

Privacy Value Model V5.4

Dual-Agent Privacy Architecture — The Amnesia Protocol

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Abstract

Multiplicative equation for privacy as quantifiable economic value. Three-axis separation (agent, data, inference), holographic bound (96/64), path integral edge value, reconstruction ceiling $R < 1$ (proven), algebraic foundation $\mathbb{Z}/(2^6)\mathbb{Z}$ with dihedral group D_{64} , operational cycle, amnesia-enforced separation (C17). Conjectures C1–C21 tracked. Five grimoires closed. Second Person Spellbook next.

Master Inscription: (S perp Gap perp M) FP = neg oplus bnot to succ

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1 The Equation

Static form:

$$\begin{aligned}
 V(\pi, t) = & P^{1.5} \cdot C \cdot Q \cdot S \cdot e^{-\lambda t} \cdot (1 + A_h(\tau)) \\
 & \cdot \left(1 + \sum_i w_i \frac{n_i}{N_0} \right)^k \cdot G(\text{guilds}) \\
 & \cdot R(d, \text{compression}, \rho) \cdot M(u, y) \\
 & \cdot \Phi_{\text{agent}}(\Sigma) \cdot \Phi_{\text{data}}(\Delta) \cdot \Phi_{\text{inference}}(\Gamma) \\
 & \cdot T_f(\pi)
 \end{aligned}$$

Differential form: $\frac{dV}{dt} = \nabla_{\partial M} \cdot J_{\partial M} + S(x) - D(x)$

Gating: Multiplicative. Any term = 0 $\implies V = 0$.

Lattice: π is a path through $\mathcal{L} = \mathbb{Z}/64\mathbb{Z}$, t is time since data generation.

2 Inherited Terms (V1–V4)

Symbol	Name	Domain	Description
P	Privacy Strength	$[0, 1]$	Cryptographic enforcement. Exponent 1.5 via C6.
C	Credential Verifiability	$[0, 1]$	Verify without revealing.
Q	Data Quality	$[0, 1]$	Accuracy, completeness, fitness.
S	Scope / Sensitivity	\mathbb{R}^+	Domain-specific multiplier.
$e^{-\lambda t}$	Temporal Decay	$(0, 1]$	Freshness. $\lambda > 0$.
$M(u, y)$	Market Maturity	$[0, 1]$	User sophistication, market year.

3 Holonic Temporal Memory

$$A_h(\tau) = \sum_j p(\tau_j) \cdot w(\tau_j) \cdot e^{-\mu \cdot \text{age}(\tau_j)}$$

GUID-addressed holons. Infrastructure-independent. $p(\tau_j) = 0 \implies A_h = 0$.

4 Three-Axis Separation

$$\Phi_{v5} = \Phi_{\text{agent}}(\Sigma) \cdot \Phi_{\text{data}}(\Delta) \cdot \Phi_{\text{inference}}(\Gamma)$$

Axis	Formula	Meaning
Agent	$\Phi_a = \min(1, \frac{S/M}{\varphi}) \cdot \det(\Sigma)$	Swordsman \perp Mage. $\cong D_{2n}$ (C14, 75%)
Data	$\Phi_d = 1 - \max_j(\text{share}_j)$	No single provider holds majority
Inference	$\Phi_i = 1 - I(\text{model}; \text{executor})$	Generator \perp Solver

Collapse any axis \implies total collapse.

5 Reconstruction Difficulty

$$R(d, c, \rho) = R_{\text{base}}(d) \cdot \left(1 - \frac{1}{c} \right) \cdot (1 + \alpha \cdot \rho)$$

Ceiling (proven): $R < 1$ under budget constraints. **Error floor (proven):** $P_e \geq 1 - R_{\text{max}}$ via Fano.

$\rho = f(\text{traversal depth, duration, intentional transitions})$. Dual: privacy amplifier + agent maturity.

6 Guild Efficiency

$$G(\text{guilds}) = \prod_g (1 + \text{efficiency}_g \cdot \text{active}_g / \text{total}_g)$$

Shared-parent coordination: $O(1)$ not $O(N^2)$.

7 Path Integral

$$T_f(\pi) = 1 + \beta \int_{\pi} F(\gamma) d\gamma \cong 1 + \beta \sum_{i=1}^n R(\text{step}_i)$$

$F(\gamma) = \text{resolution_depth} \cdot \text{fidelity}$. One lap = one cycle. Dragon (\$ \$62 laps) = closure.

8 Holographic Bound

$$\partial M : 96 \text{ edges encoding } 64 \text{ vertices, toroidal topology} \quad \frac{96}{64} = 1.5 = P^{1.5}$$

C4 RESOLVED. Boundary encodes bulk. dV/dt computes on ∂M , not the 64-vertex interior.

$$J_{\partial M} = J_{\text{agent}} + J_{\text{data}} + J_{\text{inference}} + J_{\text{compression}} + J_{\text{holonic}}$$

9 Separation Bound

$$I(S; M | FP) < \varepsilon^* \quad (\text{load-bearing wall})$$

Theorem (95%): Conditional independence \implies additive MI bound $\implies R_{\max} < 1$.

Amnesia: $\varepsilon_{\text{amnesia}} < \varepsilon_{\text{policy}}$ (C17, 60%). Topology > policy.

Betweenness centrality: $C_B(v) = \sum_{s,t} \sigma(s, t|v) / \sigma(s, t)$ (Brandes, 2001). The \perp is the node with maximal betweenness in the trust graph.

