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DevOps Certification Training

COURSE OUTLINE

MODULE 10

1. Introduction to DevOps

2. Version Control with Git

3. Git and Jenkins

4. Continuous Integration with Jenkins

5. Configuration Management using Ansible

6. Containerization using Docker Part - I



7. Containerization using Docker Part - II

8. Container Orchestration Using
Kubernetes Part-I

9. Container Orchestration Using
Kubernetes Part-II

10. Monitoring Using Prometheus and
Grafana

11. Provisioning Infrastructure using
Terraform Part - I

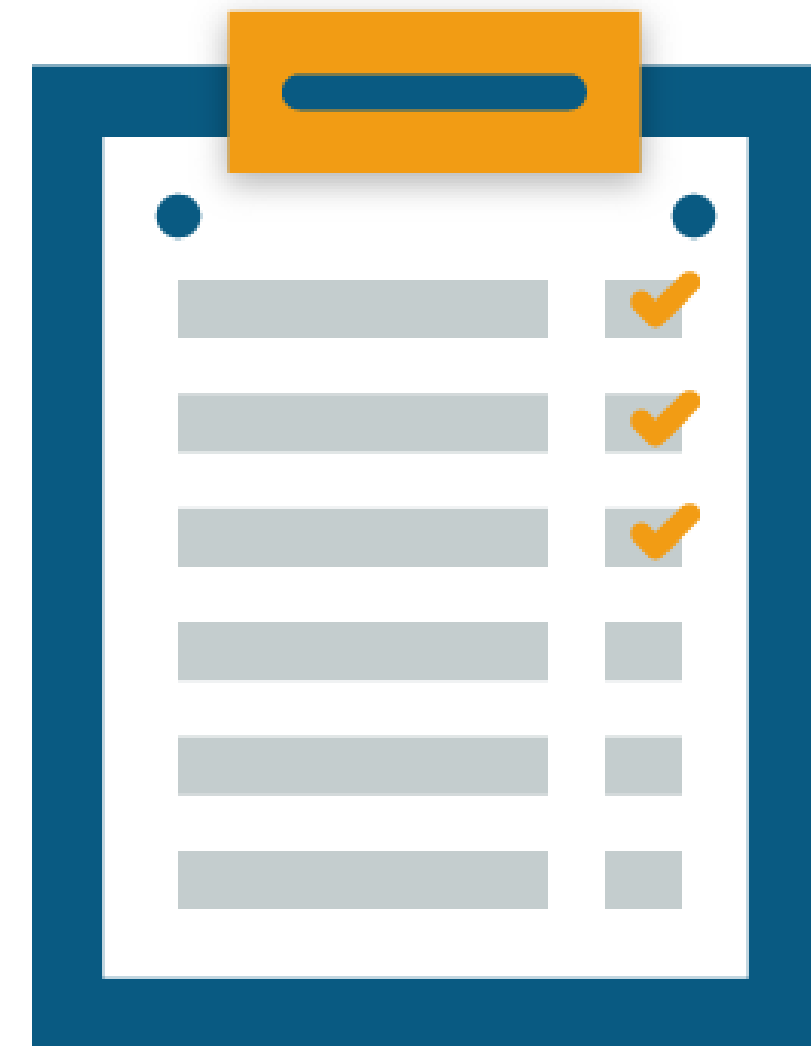
12. Provisioning Infrastructure using
Terraform Part - II

Module 10 – Monitoring using Prometheus and Grafana

Topics

Following are the topics covered in this module:

- Introduction to Continuous Monitoring
- Continuous Monitoring Tools in DevOps
- Monitoring using Prometheus
- Dashboard Visualization using Grafana
- Creating a Dashboard to monitor the Pipeline



Objectives

After completing this module, you should be able to:

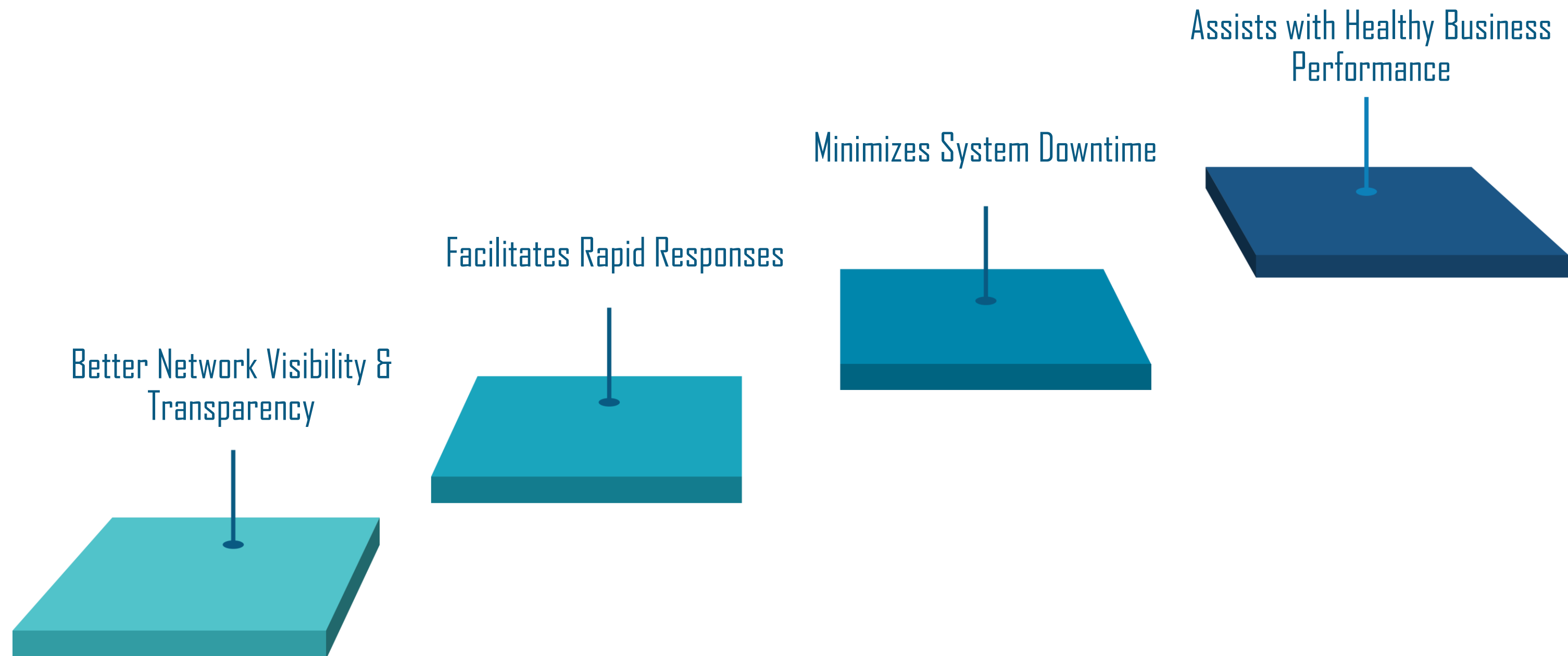
- Understand Continuous Monitoring in DevOps
- Identify the different Continuous Monitoring Tools in DevOps
- Monitor your environment using Prometheus
- Visualize Prometheus Data using Grafana Dashboards
- Create a Monitoring system for your DevOps Pipeline





