (due to **pre-defined thresholds** applied to real-time or forecasting analysis) in order to warn the right teams.





# We asked ChatGPT...

To identify some SLIs for a CI/CD platform



F Which SLI would you apply in the context of a CI/CD platform

It depends on the specific goals and requirements of the organization and its CI/CD platform. However, some commonly used Service Level Indicators (SLIs) in the context of a CI/CD platform include:

- Build success rate: This measures the percentage of builds that are successful.
- Build lead time: This measures the time it takes from when code is committed to when the build is finished.
- Test success rate: This measures the percentage of tests that pass.
- Deployment success rate: This measures the percentage of deployments that are successful.
- Deployment lead time: This measures the time it takes from when code is committed to when it is deployed to production.
- Mean time to recover (MTTR): This measures the time it takes to recover from a failed deployment.
- Change failure rate: This measures the percentage of deployments that caused a service disruption.
- Time to restore service: This measures the time it takes to restore service after a failure.

It's important to use the appropriate SLI based on your organization's goals, requirements and constraints. Some organizations may focus more on speed, while others may prioritize stability and reliability.

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!**