Google Compute Engine Administrator Course

Course Duration: 32 Hours **Course code: GCEA**

1. Course Overview

This course provides in-depth knowledge of managing virtual machine infrastructure using Google Compute Engine (GCE). It focuses on provisioning, configuring, securing, and optimizing VM instances in Google Cloud. Learners will gain hands-on experience in managing compute resources, implementing high availability, and ensuring performance and cost efficiency.

2. What you'll learn?

By the end of the course, you will be able to:

- Understand Google Compute Engine architecture and components
- Create and manage VM instances efficiently
- Configure networking, storage, and security for VMs
- Implement autoscaling and load balancing
- Monitor and troubleshoot compute resources
- Optimize performance and cost of VM workloads
- Manage backups, snapshots, and disaster recovery
- Automate compute infrastructure

3. Target Audience

- Cloud Engineers and Administrators
- System Administrators
- DevOps Engineers
- IT Infrastructure Professionals
- Beginners working with Google Cloud compute services

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4. Pre-Requisites

Before taking this course, you should have:

- Basic understanding of cloud computing
- Familiarity with Linux/Windows systems
- Basic networking knowledge
- Exposure to Google Cloud (recommended)

5. Course content

Module 1: Course Introduction

- Course overview and objectives
- Introduction to Google Compute Engine
- Use cases and benefits

Module 2: Compute Engine Fundamentals

- Overview of GCE architecture
- Regions, zones, and machine types
- VM lifecycle
- Pricing models

Module 3: Creating and Managing VM Instances

- Creating VM instances
- Instance configuration and customization
- Managing VM states
- Using gcloud CLI and Console

Module 4: Storage for Compute Engine

- Persistent disks
- Local SSDs
- Snapshots and images
- Disk management

Module 5: Networking for Compute Engine

- Virtual Private Cloud (VPC)
- Subnets and IP addressing
- Firewall rules
- External and internal connectivity

Module 6: Instance Groups and Autoscaling

- Managed and unmanaged instance groups
- Autoscaling policies
- Load balancing basics
- High availability design

Module 7: Load Balancing

- Types of load balancers
- Configuring load balancing
- Traffic distribution strategies
- Health checks

Module 8: Security for Compute Engine

- IAM roles and permissions
- OS-level security
- Shielded VMs
- Best practices for securing VMs

Module 9: Monitoring and Logging

- Cloud Monitoring
- Cloud Logging
- Metrics and alerts
- Troubleshooting issues

Module 10: Backup and Disaster Recovery

- Snapshot management
- Backup strategies
- Disaster recovery planning
- High availability setups

Module 11: Automation and Scripting

- Using gcloud CLI
- Startup and shutdown scripts
- Automation with scripts
- Scheduling tasks

Module 12: Performance Optimization

- Right-sizing VM instances
- Resource utilization
- Performance tuning
- Cost optimization strategies

Module 13: Managing Images and Templates

- Creating custom images
- Instance templates
- Reusable configurations
- Deployment consistency

Module 14: Troubleshooting and Best Practices

- Debugging VM issues
- Common errors and solutions
- Best practices for compute management
- Operational efficiency

Module 15: Real-World Use Cases and Capstone Project

- Deploying scalable applications
- Infrastructure management scenarios
- End-to-end compute project
- Final evaluation

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