Introduction to Continuous Monitoring

Why use Continuous Monitoring?

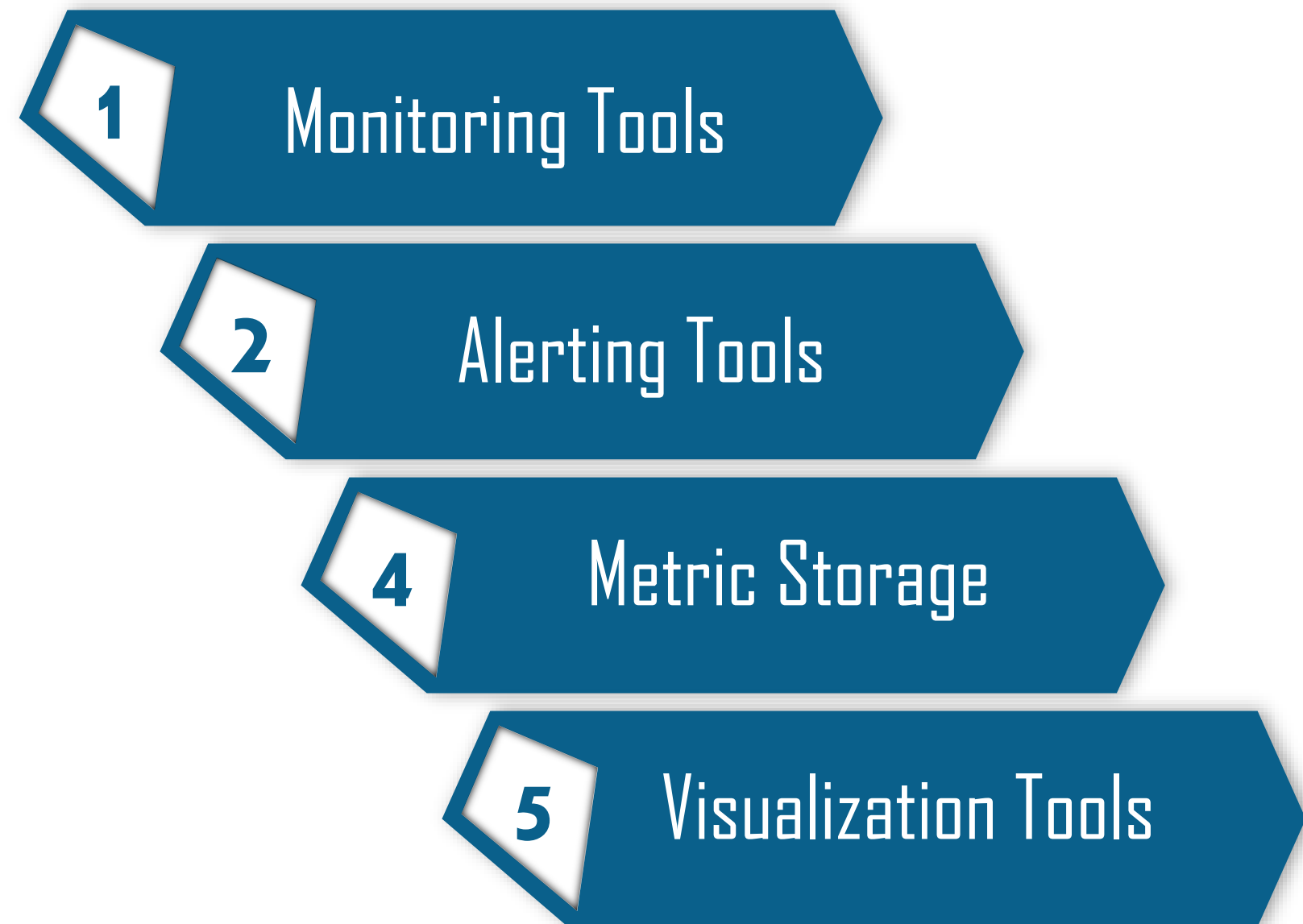


Continuous Monitoring

It is an automated process by which one can observe and detect compliance issues and security threats during each phase of the DevOps pipeline



Continuous Monitoring Tools in DevOps



Continuous Monitoring Tools in DevOps

1

Monitoring Tools

2

Alerting Tools

4

Metric Storage

5

Visualization Tools

Sensu



Nagios[®]

