Opensearch Course Contents (5 days)
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Prerequisites:

- Basic understanding of search and indexing concepts.
- Familiarity with distributed systems and database management.
- Proficiency in Linux command line interface.
- Experience with at least one programming language such as Python or Java.

Objectives:

- Gain a comprehensive understanding of OpenSearch architecture and components.
- Learn to deploy and manage OpenSearch clusters in production environments.
- Develop skills in indexing and querying data using OpenSearch.
- Understand advanced features such as security, monitoring, and scaling in OpenSearch clusters.

Day 1: Introduction to OpenSearch

- Overview of OpenSearch: History, features, and use cases.
- Comparison with Elasticsearch: Similarities and differences.
- Installation and setup of OpenSearch clusters.
- Understanding OpenSearch architecture: Nodes, clusters, and indices.
- Introduction to OpenSearch APIs: CRUD operations, search queries, and aggregations.
- Hands-on: Installing and configuring OpenSearch cluster on a local environment.
- Index creation and document insertion using OpenSearch APIs.
- Querying data: Basic search queries and filters.
- Introduction to Kibana: Overview and installation.
- Visualizing data with Kibana: Creating dashboards and visualizations.
- Q&A session: Clarification of concepts covered.
- Group discussion: Use cases and scenarios for OpenSearch deployment.
- Review of Day 1 topics and key takeaways.
- Preparation for Day 2 sessions.

- Assignment: Indexing and querying sample dataset using OpenSearch and visualizing results in Kibana.

Day 2: Advanced OpenSearch Features

- Performance tuning: Optimizing OpenSearch cluster performance.
- Understanding sharding and replication in OpenSearch.
- Introduction to OpenSearch plugins: Security, monitoring, and more.
- Hands-on: Installing and configuring OpenSearch plugins.
- Introduction to OpenSearch Security: Authentication and authorization.
- Setting up role-based access control (RBAC) in OpenSearch.
- Introduction to OpenSearch monitoring: Metrics and health checks.
- Hands-on: Configuring monitoring and alerts in OpenSearch.
- Introduction to scaling OpenSearch clusters: Horizontal and vertical scaling.
- Deploying multi-node clusters: High availability and fault tolerance.
- Q&A session: Addressing questions on advanced OpenSearch topics.
- Group discussion: Best practices for performance optimization and scaling.
- Review of Day 2 topics and practical exercises.
- Preparation for Day 3 sessions.
- Assignment: Implementing security and monitoring configurations for an OpenSearch cluster.

Day 3: OpenSearch Operations and Maintenance

- Backup and restore strategies for OpenSearch clusters.
- Hands-on: Implementing backup and restore operations in OpenSearch.
- Introduction to index lifecycle management (ILM) in OpenSearch.
- Managing index retention policies and rollover strategies.
- Introduction to OpenSearch Snapshot Lifecycle Management (SLM).
- Hands-on: Configuring snapshot lifecycle policies for data backup.
- Introduction to OpenSearch troubleshooting: Common issues and solutions.
- Hands-on: Troubleshooting and debugging OpenSearch

cluster issues.
- Introduction to OpenSearch upgrade strategies and best practices.
- Hands-on: Performing rolling upgrades of OpenSearch clusters.
- Q&A session: Troubleshooting and upgrade-related queries.
- Group discussion: Backup and recovery strategies for production environments.
- Review of Day 3 topics and practical exercises.
- Preparation for Day 4 sessions.
- Assignment: Designing a backup and recovery strategy for a production OpenSearch cluster.

Day 4: Advanced OpenSearch Administration

- Introduction to OpenSearch on Kubernetes: Deployment options and considerations.
- Hands-on: Deploying OpenSearch clusters on Kubernetes using operators.
- Understanding OpenSearch performance monitoring on Kubernetes.
- Hands-on: Implementing monitoring and logging for OpenSearch on Kubernetes.
- Introduction to OpenSearch on AWS: Deployment options and services.
- Hands-on: Deploying OpenSearch clusters on AWS EC2 instances.
- Understanding managed OpenSearch services on cloud platforms.
- Hands-on: Deploying OpenSearch using managed services on AWS.
- Introduction to OpenSearch integrations with other tools and services.
- Hands-on: Integrating OpenSearch with data ingestion pipelines.
- Q&A session: Kubernetes deployment, cloud integration, and tooling queries.
- Group discussion: Pros and cons of different deployment options for OpenSearch.
- Review of Day 4 topics and practical exercises.
- Preparation for Day 5 sessions.
- Assignment: Deploying an OpenSearch cluster on Kubernetes or AWS and configuring monitoring and logging.

Day 5: OpenSearch Optimization and Best Practices

- Introduction to OpenSearch performance optimization techniques.
- Hands-on: Implementing performance optimizations for OpenSearch clusters.
- Introduction to OpenSearch query optimization: Query DSL and performance tuning.
- Hands-on: Optimizing search queries for improved performance.
- Understanding data modeling and mapping in OpenSearch.
- Hands-on: Designing efficient index mappings for data ingestion.
- Introduction to OpenSearch security best practices: Encryption and access controls.
- Hands-on: Implementing encryption and access controls in OpenSearch.
- Introduction to OpenSearch governance and compliance.
- Hands-on: Implementing governance and compliance policies in OpenSearch.
- Q&A session: Performance optimization, security, and compliance queries.
- Group discussion: Best practices for optimizing and securing OpenSearch clusters.
- Review of Day 5 topics and practical exercises.
- Course recap: Key takeaways and learnings from the training program.
- Course evaluation and feedback: Participants provide feedback on the course content, delivery, and overall experience.