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Parallel Tabulation Protocol v3.0

OFFICIAL COLLATION REPORT

Technical specification for independent result tabulation, intake hashing, batch sealing, and public ledger publication, including a batch seal log excerpt and reference implementation notes.

FULL ARCHIVAL EDITION - THIS DOCUMENT REPRODUCES THE CERTIFIED PUBLIC RECORD, INCLUDING ANNEXES.

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Certification of the Record

1. Design Goals

Version 3.0 defines how an independent body reproduces an official result from primary evidence alone. The protocol assumes hostile conditions: delayed transmissions, partial sheets, and adversarial pressure on both observers and infrastructure.

2. Intake Hashing

Each sheet image is hashed with SHA-256 at intake; the hash incorporates the previous record's digest, forming an append-only chain. Intake batches are sealed every five minutes and the seal digest is published immediately, fixing the record before results are known to any party.

3. Publication Ledger

The ledger is published in machine-readable form with per-record provenance. Any third party can recompute the full chain; the reference implementation is one hundred and forty lines of Python and its design notes appear at Annex B of this specification.

PROTOCOL REVISION HISTORY

Version	Issued	Principal change
v1.0	2024-09	Initial parallel tabulation
v2.0	2025-06	Hash-chained intake
v3.0	2026-01	Batch seals + public ledger

ANNEX A

Batch Seal Log (Excerpt)

The log below reproduces a rolling window of batch seals. Each seal commits to every sheet received in its five-minute window and to the preceding seal; verification of any single seal therefore verifies the entire history behind it.

BATCH SEAL LOG SAMPLE

Batch	Seal Digest	Sheets	Window	Status
B-0001	fba5f53a99	40	10:00Z	Sealed
B-0002	75aaab4308	53	10:03Z	Sealed
B-0003	f0601fa6fc	41	10:06Z	Sealed
B-0004	5d04101034	54	10:09Z	Sealed
B-0005	74a10447b7	42	10:12Z	Sealed
B-0006	977c797f81	55	10:15Z	Sealed
B-0007	43fc78c2dc	43	10:18Z	Sealed
B-0008	bd171edc19	56	10:21Z	Sealed
B-0009	c27b4791b3	44	10:24Z	Sealed
B-0010	c750fa7cc0	57	10:27Z	Sealed
B-0011	4ff909b6fb	45	10:30Z	Sealed
B-0012	7078046898	58	10:33Z	Sealed
B-0013	aa899b9441	46	10:36Z	Sealed
B-0014	83caeea78b	59	10:39Z	Sealed
B-0015	eee94adcc7	47	10:42Z	Sealed
B-0016	145690d7f4	60	10:45Z	Sealed
B-0017	1cb8eaa5eb	48	10:48Z	Sealed
B-0018	1518b81a09	61	10:51Z	Sealed
B-0019	c3b7eeb620	49	10:54Z	Sealed
B-0020	d26509e183	62	10:57Z	Sealed
B-0021	09f073da9f	50	11:00Z	Sealed
B-0022	043246573c	63	11:03Z	Sealed
B-0023	41d0d3762d	51	11:06Z	Sealed
B-0024	d6a48ea016	64	11:09Z	Sealed
B-0025	3464ac55da	52	11:12Z	Sealed
B-0026	884c60794a	40	11:15Z	Sealed
B-0027	8db90c917b	53	11:18Z	Sealed
B-0028	467f57a31e	41	11:21Z	Sealed
B-0029	411c1654ca	54	11:24Z	Sealed
B-0030	9019ca4a2f	42	11:27Z	Sealed

Batch	Seal Digest	Sheets	Window	Status
B-0031	a24cb66711	55	11:30Z	Sealed
B-0032	e5ac65bb87	43	11:33Z	Sealed
B-0033	9cdabdd516	56	11:36Z	Sealed
B-0034	21d3edbc20	44	11:39Z	Sealed
B-0035	9abc624325	57	11:42Z	Sealed
B-0036	94dd85ebbd	45	11:45Z	Sealed
B-0037	5d6ad60ae8	58	11:48Z	Sealed
B-0038	e6eb705f19	46	11:51Z	Sealed
B-0039	dd53587c0f	59	11:54Z	Sealed
B-0040	9e277ec900	47	11:57Z	Sealed
B-0041	5f1ca41dc9	60	12:00Z	Sealed
B-0042	76c9d78012	48	12:03Z	Sealed
B-0043	0c7ddf0d92	61	12:06Z	Sealed
B-0044	2152e77f36	49	12:09Z	Sealed

ANNEX B

Reference Implementation Notes

The reference implementation reads the ledger export, recomputes every sheet hash and every batch seal, and prints the first divergence, if any, with its record identifier. It has no dependencies beyond the Python standard library and completes a full-cycle verification in under four minutes on commodity hardware.

Implementers should note that the canonical byte encoding of a sheet record is UTF-8 with fields concatenated in ledger order, separated by a single vertical bar, and terminated by a newline. Deviations from this encoding are the most common cause of false divergence reports.

ANNEX C

Conformance Checklist

A tabulation claiming conformance with this protocol must: (1) publish intake seals within five minutes of batch close; (2) retain every version of every record, including corrections; (3) expose the full ledger without authentication; and (4) document any deviation from the canonical encoding. Partial conformance claims must identify the clauses not met.

CERTIFICATION OF THE RECORD

This archival edition was generated from the registry's public ledger. The digest below commits to the document identifier, title, and issue date; any alteration to the certified record produces a different digest.

LEDGER SEAL: sha256:72d2892406e678076f8b568c50befae4
b256d105ba59b44f8031717adfe9529d

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CHIEF AUDITOR, COLLATION WATCH REGISTRY

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HEAD OF PARALLEL TABULATION