+33 (0)1 48 10 09 46
formation@ambient-it.net
140 Avenue Jean Lolive 93500 Pantin - France

Updated on 10/07/2026

Sign Up

Garage Training: Resilient S3 Storage

2 days (14 hours)

Overview

Garage is a distributed object storage solution compatible with the S3 API, designed for self-hosting and resilience. With geographically distributed replication and a lightweight architecture, Garage allows you to build a storage service spread across multiple sites and tailored to the constraints of your infrastructure.

Our Garage Training: Resilient S3 Storage will guide you from an initial deployment to an operational cluster, helping you master the architectural choices essential to its availability and operation.

You'll learn how to configure nodes, organize replication zones, and size the usable capacity. You'll set up buckets, access keys, and permissions, then perform practical integrations with the AWS CLI and backup tools.

By the end of the course, you'll be able to deploy a geodistributed S3 cluster and verify its behavior in the event of a failure. You'll know how to distinguish between replication and backup, secure access, and anticipate compatibility limitations.

This training also covers cluster monitoring, integrity checks, metadata snapshots, and maintenance best practices to ensure the reliability of your storage in a real-world environment.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Design a Garage architecture tailored to failure domains and capacity constraints
- Deploy a three-node cluster and configure replication across multiple zones
- Manage buckets, keys, and access permissions
- Integrate S3 storage with transfer clients and a backup solution
- Monitor the cluster and verify its availability during a controlled outage
- Prepare for maintenance operations and develop an independent backup strategy

Target Audience

- DevOps Engineer
- System Administrator
- Infrastructure Engineer
- SRE Engineer
- Cloud Architect

Prerequisites

- Proficiency with common Linux commands and the Bash terminal for server administration
- Experience deploying containers with Docker and managing persistent volumes
- Knowledge of IP networks, DNS, and HTTP communication between services
- Understanding of object storage principles and accessing an S3 API from a client

Technical Prerequisites

- Computer with 4 cores, 16 GB of RAM, and 30 GB of free space for the local lab
- Ubuntu 24.04 LTS system (native or in a virtual machine) with administrator privileges and virtualization enabled
- Installation of Docker Engine and Docker Compose v2 with access to lab images and persistent volumes
- AWS CLI v2 and rclone clients available, as well as restic for backup exercises, with versions validated prior to the session
- Stable internet connection allowing downloads and lab communications,
  SSH terminal and text editor available; no cloud account required

Our Garage Training Program: Resilient S3 Storage

[Day 1 - Morning]

Fundamentals and Initial Deployment

- Principles of object storage, buckets, objects, and uses of the S3 API
- Garage architecture, nodes, metadata, and data blocks
- Concepts of replication, quorum, and consistency in a distributed system

- Configuring garage.toml, service ports, and persistent volumes with Docker
- Initial administration using the Garage CLI, creating a bucket, and assigning permissions to a key
- Hands-on Workshop: Deploying a discovery node with persistent storage, creating an access point, and
  transfer objects using the AWS CLI.

[Day 1 - Afternoon]

Building the geographically distributed cluster

- Designing failure domains and distributing nodes across separate physical sites
- Inter-node connectivity, advertised addresses, and RPC secret protection
- Configuring the replication factor and the impact of quorums on availability
- Layout management, zone assignment, capacity declaration, and applying changes
- Calculating usable capacity, balancing zones, and principles of data redistribution
- Hands-on workshop: Build a three-node cluster across three simulated zones, implement three-copy replication, and verify S3 access from multiple nodes.

[Day 2 - Morning]

S3 Security and Integrations

- Configuring S3 clients, endpoints, regions, signatures, and bucket addressing
- Managing access keys and permissions per bucket according to the principle of least privilege
- Exposing the service with a reverse proxy and TLS; isolating internal and administrative interfaces
- Validating S3 compatibility, multipart transfers, and differences with access policies and AWS versioning
- Integrations with rclone and restic; distinction between backing up to Garage and backing up the cluster itself
- Hands-on workshop: Configure two access points with distinct permissions, transfer files using rclone, and backing up and restoring a dataset with restic on Garage.

[Day 2 - Afternoon]

Monitoring and Validating Resilience

- Monitoring with Prometheus and Grafana, tracking errors, capacity, and node status
- Troubleshooting using logs, the CLI, and synchronization metrics
- Node failure and zone loss scenarios, availability limitations related to quorums and the S3 entry point
- Integrity checks using scrubbing, repair tracking, and metadata snapshots
- Maintenance preparation, node replacement, layout changes, upgrades, and independent backups

- Hands-on workshop: Monitor the cluster, shut down a node representing a zone, test reads and writes via an available node, then restore service and verify resynchronization and file integrity.

Target Audience

This training is intended for both individuals and companies—large or small—seeking to train their teams in new, advanced IT technologies or to acquire specific industry knowledge or modern methodologies.

Entry-Level Assessment

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency level across various types of technologies, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth operation of the training session.

Teaching Methods

Hands-On Training: 60% Practical, 40% Theoretical. Training materials distributed in digital format to all participants.

Organization

The course alternates between theoretical input from the instructor—supported by examples and reflection sessions—and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.

Training organization registered under number 11 75 54743 75. This registration does not constitute state accreditation.
© Ambient IT 2015-2026. All rights reserved. Paris, France - Switzerland - Belgium - Luxembourg