Dweve
Weaving Intelligence

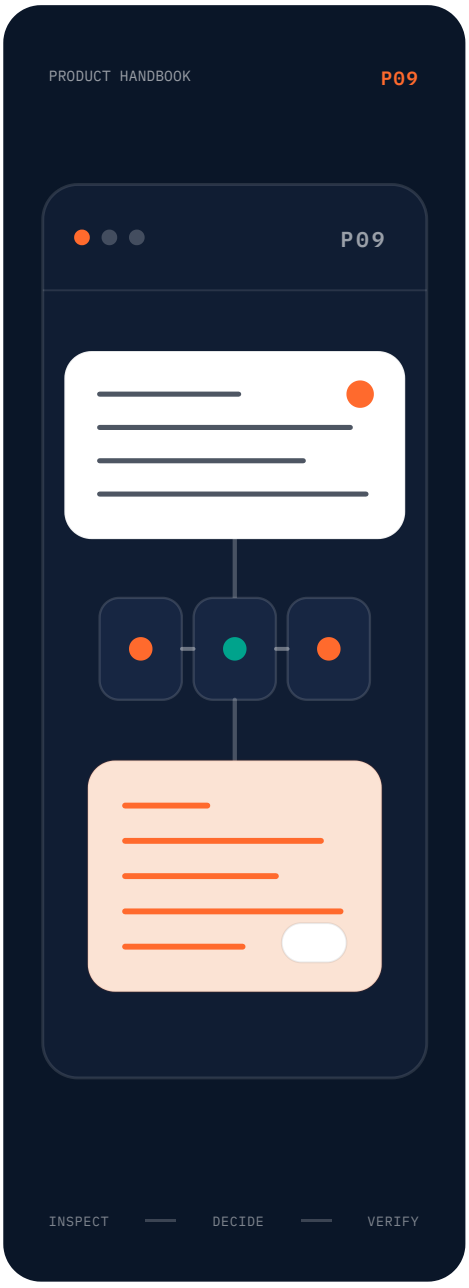
ENGLISH SOURCE EDITION · JULY 2026

PRODUCT HANDBOOK · P09

The Kera product handbook

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

KERA RESPONSIBILITY WORKFLOW EVIDENCE DEPLOYMENT ACCEPTANCE



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

P09

CONTENTS

Kera, from responsibility to production

The handbook keeps one illustrative scenario, a graph programme is planned directly for CPU and accelerator targets, throughout the product, technical, governance, and operating explanation.

PRIMARY READERS	READING DEPTH	DECISION THIS SUPPORTS
Product, architecture, delivery and operations teams	Professional + technical	A complete product explanation for teams deciding where Kera fits, how it works, and what they must prove before relying on it.

READING RULE

Product mechanism comes from Kera 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 Kera handbook

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

Kera owns the graph-native language, content-addressed IR, compiler, planner, and target emission path. 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 Kera have useful features?” It is whether Kera can accept a typed graph programme with shapes, effects, ownership, host/device memory, target, flags, capability, resource, movement, and determinism requirements; reliably produce a versioned target-specific plan or artefact whose graph identity, transformations, effects, ownership, and execution requirements remain inspectable; integrate through Kera source/tooling, .keg artefacts, x86-64/ARM64/RISC-V and other published targets, GPU/FPGA/WASM paths where scoped, Core operations, distributed ring/checkpoint machinery, CI, and deployment manifests.; 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

Kera

the graph-native language, content-addressed IR, compiler, planner, and target emission path

PRIMARY INPUT

Typed work

a typed graph programme with shapes, effects, ownership, host/device memory, target, flags, capability, resource, movement, and determinism requirements

PRIMARY OUTPUT

Result + state

a versioned target-specific plan or artefact whose graph identity, transformations, effects, ownership, and execution requirements remain inspectable

DECISION

Fit + proof

Select, test, operate, and govern the boundary.

