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LESSON : DEVOPS

SUBJECT : PROMETHEUS-GRAFANA

BATCH : B 224

AWS-DEVOPS

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Monitoring: What it is & why to

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Monitoring is watching: It's like keeping an eye on your computer systems to see how they're doing.

Collect data: Monitoring gathers data about how fast a system is running, if there are errors, and other important info.

Get alerts: It can tell you when something goes wrong, often before it becomes a bigger problem.

Make decisions: The information helps you decide when to upgrade, fix, or change things to keep systems healthy.

Improve performance: By understanding data from monitoring, you can make systems faster and more reliable.

Secure and comply: Helps make sure your systems are secure and meet rules set by companies.

Monitoring: What it is & why to

Ensure that a system or service is:

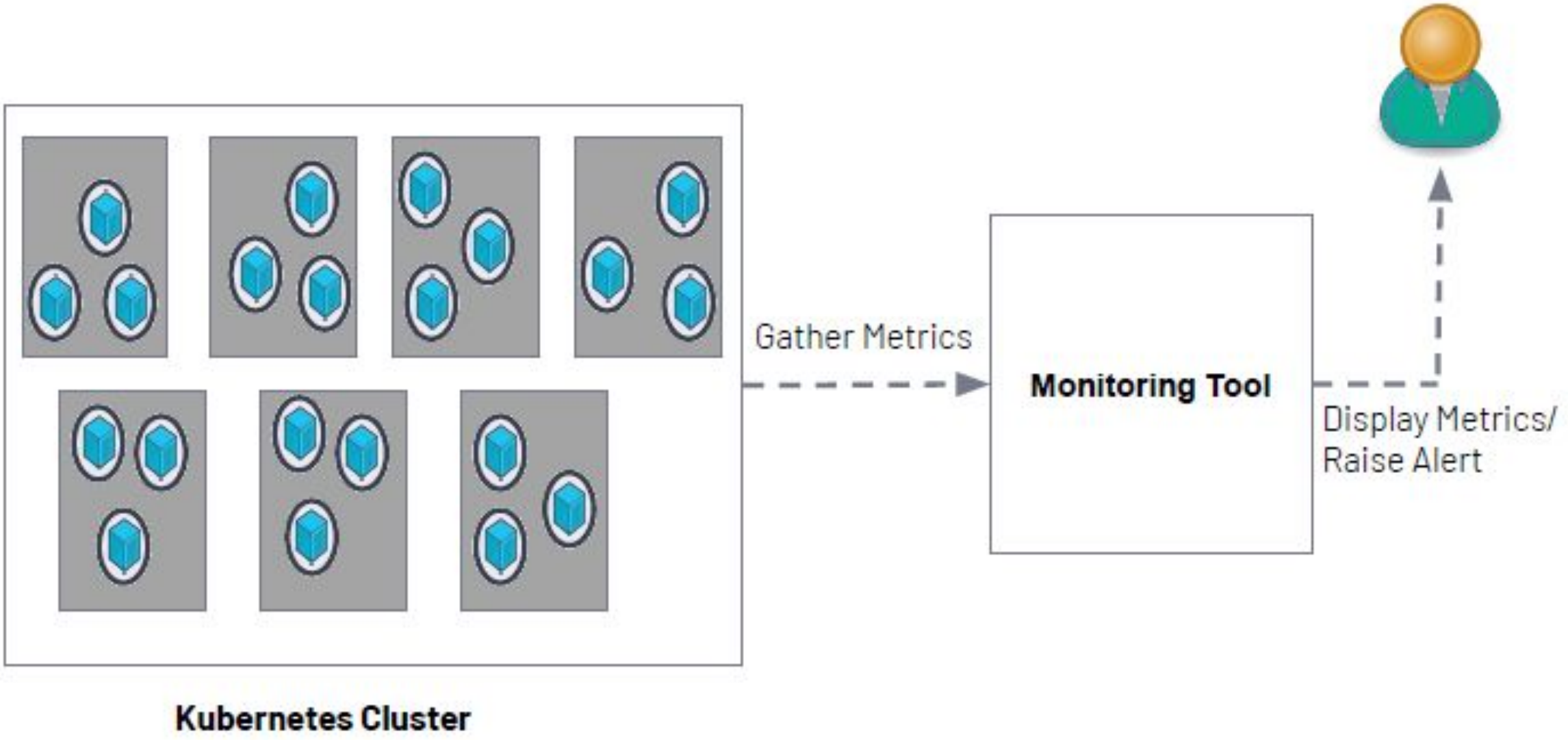
- Available
- Fast
- Correct
- Efficient
- etc.

