

PRODUCT HANDBOOK · P04

The Spindle product handbook

Responsibility, state, contracts, a complete workflow, failure, evidence, deployment, security, recovery, and production acceptance for Spindle.

SPINDLE

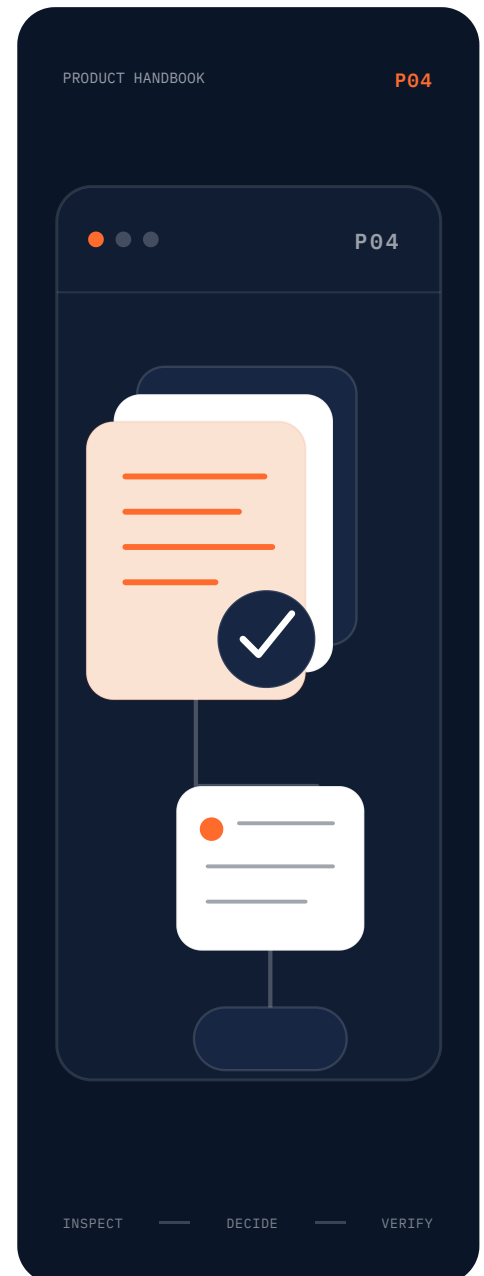
RESPONSIBILITY

WORKFLOW

EVIDENCE

DEPLOYMENT

ACCEPTANCE



Read this when you need Spindle explained as a working product boundary, not a list of features.

P04

CONTENTS

Spindle, from responsibility to production

The handbook keeps one illustrative scenario, a policy corpus changes while historical decisions must remain explainable, throughout the product, technical, governance, and operating explanation.

PRIMARY READERS

Product, architecture, delivery and operations teams

READING DEPTH

Professional + technical

DECISION THIS SUPPORTS

A complete product explanation for teams deciding where Spindle fits, how it works, and what they must prove before relying on it.

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READING RULE

Product mechanism comes from Spindle product page. Illustrative fields and acceptance procedures show what to demand from the current implementation; they are not invented feature claims.

SOURCE DISCIPLINE

Dweve-specific facts are taken directly from the English website text audited 2026-07-20; web-navigation wording is humanised for print. Evaluation guidance is editorial, and scenarios and derived visuals are illustrative. Unsupported synthesis is replaced by canonical copy or omitted.

READ THIS FIRST • DECISION

Who should read the Spindle handbook

This handbook is for product owners, architects, engineers, security and operations teams, reviewers, and buyers deciding whether Spindle is the right boundary for a real workflow.

Spindle owns the governed lifecycle from source material to reusable knowledge atoms. Read the boundary chapter to decide whether that responsibility exists in the target workflow and whether another product already owns it. Read the walkthrough to see the state and evidence that move through one case. Read the final chapter to understand deployment and customer operating duties.

The decision is not “does Spindle have useful features?” It is whether Spindle can accept approved sources with owner, scope, rights, effective version, collection/parse method, transformation policy, quality threshold, and withdrawal rule; reliably produce queryable governed atoms and indexes whose path can be followed backward to source and forward into dependent work; integrate through Winnow collection, Bindery/Reed parsing, BitWeave retrieval, Fabric knowledge objects, Loom context, typed events/webhooks, distributed graph, atom store, time series, vector index, and customer repositories.; expose failures and evidence; run in the required posture; and remain operable, recoverable, verifiable, portable, and governed.

The website is the only factual source for this edition. Current interfaces, packages, availability, source/repository status, benchmark conditions, assurance, commercial rights, support, and contracts must be verified at the decision date. Strong public claims become acceptance targets, not brochure guarantees.

PRODUCT**Spindle**

the governed lifecycle from source material to reusable knowledge atoms

PRIMARY INPUT**Typed work**

approved sources with owner, scope, rights, effective version, collection/parse method, transformation policy, quality threshold, and withdrawal rule

PRIMARY OUTPUT**Result + state**

queryable governed atoms and indexes whose path can be followed backward to source and forward into dependent work

DECISION**Fit + proof**

Select, test, operate, and govern the boundary.

PRIMARY ACCEPTANCE

Ingest one changing and one conflicting source; inspect the atoms and lineage; fail a quality gate; rebut a bias tag; withdraw a version; prove dependent retrieval changes; and retrieve an old case with the old source path intact.

READ THIS FIRST • TERMS

Vocabulary and source discipline

The handbook separates the Spindle product from its lower components, user or API surfaces, deployment posture, commercial rights, and illustrative workflow.

Product responsibility

Spindle is the product boundary for the governed lifecycle from source material to reusable knowledge atoms. A product can use foundations and other products without absorbing their state or guarantee. The caller consumes a product result; it should not reach into lower implementation internals.

Contract, manifest, and evidence

A contract defines typed meaning at a boundary, including errors and authority. A manifest identifies actual versions and dependencies used. Evidence is a typed artefact that supports a specific question, provenance, state, action, integrity, proof or replay, not a synonym for every log.

Scenario and claim status

A managed-service contract states its processing perimeter, placement policy, key responsibilities, and the public-Mesh services Dweve operates. On a licensed or air-gapped deployment, the selected products run on your hardware behind your firewall, you hold the keys, and Dweve ships signed binaries only.

TERM	ANSWERS	DOES NOT ANSWER
Product	Who owns the job/state?	Where or how sold
Surface	How a caller enters?	Who owns lower work
Foundation	Which mechanism is inspectable?	Product availability/right
Posture	Who operates and where?	Workflow suitability
Evidence	Which proposition can be checked?	Legitimacy/correctness by itself
Illustration	How a flow could be evaluated?	Implemented schema/customer result

Here is the whole idea, one simple step at a time, with an everyday example for each one.

KNOWN PORTFOLIO AMBIGUITY

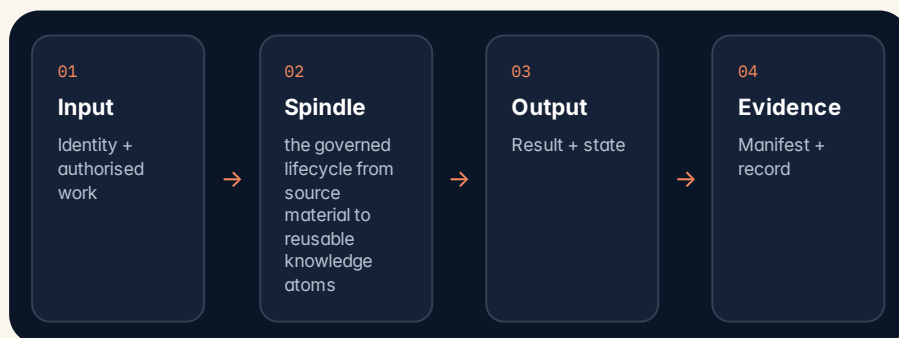
The current published page set exposes the current product set while some overview wording uses a different count or positions Kera underneath the visible product set. This handbook names the selected product description and avoids relying on one disputed total.

01

RESPONSIBILITY AND BOUNDARY

Spindle owns one product job and its state

The first chapter defines what enters, what the product owns, what leaves, which dependencies it may use, and which decisions remain outside it.



The handbook's repeated product-boundary model.