PRIMARY ACCEPTANCE

Compile a representative graph; inspect types, effects, movement and .keg identity; compare target plans; reject an undeclared effect and illegal move; verify hard-mode output across supported targets; benchmark emitted paths against the declared baseline; and reproduce from pinned artefacts.

READ THIS FIRST · TERMS

Vocabulary and source discipline

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

Product responsibility

Kera is the product boundary for the graph-native language, content-addressed IR, compiler, planner, and target emission path. 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

Choose a Business Workspace package on the public Dweve Mesh, a licensed deployment on your hardware, or a fully disconnected environment. The operating choice determines whether capabilities are consumed through Fabric and its APIs or operated directly under a licence, which processing perimeter applies, and who holds the keys.

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

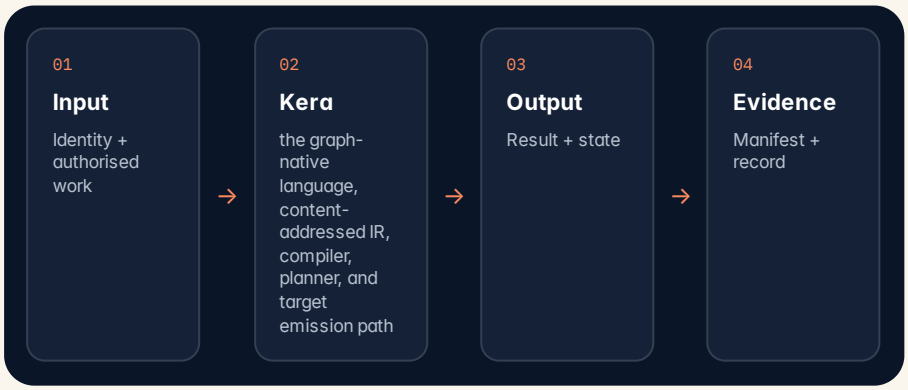
The current published page set exposes the current product set while some overview wording uses a different count or positions Kera underneath the visible product set. This handbook names the selected product description and avoids relying on one disputed total.

01

RESPONSIBILITY AND BOUNDARY

Kera 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.



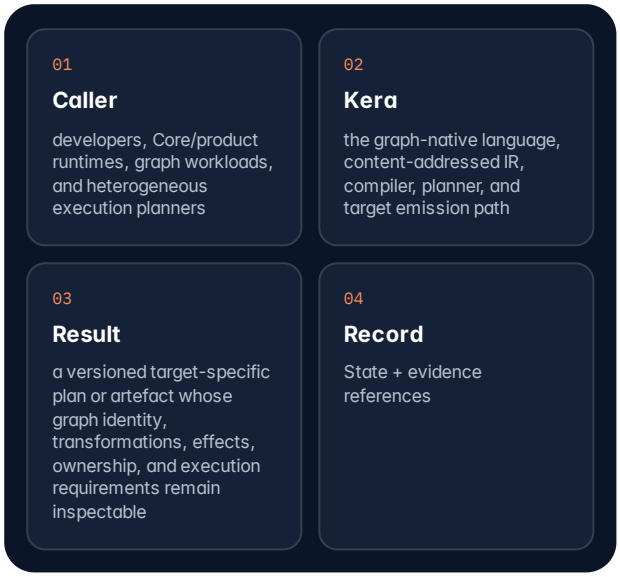
The handbook's repeated product-boundary model.

BOUNDARY · RESPONSIBILITY

Kera in one accountable sentence

Kera owns the graph-native language, content-addressed IR, compiler, planner, and target emission path. Everything else in the handbook follows from keeping that job and its state visible.

A platform product is not a list of features; it is the component accountable for a stable responsibility. For Kera, that responsibility is the graph-native language, content-addressed IR, compiler, planner, and target emission path. The product receives work from developers, Core/product runtimes, graph workloads, and heterogeneous execution planners, uses lower or adjacent capabilities from typed/effect-checked graph IR, planning, code generation, Core operations, and target runtimes, and remains connected to tooling, target hardware, distributed execution, build systems, and deployment manifests.



