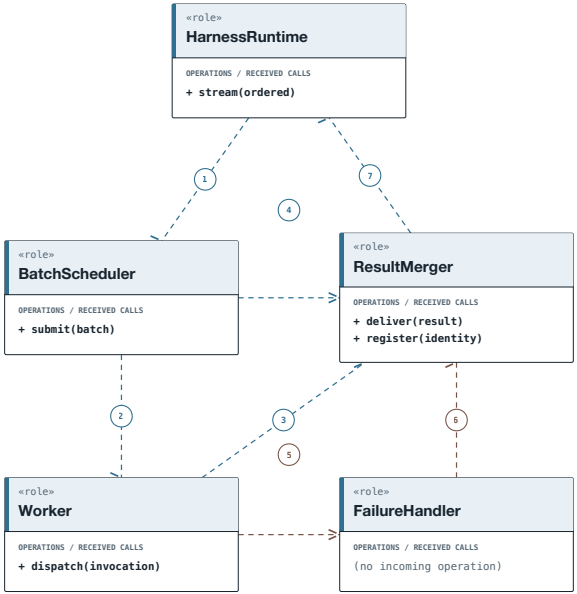
P02 Streaming concurrent batch loop

Primitive / UML CLASS VIEW / ANALYTICAL MODEL

Overlap output and independent work.

UML CLASS VIEW

dashed arrow: call dependency · brown: return/failure · analytical, not an observed trace



POINTCUT / PATTERN INTERFACE

CONTEXT	Multiple model, tool, or batch tasks are authorized to run concurrently.
TRIGGER	A batch is dispatched or streamed.
STRUCTURE	Invocation identity, cancellation control, and result correlation.
EFFECT	Streamed or completed results are merged without losing or duplicating ownership.

CONTRACT / REQUIRED BEHAVIOR

REQUIRES	The runtime exposes concurrency and a way to await or cancel outstanding work.
ENSURES	Every accepted invocation is linked to its result or explicit failure.
INVARIANT	The harness does not declare completion while unreconciled work remains.
VIOLATION	Partial failure and cancellation produce explicit terminal states and cleanup.

RELATIONSHIPS / ANALYTICAL CALLS

number · caller → callee · message

1 HarnessRuntime → BatchScheduler submit(batch)
2 BatchScheduler → Worker dispatch(invocation)
3 Worker → ResultMerger deliver(result)
4 BatchScheduler → ResultMerger register(identity)
5 Worker ↩ FailureHandler report(error)
6 FailureHandler ↩ ResultMerger reconcile(failure)
7 ResultMerger → HarnessRuntime stream(ordered)

VARIATION / TEST / NEGATIVE CONTROL

VARIATION	Batch size, asyncio or promise scheduler, streaming reducer, and ordering policy.
TEST_OBLIGATION	Test one failure, cancellation, completion order, and concurrent side effects.
NEGATIVE_CONTROL	Generic concurrency in an unrelated subsystem does not count.