

# Cascade Deactivation Through Dependency Chains

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## How Dependencies Are Declared

Each adaptation artifact carries metadata declaring its dependencies: which other artifacts must be present and active for this artifact to function correctly.

Dependencies are themselves credentialed: the depended-on artifact is identified by its content-hash and authoring credential, with the dependency relationship signed by the depending artifact's authority.

Dependencies form a directed graph. Activation evaluates the graph: an artifact cannot fire if its declared dependencies are unmet. The admissibility gate consumes the dependency state as part of the routing decision.

## Why Cascade Deactivation Is Architecturally Necessary

Without cascade deactivation, revocation produces structural inconsistency: the revoked artifact stops firing, but artifacts that depended on it continue firing under invalid assumptions. The behavior is not safely characterized — the dependent artifact may produce reasonable-looking output that is in fact based on missing context.

Cascade deactivation makes the architecture deterministic under revocation. When an authority revokes an artifact, all dependent artifacts deactivate transitively, the deactivations are recorded as credentialed observations, and downstream consumers see the cascade and can route to alternatives or operate in degraded mode explicitly rather than implicitly.

## **How the Cascade Propagates**

A revocation observation issues from the revoking authority. The admissibility gate consumes the revocation, identifies the directly-affected artifact, and walks the dependency graph to identify transitively-dependent artifacts. Each dependent artifact's activation state is updated to deactivated; the deactivation is itself a credentialed observation propagating through the mesh.

Downstream consumers — neighboring agents, infrastructure, and audit authorities — see the cascade as a credentialed observation set. The consumer may admit replacement artifacts (if available and admissible), shift to a degraded operational mode, or escalate the deactivation to operator review. The cascade and any response are recorded in lineage.

## **What This Enables for Skill Ecosystem Stability**

Enterprise skill marketplaces routinely face dependency cascades when authoring vendors update or revoke artifacts. Without architectural cascade handling, the cascade is reconstructed manually after the fact, producing operational uncertainty and audit gaps.

Cascade deactivation makes the response structural. Vendors revoke; the architecture cascades; consumers see the cascade explicitly and respond explicitly. The patent positions the primitive that production-grade agent ecosystems will require as the dependency-graph complexity grows beyond what manual reconstruction can handle.

