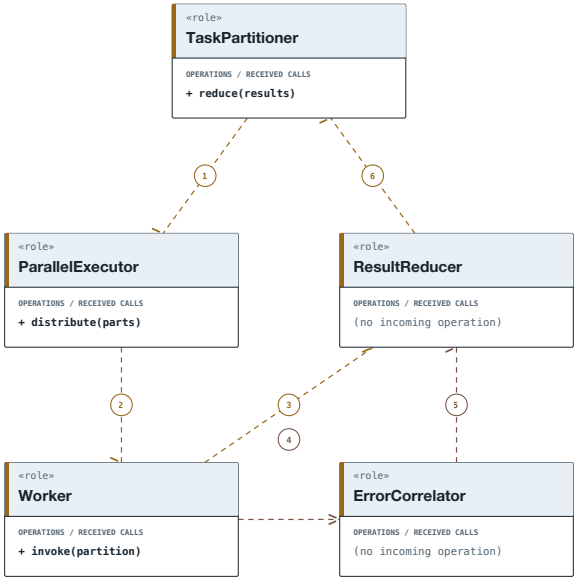
# W03 Parallelization

**Workflow / UML CLASS VIEW / ANALYTICAL MODEL**

Run independent work or alternative judgments concurrently.

**UML CLASS VIEW**

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




**POINTCUT / PATTERN INTERFACE**

| | |
|---|---|
| CONTEXT | Independent tasks or alternative judgments can run concurrently. |
| TRIGGER | A coordinator fans work out and later aggregates it. |
| STRUCTURE | Partition contract, worker identity, result correlation, and reducer. |
| EFFECT | All selected results are reconciled into a declared aggregate or failure. |

**CONTRACT / REQUIRED BEHAVIOR**

| | |
|---|---|
| REQUIRES | Work partitions are independent enough for concurrency. |
| ENSURES | Aggregation includes every expected result or records its absence. |
| INVARIANT | Partial completion is never represented as full agreement. |
| VIOLATION | Failures, timeouts, and cancellation follow declared quorum or terminal policy. |

**RELATIONSHIPS / ANALYTICAL CALLS**

number · caller → callee · message

1 TaskPartitioner → ParallelExecutor distribute(parts)
2 ParallelExecutor → Worker invoke(partition)
3 Worker → ResultReducer return(result)
4 Worker ↩ ErrorCorrelator report(error)
5 ErrorCorrelator ↩ ResultReducer correlate(errors)
6 ResultReducer → TaskPartitioner reduce(results)

**VARIATION / TEST / NEGATIVE CONTROL**

| | |
|---|---|
| VARIATION | Sectioning, voting, map-reduce, and parallel tool calls. |
| TEST_OBLIGATION | Test disagreement, correlated failure, timeout, and one missing worker. |
| NEGATIVE_CONTROL | Bare Promise.all without a fan-in contract is only a cue. |