PROMETHEUS AND GRAFANA

Course Objective:

Candidates will understand the Advanced concepts of Prometheus monitoring tool.

Duration:

6 days (4 hours per day)

Delivery Mode:

Theoretical + Demo + Lab + Exercises + MCQs

Target Audience:

The course is designed for DevOps Engineers, Software Engineers and SRE who want to excel in this monitoring tool.

Knowledge Prerequisites:

Monitoring basic knowledge and understanding of Metrics, Logs and events. Good understanding of traditional Monitoring tools.

Lab Prerequisites:

Laptop with open Internet connectivity

AWS account for each individual with Admin Access (can be provided from our end, based on separate commercial)

Linked Certification:

https://training.linuxfoundation.org/certification/prometheus-certified-associate/

Day 1 (4 hours):

Observability Concepts:

- Metrics
- Understand logs and events
- Tracing and Spans
- Push vs Pull
- Service Discovery
- Basics of SLOs, SLAs, and SLIs

Prometheus fundamentals:

- System Architecture
- Prometheus Installation

a.Binary package

b.Hocker

c.Helm chart

- Configuration and Scraping
- Understanding Prometheus Limitations
- Data Model and Labels
- Exposition Format

Day 2 (4 hours):

PromQL:

- Selecting Data
- Rates and Derivatives
- Aggregating over time
- Aggregating over dimensions
- Binary operators
- Histograms
- Timestamp Metrics

Day 3 (4 hours):

Instrumentation and Exporters:

- Client Libraries
- Instrumentation
- Exporters
- Node Exporter

a. Installation and configuration
b. Integration with Prometheus
c. Metrics collection

- Push Gateway

a. Installation and configuration
b. Integration with Prometheus
c. Metrics pushing

- Service Discovery Configuration
- Structuring and naming metrics

Day 4 (4 hours):

Alerting & Dashboarding:

- Dashboarding basics
- Alerting Architecture
- Alert Manager Installation

a. Binary package
b. Docker
c. Helm Chart

- Alerting Rules Overview
- Configuring Alerting rules
- The “for” field

 Alert Labels
 Adding Annotations
 Understand and Use Alertmanager
 Alerting basics (when, what, and why)

Day 5 (4 hours):

Alerting advanced:

 Notification Pipeline
 Configuring Routes
 Configuring Receivers
 Configuring Inhibit Rules
 Viewing Alerts in Alertmanager
 Viewing Notifications in Mattermost
 Setting Silences
 Testing Inhibit Rules
 Automating Alertmanager Actions

Alert Manager HA:

 Setting Up Alertmanager in HA Mode
 Synchronizing Alerts Across Instances
 Alertmanager State Replication
 Testing and Validating HA Setup
 Scaling Alertmanager Clusters
 Monitoring and Troubleshooting HA Alertmanager
 Automating Alertmanager Actions

Day 6 (4 hours):

Prometheus Federation:

 Setting Up Prometheus Federation
 Hierarchical Monitoring with Prometheus Federation
 Data Aggregation and Querying
 Scaling Prometheus with Federation
 Troubleshooting Federation Issues

Grafana:

 Grafana introduction
 Why do we need it?
 How Grafana works?
 Grafana Architecture
 Grafana installation
 Integrating Prometheus with Grafana
 Data sources in Grafana

Real world Architectural designs and economics around same Q & A