10 Algebraic Foundation

$$\mathcal{L} = (\mathbb{Z}/64\mathbb{Z}, +, \times) \quad D_{64} = \langle \text{neg, bnot} \mid \text{neg}^2 = \text{bnot}^2 = 1, (\text{neg} \circ \text{bnot})^{64} = 1 \rangle$$

Op	Formula	Agent	Function
neg	$(64 - x) \bmod 64$	Swordsman	Boundary. Additive inverse.
bnot	$63 - x$	Mage	Projection. Bitwise complement.
neg \circ bnot	$x + 1 = \text{succ}(x)$	First Person	The step forward. ■

PRISM coordinates: $\text{blade}(x) = (\delta, \sigma, s)$ — datum, stratum (Hamming weight), spectrum.

Pascal: $\{1, 6, 15, 20, 15, 6, 1\}$. Tiers: Null(0) / Light(1-2) / Heavy(3-4) / Dragon(5-6).

Six dimensions: Protection, Delegation, Memory, Connection, Computation, Value.

Hexagram: $[d_1 \dots d_6] \rightarrow 64$ I Ching states. Blade 63 = 111111 = Qian (The Creative).

11 Operational Cycle

$$\text{cycle}(x) = \text{succ}(x) = \text{neg}(\text{bnot}(x))$$

Stage	Operation	Agent	Ceremony
Observe	$\text{id}(x)$	First Person	Sun — disclosure
Boundary	$\text{neg}(x)$	Swordsman	Gap — silence

Stage	Operation	Agent	Ceremony
Project	bnot(neg(x))	Mage	Moon — reflection
Return	succ(x)	Composition	Recursion

$T_f(\pi) = 1 + \beta \sum_i \text{cycle}(\text{step}_i)$. Progressive trust: Understanding → Constellation → Blade → Runecraft.

12 Amnesia Protocol

Definition: Structural amnesia w.r.t. origin O if no operation sequence can reconstruct O .

ZK: completeness (output demonstrates), soundness (unique configuration), zero-knowledge (origin hidden).

Implementation: process boundary. Cosmological: Moon’s orbit (Selene’s Proof — ZK by physics). Runecraft: Ed25519 key burned on close.

13 Forge Cryptography

Property	Method
Content addressing	SHA-256
Tamper evidence	Hash chain
Pre-evocation lock	Commitment scheme
Identity binding	Ed25519 (Mage, held)
Bilateral binding	Dual Ed25519 (Mage held + Swordsman burned)

Moon phase: stratum → visibility ratio. 0 = New Moon, 6 = Full Moon.

14 Conjectures

ID	Claim	Confidence
C4	96/64 discrepancy	RESOLVED
C6	$P^{1.5} \leftrightarrow 96/64$ structural	CONVERGENT 35%
C7	Three-axis multiplicative	30%
C11	ρ amplifies + indicates maturity	55%
C12	Hexagram encoding	60%
C13	Bilateral witness quantum-resistant	65%
C14	$\Phi_a \cong D_{2n}$	75%
C15	$T_f \cong$ resolution pipeline	65%
C16	Betti number trust invariants	25%
C17	Amnesia > policy separation	60%
C18	Strange attractor dynamics ($\lambda > 0$)	25%
C19	$\rho =$ Lyapunov divergence	20%
C20	Three axes couple as Lorenz variables	30%
C21	Fractal sovereignty dimension	10%

15 Proven Results (95%)

1. Additive MI bounds from conditional independence
2. Reconstruction ceiling $R < 1$ under budget constraints
3. Error floor via Fano’s inequality
4. Graceful degradation under partial compromise
5. Ring algebra $\mathbb{Z}/(2^6)\mathbb{Z}$ substrate
6. Two-extension autonomy axiom (separate processes)
7. Pretext DOM-free measurement as privacy primitive

16 Version Lineage

Version	Date	Core Addition
V1	2024	$P \cdot C \cdot Q \cdot S$
V2	Oct 2025	$+e^{-\lambda t}$, network effects
V3	Nov 2025	$+R(d), M, \Phi$
V4	Feb 2026	$+\Sigma, A(\tau), T(\pi)$
V5	Feb 2026	+ three-axis Φ , holographic bound, T_f
V5.1	Mar 29	$+\rho$, bilateral witness (C11–C13)
V5.2	Mar 31	$+D_{2n}$, PRISM (C14–C16)
V5.3	Apr 4	+ operational cycle, amnesia (C17)
V5.4	Apr 10	Consolidated. C18–C21. Full references.

17 References

Shannon (1948). Fano (1961). Cover & Thomas (2006). Bergstra & Burgess (2019). Susskind (1995). McGilchrist (2009). Groth (2016). PLONK (2019). Nova (2022). Dwork & Roth (2014). Brandes (2001, 2008). Branco et al. (2025). Babbush et al. (2026). Cain et al. (2026). IEEE 7012-2025. UOR Foundation (2026). Hope & Ludlow (2023). Weyl & Tang (2023).

The First Person Spellbook (31 acts, v10.1.0, CLOSED). Blog: sync.soulbis.com (Parts 0–5).

Five grimoires: First Person, Zero Knowledge, Canon, Parallel Society, Plurality. Next: Second Person Spellbook.

Full spec: [privacy_value_v5_4_formal_specification.md](#) (v2.0). Companion: [pvm_v5_4_companion_guide.md](#).

Docs: github.com/mitchuski/agentprivacy-docs. Forge: spellweb.ai. Training: agentprivacy.ai. Trust: bgin.ai.

The boundary is always enough. Peer review invited: mage@agentprivacy.ai