BOUNDARY • RESPONSIBILITY

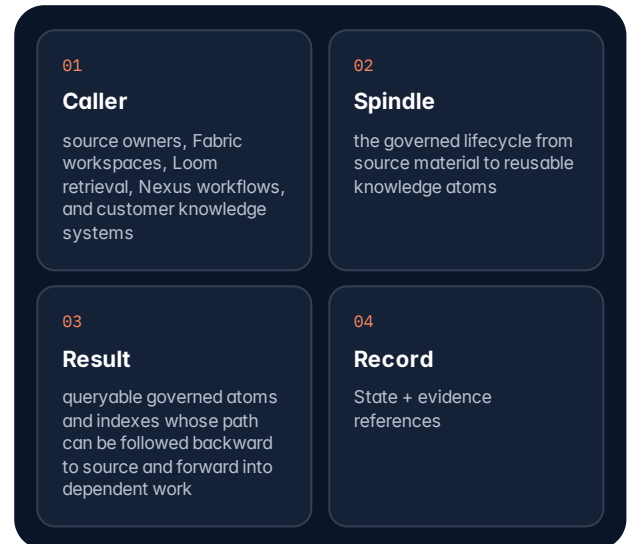
Spindle in one accountable sentence

Spindle owns the governed lifecycle from source material to reusable knowledge atoms. Everything else in the handbook follows from keeping that job and its state visible.

A model can answer. An agent can act. Neither becomes an organisation simply because more of them are connected. Dweve Nexus assembles specialised agents, models, tools, memory, policies, workflows, and human authority around an objective, then runs them as one accountable operation. Every participant receives a role. Every task has an owner. Every handover remains attached to the work. Every action stays inside its authority. Every contribution returns to one outcome. The task does not enter another chat. It becomes an organisation.

The principal input is approved sources with owner, scope, rights, effective version, collection/parse method, transformation policy, quality threshold, and withdrawal rule. The principal output is queryable governed atoms and indexes whose path can be followed backward to source and forward into dependent work. Those two sentences define the integration boundary better than a screenshot: a caller must be able to submit a typed, authorised request and distinguish completion, refusal, dependency failure, human wait, and unreconciled external action in the result.

Spindle makes knowledge governed and reusable. It does not declare a source legally authoritative, decide a policy conflict without an owner, perform general cognition, or convert quality scores into business authority.



The Spindle boundary expressed as responsibility rather than deployment shape.

DELETION TEST

Remove Spindle from the architecture. Name the state and guarantee that disappear; do not silently assign them to a model, workflow, or integration.

BOUNDARY • STATE MODEL

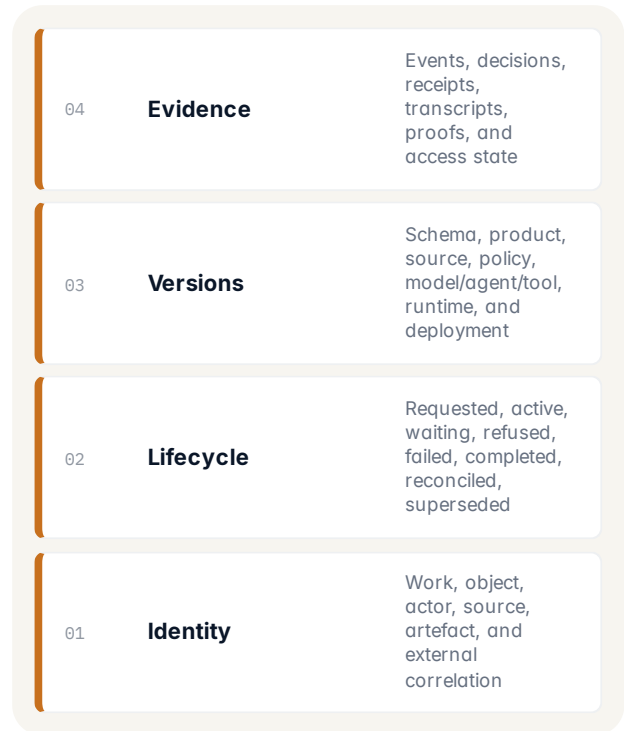
The stable state the product must own

Durable state is the material that must remain interpretable across retries, provider changes, upgrades, deployment moves, incidents, and historical review.

Different knowledge requires different proof. A disputed public claim may require three genuinely independent sources, sufficient diversity, and a minimum multidimensional quality result. An official register entry follows an authoritative primary source policy. A contractual fact may require one signed document rather than three websites repeating it. Source ancestry is recorded, so ten articles copied from one press release count as one origin.

Classify each state object as immutable/content-addressed, versioned mutable, append-only event, derived projection or cache, ephemeral attempt state, external reference, or retained evidence. Then name its owner, schema, access, retention, backup, migration, integrity, and invalidation rule. Derived data must point back to its inputs; mutable data needs concurrency and supersession semantics.

A retry should append an attempt or transition beneath the same work identity. An upgrade should migrate state with an explicit old/new version relation. A provider change should update the manifest without changing the business object. An erasure or correction should record its authorised effect without making surviving evidence impossible to interpret.



The entry point changes. The product boundaries and underlying architecture do not.

STATE REVIEW

If an operator must read a log or ask the original engineer to reconstruct a state transition, the owned product model is incomplete.

BOUNDARY • INGRESS

The input contract is more than a prompt

Identity, purpose, source scope, version, capability, authority, expected result, and evidence requirements belong in the work envelope.

The product's principal input is approved sources with owner, scope, rights, effective version, collection/parse method, transformation policy, quality threshold, and withdrawal rule. A production request should separate human-readable intent from the fields that determine access and execution. The caller does not gain a broader capability by describing it in prose; Spindle resolves the permitted operation through authenticated identity, configured policy, and the selected workload contract.

The envelope should name tenant/workspace or deployment scope, work and idempotency identity, caller and subject, purpose, source/object references, requested product capability, version-selection rule, authority ceiling, deadline and resource budget, determinism mode where relevant, expected result schema, evidence profile, and callback or reconciliation identity.

Validation happens before expensive or consequential work. Missing identity, ambiguous purpose, unknown schema, inaccessible object, duplicate request, unavailable capability, incompatible version, or authority that cannot be established returns a typed rejection. The product should never silently use "current policy", a system administrator, or a broad default source set to fill a material gap.

ILLUSTRATIVE SPINDLE ENVELOPE

work_id	spindle-4f9e
actor	role:approved-caller
purpose	bounded-workflow
objects	content-addressed refs
capability	selected_spindle_operation
authority	recommend_only
versions	approved manifest
result	typed state + artefact
evidence	standard packet

Illustrative fields. Use the current product interface and schema in implementation.

INGRESS TEST

Send missing, duplicated, stale, cross-tenant, over-broad, incompatible, and unsupported requests. None should enter hidden partial work.

BOUNDARY • RESULT

The output contract must expose operational state

A natural-language answer, success boolean, or transport status cannot carry the lifecycle, authority, provenance, and reconciliation state a caller needs.

The principal product output is queryable governed atoms and indexes whose path can be followed backward to source and forward into dependent work. Its envelope should distinguish the artefact a user or downstream system consumes from the state needed to interpret it: completed, completed with limitation, refused, awaiting review, failed before effect, uncertain after possible effect, superseded, or closed and reconciled.

Return work and result identity, schema and semantic version, actual product/runtime manifest, material source/object references, result payload or artefact reference, warnings and uncertainty, policy/authority/human state, permitted next actions, external receipt or reconciliation state, evidencetrace and proof page reference, retention/export classification, and typed error details.

The contract should remain stable across UI, API, event, or batch surfaces even when transport mapping differs. A successful HTTP request can carry a valid refusal; a failed connection can occur after external effect; a stream can end with partial work. The caller must not infer business outcome from transport alone.

RESULT STATE	CALLER BEHAVIOUR	EVIDENCE
Completed	Consume declared artefact	Manifest + result
Awaiting authority	Present/queue review	Basis + gate state
Refused	Do not retry around policy	Rule/reason + owner
Failed safely	Retry/escalate by class	Failure + no-effect state
Effect uncertain	Reconcile before retry	Attempt + target correlation
Superseded	Resolve newer work	Version relationship

Result-state semantics belong to the product contract; exact enum names are implementation-specific.

CALLER TEST

A caller should choose the safe next step from the typed state without parsing prose or inspecting an internal log.

BOUNDARY • CONTRACTS

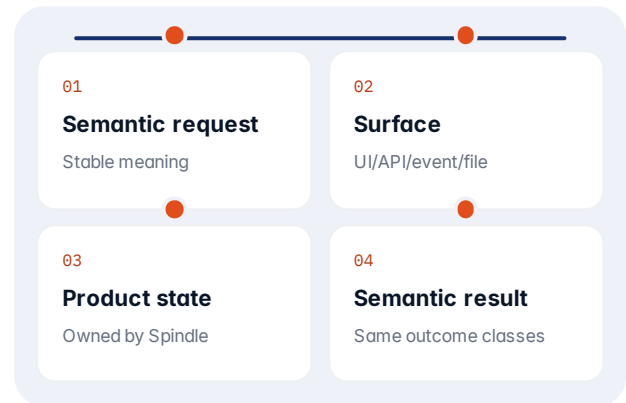
Interfaces carry the same meaning across surfaces

Spindle can be reached through the surfaces named on its route and the platform around it; transport diversity must not create semantic drift.

the published material describes seven stages, a canonical atom model, hierarchy, typed events, multi-store persistence, quality dimensions, bias categories, and forward/backward lineage. Existing systems connect as scoped source classes; atom promotions, threshold breaches, bias flags, and conflicts can emit events.

