

# Monitoring on Distributed Systems

An Overview of Common Technologies

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# Introduction

## What is a distributed system?

- **Definition:** A system components located different networked computers which communicate and coordinate to achieve a common goal
- **Example:** Microservices, cloud-based applications, internet of things

# Importance of Monitoring

**10s of Million  
Toman Lost**

**Per Minute of Downtime**

# Key Metrics to Monitor

## Golden Signals:

- **Business Metrics**

- **Latency:** Time it takes to service a request
- **Traffic:** Demand being placed on your system
- **Errors:** Rate of requests that fail
- **Saturation:** Collection and analysis of log data

- **Application & Services Logs**

# Overview of Monitoring Tools

## Categories of Monitoring Tools:

- **Metrics Collection:** Prometheus, Victoria Metrics
- **Visualization:** Grafana, Kibana
- **Logging:** ELK Stack (Elasticsearch, Logstash, Kibana), Fluentd
- **Tracing:** Jaeger
- **Alerting:** Prometheus Alertmanager, Grafana OnCall

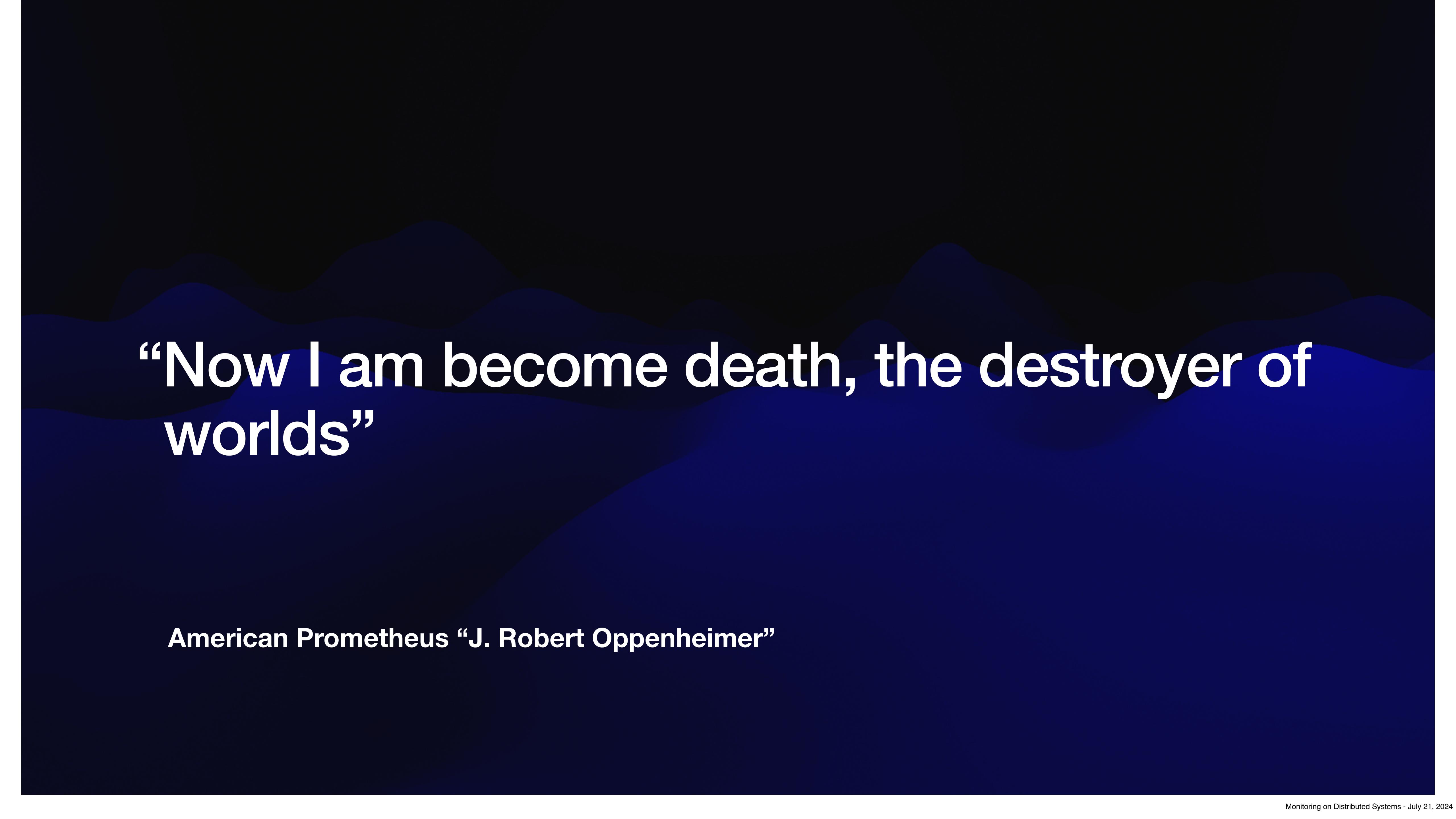
# Dictionary

The most common interpretations:

- White-Box monitoring
- Black-Box monitoring
- Dashboard
- RCA (Root Cause Analysis)

# Prometheus



The background features a dark blue gradient with abstract, wavy, undulating shapes that create a sense of depth and movement.

**“Now I am become death, the destroyer of  
worlds”**

**American Prometheus “J. Robert Oppenheimer”**

# How it Works?

## Key Features:

- **Data Collection:** Pull
- **Storage:** Time-Series
- **Metrics:** Counters and gauges
- **Labels**
- **Querying:** PromQL [Grafana?]

# Grafana



# How it Works?

## Key Features:

- **Data Visualization:** Visualize metrics on customizable dashboards
- **Alerting:** Supports alerting based on visualized metrics
- **Plugins:** Extensible with a variety of plugins for different data sources and visualized types

# Prometheus + Grafana

# How Prometheus and Grafana work together

## Workflow

- Application exposes
- Prometheus scraps
- Grafana visualizes
- Alerts on Alertmanager

# Case Study + Demo

