

WHITE PAPER

The BoundaryScore™ Assurance Architecture

How bounded claims, zero-trust evidence, independent observation, provenance and reproducibility strengthen verification for Physical AI

Assurance begins with the architecture

Physical AI assurance depends on more than an independent motion reference. Confidence also depends on how evidence is authenticated, reconciled, bounded, versioned and preserved. The BoundaryScore™ assurance framework is deliberately layered so no single machine log, sensor, participant or performance rule can silently determine the result.

Zero-trust evidence, bounded conclusions

Every BoundaryScore™ evaluation starts by defining the exact system, configuration, mission, operating conditions, exposure, evidence sources and applicable profile. Machine-state evidence and independently obtained physical evidence remain distinct, and neither is treated as unquestioned truth. MVE™ then authenticates, aligns and reconciles those evidence streams while preserving discrepancy, uncertainty and provenance. Here, zero trust is an evidence-assurance principle, not a cybersecurity certification.

What the BoundaryScore™ assurance architecture preserves

Element	What the architecture makes explicit
Evaluation boundary	The exact unit, configuration, mission, domain, exposure period and exclusions to which the conclusion applies.
Evidence integrity	Identity, provenance, timing, calibration, coverage, uncertainty and independence of supporting evidence.
Reconciliation	MVE™ reconciles reported state with independently observed behavior before performance rules are applied.
Performance + confidence	Performance and evidence confidence remain separate, so weak evidence or insufficient exposure stays visible.
Traceability + change	The path from conclusion to metric to event to source evidence remains versioned, reviewable and reproducible.

What BoundaryScore™ Verified means

BoundaryScore™ Verified can be applied to a defined metric or performance claim when the applicable verification requirements are met. It does not replace the metric. It adds an independent assurance record showing what was evaluated, what evidence supported it, how strong that evidence was, where the conclusion applies and how the result can be reviewed and reproduced.

Bound the claim. Authenticate the evidence. Reconcile observed reality. Preserve the record.