The relevant integration surfaces include Winnow collection, Bindery/Reed parsing, BitWeave retrieval, Fabric knowledge objects, Loom context, typed events/webhooks, distributed graph, atom store, time series, vector index, and customer repositories.. For each one, document authentication, authorisation, tenancy/workload scope, operation/capability negotiation, schema and version range, payload versus reference rules, ordering or streaming, timeout and cancellation, resource limits, error taxonomy, retry/idempotency, observability, and evidence returned.

A compatibility suite should drive every supported surface with the same work cases and compare resulting product state, artefact identity, authority, and evidence. Provider-specific or transport-specific information may live in extension fields, but it cannot change the meaning of a completed, refused, failed, or awaiting-authority result without an explicit contract version.



The surface adapts transport; it should not redefine the work.

PARITY EXERCISE

Create equivalent work through two selected surfaces and reconcile the resulting work identity, owned state, result, and evidence.

BOUNDARY • COMPOSITION

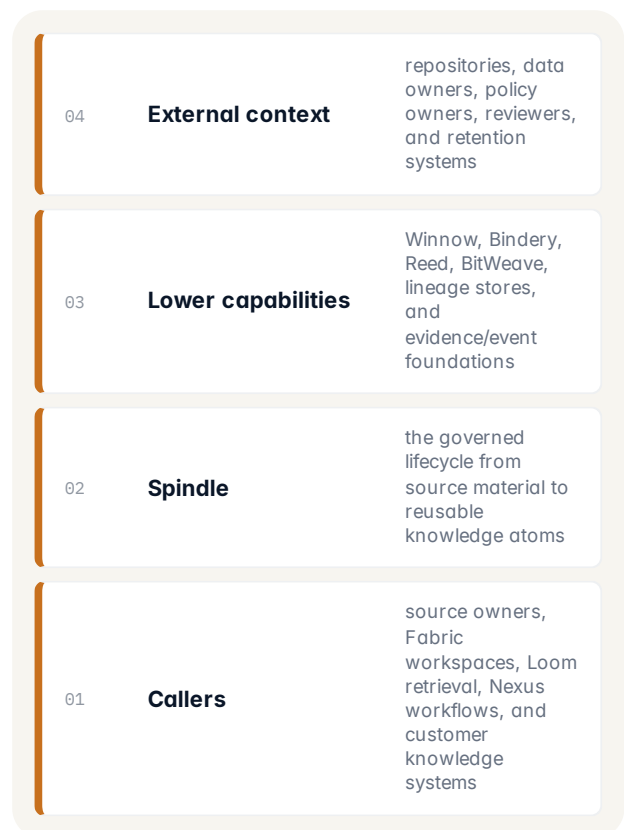
Dependencies point downward through declared artefacts

Discovery, extraction, analysis, connection, verification, governance, and export compilation run as a hierarchy of thirty-two specialised agents under a master orchestrator.

The direct callers are source owners, Fabric workspaces, Loom retrieval, Nexus workflows, and customer knowledge systems. The product can depend on Winnow, Bindery, Reed, BitWeave, lineage stores, and evidence/event foundations. Adjacent operational and organisational systems include repositories, data owners, policy owners, reviewers, and retention systems. These relationships should appear in one versioned dependency and capability manifest so startup, failure, upgrades, packaging, and offline closure can be reasoned about.

A lower component receives the minimum typed input required for its mechanism and returns an artefact, reference, state, and evidence. The product may validate, combine, route, or present that result according to its own responsibility; it should not modify the lower artefact while continuing to cite its original identity. Cross-layer feedback uses an event or explicit control contract.

Mark each dependency required, optional, or selected by policy; identify approved implementations and capabilities; record version compatibility, data/trust boundary, timeout/failure mapping, determinism effect, update coupling, and evidence. Then sever optional dependencies and verify the declared degraded mode instead of discovering hidden control-plane calls in production.



Responsibility/dependency view; exact deployment services follow the current manifest.

HIDDEN-DEPENDENCY TEST

Resolve the selected component closure with external networks disabled. Every unexpected fetch, account, model, key, licence, or telemetry call is an architecture finding.

BOUNDARY • DATA

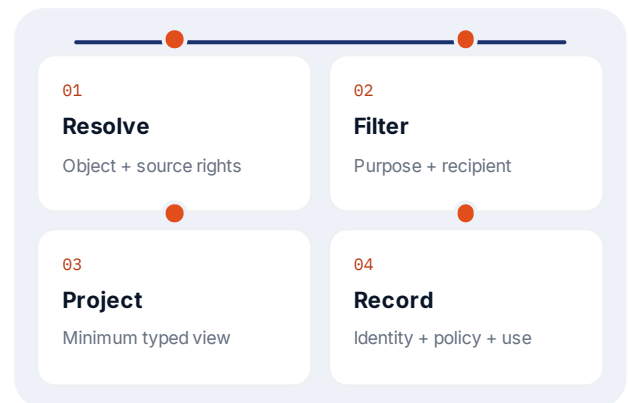
Data moves by purpose-scoped projection

The component initiating a call can know more than the recipient. Access at one layer does not automatically flow to a model, agent, tool, reviewer, or support operator.

Before Spindle passes material to Winnow, Bindery, Reed, BitWeave, lineage stores, and evidence/event foundations, it should resolve the task purpose, recipient capability, source/object rights, field/data classification, deployment/provider boundary, transformation, retention, and evidence policy. Prefer immutable references or a minimum typed projection over copying the upstream workspace, case, corpus, repository, or estate state.

Draw control flow and data flow separately. Control includes request, gate, retry, cancellation, callback, and reconciliation. Data includes payloads, source snapshots, indexes, prompts, model/tool inputs and outputs, caches, operational telemetry, evidence, backups, support bundles, and exports. Attach encryption/key ownership, store, retention, and administrator path to each data edge.

Test role and purpose changes, object revocation, provider fallback, cache invalidation, replay, support access, export, and deletion. A projection that was legal for the original worker may be illegal for a substituted agent or historical reviewer. A fallback that preserves availability can still violate the selected data boundary.



Data authority is evaluated at the receiving boundary, not inherited from orchestration.

DATA QUESTION

Where can sensitive data from a Spindle work item appear, including caches, logs, evidence, backup, replay, support, and provider paths?

BOUNDARY • IDENTITY

Human, service, agent, and signing identities stay separate

Infrastructure administration, product use, delegated work, policy ownership, approval, and cryptographic attestation are different authorities even if one directory supports them.

Spindle requests can involve source owners, Fabric workspaces, Loom retrieval, Nexus workflows, and customer knowledge systems; execution can involve Winnow, Bindery, Reed, BitWeave, lineage stores, and evidence/event foundations; operation and review involve repositories, data owners, policy owners, reviewers, and retention systems. Bind every material transition to the correct principal and delegation chain. The human who initiated work is not the service that processed it; an agent assigned a capability is not the person authorised to approve; a key that signs a packet is not business authority.

For each operation, record authentication method, tenant/workspace, subject, role or capability, purpose, resource/field scope, policy and effective version, approval or delegation, time/expiry, result/reason, revocation path, and evidence. Privileged platform access needs a separate support/emergency process and cannot silently inherit domain or evidence-disclosure rights.

Exercise revoked identities, stale roles, expired capability, delegated and break-glass access, cross-tenant/purpose calls, self-approval, reused signatures, and support access. Enforce the same decision through every surface, including API, agent, replay, administrator, and evidence export paths.

PERSON

Human identity

Authentication, organisational role, purpose, review, correction, and accountability.

RUNTIME

Service identity

One component calling another under a bounded product contract.

DELEGATE

Agent identity

Capability, task, lifecycle, tool ceiling, and result responsibility.

ATTEST

Signing identity

Purpose-specific key binding to an artefact or state.

SEPARATION TEST

Operating Spindle must not automatically grant authority to approve its domain results or inspect every retained work artefact.

BOUNDARY • GOVERNANCE

Policy and authority are runtime inputs

The product exposes and enforces configured boundaries; it does not invent the organisation's purpose, source authority, review roles, or acceptable consequence.

The request and product state should bind the applicable policy, authority ceiling, human gates, permitted actions, separation requirements, expiry, and exception route. Spindle can make those conditions executable and observable; the customer's named owners still decide their content and legitimacy.