Continuous Monitoring Tools in DevOps

1

Monitoring Tools

2

Alerting Tools

PagerDuty

servicenow™

4

Metric Storage

5

Visualization Tools



Continuous Monitoring Tools in DevOps

1 Monitoring Tools

2 Alerting Tools

5 Visualization Tools

4 Metric Storage



splunk>



Continuous Monitoring Tools in DevOps

1 Monitoring Tools

2 Alerting Tools

4 Metric Storage

5 Visualization Tools





Trade Desk's Monitoring Issues

The Trade Desk



The Trade Desk is a global tech company that markets a software platform for digital advertising

1

The company was founded in 2009 and currently hosts over 1200 employees with a market cap of 8.89 Billion USD

2

Such a massive operations is handled using a combination of physical data centers and the cloud

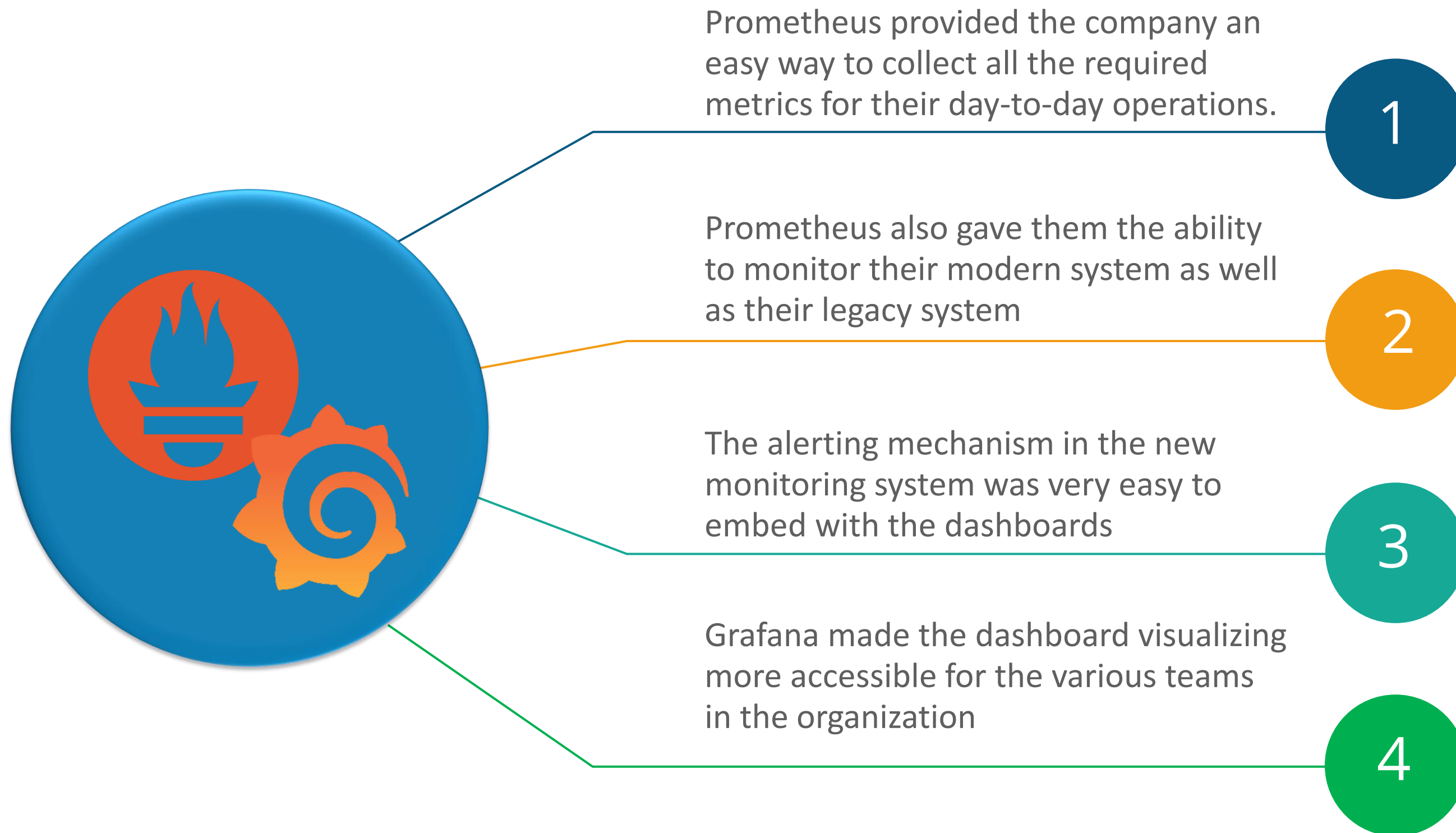
3

The Trade Desk: Monitoring Troubles

- Their old infrastructure required an extremely labour intensive, difficult to scale storage system
- This system was very unreliable in getting queries and providing metrics on time
- This meant that the system required a lot of hand-holding on a regular basis



