

DCS Atlas — Technical Roadmap

Every layer (L1–L20) in detail — what's **completed**, **pending**, and **future**. Honest status: live or zero.

Core (L1–L15) ~94% · Pilot v1 readiness ~94% · 16/20 layers live (incl. L17 2-node federation) · 8/8 lanes built

L1 Identity (CW4)		LIVE
<p>✓ COMPLETED</p> <ul style="list-style-type: none">• agent_identities table + registry applied to Supabase• Identity record: id, owner, org_id, public keys, capabilities, metadata• register / lookup / list-by-org / rotate-key operations• ed25519 keypair per agent; public key embedded in every receipt• Live on the gateway — agents resolvable by id	<p>■ PENDING</p> <ul style="list-style-type: none">• Public agent profile UI (read surface)	<p>■ FUTURE</p> <ul style="list-style-type: none">• Cross-org portable identity (one identity, many networks)
L2 Authentication (CW4)		LIVE
<p>✓ COMPLETED</p> <ul style="list-style-type: none">• Key-based auth + per-agent certificates• Bearer-token gateway middleware• RBAC scoped on org_id (every query org-isolated)• Signature-based request verification	<p>■ PENDING</p> <ul style="list-style-type: none">• Passkey / WebAuthn option for human operators	<p>■ FUTURE</p> <ul style="list-style-type: none">• Federated auth — sign in with another org's identity
L3 Memory (CW5)		LIVE
<p>✓ COMPLETED</p> <ul style="list-style-type: none">• Memory store with 6 scopes: long-term, semantic, episodic, team, org, shared• memory + memory_edges tables (graph relationships)• put / get / search / link / scope-filter operations• Supabase backend — store suite 15/15 tests passing• Per-agent + per-org isolation enforced	<p>■ PENDING</p> <ul style="list-style-type: none">• Memory-graph visual explorer UI	<p>■ FUTURE</p> <ul style="list-style-type: none">• Vector / semantic search at scale (embeddings)

L4 Receipts · R+2 (CW2)		DEPLOYED
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • ed25519 signature over RFC-8785-style canonical JSON • Hash-chained: hash = sha256(canon + "]" + sig) • Public key embedded → independently verifiable, no server • POST /receipts/generate · /receipts/verify · GET /verify/:id all live • Durable persistence ON (RECEIPTS_DB) — survives restarts • In-memory hot cache + Supabase fallback on /verify/:id • Stable org signing key pinned (ATLAS_SIGNING_SK_B64) 	<p>■ PENDING</p> <ul style="list-style-type: none"> • High-volume daily rollup / batching 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Merkle-batched receipts for millions/day
L5 Lineage · R+3 (CW2)		BUILT
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • Hash-chain + prev-receipt linkage in the receipt schema • Receipt chain verifiable end-to-end (parent → child) • Run-level grouping (runId threads receipts together) 	<p>■ PENDING</p> <ul style="list-style-type: none"> • Replay / provenance-graph endpoint (R+3 surfacing) 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Time-travel queries + Merkle inclusion proofs
L6 Verification (CW3)		LIVE
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • Public verify portal — paste receipt JSON or look up by id • Independent, offline, no-login verification • Re-checks signature + hash-chain + key client-side • /analytics/receipts-issued · /failures · /soak-health on real run_steps • Honest data — live numbers or zero, never fabricated 	<p>■ PENDING</p> <ul style="list-style-type: none"> • by_day time-series (needs run_steps.created_at column — DK schema) 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Public verify.dcsai.ai at internet scale
L7 Discovery (CW6)		BUILT
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • discovery.js — agent + capability search • Registry lookup by capability, org, reputation • Capability advertisement + matching • Series 1–6 test suites passing 	<p>■ PENDING</p> <ul style="list-style-type: none"> • Discovery UI surface (search agents) 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Global cross-org agent discovery