Express each material transition as allowed actors/capabilities, required facts or artefacts, rule/policy version, automatic versus human condition, limits, permitted next states, escalation owner, and evidence. If a judgement cannot be reduced to an approved rule, preserve it as an accountable human decision rather than hiding it inside prompt wording.

A reviewer needs the source and version, material facts, proposed result or action, conflicts/uncertainty, meaningful alternatives, consequences, and reason capture. Reopen the gate if the source, policy, result, action, or authority changes after review. Test stale and self approval, missing reviewer, excessive batch approval, and tool execution without gate state.

STATE	AUTHORITY	NEXT
Draft	Assigned worker/agent	Validate
Ready	Workflow contract	Review
Approved	Named human/policy	Act
Rejected	Named authority	Close/rework
Escalated	Rule/reviewer	Specialist
Executed	Scoped tool	Reconcile

Illustrative authority states; the domain owner supplies the actual policy.

GOVERNANCE BOUNDARY

Spindle makes knowledge governed and reusable. It does not declare a source legally authoritative, decide a policy conflict without an owner, perform general cognition, or convert quality scores into business authority.

BOUNDARY • NON-CLAIMS

The product's limitations belong in its architecture

A technically strong mechanism is easier to trust when the publication states what it cannot establish or own.

Spindle makes knowledge governed and reusable. It does not declare a source legally authoritative, decide a policy conflict without an owner, perform general cognition, or convert quality scores into business authority.

Product outputs depend on source quality, policy, customer data, configuration, model/agent/tool providers, infrastructure, operator practice, human competence, and the selected deployment. A valid trace does not make the purpose legitimate; a deterministic result does not make the rule correct; a signed approval does not prove understanding; a customer-hosted runtime does not guarantee good security operations.

Performance figures belong to their published workload, corpus, hardware, version, configuration, method, and comparison. Availability, source status, interface support, deployment rights, usage treatment, certifications, and support can change and must be verified against the current published description, delivered manifest, assurance material, and written agreement.

 CAN EXPLAIN**Mechanism**

How Spindle owns its declared work and emits state/evidence.

 CAN TEST**Installed behaviour**

Contracts, failure, recovery, deployment, performance, and evidence on a real workload.

 CANNOT SETTLE**Legitimacy**

Purpose, lawfulness, fairness, proportionality, and organisational judgement.

 CANNOT GRANT**Rights**

Commercial, source, support, deployment, and modification terms.

HONEST PRODUCT TEST

For every strong statement, name the artefact or customer exercise that would support it and the conclusion that still would not follow.

02

HOW IT WORKS

Follow a policy corpus changes while historical decisions must remain explainable

One illustrative work item turns architecture nouns into a complete sequence with source versions, product state, human authority, failure, recovery, and a record.



Illustrative flow; exact schemas and interfaces come from the current product implementation.

HOW IT WORKS • SCENARIO

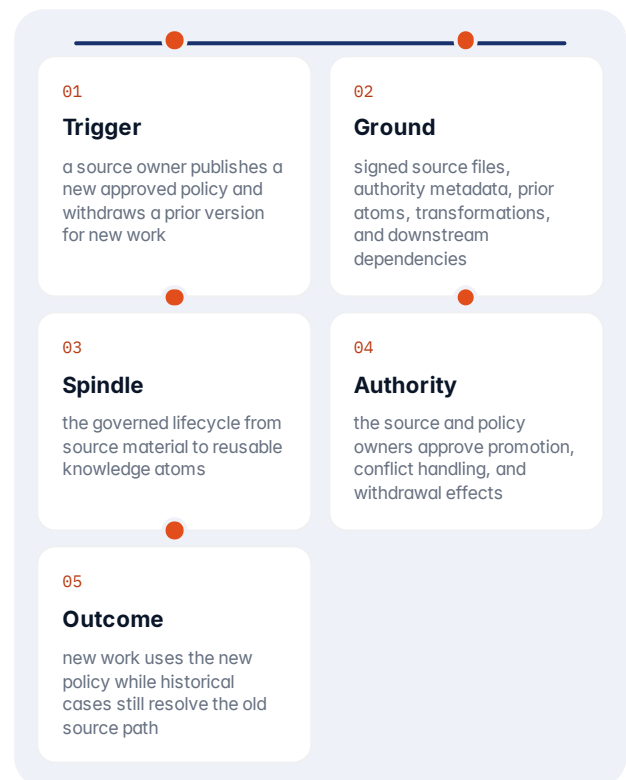
Walkthrough: a policy corpus changes while historical decisions must remain explainable

This illustrative scenario follows one work identity through source, product state, exact or interpretive work, human authority, action, result, and evidence.

The trigger is a source owner publishes a new approved policy and withdraws a prior version for new work. The approved inputs are signed source files, authority metadata, prior atoms, transformations, and downstream dependencies. The example is deliberately bounded: it is not a customer result, performance claim, or current schema. Its purpose is to make the product boundary testable in a case with material versions, decisions, failure, and a record.

Spindle is not a monolith. It is a military-inspired hierarchy of 32 agents under a Master Orchestrator, organised into a Discovery Brigade, an Extraction Corps, an Analysis Division, a Connection Network, a Quality Guard, a Governance Council, and a Export Compiler. Specialisation mimics human expert evaluation, lets work run in parallel, keeps maintenance focused per agent, and degrades gracefully when one agent fails.

Human authority remains explicit: the source and policy owners approve promotion, conflict handling, and withdrawal effects. Consequential effect is separate from proposal: Spindle promotes new atoms, updates indexes, emits typed events, and preserves old lineage. The resulting closure is new work uses the new policy while historical cases still resolve the old source path. Later pages break this path into contracts, failure, recovery, evidence, deployment, and acceptance.



Illustrative end-to-end path; current implementation interfaces supply exact object and state names.

SCENARIO ASSUMPTIONS

All identities, dates, organisations, outcomes, percentages, and field names are illustrative. Source rights, policy, human roles, integrations, and retention must be designed for the actual workflow.

HOW IT WORKS • WORK SPINE

Stage 1: create one stable work identity

The same business work survives decomposition, retries, provider changes, review, action, reconciliation, correction, and replay.

When a source owner publishes a new approved policy and withdraws a prior version for new work, the ingress surface validates tenant/workspace or deployment scope, caller and subject, purpose, source/object access, workload contract, policy selection, authority ceiling, evidence profile, and idempotency. Only then does Spindle accept a stable work identity.

Task, attempt, artefact, trace, event, receipt, and external-correlation identities derive beneath the work. A retry appends an attempt; a correction or new decision supersedes the prior version; a duplicated delivery resolves to the existing state; an external callback resolves through its correlation. None silently becomes a new unrelated case.

The work manifest begins at acceptance and grows with actual versions used. This matters when configuration or “current” product state changes during a long-running case. Historical review loads the manifest bound to the work, not whatever is latest at review time.

WORK RECORD		spindle-work-4f9e
PURPOSE	bounded scenario	BOUND
CALLER	role + tenant	BOUND
SOURCES	approved references	PENDING
AUTHORITY	declared ceiling	BOUND
STATE	accepted	OPEN
EVIDENCE	packet manifest	OPEN
Illustrative record shape; use the product's implemented object model.		

IDENTITY CHECK

Start from the authoritative external record and the product record independently. Both should resolve to the same work and closed/superseded state.

HOW IT WORKS • GROUNDING

Stage 2: bind sources, policy, and actual versions

The result must be traceable to the material that applied to this work at its effective time, including conflicts and transformations.

The scenario depends on signed source files, authority metadata, prior atoms, transformations, and downstream dependencies. Each decisive input needs an owner, publisher or system of record, scope, authority, effective interval, rights, confidentiality/data class, transformation lineage, conflict/precedence rule, review/withdrawal policy, and stable identity.

Spindle should consume approved references or minimum projections, validate versions and access, and preserve which material actually entered the work. Retrieval or selection may rank candidates, but ranking cannot decide authority. Missing, withdrawn, stale, conflicting, or insufficient source state becomes a refusal or escalation according to the workflow.

The manifest also pins product, workflow, model/expert/agent/tool, solver or numeric profile, policy, schema, compiler/runtime, target, deployment, and relevant trust identities. Content hashes are useful for immutable artefacts; signed version identifiers and effective metadata cover state that cannot be reduced to a file.

SOURCE + VERSION BINDING		effective-work-state
SOURCE	identity + authority	PINNED
POLICY	version + effective time	PINNED
TRANSFORM	method + lineage	LINKED
RUNTIME	product + dependencies	PINNED
CONFLICT	rule or escalation	CHECKED
RIGHTS	purpose + recipient	CHECKED
The "current" version is not evidence of what a historical case used.		

