

MIN IO

Day 1 – Introduction & Fundamentals

- **Module 1:** Overview of Object Storage
 - Difference between block, file, and object storage
 - Why MinIO? Use cases in enterprise and cloud-native environments
 - **Module 2:** MinIO Architecture & Concepts
 - Distributed, erasure coding, bitrot protection
 - High availability design
 - **Module 3:** Installing & Setting Up MinIO
 - Single-node vs multi-node setup
 - CLI installation & configuration
 - **Hands-On Lab:** Deploy single-node MinIO on local environment
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Day 2 – Core Features & Operations

- **Module 4:** Buckets & Objects Management
 - Creating buckets, uploading/downloading objects
 - Object versioning & lifecycle policies
 - **Module 5:** Access Control & Security
 - Users, groups, and policies
 - Encryption (server-side & client-side)
 - **Module 6:** MinIO Client (mc) & SDKs
 - Using mc for administration
 - Integration with Python, Java, and Go SDKs
 - **Hands-On Lab:** Create bucket policies, secure access, and use SDK for object operations
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Day 3 – Advanced Configuration & Integrations

- **Module 7:** Distributed Deployment
 - Multi-node/multi-drive setup
 - Load balancing with Nginx/HAProxy
- **Module 8:** Data Management & Replication
 - Erasure coding deep dive

- Bucket replication across clusters
 - **Module 9: Monitoring & Logging**
 - Prometheus & Grafana integration
 - Audit logs
 - **Hands-On Lab:** Deploy a distributed cluster and configure bucket replication
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Day 4 – Enterprise Use Cases

- **Module 10: MinIO in Kubernetes**
 - Deployment via Helm charts & Operator
 - StatefulSets and persistent volumes
 - **Module 11: Integration with Big Data & AI/ML Workloads**
 - Apache Spark, Presto, TensorFlow integrations
 - **Module 12: Backup & Disaster Recovery**
 - Using MinIO with Velero, TrilioVault, or other backup tools
 - **Hands-On Lab:** Deploy MinIO on Kubernetes & integrate with Spark/ML pipeline
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Day 5 – Performance, Scaling & Best Practices

- **Module 13: Performance Optimization**
 - Network, disk, and cluster tuning
 - Benchmarking with warp tool
- **Module 14: Scaling Strategies**
 - Horizontal vs vertical scaling
 - Global federation for multi-site setups
- **Module 15: Best Practices & Case Studies**
 - Real-world enterprise adoption examples
 - Security hardening & compliance considerations
- **Capstone Lab/Project:**
 - Deploy a multi-node MinIO cluster
 - Enable replication & monitoring
 - Run benchmark tests and prepare performance reports