

# Monitoring with Prometheus

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# Overview



How monitoring fits in with logging and tracing?

What is observability?

Deploying Prometheus and Grafana

Leveraging available Prometheus exporters to monitor the cluster

Creating dashboards in Grafana



# Monitoring



Process of collecting data from the system



Historical view



Different types of metrics



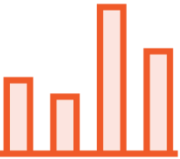
Actionable data



# Monitoring



**Availability**



**Resource utilization**



**Performance**



# Cloud Native Monitoring

Resources are volatile

A lot of components

The need for service discovery

Integration with infrastructure



# Monitoring, Logging, and Tracing



**Different aspects of the state of the system**

**Metrics that are correlated**

**Combined they can provide observability**



# Observability

The ability to infer internal states of a system based on the system's external outputs.



# Observability in Debugging



Reproducing unusual behavior in distributed systems may be extremely hard



Observing the state of the system may be a better way to understand the reason for the behavior



Observability helps reason about a system without changing its state



Observability helps to learn the system's behavior under normal circumstances



It can prevent some problems from happening





# Monitoring Tools



Prometheus

Graphite

InfluxDB

OpenTSDB

Nagios/Zabbix/Icinga

# Prometheus

Cloud Native Computing Foundation  
graduated project

Optimized for time series data

Built-in service discovery

Flexible query language

Numerous integrations

Works in a Pull model

Uses HTTP and plain text



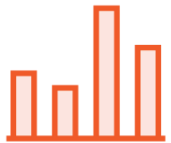
# Metric Types in Prometheus



**Counter**



**Gauge**



**Histogram**



**Summary**



# Grafana

**Query, visualization, and alerting**

**Pluggable data source model**

**Focused on time-series data**



# The Benefits of the CNCF Ecosystem

**Great integration  
between  
components**

**A lot of value  
provided “for  
free”**

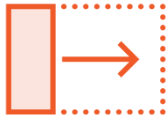
**Standardized  
solutions with  
good support**



# Adding Prometheus Instrumentation



Many CNCF products provide built-in instrumentation



Some frameworks allow middleware supporting instrumentation



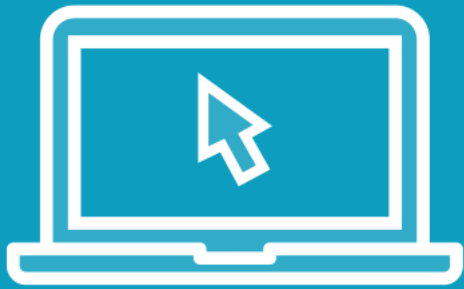
There are official libraries for many languages



Prometheus pull API works over HTTP allowing exporting metrics in other languages



# Demo



Deploy Prometheus

Configure exporters

Create a dashboard in Grafana

Set the alert



# Summary



Monitoring had to evolve to fit the cloud-native landscape

Observability lets us understand how the system works

Observability lets us prevent problems from happening

