

# Logging, Monitoring, and Observability in Google Cloud

The best course to monitor, troubleshoot and improve your infrastructures and applications performances

2jours / 14h

## Learning outcomes

- Plan and implement a well-architected logging and monitoring infrastructure
- Define Service Level Indicators (SLIs) and Service Level Objectives (SLOs)
- Create effective monitoring dashboards and alerts
- Monitor, troubleshoot, and improve Google Cloud infrastructure
- Analyze and export Google Cloud audit logs
- Find production code defects, identify bottlenecks, and improve performance
- Optimize monitoring costs

## Target audience

- Cloud architects, administrators, and SysOps personnel
- Cloud developers and DevOps personnel

## Prerequisites

- **Google Cloud Platform Fundamentals: Core Infrastructure** or equivalent experience
- Basic scripting or coding familiarity
- Proficiency with command-line tools and Linux operating system environments

# Course Outline

## Module 1: Introduction to Google Cloud Monitoring Tools

- Understand the purpose and capabilities of Google Cloud operations-focused components: Logging, Monitoring, Error Reporting, and Service Monitoring
- Understand the purpose and capabilities of Google Cloud application performance management focused components: Debugger, Trace, and Profiler

## Module 2: Avoiding Customer Pain

- Construct a monitoring base on the four golden signals: latency, traffic, errors, and saturation
- Measure customer pain with SLIs
- Define critical performance measures
- Create and use SLOs and SLAs
- Achieve developer and operation harmony with error budgets

## Module 3: Monitoring Critical Systems

- Choose best practice monitoring project architectures
- Differentiate Cloud IAM roles for monitoring
- Use the default dashboards appropriately
- Build custom dashboards to show resource consumption and application load
- Define uptime checks to track aliveness and latency

## Module 4: Alerting Policies

- Develop alerting strategies
- Define alerting policies
- Add notification channels
- Identify types of alerts and common uses for each
- Construct and alert on resource groups
- Manage alerting policies programmatically

## Module 5: Advanced Logging and Analysis

- Identify and choose among resource tagging approaches
- Define log sinks (inclusion filters) and exclusion filters
- Create metrics based on logs
- Define custom metrics
- Link application errors to Logging using Error Reporting

- Export logs to BigQuery

## **Module 6: Working with Audit Logs**

- Audit Logs
- Data Access Logging
- Audit Logs Entry Format
- Best Practices

## **Module 7: Configuring Google Cloud Services for Observability**

- Integrate logging and monitoring agents into Compute Engine VMs and images
- Enable and utilize Kubernetes Monitoring
- Extend and clarify Kubernetes monitoring with Prometheus
- Expose custom metrics through code, and with the help of OpenCensus

## **Module 8: Monitoring Google Cloud VPC**

- Collect and analyze VPC Flow logs and Firewall Rules logs
- Enable and monitor Packet Mirroring
- Explain the capabilities of Network Intelligence Center
- Use Admin Activity audit logs to track changes to the configuration or metadata of resources
- Use Data Access audit logs to track accesses or changes to user-provided resource data
- Use System Event audit logs to track GCP administrative actions

## **Module 9: Managing Incidents**

- Define incident management roles and communication channels
- Mitigate incident impact
- Troubleshoot root causes
- Resolve incidents
- Document incidents in a post-mortem process

## **Module 10: Investigating Application Performance Issues**

- Debug production code to correct code defects
- Trace latency through layers of service interaction to eliminate performance bottlenecks
- Profile and identify resource-intensive functions in an application

## **Module 11: Optimizing the Costs of Monitoring**

- Analyze resource utilization cost for monitoring related components within Google Cloud
- Implement best practices for controlling the cost of monitoring within Google Cloud