GROUNDING TEST

Change the source or policy after review. New work should bind the new version; old work should retain the old path; pending work should follow an explicit reopen rule.

HOW IT WORKS • MECHANISM

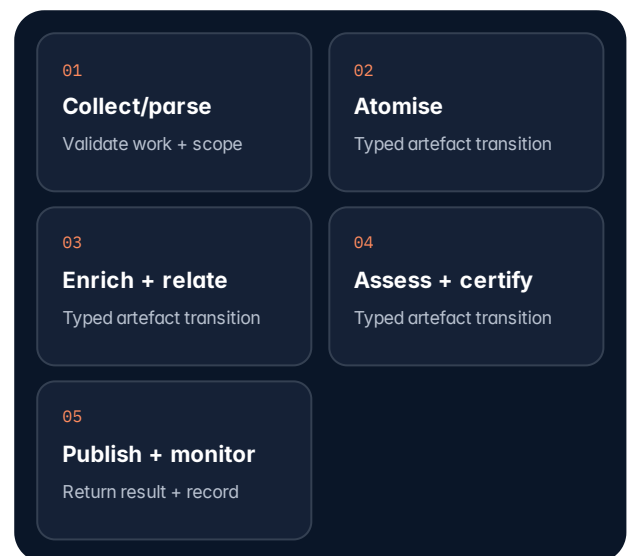
Stage 3: execute the Spindle product flow

The published description's conceptual sequence is Collect/parse → Atomise → Enrich + relate → Assess + certify → Publish + monitor. Every transition has an owner, validation, failure state, and evidence contribution.

the published material describes seven stages, a canonical atom model, hierarchy, typed events, multi-store persistence, quality dimensions, bias categories, and forward/backward lineage. Existing systems connect as scoped source classes; atom promotions, threshold breaches, bias flags, and conflicts can emit events.

For the scenario, the product takes approved sources with owner, scope, rights, effective version, collection/parse method, transformation policy, quality threshold, and withdrawal rule. Each stage validates the work and relevant artefact version before transition. Lower calls receive minimum typed inputs and return artefact identity plus explicit state. Spindle owns the coherent lifecycle even when another product or foundation performs cognition, parsing, exact arithmetic, policy, sandboxing, storage, or proof.

The result is queryable governed atoms and indexes whose path can be followed backward to source and forward into dependent work. That output should expose enough typed state for the caller to act safely and enough references for authorised review. Internal implementation can parallelise, stream, cache, retry, or choose an approved provider, but it must not lose ordered/causal identity or change the product's declared result meaning.



Conceptual Spindle flow from the current product description.

TRANSITION CHECKLIST

Identity; input/version; authority; validation; timeout/cancel; retry/idempotency; failure class; output schema; evidence; next owner.

HOW IT WORKS • COGNITION AND COMPUTE

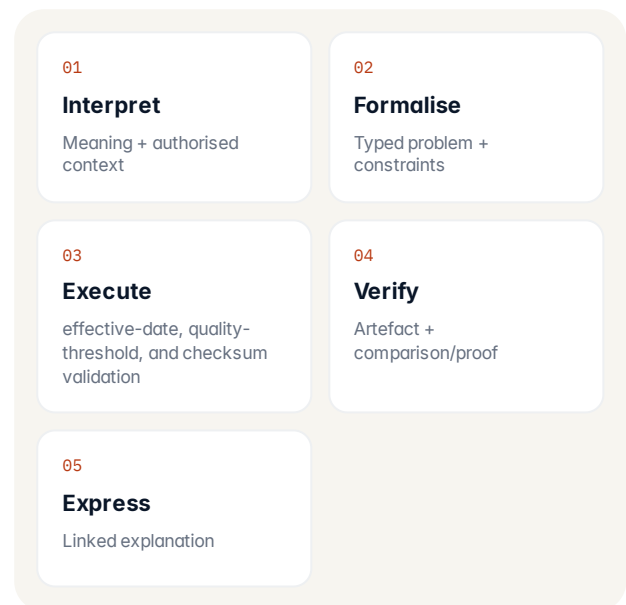
Stage 4: keep exact work outside fluent invention

The scenario's exact boundary is effective-date, quality-threshold, and checksum validation. Interpretation and expression can use cognitive components; exact rules, arithmetic, simulation, or compilation use typed deterministic contracts where required.

The product identifies which subproblem requires source-aware interpretation and which requires exact mechanics. The interpretive side receives authorised context, catalogue/model and constraint versions, and a requested determinism/evaluation mode. The exact side receives typed units, shapes, rules, numeric profile, target and comparison or proof requirement.

A cognitive artefact may frame the exact question and explain the verified result. It must not recompute or paraphrase away a threshold, amount, constraint, compiler diagnostic, or simulation output. Conversely, the exact component returns a result/proof under its formal contract; it does not decide source legitimacy, purpose, or human authority.

Failure remains typed: insufficient context, conflicting sources, unsupported operation, invalid solver/proof, overflow/tolerance breach, target mismatch, model/provider outage, constraint conflict, or expression that cannot remain faithful. The workflow can retry approved components or escalate; it cannot invent a successful exact answer.



A separation of responsibilities; some product scenarios may use only a subset.

EXACTNESS TEST

Can an independent reviewer verify the exact artefact without reading the prose, and verify that the prose preserves the artefact without rerunning the model?

HOW IT WORKS • REVIEW

Stage 5: keep human authority meaningful

The source and policy owners approve promotion, conflict handling, and withdrawal effects.

The review state packages the material facts, source and policy versions, product result, exact artefacts where used, uncertainty and conflict, proposed action or publication, affected object or person, limits, and the real alternatives available to the reviewer. The interface should help a competent person challenge the work rather than encourage a fast confirmation.

For this scenario, the source and policy owners approve promotion, conflict handling, and withdrawal effects. The reviewer identity, organisational role, purpose, scope, separation requirements, information shown, decision, reason, time, expiry, correction or escalation, and downstream effect attach to the work. A reviewer can approve, reject, correct, request evidence, narrow, or escalate according to policy.

If sources, policy, result, action, recipient, or target state change after review, reopen or invalidate the gate. Test missing, wrong-role, self, expired, delegated, bulk, and emergency review. Measure correction and disagreement; a low correction rate may indicate excellent work or ceremonial oversight.

SEE

Material basis

Facts, source/policy version, uncertainty, conflict, and exact artefacts.

CHOOSE

Real alternatives

Approve, correct, reject, request evidence, narrow, or escalate.

UNDERSTAND

Consequence

What publication or side effect follows each decision.

RECORD

Authority state

Identity, scope, reason, time, expiry, and transition.

MEANINGFUL REVIEW TEST

Seed a plausible but wrong recommendation. Can the authorised reviewer see enough to catch it before effect?

HOW IT WORKS • SIDE EFFECTS

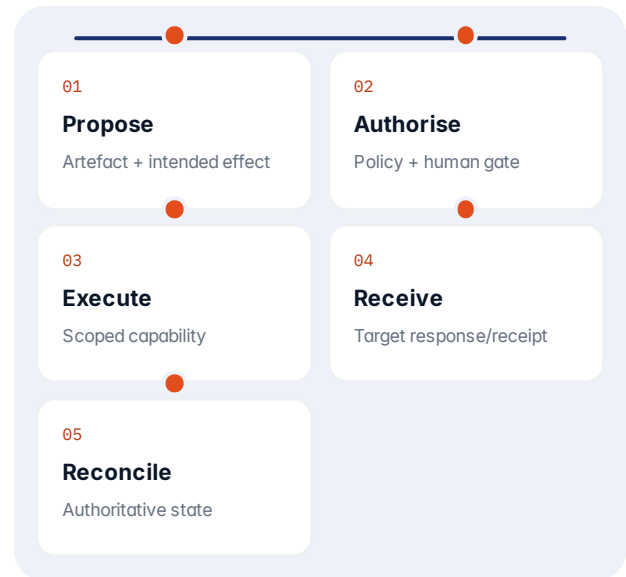
Stage 6: separate proposal, action, and reconciliation

Spindle promotes new atoms, updates indexes, emits typed events, and preserves old lineage.

Every new data project begins with an old bill. Teams collect sources somebody already collected, clean information somebody already cleaned, and reconstruct ownership, provenance, permissions, and regulatory context around yet another dataset that will eventually go stale. Spindle changes the economic model: knowledge becomes a durable asset, verified once, governed continuously, and reused with proof.

A successful call is an execution attempt, not automatically a closed business transaction. Attach the target response or receipt, then query or consume authoritative state as needed. Timeouts after possible effect enter an “uncertain, reconcile” state. Retry only after idempotency or reconciliation proves it is safe.