Monitoring: What it is & why to

Potential Problems:

- Disk full → no new data stored
- Software → bug, request errors
- High temperature → hardware failure
- Network outage → services cannot communicate
- Low memory utilization → money wasted

Monitoring: What it is & why to



What is Prometheus?

What is Prometheus?

Metrics-based monitoring & alerting stack

- Metrics collection and storage
- Querying, alerting, dashboarding
- For all levels of the stack!

Made for dynamic cloud/container environments

What is Prometheus?

A quick overview of what Prometheus is about:

- **Gather metrics** into database
  - Scheduled pull/harvest/scrape actions – **HTTP/TCP** requests
  - Provide exporters (adapters) that expose metrics
- Make metrics available to consuming systems and humans
  - Such as **Grafana** (for dashboarding), **REST APIs**, through Prometheus UI – **Graphs**, **Console**, **PromQL**
- Analyze metrics according to **alert rules** and determine if alerts are "**firing**"
- Act on firing alerts and send **notifications**

Terminology

- **Prometheus Server**: The main server that scrapes and stores the scraped metrics in a time series database
- **Time-series Database:** Designed to store data that changes with time
- **Scrape:** Prometheus server uses a pulling method to retrieve metrics
- **Target:** The Prometheus server's clients that it retrieves info from (Linux/Windows Server, single app, db, Apache server, etc.)
- **Alert Manager**: Component responsible for handling alerts
- **Exporter:** Target libraries that convert and export existing metrics into Prometheus format

Terminology

- **Instance:** The endpoint that is scraped, usually corresponding to a single process
- **Job:** A collection of instances with the same purpose

For example, an API server job with four replicated instances:

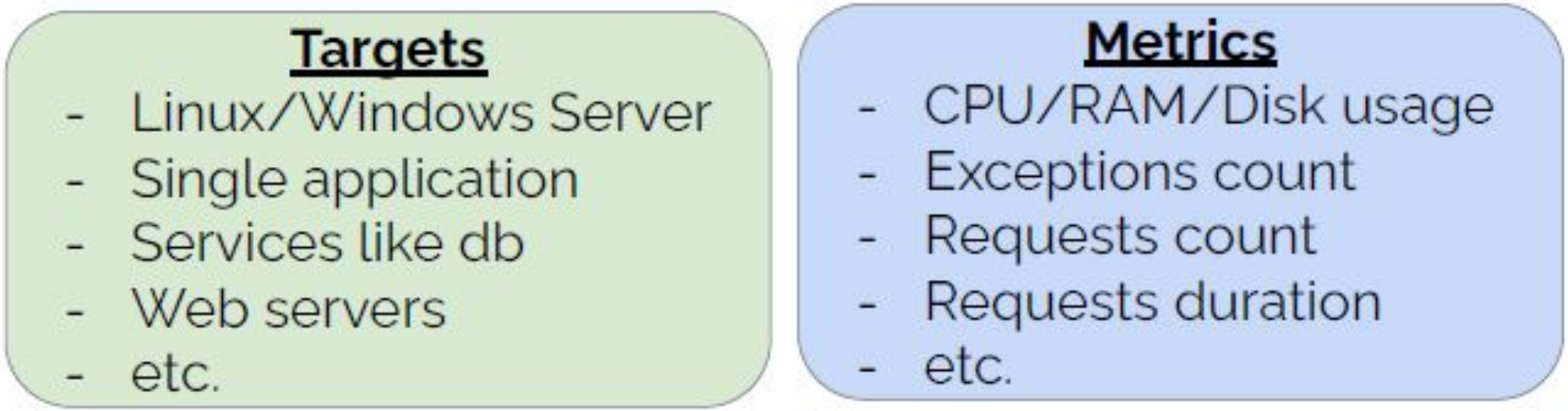
- job: api-server
  instance 1: 1.2.3.4:5670
  instance 2: 1.2.3.4:5671
  instance 3: 5.6.7.8:5670
  instance 4: 5.6.7.8:5671