The Kera boundary expressed as responsibility rather than deployment shape.

The principal input is a typed graph programme with shapes, effects, ownership, host/device memory, target, flags, capability, resource, movement, and determinism requirements. The principal output is a versioned target-specific plan or artefact whose graph identity, transformations, effects, ownership, and execution requirements remain inspectable. 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.

Kera preserves and lowers programme meaning. Core owns runtime operation execution. Kera does not prove a programme's business purpose, make every target currently supported, erase backend-specific performance, or guarantee that a legal optimisation is beneficial on every workload.

DELETION TEST

Remove Kera 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.

Kera is a statically typed systems language with a graph-native, content-addressed IR. Programs compile to .keg files, directed acyclic graphs of operations, and execute across CPU, GPU, FPGA, and WASM. No LLVM: custom code generation for x86-64, ARM64, and RISC-V with register allocation and SIMD kernel selection. Effect-tracked side effects. Rust-style ownership across host, device, pinned, and unified memory. A Rust workspace with distributed execution, capability-based security, and LSP tooling.

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.

04	**Evidence**	Events, decisions, receipts, transcripts, proofs, and access state
03	**Versions**	Schema, product, source, policy, model/agent/tool, runtime, and deployment
02	**Lifecycle**	Requested, active, waiting, refused, failed, completed, reconciled, superseded
01	**Identity**	Work, object, actor, source, artefact, and external correlation

