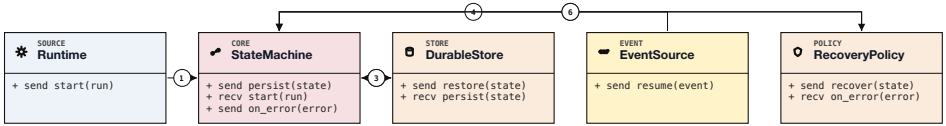
P03 Asynchronous state machine

Primitive · A² A1 · state role collaboration

Make waiting and resumption explicit.

STRUCTURE · PARTICIPANT COLLABORATION



PATTERN INTERFACE

context
A harness run may pause for external work or user input.

trigger
An event requests suspension or arrives to resume a paused run.

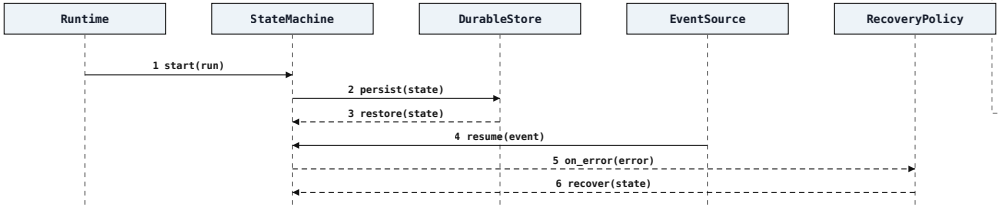
structure
Enumerated states, legal transitions, event identity, and resumption state.

effect
A resumed run follows only the legal transition and preserves durable state.

CONTRACT ANNOTATIONS

requires	State can be serialized or retained and incoming events can be identified.
ensures	Accepted events move the machine to a defined state and duplicate events are handled.
invariant	No transition crosses from a disallowed state or executes twice after replay.
violation	Invalid, duplicate, or interrupted events leave a recoverable state or raise explicitly.

INTERACTION



MESSAGE TRACE `1 start(run) → 2 persist(state) → 3 restore(state) → 4 resume(event) → 5 on_error(error) → 6 recover(state)`

Evidence: 38/41 repositories, 34/36 families; 38 trajectories (19 multi-checkpoint); exact audit: not sampled.

Variation: Transition dispatch, persistence backend, and recovery policy.

Negative control: An enum without transition enforcement is not sufficient.