Terminology

- Prometheus pulls (**scrape**) metrics from a client (**target**) over **http** and places the data into its **time series database** that you can query using its own query language: **promQL**
- Prometheus uses “**exporters**” that are installed/configured on the clients in order to convert and expose their metrics in a Prometheus format
- The **AlertManager** receives metrics from the Prometheus server, makes sense of the metrics and then forwards an alert to the chosen notification system

How Prometheus works

- Prometheus server monitors **targets** and each target has **metrics** that are monitored.



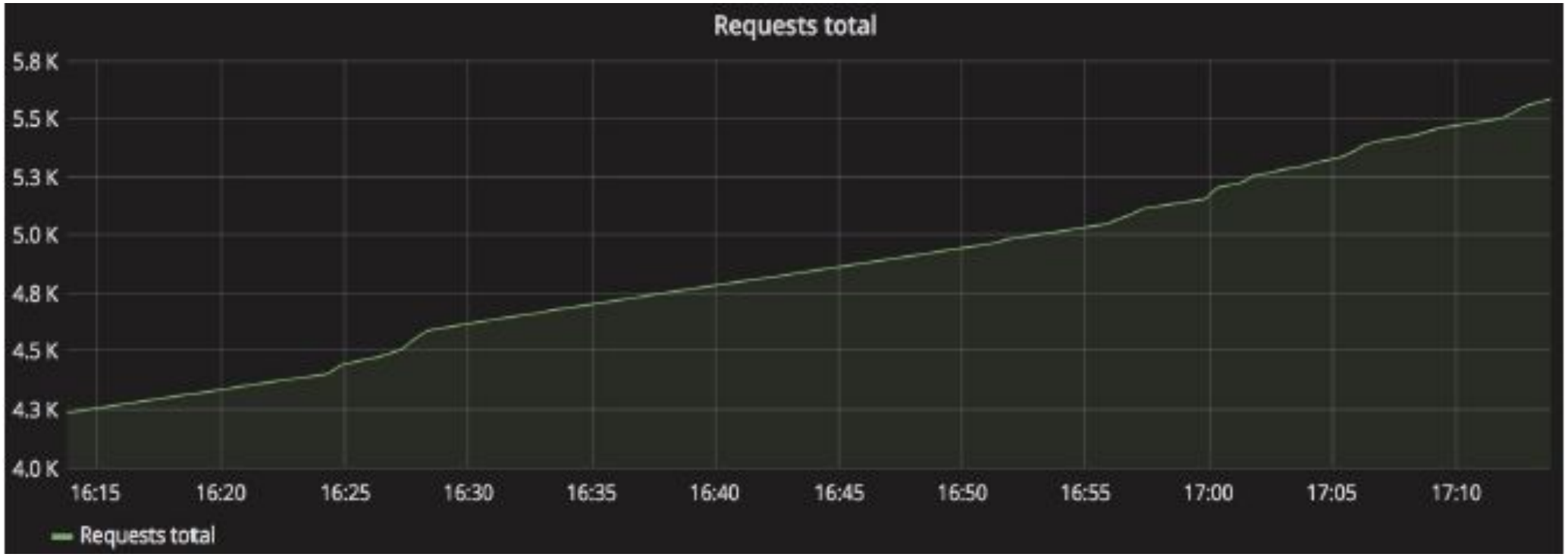
How Prometheus works

- Prometheus stores metrics as human-readable text-based format

HELP: description of what metric is
TYPE: metric type

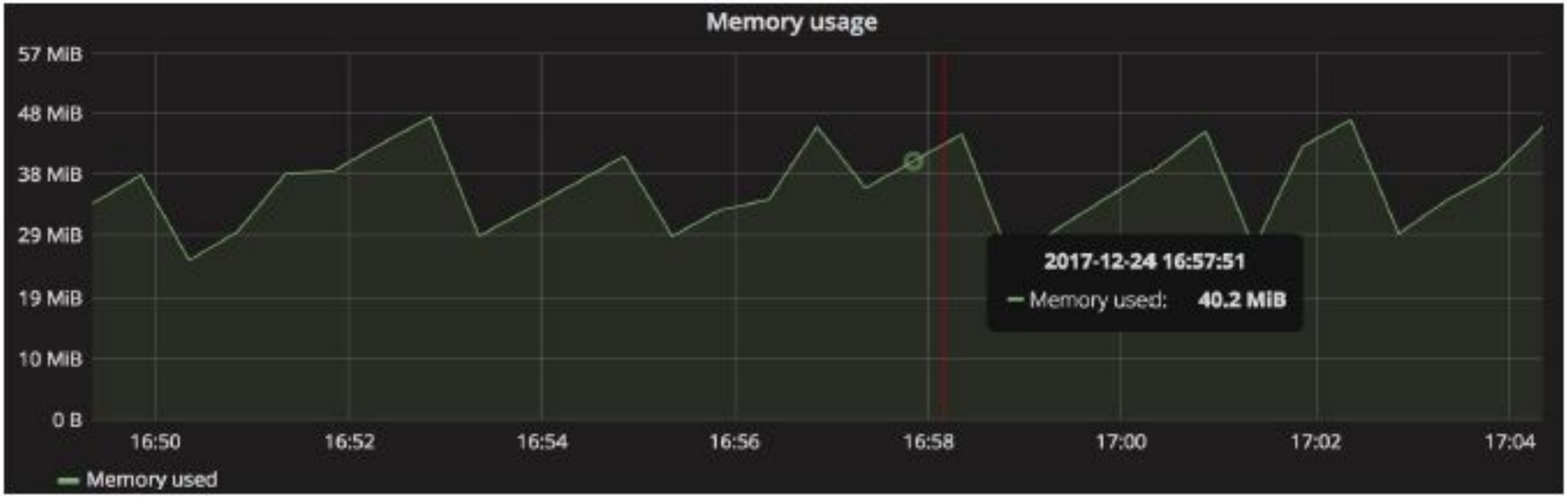
Metric Types

- **Counter**: used for any value that **increases**, such as a request count or error count