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 a typed graph programme with shapes, effects, ownership, host/device memory, target, flags, capability, resource, movement, and determinism requirements. 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; Kera 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 KERA ENVELOPE

```
work_id       kera-4f9e
actor         role:approved-caller
purpose       bounded-workflow
objects       content-addressed refs
capability    selected_kera_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 a versioned target-specific plan or artefact whose graph identity, transformations, effects, ownership, and execution requirements remain inspectable. 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

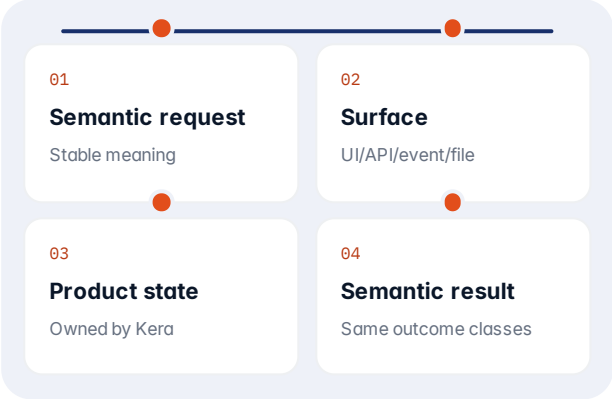
Interfaces carry the same meaning across surfaces

Kera 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 a statically typed systems language with content-addressed .keg DAGs, effect-tracked side effects, Rust-style ownership across memory spaces, custom planning and code generation rather than LLVM at the centre, register allocation, SIMD selection, direct target emission, distributed execution, and LSP/tooling.

The relevant integration surfaces include Kera source/tooling, .keg artefacts, x86-64/ARM64/RISC-V and other published targets, GPU/FPGA/WASM paths where scoped, Core operations, distributed ring/checkpoint machinery, CI, and deployment manifests.. 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

Kera calls lower capabilities without reaching into their hidden state, and callers above it consume its declared result rather than reimplementing its job.

The direct callers are developers, Core/product runtimes, graph workloads, and heterogeneous execution planners. The product can depend on typed/effect-checked graph IR, planning, code generation, Core operations, and target runtimes. Adjacent operational and organisational systems include tooling, target hardware, distributed execution, build systems, and deployment manifests. 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.

04	**External context**	tooling, target hardware, distributed execution, build systems, and deployment manifests
03	**Lower capabilities**	typed/effect-checked graph IR, planning, code generation, Core operations, and target runtimes
02	**Kera**	the graph-native language, content-addressed IR, compiler, planner, and target emission path
01	**Callers**	developers, Core/product runtimes, graph workloads, and heterogeneous execution planners

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

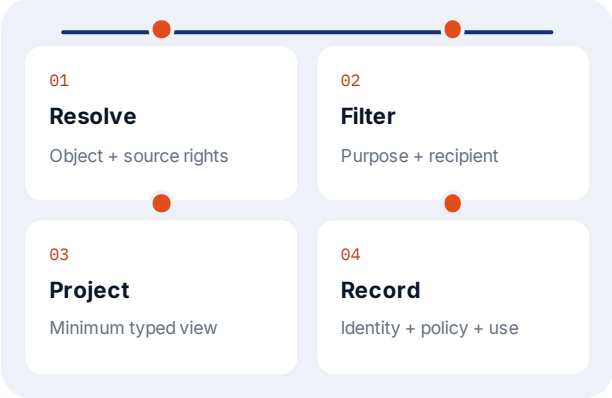
Data moves by purpose-scoped projection

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 Kera passes material to typed/effect-checked graph IR, planning, code generation, Core operations, and target runtimes, 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 Kera 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.

Binary matrix multiplication on AVX-512 is not treated as floating-point matrix multiplication with smaller values. Packed-bit operations use the bit instructions available to the machine. Integer and fixed-point operations use the correct accumulator and overflow behaviour. GPU paths use the execution structure of the target. Scalar implementations remain present as the reference and universal floor. That creates an accountable answer to a simple question: what code actually performed this operation on this machine? Core can name the path.