Record proposal, approval, execution transcript or action receipt, provider/target identity, request commitment, response, external correlation/version, reconciliation attempts, final state, notification, and correction. A compensating action is new governed work; it does not erase the first effect.



The target system, not the tool call alone, closes an external action.

AMBIGUOUS-TIMEOUT TEST

Drop the response after the target accepts the action. The workflow must reconcile without either losing or duplicating the effect.

HOW IT WORKS • EVIDENCE

Stage 7: build the evidence packet with the work

The result is new work uses the new policy while historical cases still resolve the old source path; its record should be retrievable by an authorised reviewer without reconstructing the case from screenshots, current configuration, or operator memory.

Spindle breaks information into knowledge atoms: individually identifiable facts, assertions, relationships, and records that keep their source, history, evidence, rights, governance status, and integrity proof. Datasets become reproducible selections from that governed base, so the work of preparation is done once and reused everywhere.

Evidence design for this product includes Retain source/version identity, collection and parse record, every material transformation, atom and hierarchy versions, quality observations, bias/compliance state, conflict and rebuttal, promotion authority, downstream use, and withdrawal effects.. Operational telemetry can reference the packet but should not become its only store. Sensitive artefacts remain behind purpose-specific access; the packet manifest supports an officer, operator, examiner, affected person, or support engineer resolving different authorised subgraphs under one integrity identity.

Define completeness before work can close. If a declared consequential packet item is missing or cannot be committed, the workflow may have to hold publication/action or enter an explicit evidence-incomplete state. Retain schemas, keys, verifiers, runtimes and manifests required for supported historical checking.

WORK RECORD		scenario-packet
IDENTITY	work + purpose + actors	SEALED
SOURCES	versions + lineage + rights	SEALED
PRODUCT	Spindle + dependency manifest	SEALED
AUTHORITY	policy + human states	SIGNED
OUTCOME	result + target receipt	CLOSED
PROOF	integrity + verifier deps	VERIFIED
Illustrative packet manifest; access determines which artefacts a reviewer may resolve.		

PACKET TEST

Select a random historic case, retrieve it without production engineers, verify integrity offline, and reconcile the recorded human and target states.

HOW IT WORKS • FAILURE

Failure paths are first-class product behaviour

A source, model, agent, tool, reviewer, target, store, network, policy, evidence check, or deployment dependency can fail before, during, or after possible effect.

For Spindle: Quarantine unreadable or unauthorised material, preserve parse/transform errors, stop promotion below configured thresholds, expose contradictory sources, retain disputed tags and rebuttal, prevent a withdrawn source from silently feeding new work, and identify dependent atoms and cases. Every failure maps to a typed state, safe default, retry/timeout/cancel rule, owner, alert, evidence, and recovery or escalation path. A valid refusal is not a system error; an effect-uncertain timeout is not safe to retry blindly; an evidence mismatch is not a warning to ignore.

Model failure by boundary: invalid/missing input, authentication/authority denial, source conflict/unavailable, lower artefact invalid, model/provider outage, resource/budget limit, human unavailable, tool denied, external target ambiguous, persistence/queue error, integrity/replay mismatch, and operator deployment page failure. Combine faults after the single-fault paths work.

Inject failures through the production-like path and preserve original work identity, every attempt and decision, actual safe state, telemetry, packet, target reconciliation, recovery time, manual intervention, and runbook change. Do not clean state before the investigator sees it.

FAILURE CLASS	UNSAFE RESPONSE	GOVERNED RESPONSE
Source/policy	Guess/current default	Stop, approved snapshot, or escalate
Dependency	Invisible fallback	Approved substitute + manifest or hold
Authority	Auto-approve	Queue/delegate by explicit rule or stop
Tool/target	Blind retry	Receipt/idempotency/reconcile
Evidence	Publish anyway	Hold/quarantine/investigate
Recovery	Overwrite attempts	Append transitions + retain history

The configured response belongs to the workload and consequence.

SAFE COMPLETION

Refusal, escalation, or stopped action can be the correct completed outcome when continuing would violate the contract.

HOW IT WORKS • RECOVERY

Recovery preserves identity and reconciles reality

Retry, resume, reassign, substitute, checkpoint, compensate, restore, and replay solve different failure states and must not be treated as synonyms.

Retry repeats a safe attempt under the same contract; resume continues from a durable checkpoint; reassign changes the responsible worker; substitute changes an approved implementation and manifest; compensate performs a new action to counter a prior effect; restore reconstructs platform state; replay or verification examines historical work. Each transition keeps the original and new identities.

Seven stages and hard gates exist for one reason: a fact that cannot be traced back to its source is not a fact. Spindle is a pipeline, not a pile. Each fact enters as a candidate and advances only when it meets the quality, consensus, and provenance requirements of the next stage. AI Act Article 10 compliance requires a quality score of 0.7 or above at the Certified gate. Consensus requires at least 3 independent sources with a diversity score of 0.6 or above (entropy-based). If a fact fails a gate it stays where it is, flagged with a reason. It does not leak into training or answers.

A clean-room recovery test restores configuration, identities, product state, sources/knowledge, policies, model/agent/tool manifests, evidence/proof material, schemas/verifiers, queues and external correlations. It runs one safe new case, retrieves/verifies one historic case, and reconciles authoritative target state.

01

Classify

Know whether effect occurred and which state is durable.

02

Choose

Retry, resume, reassign, substitute, escalate, compensate, restore, or stop.

03

Execute

Use explicit owner, version, limits, and idempotency.

04

Reconcile

Compare product, evidence, and authoritative external state.

05

Close

Retain all attempts and improve corpus/runbook.

RECOVERY PROOF

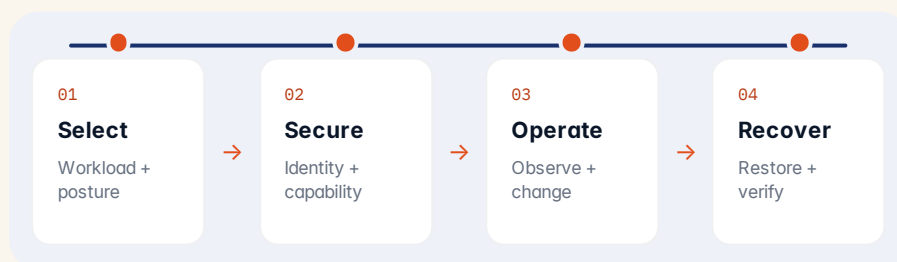
Ingest one changing and one conflicting source; inspect the atoms and lineage; fail a quality gate; rebut a bias tag; withdraw a version; prove dependent retrieval changes; and retrieve an old case with the old source path intact.

03

ADOPTION AND OPERATION

Make Spindle a service the organisation can rely on

Deployment, security, observability, change, recovery, acceptance, and ownership decide whether product architecture survives production.



A product is production-ready only when each step has an owner and exercised evidence.

ADOPTION AND OPERATION • POSTURE

Choose the deployment posture from workload obligations

Managed Fabric access, licensed customer operation, and air-gapped operation are responsibility and dependency arrangements, not product features or generic security rankings.

For the scenario, a policy corpus changes while historical decisions must remain explainable, begin with permitted data movement, administrative/key custody, continuity, latency and integration locality, supplier independence, update control, source/modification and licence rights, evidence custody, support, and the organisation's ability to operate Spindle.

Controlled, Autonomous, and Independent are Government & Critical Infrastructure package tiers. Every tier carries the full licensed platform in a customer-operated, physically isolated estate. The difference is source access, modification rights, technology transfer, and the independence path. List prices are EUR 2,000,000, EUR 4,000,000, and EUR 6,000,000 per year, with 25 percent pre-order pricing on all three.

A mixed estate can use more than one posture, but work identity, artefact versions, data transfer, policy, evidence, and historical interpretation must cross explicitly. Select the least operationally complex posture that can demonstrably satisfy the workload's real obligations.



Directional comparison; current service description, architecture, and agreement settle exact responsibilities.

POSTURE DECISION

A more isolated posture is not automatically safer if the organisation cannot patch, monitor, restore, investigate, and support it.

