APTrust Storage Fact Sheet

Updated January 2023

APTrust Tier	High Assurance	Basic Archive	Deep Archive
AWS title	Standard Storage	Glacier-only Storage	Glacier Deep Archive
Storage Type	Object and Nearline	Nearline	Nearline
Assurance Level	High	Medium	Medium
Redundancy	6 copies (3 in S3, 3 in Glacier)	3 copies in a single Glacier region[1]	3 copies in a single Glacier region[2]
Geographic Diversity	Northern Virginia (S3) and Oregon (Glacier)	Northern Virginia or Ohio or Oregon (All 3 copies stored in 1 Glacier region.)	Northern Virginia or Ohio or Oregon (All 3 copies stored in 1 Glacier region.)
Checksum Digests	MD5, SHA256	MD5, SHA256 on ingest, but no ongoing fixity checks	MD5, SHA256 on ingest, but no ongoing fixity checks
Fixity (Bit-Integrity) Monitoring	Ingest, Active every 90 days + Passive (AWS[3], frequency undetermined), Restoration	Ingest, Passive fixity checks (AWS, frequency undetermined), Restoration	Ingest, Passive fixity checks (AWS, frequency undetermined), Restoration
Pharos Repository	Yes	Yes	Yes

[1] All three copies are stored in the same Glacier region, as specified by the depositor in each bag's aptrust-info.txt tag file, see https://wiki.aptrust.org/Bagging_specifications#aptrust-info.txt.
[2] All three copies are stored in the same Glacier region, as specified by the depositor in each bag's aptrust-info.txt tag file, see https://wiki.aptrust.org/Bagging_specifications#aptrust-info.txt.
[3] Amazon Web Services.

Objects[4]			
Minimum Retention	120 days (Glacier copies only)	120 days	180 days
Cost/GB/TB Year	$0.41016 GB / $452 TB	$0.05859 GB / $60 TB	$0.01953 GB / $20* TB
Eligible as part of 10TB allotment	Yes	Yes, credit is applied first to most expensive preservation storage	Yes, credit is applied first to most expensive preservation storage

High Assurance[5] makes sense for objects that are high-value and/or will be regularly replaced with new versions. The characteristics include:

- **High redundancy.** APTrust stores six copies of each file across multiple AWS regions and availability zones.
- **Geographic diversity.** These files are stored in S3 in Virginia and Glacier in Oregon.
- **Regular fixity checks.** APTrust runs fixity checks on these files every 90 days.
- **Rapid restoration.** Items in Standard storage can typically be restored within a few hours at no cost to the depositor.

Basic Archive makes sense for objects you want to preserve at minimal cost and which you do not expect to retrieve, except in cases of emergency or disaster. The characteristics include:

- **Reduced number of copies for reduced cost.** Three copies in a single region. Glacier-only storage is significantly less expensive than S3 storage.
- **No added fixity checking.** Fees for retrieving Glacier files every 90 days would be prohibitive.
- **Longer restoration time.** Restoring bags from Glacier involves the extra step of temporarily moving files from Glacier to S3 before reconstructing a bag. This step usually takes several hours.

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[4] The APTrust repository (Registry) tracks digital content as it is ingested, replicated, monitored, and restored. All digital objects and files receive unique identifiers and event history is recorded. See the API documentation for more information on the repository data model: https://aptrust.github.io/userguide/pharos/

[5] See the latest version of the Core Preservation Service Policy for full details on the Standard Storage service. https://doi.org/10.18130/7mqf-cq87

- **Encryption at rest.** All Glacier files are encrypted at rest and decrypted upon retrieval. AWS manages the encryption keys as well as the encryption/decryption of data.
- **Additional fees for data retrieval.** For standard retrievals, AWS charges $0.01 per GB and $0.05 per 1,000 requests.[6]

All storage options include:

- Access to a community of like minded developers, practitioners, and information professionals engaged in preserving digital content for society and collaborating to find solutions for shared challenges.
- A GUI and CLI tool for sending content that can be used on the desktop or integrated with server applications.
- A robust preservation repository with GUI and API access, user management, event history for every object, reporting, search, and with additional features added based on community interests and needs.

[6] https://aws.amazon.com/glacier/faqs/