

AI Governance Project

Compute Gating & Enforcement Architecture (Note IV Summary)

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The Structural Challenge

AI systems are evolving into persistent, planning, economically active agents operating across jurisdictions. Governance cannot remain declarative — it must become executable. The core challenge is architectural synchronization between capability growth and enforcement maturity.

Four-Tier Capability Model

Tier	System Type	Governance Mode
1	Assistive Systems	Disclosure & rate limits
2	Hybrid Distributed Agents	Auditability & traceability
3	Autonomous Operational Agents	Runtime constraint enforcement
4	Autonomous Economic Agents	Infrastructure-level gating

Enforcement Topology

AI Agent → Constraint Engine → Verification Network → Compute Authorization Layer → Cloud / Sovereign Compute Infrastructure

Compute Gating Function

$C_access = f(I, T, R, J, V, E)$
I = Identity Integrity | T = Capability Tier | R = Resource Profile | J = Jurisdiction Context | V = Verification Signals | E = Economic Activity State

Strategic Implications

- Sovereignty attaches to compute control
- Governance without runtime hooks becomes symbolic
- Compute control without safeguards risks concentration
- Balanced constraint is the central design challenge