Solution: Prometheus and Grafana



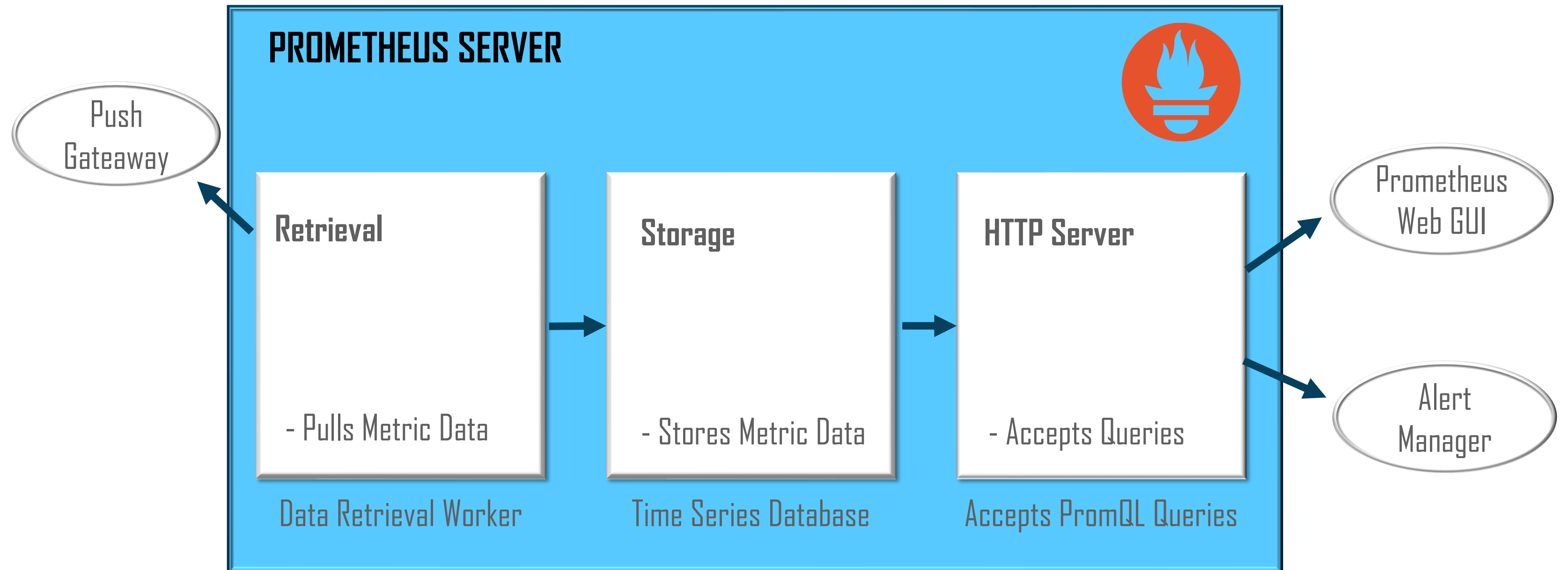
Prometheus

Prometheus

- It is a community-driven open-source monitoring framework
- Has a robust alert mechanism
- A Cloud Native Computing Foundation (CNCF) graduated project



Prometheus Architecture



Prometheus: Features

Dimensional Data

Uses a dimensional data model where series are identified by a metric name and a set of key-value pair

Simple Operations

Servers running Prometheus are independent of each other for reliability. Since it is written in GO Language, the binaries can easily be updated

Alert System

All the alerts are managed by an alert manager. The alerts are defined using the Prometheus's own PromQL

Visualization

Offers various options to visualize the monitoring data. The built-in expression browser can be integrated with tools such as Grafana

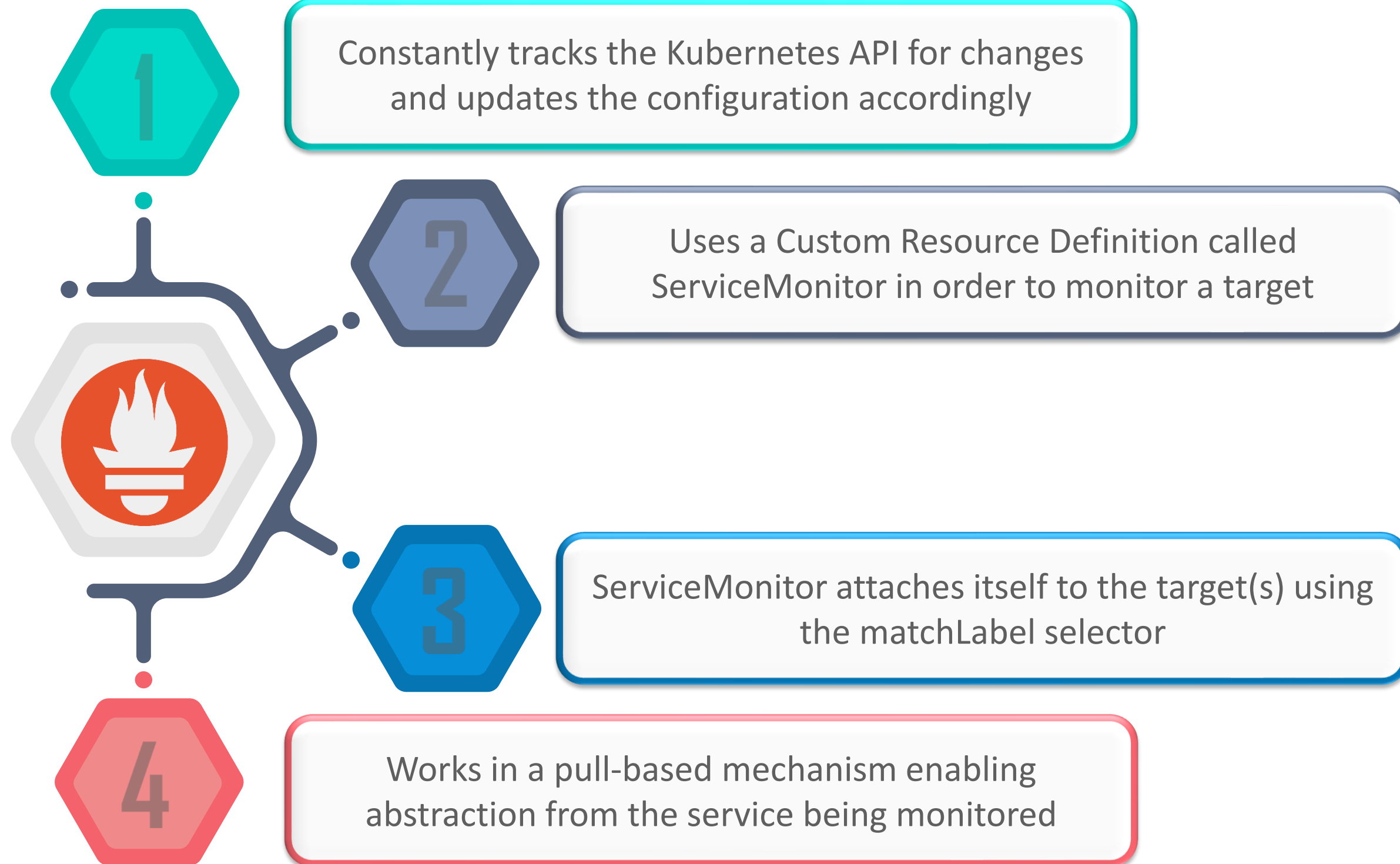
Library Support

With support of over ten different languages, creating and implementing custom libraries is very easy