ADOPTION AND OPERATION • MANAGED

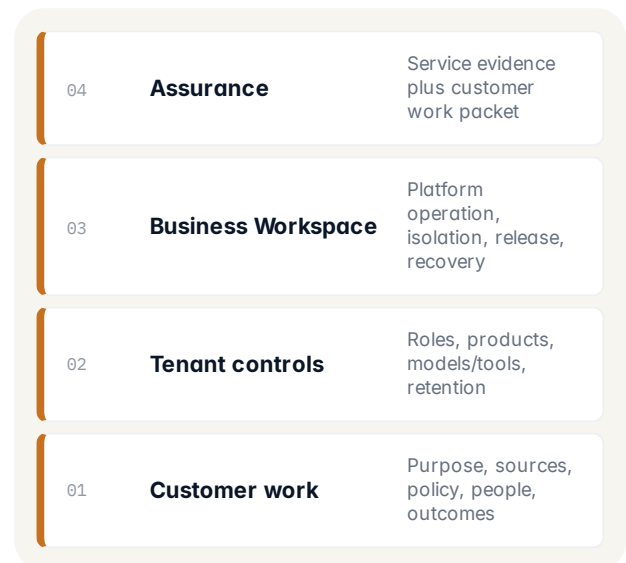
Receive Spindle capabilities through managed Fabric

Define the managed Fabric or public-Mesh service surface, support, evidence, and customer responsibility boundaries without implying that the customer operates Spindle directly.

Map how Fabric, where Spindle capabilities are exposed when included is reached; which product and evidence stores are involved; whether model, tool, connector, or provider paths leave the immediate service; how tenant/workspace access is separated; and which administrative or support paths can reach configuration, payloads, telemetry, or evidence.

The current service description and agreement should settle region, tenancy/isolation, encryption and key model, customer and Dweve administration, identities, providers/subprocessors where applicable, retention/deletion, backups/recovery, availability/change/incident, evidence access/export, usage/limits, support, and exit.

Exercise a representative tenant: create work through Fabric, where Spindle capabilities are exposed when included, remove a participant or credential, change a permitted provider or dependency, test deletion/export and packet retrieval, raise an incident, confirm support access controls, and document the customer owner for every source, policy, role, action, and retained result.



Validate this responsibility model against the current service description.

MANAGED EVIDENCE

Request the current data/control flow, admin/support process, incident route, recovery commitment, export format, and applicable assurance material.

ADOPTION AND OPERATION • LICENSED

Operate Spindle as a licensed platform service

Customer control over infrastructure and keys brings customer responsibility for capacity, security, changes, recovery, evidence, and service continuity.

Specify the complete Spindle environment: signed product and dependency packages, models/policies/sources where used, compute and target hardware, operating platform, stores/queues, identity, keys/trust, network, observability, backups, evidence/verifier dependencies, licence material, and integrations. Pin versions and supported combinations.

Assign an accountable service owner; platform, security, identity, source/knowledge, workflow/policy, evidence, change, incident and support owners; and administrators with separated privileges. Document capacity, service objectives, on-call/escalation, vulnerability/patch process, update windows, clean restore, and customer-modification support.

Acceptance includes install, cold restart, dependency outage, representative load, least privilege, key rotation, backup/restore, product workflow failure, historic packet verification, update/rollback, supplier disconnect, export, and decommission. A binary that starts has not passed this operating test.

WORK RECORD		licensed-production
SERVICE	accountable product owner	ASSIGN
PLATFORM	install/observe/recover	ASSIGN
SECURITY	keys/network/access	ASSIGN
DOMAIN	source/policy/review	ASSIGN
EVIDENCE	retain/verify/disclose	ASSIGN
CHANGE	test/promote/rollback	ASSIGN
An unassigned row is an operational dependency, not a later detail.		

COMMERCIAL BOUNDARY

Confirm included product/version, environments, usage, source/modification, updates, support, DR copies, offline rights, and exit in the current agreement.

ADOPTION AND OPERATION • DISCONNECTED

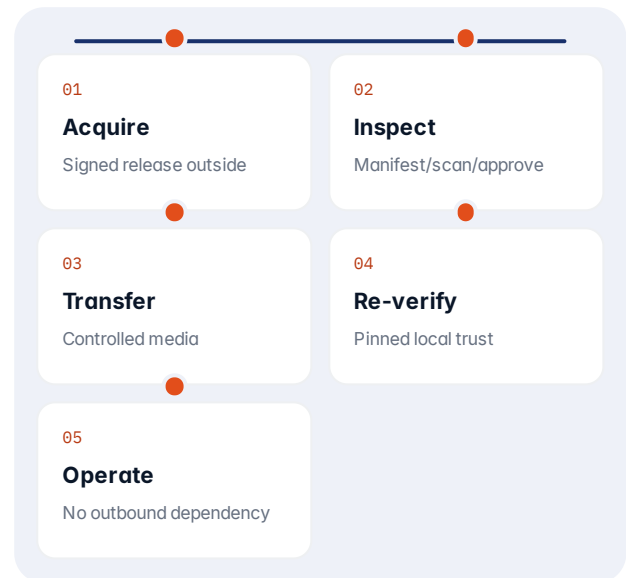
Prove Spindle works in an air gap

No outbound dependency covers installation, licence validation, work, evidence, verification, administration, recovery, updates, and support, not merely model inference.

Source changes, consent withdrawals, licence changes, policy updates, and external corrections enter Spindle as lifecycle events. Forward lineage answers which atoms and exports depend on the event. Backward lineage reconstructs every source and transformation behind an atom. Only affected gates rerun, and the resulting transition is recorded.

Operate with physically unavailable external DNS, package registry, model/provider, telemetry, licence, account, certificate, time, and support services. Updates move through an approve–transfer–reverify–stage–corpus/replay–promote path with a locally usable rollback. Outbound diagnostics are minimised, reviewed, authorised, protected, and recorded.

Test cold start after prolonged disconnection, licence/time/key/certificate boundaries, normal and failed product work, local packet generation and offline verification, backup/restore, update/rollback, support without raw data export, and removal. Every unexpected network attempt or external prerequisite is an air-gap finding.



Air-gap intake path for Spindle; outbound support needs a separate least-data path.

CABLE-ABSENT PROOF

Run the complete scenario, its failure and recovery cases, and the historical verifier while every external path is physically unavailable.

ADOPTION AND OPERATION • SECURITY

Threat-model the product as part of a system

Untrusted callers, sources, models, agents, tools, dependencies, administrators, support processes, evidence readers, and packages create chained paths across product boundaries.

External dependencies remain possible sources of change: a hosted model may produce a different output, a tool may return new data, a web resource may change, a business system may be mutated between executions. Nexus records those calls, their position in the run, the version information available, the inputs sent, and the outputs returned. Captured replay reuses recorded dependency outputs to reconstruct the original controlled execution; live replay calls the dependency again and compares. When the operation diverges, the diff can identify the layer and external boundary at which the change entered.

Use default-deny capabilities, minimum context projection, structural separation of data and instructions, output/schema validation, policy after model generation, sandbox/tool limits, purpose-specific keys and signatures, immutable/signed packages, least-privilege administration, secret/PII handling, rate/resource controls, monitoring, and incident containment.

Build an abuse corpus and chained tests, not only prompt strings. Attempt a malicious source to influence output, output to select a tool, tool to access a forbidden resource, error/log to expose a secret, support/export to cross the boundary, and fallback to change provider/data locality. Retain findings and regression cases.

BOUNDARY	QUESTION	EVIDENCE
Identity	Can authority be delegated/escalated?	Permit/deny trail
Source/model	Can data become instruction?	Adversarial corpus
Agent/tool	Can output expand capability?	Gate + transcript
Admin/support	Can operation bypass domain policy?	Privileged-access record
Package	What runs and from where?	Manifest + signatures
Evidence	Who can inspect/export?	Purpose + access event

Threat paths cross product, deployment, and organisational boundaries.

SECURITY RULE

A network perimeter cannot substitute for identity, capability, data, action, and evidence controls inside it.

ADOPTION AND OPERATION • OBSERVABILITY

Observe service health without duplicating sensitive work

Telemetry answers availability, performance, capacity, threat, and incident questions; governed work evidence answers source, authority, decision, action, and replay questions.

The Knowledge Atom is the indivisible unit Spindle works with: the content itself, its epistemological state, a six-dimensional quality score, complete provenance, and typed graph relationships. Provenance carries the source chain, authors, dates, credibility scores, and transformation history. The same fact stored from the same source is deduplicated in the graph, so a Canonical atom appears once.

Define metric/logtrace and proof page schema, tenant/privacy handling, sampling, payload prohibition/redaction, retention, clocks/order, exporter, local buffering, access, alerts, service objectives, dashboards, and the authorised pivot into a work packet. Ensure licensed and air-gapped operations remain observable without a managed telemetry service.

Seed normal saturation, dependency failure, access denial, malicious input, evidence mismatch, dropped exporter, clock drift, queue duplication, and target reconciliation fault. Follow alert to safe state and relevant authorised evidence, then close incident and change record without broad payload disclosure.

OPERATE

Metrics/health

Rate, latency, resource, queue, dependency, SLO, and saturation.

INVESTIGATE

Service trace/log

State/error class, component, work id, admin/change, and security signal.

EXPLAIN

Work evidence

Sources, versions, artefacts, authority, result, action, and packet.