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 Kera 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. Kera 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

Kera preserves and lowers programme meaning. Core owns runtime operation execution. Kera does not prove a programme's business purpose, make every target currently supported, erase backend-specific performance, or guarantee that a legal optimisation is beneficial on every workload.

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.

Kera preserves and lowers programme meaning. Core owns runtime operation execution. Kera does not prove a programme's business purpose, make every target currently supported, erase backend-specific performance, or guarantee that a legal optimisation is beneficial on every workload.

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 Kera 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

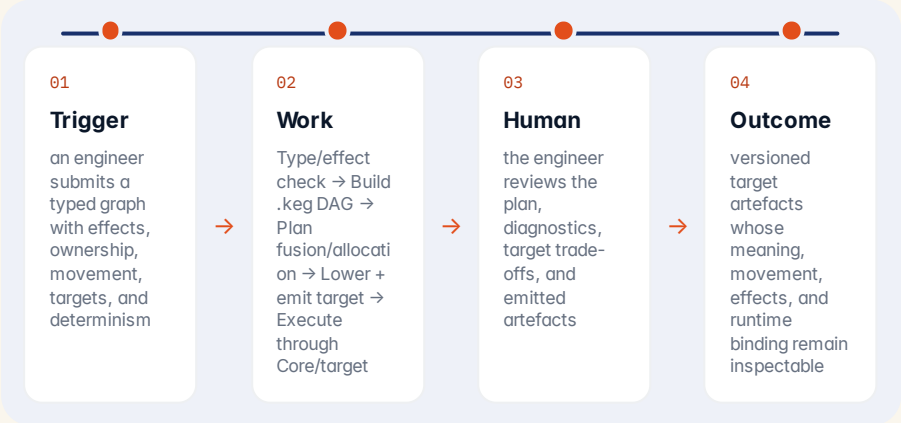
For every strong statement, name the artefact or customer exercise that would support it and the conclusion that still would not follow.

02

HOW IT WORKS

Follow a graph programme is planned directly for CPU and accelerator targets

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

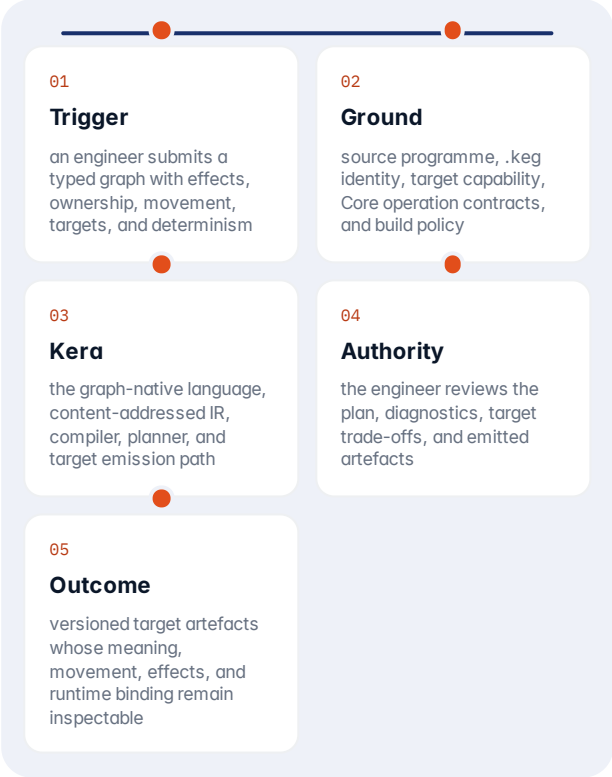
Walkthrough: a graph programme is planned directly for CPU and accelerator targets

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

The trigger is an engineer submits a typed graph with effects, ownership, movement, targets, and determinism. The approved inputs are source programme, .keg identity, target capability, Core operation contracts, and build policy. 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.

Kera is a statically typed systems language with a graph-native, content-addressed IR. Programs compile to .keg files, directed acyclic graphs of operations, and execute across CPU, GPU, FPGA, and WASM. No LLVM: custom code generation for x86-64, ARM64, and RISC-V with register allocation and SIMD kernel selection. Effect-tracked side effects. Rust-style ownership across host, device, pinned, and unified memory. A Rust workspace with distributed execution, capability-based security, and LSP tooling.

Human authority remains explicit: the engineer reviews the plan, diagnostics, target trade-offs, and emitted artefacts. Consequential effect is separate from proposal: Kera emits target-specific plans or code while retaining graph identity and transformation history. The resulting closure is versioned target artefacts whose meaning, movement, effects, and runtime binding remain inspectable. 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 an engineer submits a typed graph with effects, ownership, movement, targets, and determinism, 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 Kera 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	kera-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 source programme, .keg identity, target capability, Core operation contracts, and build policy. 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.

Kera 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

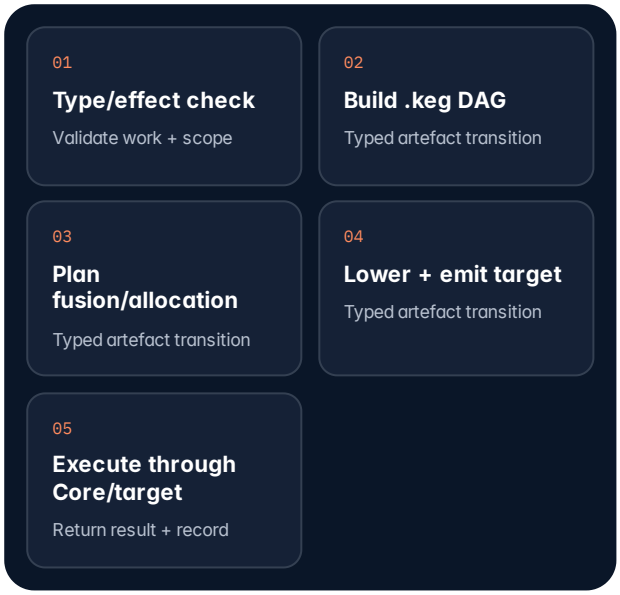
Stage 3: execute the Kera product flow

The published description's conceptual sequence is Type/effect check → Build .keg DAG → Plan fusion/allocation → Lower + emit target → Execute through Core/target. Every transition has an owner, validation, failure state, and evidence contribution.

the published material describes a statically typed systems language with content-addressed .keg DAGs, effect-tracked side effects, Rust-style ownership across memory spaces, custom planning and code generation rather than LLVM at the centre, register allocation, SIMD selection, direct target emission, distributed execution, and LSP/tooling.