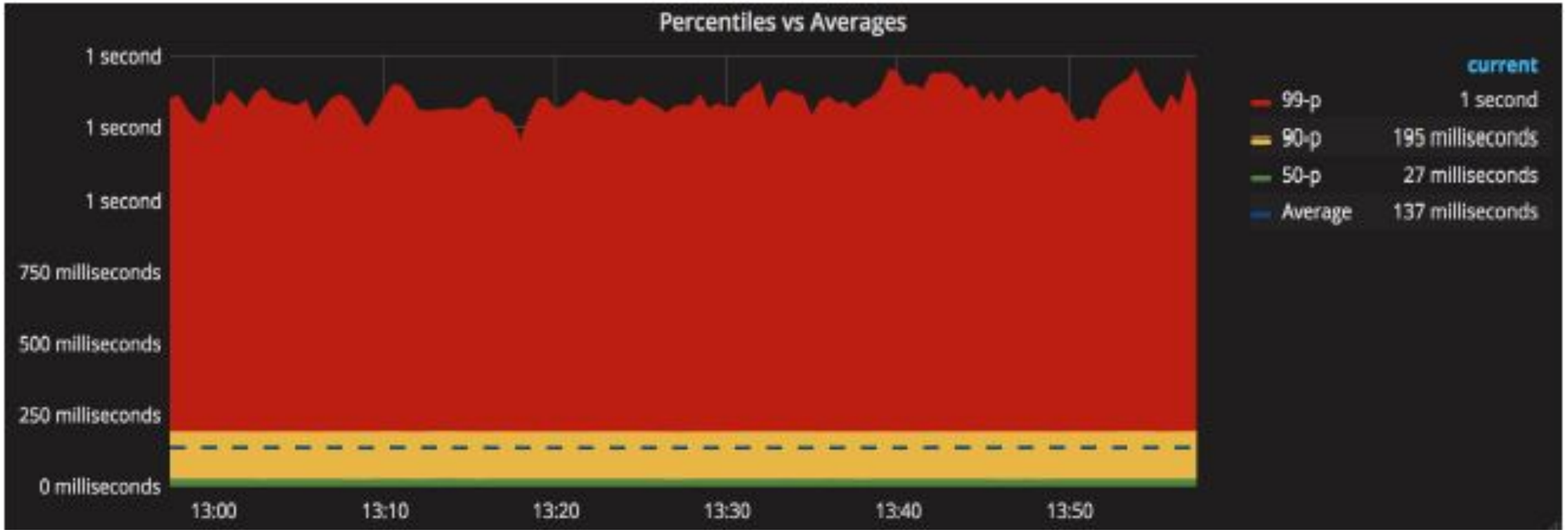
Metric Types

- **Gauge:** used for values that **go down as well as up**, such as current memory usage or the number of items in a queue or the number of requests in progress



Metric Types

- **Histogram/Summary:** measure the frequency of value observations. It tracks how long something takes or how big such as the size of a request.