Efficient Storage

Prometheus stores all the monitoring data on the local disk itself in an efficient custom format

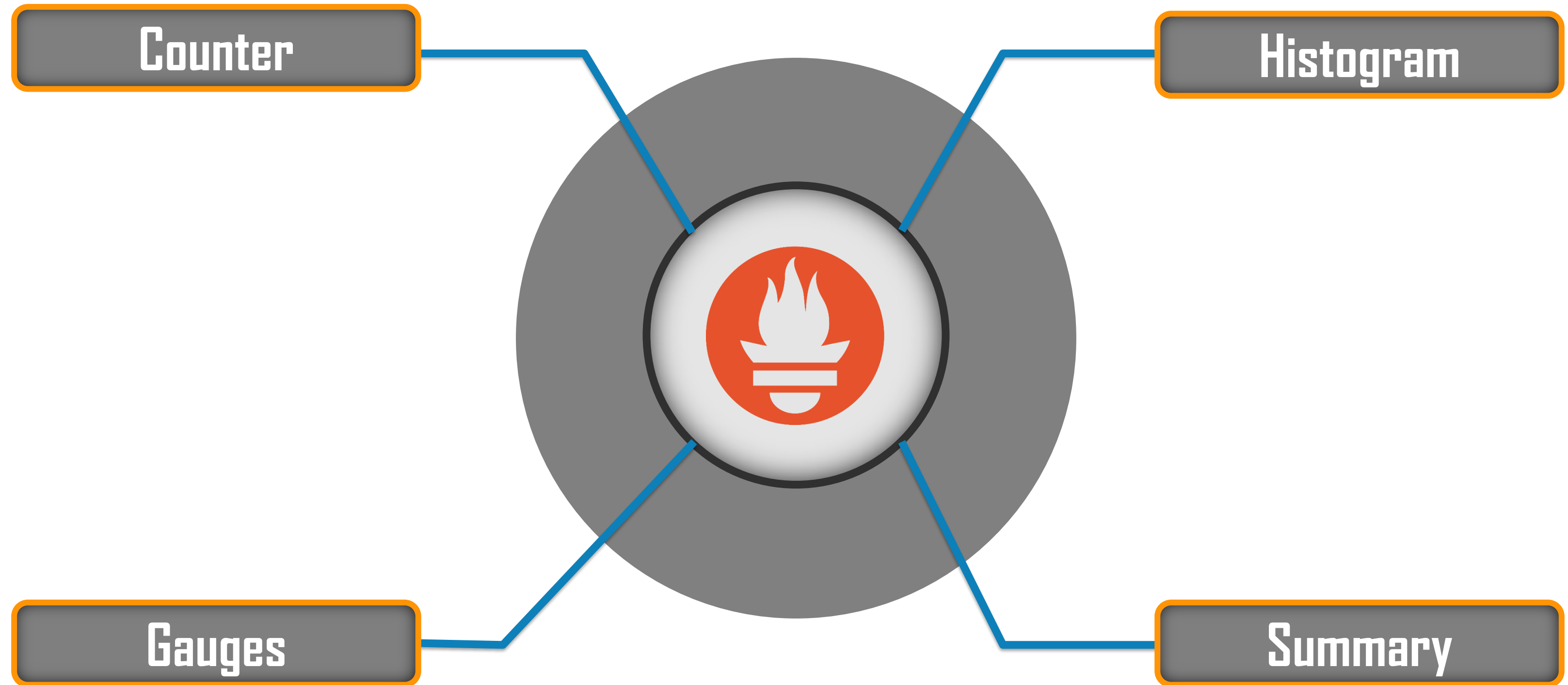
Prometheus on Kubernetes: Working





Prometheus Metrics and Its Types

Prometheus Metrics and Its Types