Kera is a statically typed systems language with a graph-native, content-addressed IR. Programs compile to .keg files, directed acyclic graphs of operations, and execute across CPU, GPU, FPGA, and WASM. No LLVM: custom code generation for x86-64, ARM64, and RISC-V with register allocation and SIMD kernel selection. Effect-tracked side effects. Rust-style ownership across host, device, pinned, and unified memory. A Rust workspace with distributed execution, capability-based security, and LSP tooling.

The result is a versioned target-specific plan or artefact whose graph identity, transformations, effects, ownership, and execution requirements remain inspectable. 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 Kera 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

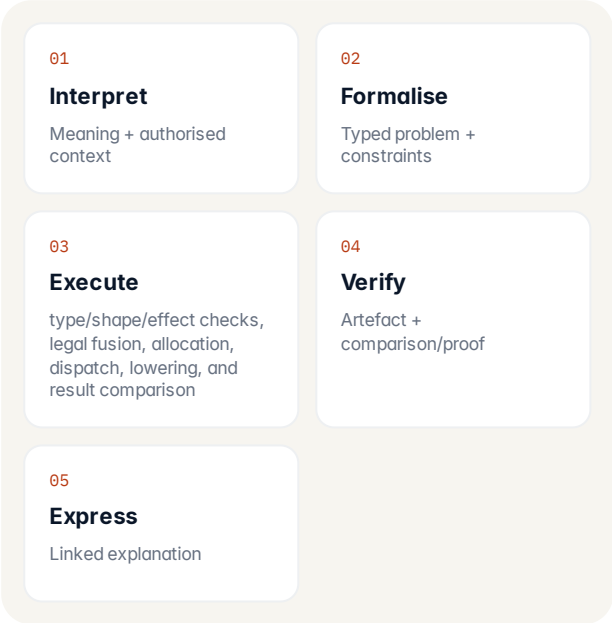
Stage 4: keep exact work outside fluent invention

The scenario's exact boundary is type/shape/effect checks, legal fusion, allocation, dispatch, lowering, and result comparison. 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 engineer reviews the plan, diagnostics, target trade-offs, and emitted artefacts.

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 engineer reviews the plan, diagnostics, target trade-offs, and emitted artefacts. 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

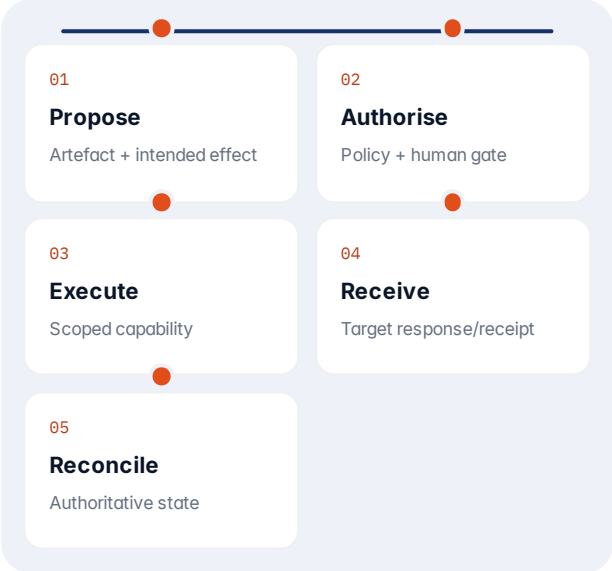
Stage 6: separate proposal, action, and reconciliation

Kera emits target-specific plans or code while retaining graph identity and transformation history.

Most compilers stop understanding the computation long before the machine executes it. Kera keeps the operation, graph, type, effect, ownership, memory, and execution contract visible through planning, then emits target-specific execution itself. No generic compiler sits in the centre trying to rediscover the operation from lowered code. The graph remains the programme, and it goes straight to the machine.

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 versioned target artefacts whose meaning, movement, effects, and runtime binding remain inspectable; its record should be retrievable by an authorised reviewer without reconstructing the case from screenshots, current configuration, or operator memory.

The AION native format is a HEDL-encoded proof artefact with a signed Merkle root and policy metadata. For interop with existing proof tooling, the verifier also emits Alethe, a standard format used by SMT solvers, and LRAT, a clause-based format used by certified SAT checkers. Both are lossless transforms of the same proof. Most users stay on the native format.

Evidence design for this product includes Retain source and graph hash, type/effect result, ownership/movement decisions, applied transforms, fusion/allocation/dispatch plan, target/features, generated artefact identity, distributed/checkpoint metadata, Core/runtime binding, diagnostics, and result verification.. 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	**Kera + 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 Kera: Reject type/shape mismatch, undeclared effect, illegal ownership or movement, unsupported target/capability, impossible allocation, invalid fusion, non-deterministic transform under a hard contract, code-generation mismatch, distributed/checkpoint error, and artefact whose identity cannot be reconciled with its graph. 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 operatordeployment 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.