GOVERN

Access record

Purpose, actor, disclosed subgraph, export, and correction/deletion event.

OBSERVABILITY TEST

Operations should diagnose a seeded incident without either losing work correlation or reading unrestricted case content.

ADOPTION AND OPERATION • CHANGE

Updates are product-behaviour changes

A new release, model, source, policy, agent, tool, foundation, compiler/runtime, schema, or customer dependency can change the result and historical evidence.

The Loom model is defended against extraction, adversarial attacks, integrity violations, and abuse across 10 threat types. Compiled binaries carry protection interpreted weights cannot match: integrity verification with SHA3-256 and BLAKE2b plus digital signatures, statistical adversarial detection, extraction protection with query-pattern analysis and response noise, and access control. For BYOK external models you hold the keys, so their security is yours to manage.

Stage on a copy, migrate, and run the product acceptance corpus: normal distribution, boundary, refusal, malicious input, dependency failure, human gate, action/reconciliation, packet verification, historic replay, load and recovery. Define acceptable variation before seeing output. Obtain domain, technical, security, evidence and operations approvals for their boundaries.

Promote segmentally with a reversible window and state reconciliation. Test rollback after new work exists; preserve new and old artefacts, mappings and verifier dependencies; prevent mixed-version queues from applying the same effect twice. Retain the decision whether to close, hold, narrow or revert.

01

Classify delta

Behaviour, schema, state, security, operations, evidence.

02

Stage

Migrate copy and run full corpus/history.

03

Approve

Named owner per affected boundary.

04

Promote

Scoped, observed, and reversible.

05

Close/rollback

Reconcile state and preserve evidence.

COMPATIBILITY QUESTION

Can the new version still interpret and verify the historical work the organisation is required to retain?

ADOPTION AND OPERATION • CONTINUITY

Restore the product and its accountability

Recovery covers configuration, identity, product state, sources/policies, runtime artefacts, evidence/verifiers, queues, and external reconciliation, not only a database backup.

The architecture is organised by responsibility, not an arbitrary hierarchy. Fabric and Charter direct the work; Nexus, Aura, and Spindle coordinate actors and knowledge; Loom reasons; BitWeave, Lattice, AION, and Twin keep state, policy, and evidence; Core, Kera, Reed, and Numerus execute the computation. Mesh governs where it all runs. The implementation spans 2,900+ operations in 76 categories, 25 numeric formats, and 12 targets including SSE2, AVX2, AVX-512, NEON, SVE2, CUDA, ROCm, Metal, Vulkan, WebGPU, and WASM.

Preserve product/dependency packages, models/agents/tools, policies/sources needed for historical work, schemas, public keys and trust policy, verifiers/runtimes, packet manifests, backups/checkpoints, external correlations and idempotency state, documentation and operator procedures. Resolve deletion, correction, legal hold and proof preservation deliberately.

Restore into clean replacement infrastructure with no undocumented operator state. Re-establish trust and identities; rebuild derived state; run a safe new work case; retrieve and verify a historical one; replay read-only or simulated paths; reconcile authoritative external systems; measure achieved loss/outage; and record exceptions.

WORK RECORD		clean-room-restore
SERVICE	config + identity + keys	RESTORE
PRODUCT	owned state + queues	RESTORE
INPUTS	sources/policy/artefacts	RESTORE
EVIDENCE	packets + schemas + verifier	RESTORE
NEW WORK	safe acceptance case	EXECUTE
HISTORY	retrieve + verify + reconcile	PROVE
A green backup job is not a clean-room recovery exercise.		

CONTINUITY BOUNDARY

Service recovery and accountability recovery can have different dependencies and objectives. Measure both.

ADOPTION AND OPERATION • ACCEPTANCE

Evaluate the product with a representative corpus

A real proof tests the product boundary, scenario, failures, authority, evidence, deployment, performance, recovery, and exit, not one polished happy path.

Begin with the product-specific exercise: Ingest one changing and one conflicting source; inspect the atoms and lineage; fail a quality gate; rebut a bias tag; withdraw a version; prove dependent retrieval changes; and retrieve an old case with the old source path intact. Add historic normal cases across real formats and roles, then boundary values, missing/conflicting/withdrawn sources, incompatible versions, unsupported capabilities, policy denial, malicious input, unavailable dependency, reviewer absence, ambiguous target effect, evidence mismatch, update, and restore.

Define invariants and outcome classes instead of one expected prose string. Correct sources and versions, data boundary, capability/authority, exact artefacts, required warning/refusal, task/action state, target reconciliation, packet completeness, and verification must hold. Protect and version the corpus; separate configuration/training from evaluation.

Run in the intended posture and representative hardware/service configuration. Preserve request, manifests, corpus and rights, raw outputs, timing/resources, errors, packet/verdict, human review, target state, exceptions, and disposition. A public benchmark or demo can guide cases; it cannot replace customer acceptance.

NORMAL

Distribution

Representative volume, formats, roles, sources, and outcomes.

BOUNDARY

Decision edges

Threshold, missing, conflict, version transition, uncertainty.

ABUSE

Disallowed path

Source/prompt/schema, access, capability, tool, export, and egress.

RESILIENCE

Failure/recovery

Dependency, human, target, evidence, restore, replay, and rollback.

RELEASE RULE

A feature tour shows possibility. A controlled corpus produces repeatable evidence about the product boundary.

ADOPTION AND OPERATION • OWNERSHIP

Run the product as a governed operational service

After release, sources, policies, models, agents, tools, packages, dependencies, case mix, threats, and people change. The product needs ongoing domain and technical ownership.

The accountable Spindle owner is responsible for purpose, scope, outcomes, continued fitness and stop decisions. Source/policy/domain owners govern inputs and authority; technical owners maintain contracts/configuration; security owns threat controls; operations owns health/change/recovery; evidence owners maintain retrieval/verification/disclosure; human managers own competence and meaningful review.

Create review triggers for source or policy change, model/agent/tool/provider update, product/foundation release, new data/classification, changed consequence or autonomy, drift in outcome/denial/correction, repeated exception, incident/complaint/audit finding, capacity/support pressure, deployment migration, and rights/contract changes.

Hold regular case and control reviews across completed, corrected, refused, escalated and failed work. Inspect sources, product/dependency manifest, authority, action/target, packet and user impact. Decide whether to change corpus, source, policy, role, contract, capacity, security, runbook, product scope, or stop condition. Expansion is a new decision.

WORK RECORD		spindle-monthly-control
OUTCOME	flow + quality + impact	REVIEW
INPUTS	source/policy/versions changes	REVIEW
AUTHORITY	roles/gates/overrides	REVIEW
SECURITY	abuse/incident/access	REVIEW
OPERATION	SLO/capacity/change/recovery	REVIEW
EVIDENCE	sample retrieval + verify	REVIEW
Record actions, owners, dates, accepted limits, and expansion/stop decisions.		

OPERATING PRINCIPLE

No platform metric or supplier control substitutes for a domain owner who can narrow or stop the workflow.

FIND A SUBJECT

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Page references point to the substantive explanation, worked example, control, boundary, or decision record, not merely to a passing label.

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CLOSING PRODUCT RECORD

The next Spindle action is a bounded product proof

Use the scenario “a policy corpus changes while historical decisions must remain explainable” or one equally specific customer workflow. Require the product to show both its intended result and the evidence needed to judge the boundary.

Write the trigger, work identity, purpose, actors, sources and versions, product capability, lower dependencies, policy and authority, expected artefact, permitted action, external target, evidence packet, deployment, service objective, and failure/stop conditions. Remove every product or component that has no named responsibility.

Run the current Spindle implementation against a protected corpus of normal, boundary, refusal, malicious, failure, recovery, historical verification, target reconciliation, update and restore cases. Exercise the selected managed, licensed, or air-gapped posture. Preserve raw manifests, outputs, timing/resources, decisions, packets, and gaps.

Then make the production decision with domain, technical, security, operations, assurance, procurement/legal, and affected-user owners: proceed, narrow, remediate, contract a missing condition, hold, or stop. The product earns reliance when that decision is evidence-backed and reversible, not when the brochure is persuasive.

WORK RECORD		spindle-proof
SCOPE	one product/workflow	BIND
ARCHITECTURE	contracts + manifests	INSPECT
CORPUS	normal + boundary + abuse	RUN
RESILIENCE	failure + restore + replay	RUN
OPERATION	posture + owners + capacity	PROVE
DECISION	go/narrow/hold/stop	RECORD
A product proof ends in a decision record, not a demo summary.		

ACCEPTANCE EXERCISE

Ingest one changing and one conflicting source; inspect the atoms and lineage; fail a quality gate; rebut a bias tag; withdraw a version; prove dependent retrieval changes; and retrieve an old case with the old source path intact.