Prometheus Metrics and Its Types

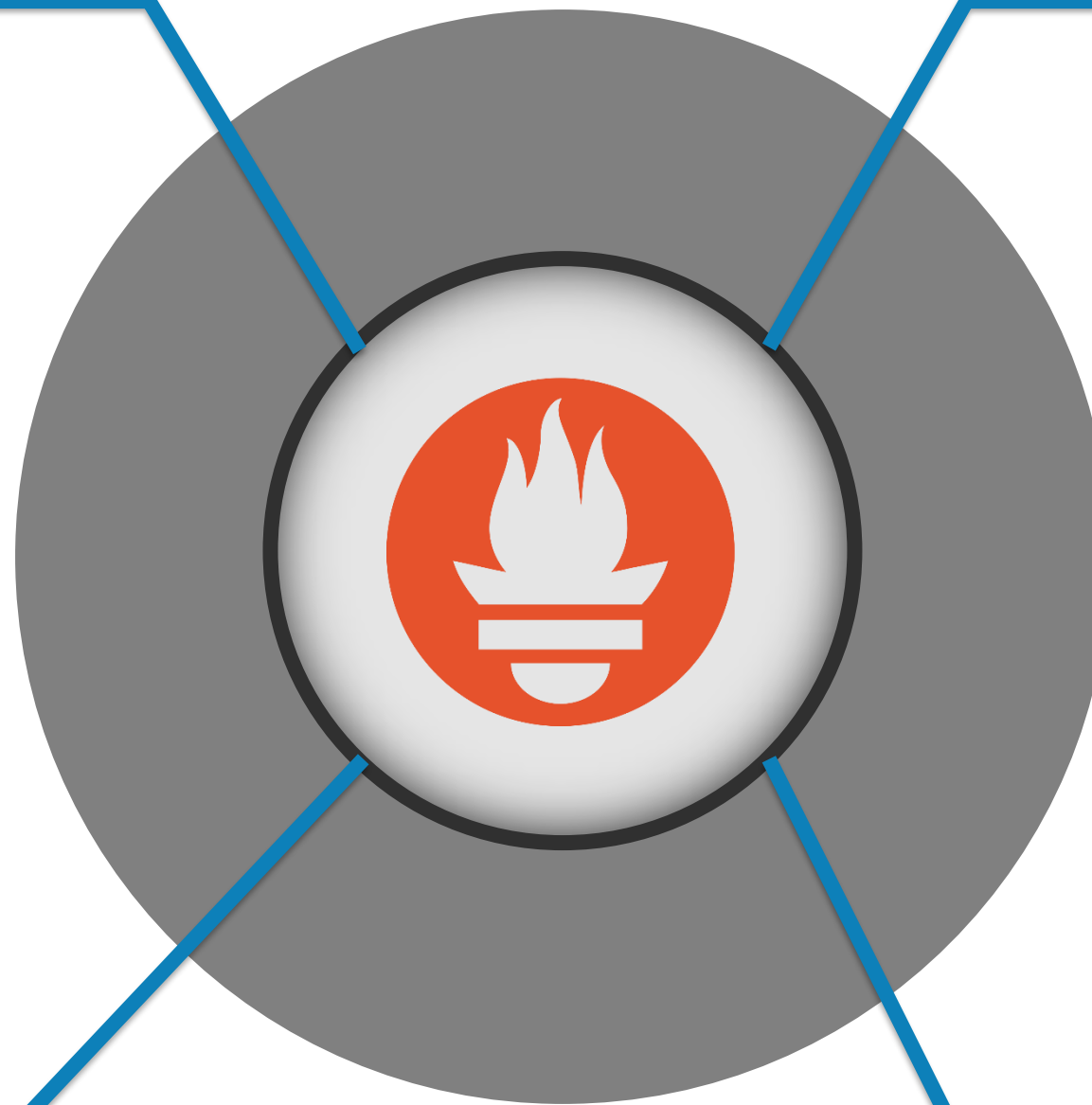
Counter

- Record a value that only goes up
- Query how fast the value is increasing

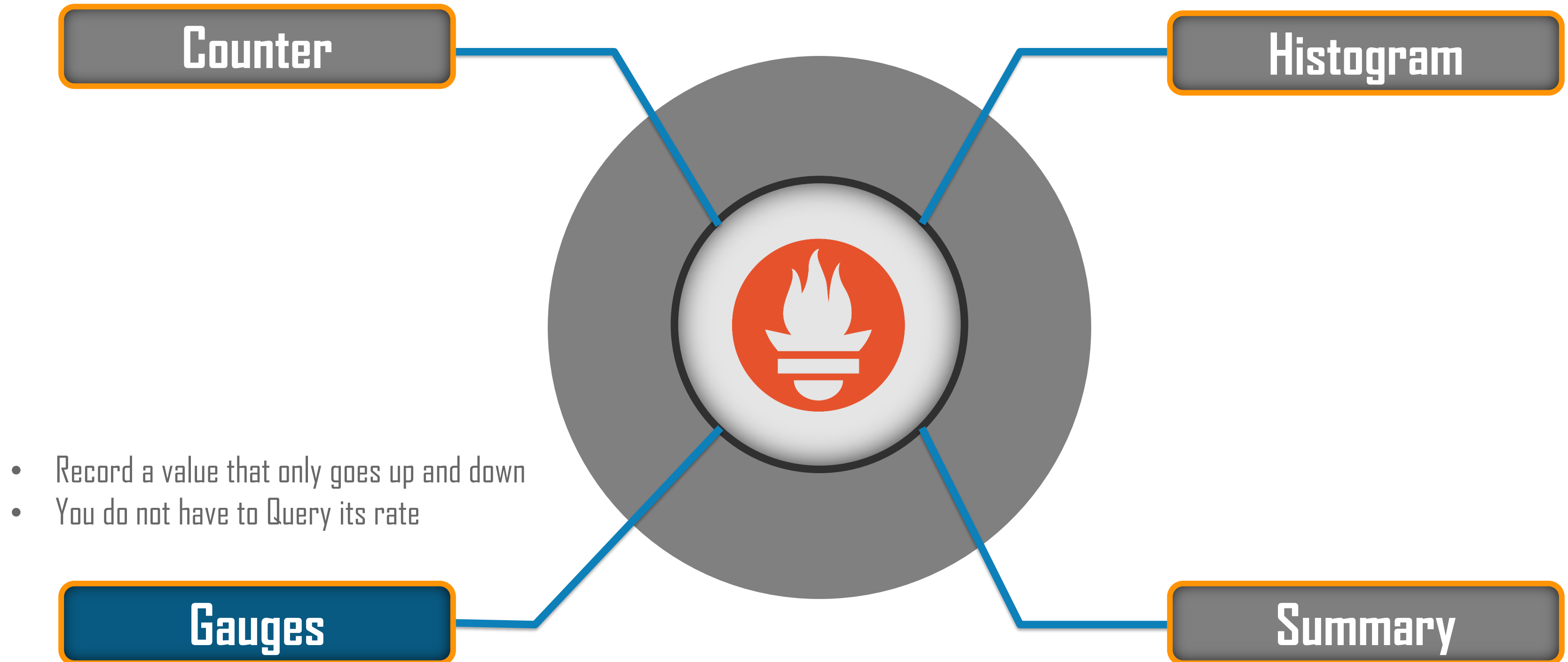
Histogram

Gauges

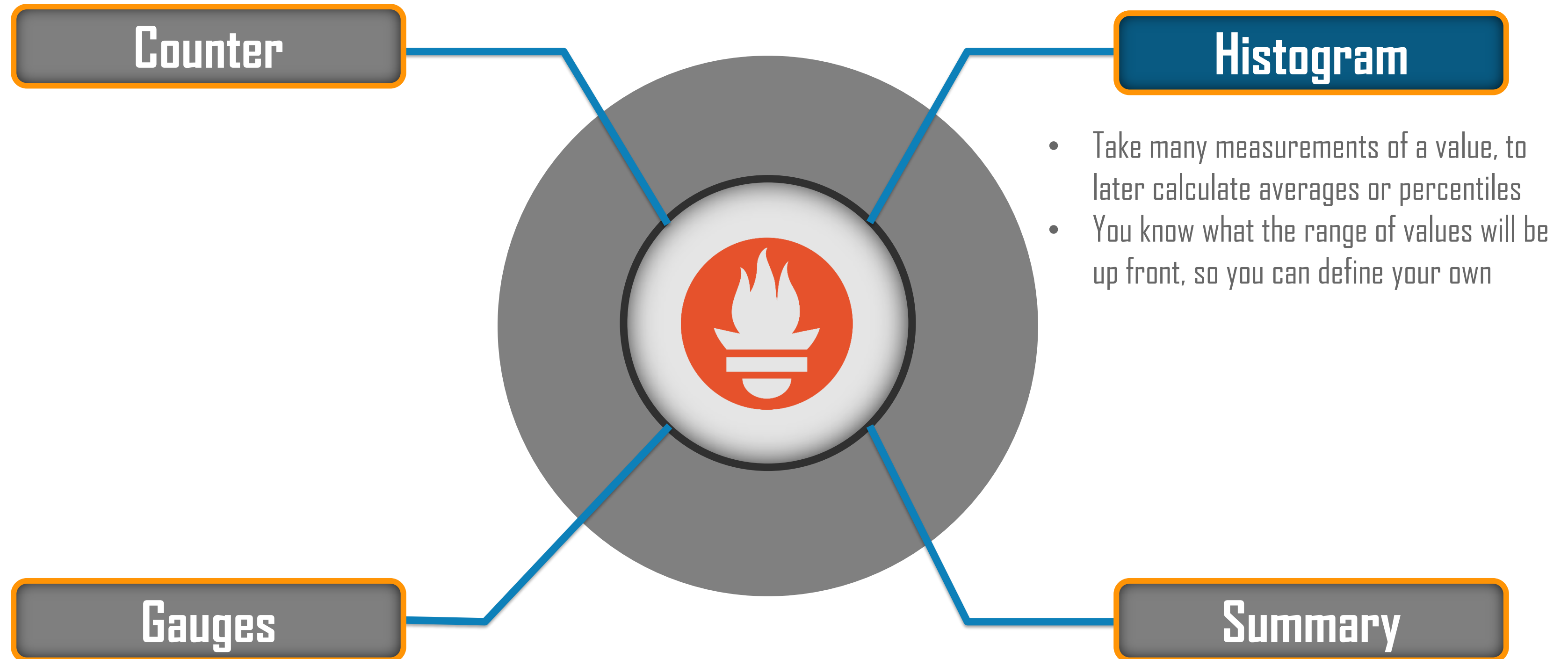
Summary