For Kera, recovery must preserve source programme, typed DAG, operation and shape identity, effect set, ownership and memory spaces, .keg content address, legal transforms, fusion/allocation/dispatch plan, target artefact, distributed/checkpoint plan, and tool diagnostics. If the product calls lower components or external systems, it also preserves their artefact/receipt identities and compatibility. Queues and callbacks need idempotency; mutable objects need version/concurrency rules; human approvals need expiry/revalidation; changed source/policy or provider requires an explicit reopen decision.

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

Compile a representative graph; inspect types, effects, movement and .keg identity; compare target plans; reject an undeclared effect and illegal move; verify hard-mode output across supported targets; benchmark emitted paths against the declared baseline; and reproduce from pinned artefacts.

03

ADOPTION AND OPERATION

Make Kera 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 graph programme is planned directly for CPU and accelerator targets, 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 Kera.

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

Kera direct operation belongs to a licence

Managed Fabric does not grant direct Kera operation. Define how the managed access surfaces avoid implying that product entitlement, then specify the licensed boundary when direct operation is required.

Map the managed Fabric surfaces available to the customer and show that none grants direct Kera operation. When the customer needs to operate Kera, move the design to a licensed tier and specify the customer infrastructure, product scope, keys, updates, support, evidence, and rights.

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 the boundary explicitly: confirm that managed credentials cannot reach Kera as a directly operated product, then test the licensed installation, local authority, export, incident, recovery, and support paths required for customer operation.

04	**Assurance**	Service evidence plus customer work packet
03	**Business Workspace**	Platform operation, isolation, release, recovery
02	**Tenant controls**	Roles, products, models/tools, retention
01	**Customer work**	Purpose, sources, policy, people, outcomes

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 Kera 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 Kera 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

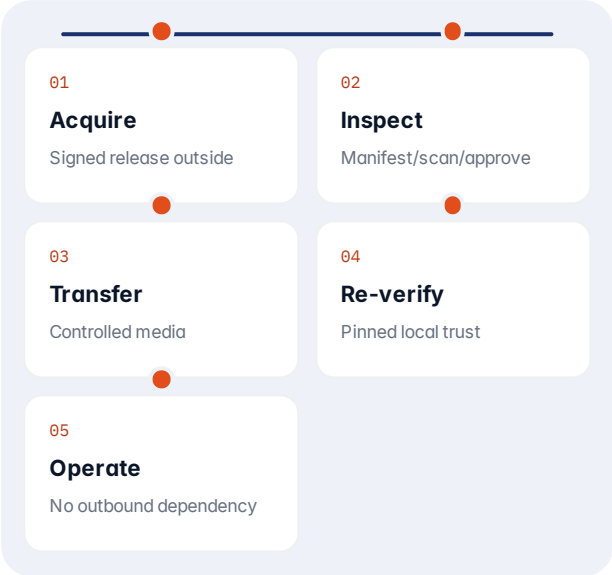
Prove Kera works in an air gap

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

This category is for government and critical-infrastructure estates that require digital sovereignty as an outcome. Customer operation, a declared jurisdictional boundary, physical isolation, and no outbound dependency define the operating model; estate scale, source rights, and modification rights are stated in the package and Order Form.

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 Kera; 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.

AI infrastructure is usually described through APIs. Core is better understood through implementations. The real unit of coverage is not an operation name. It is the complete execution cell: algorithm x datatype x width x packing x accumulator x backend x instruction set x dispatch policy x determinism mode. Core implements the supported matrix across more than 2,900 operations, 76 operation categories, 25 numerical formats, multiple packing models, CPU and GPU backends, browser targets, scalar reference paths, and specialised deployment targets. Every supported cell is real code. Not a capability flag. Not a generic wrapper over one preferred representation. Not an export into somebody else's runtime.

