

Biological-Device Binding Through Continuity

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What Biological-Device Binding Specifies

A biological identity attestation (produced by the trust-slope continuity validator over multimodal biometric signals) binds to one or more governed devices through a credentialed binding observation. The binding is recorded in the lineage of both the operator's personal semantic agent and each bound device. Re-validation occurs continuously through the same biological signals; the binding status updates as continuity evidence accumulates or diminishes.

The architecture differs from conventional session-based authentication in continuity rather than discrete events. Session authentication asserts identity at session start and assumes it through session duration. Continuity-based binding evaluates continuously, producing graduated binding status (nominal, elevated-monitoring, degraded, suspended, terminated) that reflects current evidence rather than start-of-session evidence.

Why Session-Based Authentication Doesn't Fit Modern Operating Patterns

Modern operating patterns extend across longer time horizons than session models support. A robotaxi operator's authority lasts through a multi-hour shift. A surgeon's

authority spans a multi-hour procedure. A factory operator's authority extends through a shift change. Session-based authentication produces re-authentication events that interrupt operation; continuous re-validation produces graduated status that operates across the full duration.

The session model also produces structural failures during transitions. When a session ends and a new session begins (operator handoff, shift change, emergency operator assumption), the architecture has no graduated handoff mechanism. The new session is either authorized or not. Binding-status broadcast through the mesh provides the graduated handoff that operational reality requires.

How Continuity Validation Composes With Device Authority

The trust-slope continuity validator consumes multimodal biometric signals (cardiovascular, respiratory, behavioral, galvanic) and produces a continuity attestation. The attestation binds to specific devices through credentialed binding observations: the device's own continuity-based identity (continuity-identity processor IC) and the operator's biological continuity attestation reference each other in the binding observation.

Re-validation runs continuously. As the operator's biometric signals evolve consistently with their biological state, the continuity validator confirms identity. As signals diverge from continuity (incapacitation, stress events, biometric fraud attempts), the validator produces graduated status updates. The binding's status is observable through the mesh as a credentialed observation.

What This Enables for Operator-Bound Operation

L4 robotaxi operations gain structural operator-bound authority. The operator's continuity attestation binds to the vehicle through a credentialed observation; the

vehicle's authority to operate at L4 depends on the operator's binding status. Handoff between operators (shift change, emergency assumption) operates through graduated binding status broadcast.

Medical autonomous decisions gain structural clinician-bound authority. The clinician's continuity attestation binds to the medical-decision-support system; the system's authority to act on its own depends on the clinician's binding status. Defense operator-bound systems (especially LAWS-relevant deployments where operator-bound authority is regulatory requirement) gain the same structural support. The patent positions the primitive at the layer where operator-bound authority across domains has been ad-hoc reconstructed.