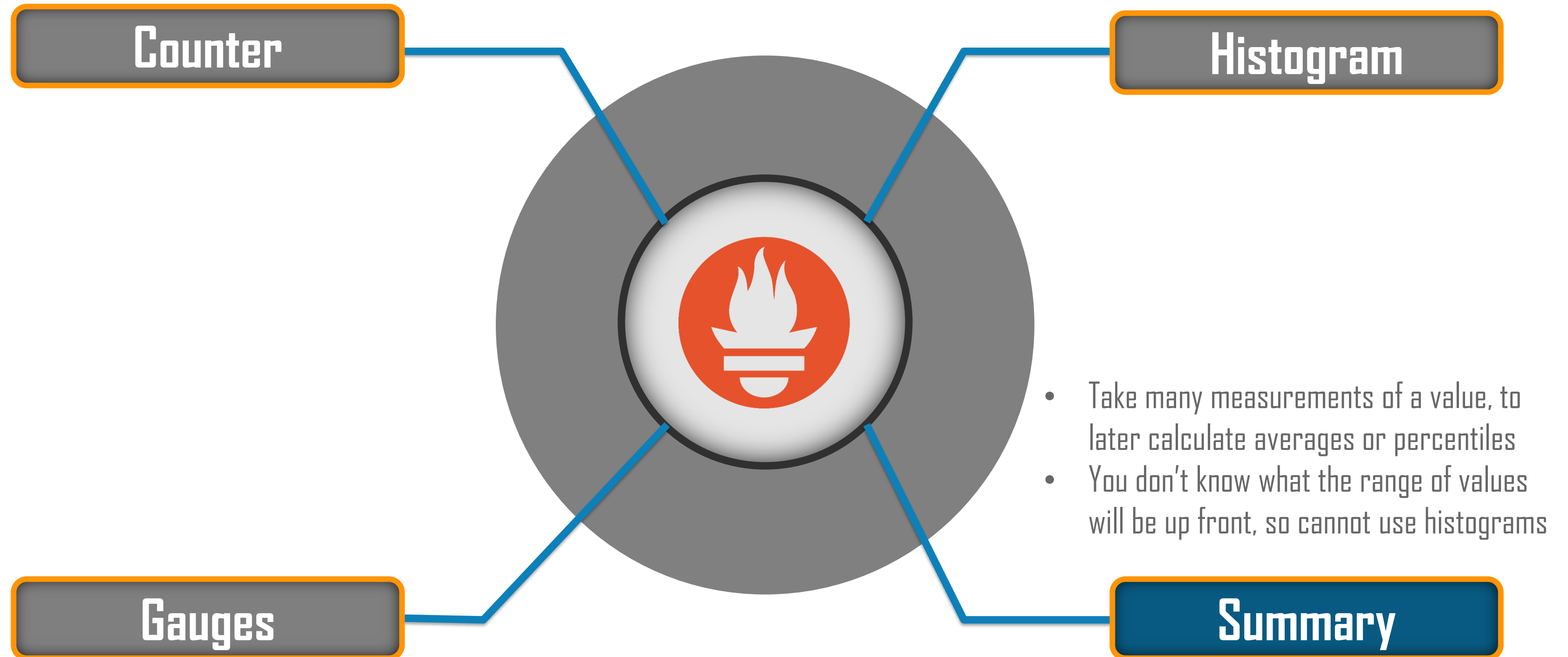
Prometheus Metrics and Its Types



Prometheus Metrics and Its Types



Prometheus Metrics and Its Types



Demo: Prometheus

Grafana

Grafana

Grafana is a *multi-platform* open source analytics and interactive visualization web application. It provides:

