iRODS S3 API:
User and Bucket Mapping, Presigned URLs, and Dataverse

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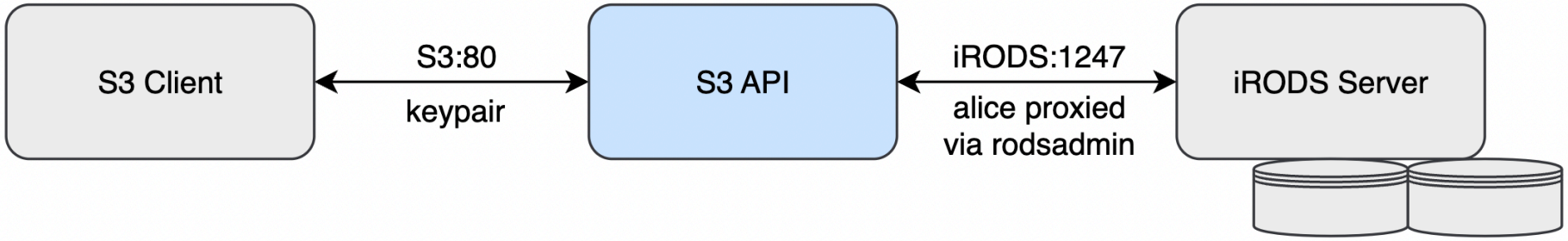
Overview

- Motivation / Goals
- Architecture / Implementation
- History
- Release updates
  - 0.4.0
  - 0.5.0
  - 0.6.0
- Demo
- Future Work

Motivation / Goals

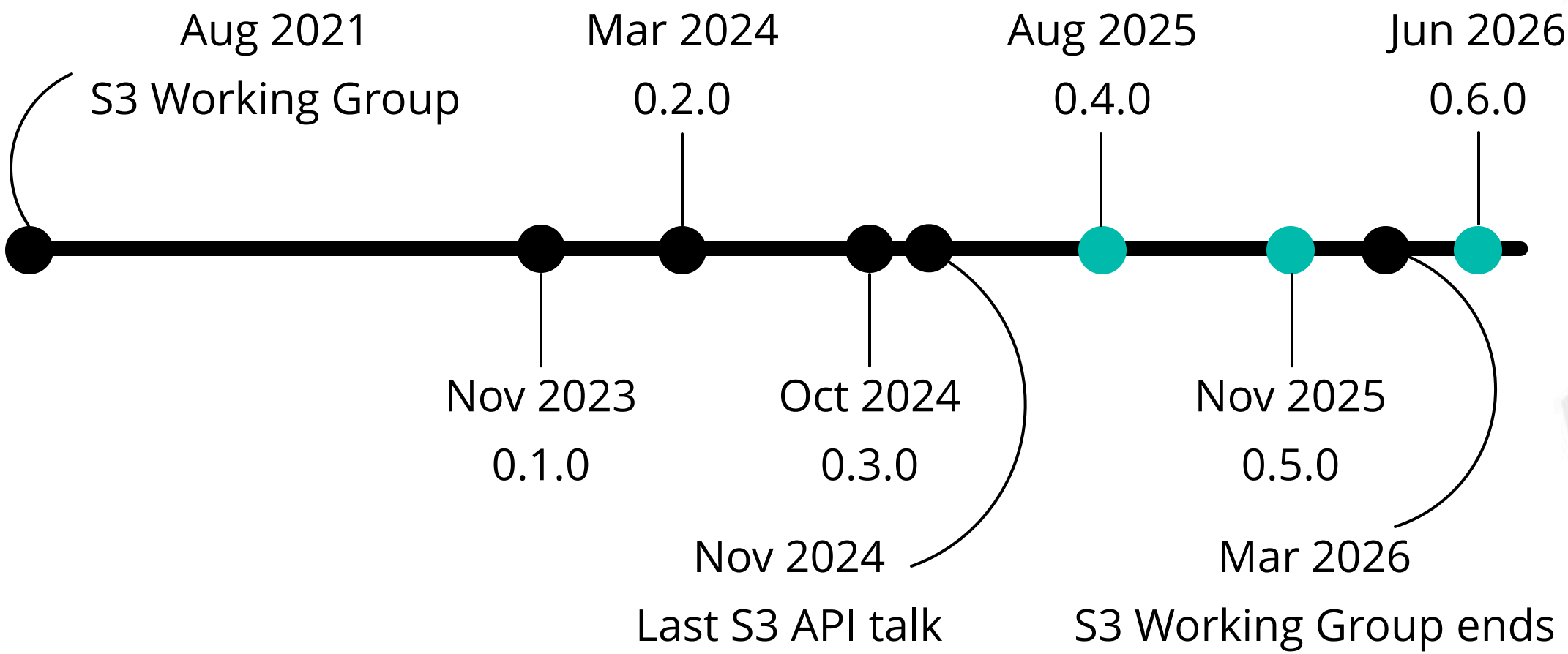
- Present iRODS as the S3 protocol
- Multi-user / Multi-bucket
- Load Balancer friendly
- Maintainable
- Performance similar to other S3 backends

Architecture / Implementation



- Single binary
- Single configuration file
- Shipped as Docker image
- Multi-user / Multi-bucket
- Requires rodsadmin credentials

History


Aug 2021
S3 Working Group
Nov 2023
0.1.0
Mar 2024
0.2.0
Oct 2024
0.3.0
Nov 2024
Last S3 API talk
Aug 2025
0.4.0
Nov 2025
0.5.0
Jun 2026
0.6.0
Mar 2026
S3 Working Group ends

- Added iRODS 5 compatibility
- Server configuration validated on startup
- Added presigned URL download and upload support
  - Time-limited, anonymous data access
  - Enables large-file storage for Dataverse in iRODS

https://github.com/irods/irods_client_s3_api/releases/tag/0.4.0

Added plugin architecture for user and bucket mapping.

- Modeled after HTTP API 0.5.0 user mapping changes
- Enables dynamic user / bucket mapping
  - Adjust mappings without restarting S3 API server
- Mapping configurations separated from main config file
  - Currently supports local JSON file configs

https://github.com/irods/irods_client_s3_api/releases/tag/0.5.0

- Basic support for popular Windows-based S3 GUIs
  - Tested with S3 Browser and Cyberduck
  - Create, list, and delete empty prefixes
  - Implemented ListObjects(V1) and some stub endpoints
- Automated build-and-test workflows across iRODS versions

https://github.com/irods/irods_client_s3_api/releases/tag/0.6.0

Demo

- Stand up S3 API 0.6.0 and iRODS 5.0.2 using irods_demo
- Upload data to iRODS with Cyberduck via S3 API
- Anonymous download with presigned URL from Cyberduck

Try it yourself: https://github.com/irods/irods_demo

Future Work

- Additional S3 capabilities / endpoints:
  - Object and bucket tagging
  - ACLs
  - Multipart management
- Virtual Hosting-style addressing
- Additional authentication schemes (irods, PAM)
- Performance improvements (multipart)

Thanks for listening