

SNIA DEVELOPER CONFERENCE



By Developers FOR Developers

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# SNIA Cloud Object Storage Test Tools - Foundation for Heterogeneous Multi- Vendor Interoperability

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[www.sniadeveloper.org](http://www.sniadeveloper.org)

# Why S3 Interoperability Testing?

- S3 most widely adopted *de facto* cloud object storage (COS) API
  - Native S3 operation well supported (between AWS services working directly with clients)
- Compatible third-party “S3-like” storage widely available in cloud, hybrid, and on-prem deployments (micro-services, Kubernetes, etc.)
  - Customer demand / expectation for S3 multi-vendor interoperability strong, especially for emerging technologies or advanced customer integration
    - S3-compatible storage developed and supported independently
    - Variations between third-party S3 storage implementations impact multi-vendor interoperability
- COS expanding, innovating new use cases (AI), and rapidly evolving
- SNIA COS Plugfests demonstrate immense S3 multi-vendor value
  - SNIA aims to eliminate barriers to attain any-to-any interoperability on popular COS APIs, including AWS S3, Google Cloud Storage, and Azure Blob

# Developer Difficulties

- Inconsistent experience and problematic isolation between SDKs, clients, and S3-compatible storage developers
  - Developers support their platform and customers first
  - Storage providers may lag behind in supporting the latest canonical SDK release, which results in disconnect between clients or integrations that quickly update
- Inconsistent or missing developer-oriented documentation
- No public roadmap for reference API, tools, and utilities
  - Informal technical communication (blogs), which lack clear timing and precise definition of release content
  - No multi-vendor neutral industry forum for developers to share experience, tools, best practices, and COS community interoperability test results (until now)

# Why S3 Interoperability Testing Matters

- Customers assume "S3 compatible" storage is standardized
  - Customers desire and expect ubiquitous easy to use interface for everything, everywhere
  - This is precisely what SNIA COS community is attempting to address
- S3 API can often be a moving target for third-party storage
  - REST API is relatively stable, but SDKs / clients hide low-level behavioral changes, which third-party storage developers must deeply account for and integrate into their storage software stack
  - Most S3 third-party storage vendors implement a subset of the API, causing variation
  - Third-party storage developers choose different options within the API, causing further variation
- Diverse and expanding use-cases for object storage
  - Object storage is frequently multi-cloud or on-prem - **hybrid cloud deployment is common**
  - Storage behavior is often deeply integrated in software and not easily customizable for different levels of compatibility (especially for advanced function with multi-vendor end-to-end data flows)

# SNIA Cloud Object Storage Interoperability Projects

## SNIA COS Plugfests

- Expert face-to-face interoperability events, builds developer network and expedites resolution of COS API compatibility issues
- *Open to all*



## SNIA COS Test Tools TWG

- Expands multi-vendor interoperability tooling available to everyone in the COS ecosystem
- Expedites collaboration among cloud storage developers, architects and test support engineers
- Enhances customer experience of popular COS APIs: AWS S3, Google Cloud Storage, and Azure Blob
- *Open to SNIA members only*

# COS Test Tools Technical Work Group (TWG)

## Provisional TWG

- Initial discussions post SDC 2024
- Officially “provisional” January 2025
- Create charter documents and focus on achievable goals for 2025
- Exploratory discussions @ Denver SDC 2025 Plugfest

## Phase 1 (2025)

- Approved by SNIA TC in June 2025
- Work item: publish white paper “Developer Strategies for Cloud Object Storage Multi-Vendor Interoperability”
- Identify and test candidate open-source tools with a focus on S3 API storage servers

## Phase 2 (2026...)

- Expand scope to add S3 / COS performance test tools
- Begin development on open-source test tools based on P1 findings
- Integrate open-source test tool automation into future COS Plugfests

# Objectives: COS Test Tools TWG

- We drive collaboration to reduce duplicate effort, reduce time to market and improve end-user experience regardless of provider
- Research, document and promote industry behavioral and interoperability consensus on widely popular industry COS APIs
- Engage with leading industry developers to collect/catalog API test suite specifications and test traces from a wide array of client and server vendors, as well as conduct ongoing research to seek out, identify and resolve specific API issues
- Act as a community driven, vendor-neutral forum to proactively identify, define, and publish common COS API behaviors/documentation
- Collaboratively drive industry-led testing by identifying existing open-source, vendor neutral testing resources or producing novel test tools (available via BSD 3-clause license)

# Process: COS Test Tools TWG

- Investigate open-source tools / resources to address COS interoperability issues
- Create vendor neutral evaluation and acceptance criteria for COS API testing resources

- Solicit feedback from COS community to refine focus on future efforts



- Produce / modify / expand new or existing tools / resources
- Promote findings via speaking opportunities, webinars, or other media

- Integrate interoperability tooling / resources into testing pipelines of products and services
- Refine test integration into COS Plugfests

# Roadmap: COS Test Tools TWG

Q1 2026

Gain Feedback on Published Whitepaper  
Begin Tool Development  
Performance Test Tool Evaluation

Q2/Q3 2026

Publish Performance Test Tool Whitepaper  
Utilize Test Tools at COS Plugfests

Q4 2026

Broaden and Proliferate API Interoperability Testing  
Investigate COS Client/SDK Testing

# Takeaways: COS Test Tools TWG

## Strategic Takeaways

- Active participation in both SNIA Plugfests & Test Tools TWG crucial for success
- Diverse ecosystem participation will increase value and speed of industry results
- Focused community collaboration will yield better customer & end user experience, as well as reduce development and support costs

Help shape the future of open-source COS test tools

Email us for additional info on how to join:  
[costttwg-chair@snia.org](mailto:costttwg-chair@snia.org)

[snia.org/groups/cst](https://snia.org/groups/cst)

## Educational Cloud Storage Webinars



SNIA  Cloud Storage Technologies

Agentic AI  
Use Cases, Benefits, Risks

Live Webinar  
June 26, 2025  
10:00 am PT / 1:00 pm ET

Erin Farr  
IBM

Michael Hoard  
SNIA CST

SNIA Cloud Object Storage Community

Cloud Object Storage  
**Plugfest**

[SNIA COS Plugfests](#)

SNIA Cloud Object Storage  
**Test Tools**

[SNIA COS Test Tools TWG](#)

CST committed to the adoption, growth and standardization of **intelligent data storage usage** in cloud infrastructures

- [Join SNIA](#) - Simplified Membership Model for FY'25
  - Pay one fee for SNIA Membership - Participate in ANY group!
- Join SNIA Cloud Object Storage Community - email us at [askcloudplugfest@snia.org](mailto:askcloudplugfest@snia.org)



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