- ✓ Charts
- ✓ Graphs
- ✓ Alerts



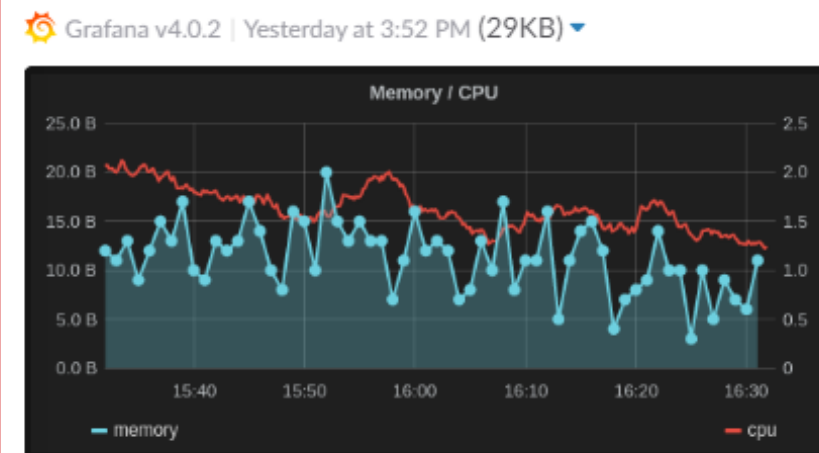
Grafana Features

Visualize



Grafana has a plethora of visualization options to help you understand your data, beautifully

Alert



Seamlessly define alerts where it makes sense — while you're in the data

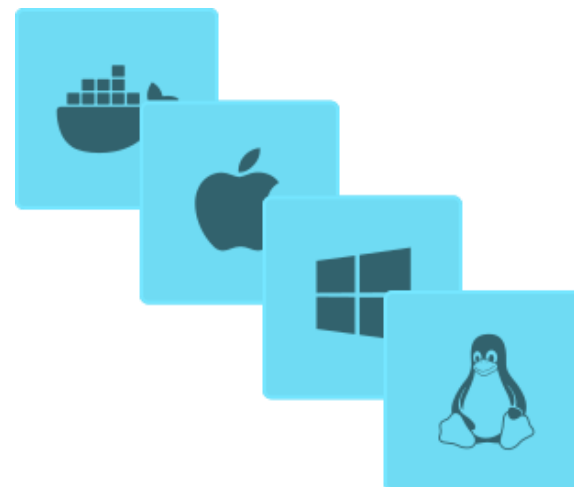
Grafana Features

Unify



Grafana supports dozens of databases, natively. Mix them together in the same Dashboard

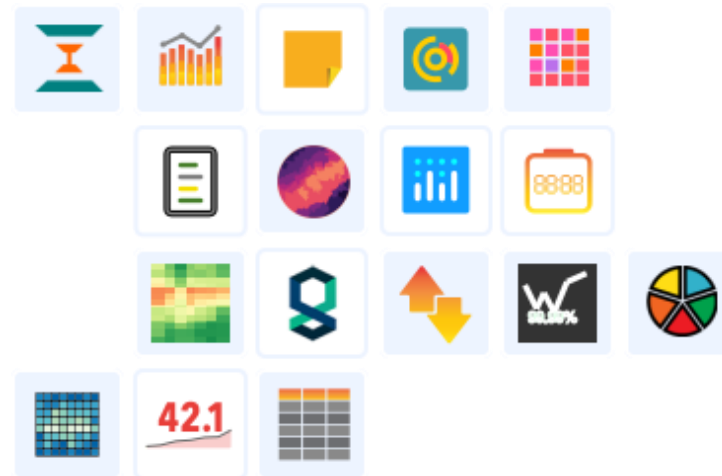
Alert



Grafana's completely open source, and backed by a vibrant community

Grafana Features

Extend



Discover hundreds of dashboards and plugins in the official library


Collaborate



Bring everyone together, and share data and dashboards across teams



Demo: Creating a Grafana Dashboard



Demo: Monitoring a Pipeline using Prometheus and Grafana

Summary

Continuous Monitoring

It is an automated process by which one can observe and detect compliance issues and security threats during each phase of the DevOps pipeline



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Continuous Monitoring Tools in DevOps

What are the tools available in the market today??



- 1 Monitoring Tools
- 2 Alerting Tools
- 4 Metric Storage
- 5 Visualization Tools

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Prometheus

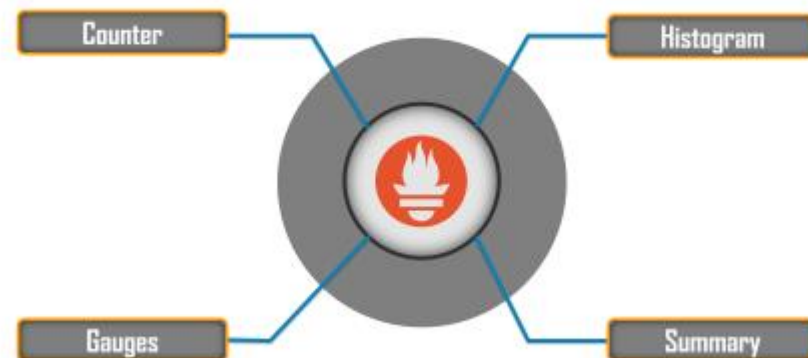
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Prometheus Metrics and Its Types



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Seamlessly define alerts where it makes sense — while you're in the data

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Questions



FEEDBACK





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