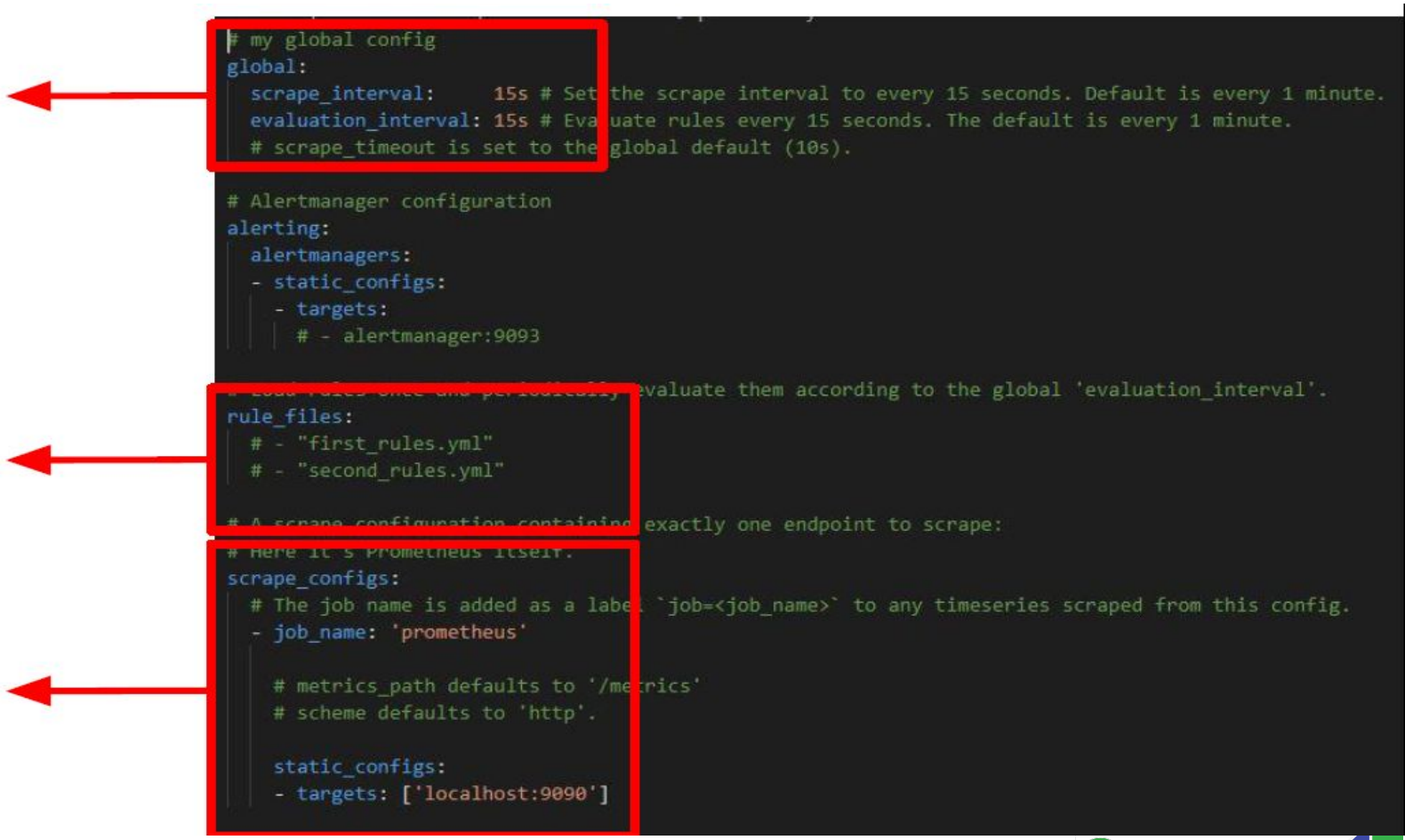
Configuring Prometheus

- Prometheus comes with a sample configuration file

at which interval targets will be scraped

rules for gathering metric values or creating alerts

Resources that Prometheus monitors

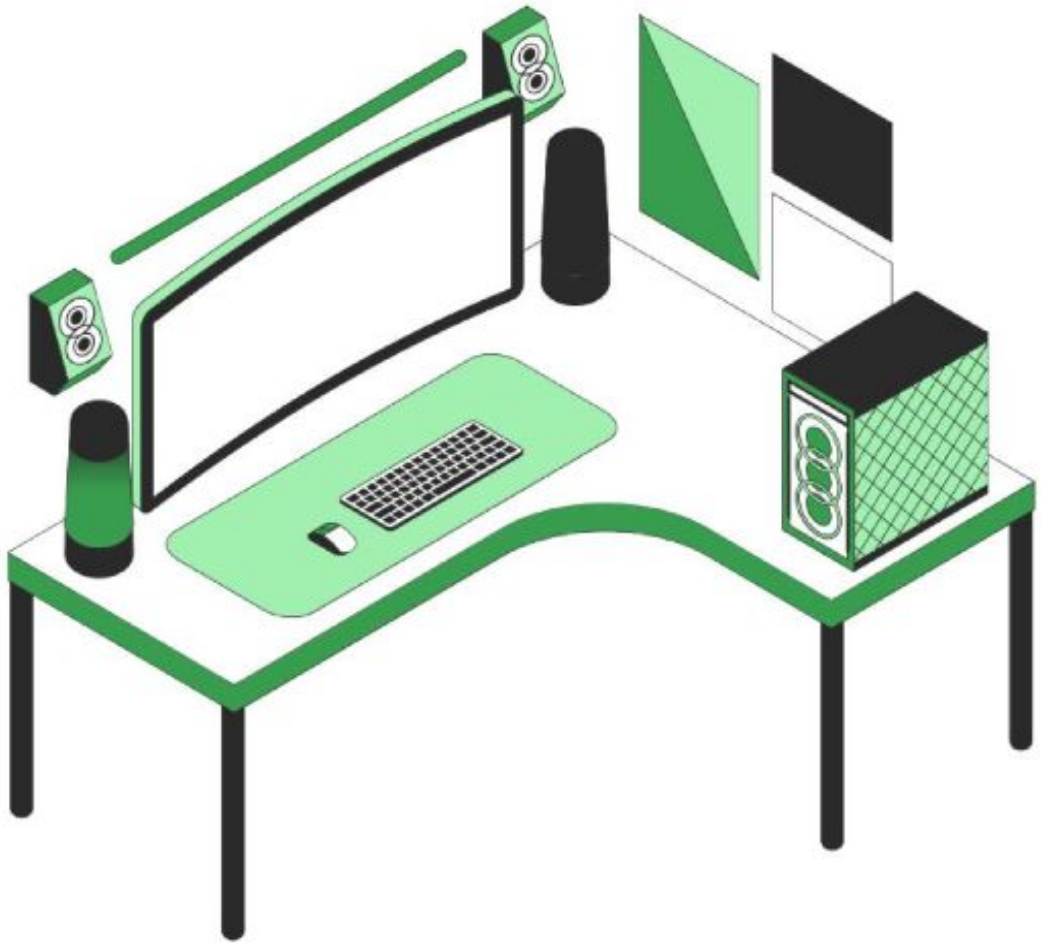


What is Grafana?

What is Grafana?

Grafana is an open-source analytics and interactive visualization web application.

It provides charts, graphs, and alerts for the web when connected to supported data sources.



Do you have any questions?

Send it to us! We hope you learned something new.