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.

Kera makes memory spaces and ownership explicit. The graph can state where data lives, which operation owns it, which may mutate it, and when ownership transfers. The planner can account for movement before execution rather than discovering it through runtime calls. A removed transfer is faster, an explicit transfer is inspectable, and an illegal transfer can be rejected.

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.

Build the change delta across source programme, typed DAG, operation and shape identity, effect set, ownership and memory spaces, .keg content address, legal transforms, fusion/allocation/dispatch plan, target artefact, distributed/checkpoint plan, and tool diagnostics. Classify interface/schema, state migration, source/policy, model/agent/tool, numeric/determinism, performance, security, operational dependency, evidence/verifier, licence and support effects. Pin both old and new manifests.

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.

Classify every element of source programme, typed DAG, operation and shape identity, effect set, ownership and memory spaces, .keg content address, legal transforms, fusion/allocation/dispatch plan, target artefact, distributed/checkpoint plan, and tool diagnostics as source-of-truth, append log, derived index/cache, configuration/secret, immutable artefact, evidence, or external reference. Set workload-level recovery objectives and a restore order that prevents new work from running with stale policy or duplicated queued action.

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

Take the trace file, run the open-source verifier on your laptop, and you have your proof. We could disappear and the trace would still verify.

Begin with the product-specific exercise: Compile a representative graph; inspect types, effects, movement and .keg identity; compare target plans; reject an undeclared effect and illegal move; verify hard-mode output across supported targets; benchmark emitted paths against the declared baseline; and reproduce from pinned artefacts. 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 Kera 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	kera-monthly-control	
OUTCOME	**flow + quality + impact**	REVIEW
INPUTS	**source/policy/version 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

Subject index

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

SUBJECT INDEX CONTINUED

Subject index · K–V

Terms are grouped alphabetically. Consecutive page references are collapsed into ranges.

SUBJECT INDEX CONTINUED

Subject index · W–W

Terms are grouped alphabetically. Consecutive page references are collapsed into ranges.

CLOSING PRODUCT RECORD

The next Kera action is a bounded product proof

Use the scenario “a graph programme is planned directly for CPU and accelerator targets” 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 Kera 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	kera-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

Compile a representative graph; inspect types, effects, movement and .keg identity; compare target plans; reject an undeclared effect and illegal move; verify hard-mode output across supported targets; benchmark emitted paths against the declared baseline; and reproduce from pinned artefacts.