L8 Agent-to-Agent comms (CW6)		BUILT
<ul style="list-style-type: none"> ✓ COMPLETED • a2a-bus: direct messaging between agents • Task requests + delegation flows • Negotiation protocol (offer / counter / accept) • Organization formation flows • ~64 tests across the coordination suite 	<ul style="list-style-type: none"> ■ PENDING • Runnable A2A demo UI 	<ul style="list-style-type: none"> ■ FUTURE • Cross-org A2A messaging over federation
L9 Reputation (CW4)		LIVE
<ul style="list-style-type: none"> ✓ COMPLETED • agent_reputation table applied • Score computed ONLY from verified receipts (no self-report) • Per-capability + aggregate scoring • Tamper-evident — backed by the receipt chain 	<ul style="list-style-type: none"> ■ PENDING • Reputation display UI / badges 	<ul style="list-style-type: none"> ■ FUTURE • Portable cross-network reputation
L10 Marketplace (CW8)		DARK
<ul style="list-style-type: none"> ✓ COMPLETED • Marketplace listing data model built • Sites + agents publishable into the registry • Listing / pricing / category schema 	<ul style="list-style-type: none"> ■ PENDING • Live listing UI (opens after economy flip) 	<ul style="list-style-type: none"> ■ FUTURE • Open agent + site marketplace with discovery
L11 Wallets (CW8)		DARK
<ul style="list-style-type: none"> ✓ COMPLETED • openWallet + balance tracking (economy.mjs) • Credit / debit / transfer primitives • 60/60 economy tests passing in shadow mode 	<ul style="list-style-type: none"> ■ PENDING • Flip to live (DK · real keys + limits) 	<ul style="list-style-type: none"> ■ FUTURE • Live multi-agent wallets with real balances
L12 Economy (CW8)		SETTLEMENT WIRED
<ul style="list-style-type: none"> ✓ COMPLETED • Real Stripe checkout LIVE: Hobby \$9 · Pro \$29 · Team \$99 • Agent settlement WIRED to Stripe — escrow open→settle→PaymentIntent • Verified end-to-end in test mode (pi_... succeeded, \$0 real money) • /economy/escrow/open · /settle · /ledger live on the gateway • Live-mode safety proven: settlement escalates to DK (never auto-pays) • Razorpay INR rails available (■999 / ■2999) as option 	<ul style="list-style-type: none"> ■ PENDING • Flip to real money: swap sk_live key + ECONOMY_MODE=live + approve each tx (DK · staged) 	<ul style="list-style-type: none"> ■ FUTURE • Live settlement + autonomous agent payments

L13 Governance (CW8)		LIVE
<ul style="list-style-type: none"> ✓ COMPLETED • decide() policy gate live on the gateway • ALWAYS_DK set — money/destructive actions escalate to owner • RBAC enforced on org_id • Compliance posture: GDPR / DPDP aware • Every gated decision is itself receipted 	<ul style="list-style-type: none"> ■ PENDING • Policy + spend-limit expansion UI 	<ul style="list-style-type: none"> ■ FUTURE • Fine-grained per-capability policy engine
L14 Federation core (CW2)		BUILT
<ul style="list-style-type: none"> ✓ COMPLETED • Decentralized trust-root model • makeFederationVerifier — multi-root ed25519 verify • fromCW2Receipt adapter • Cross-verify proven in tests — no central server • Returns {valid, org, checks} with org attribution 	<ul style="list-style-type: none"> ■ PENDING • (superseded — now live in production at L17) 	<ul style="list-style-type: none"> ■ FUTURE • Multi-issuer / zero-knowledge verification
L15 Organizations (CW6)		BUILT
<ul style="list-style-type: none"> ✓ COMPLETED • organization.js — multi-agent organizations • Agent-network formation + membership • Role assignment within an org • Org-scoped memory + receipts 	<ul style="list-style-type: none"> ■ PENDING • Org management UI 	<ul style="list-style-type: none"> ■ FUTURE • Self-running, self-governing orgs
L16 Autonomous Companies		BUILDABLE NOW
<ul style="list-style-type: none"> ✓ COMPLETED • autonomous-company.mjs — shadow run works today • Building blocks live: identity, A2A, memory, governance • Economy in shadow → receipted end-to-end P&L; • Frontier test suite 6/6 passing 	<ul style="list-style-type: none"> ■ PENDING • Run live in shadow NOW (receipted P&L;). Real money needs the economy flip (DK) — a business gate, not a code blocker. 	<ul style="list-style-type: none"> ■ FUTURE • Agents found, staff + run real companies with receipted P&L;

L17 Cross-Org Federation		LIVE · 2 NODES
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • CONFIRMED: 2-org federation live — dcs-atlas ■ dcs-atlas-2 • Bidirectional cross-org verify PROVEN both directions (valid + org attribution) • 2 independent Railway nodes — no central server in the path • /.well-known/atlas-root.json published per node • Peer-root ingestion live (ATLAS_PEER_ROOTS) — ready for more orgs 	<p>■ PENDING</p> <ul style="list-style-type: none"> • First external partner node (adoption — needs a 2nd org, not code) 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Decentralized, multi-issuer federation at scale
L18 Sovereign Networks		NO BLOCKER
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • All services zero-dep (node:crypto + fetch) → self-hostable • docker-compose.yml + .env.sovereign.example shipped • Self-host runbook written (gateway :3000 · receipts :8091 · soak :8090) 	<p>■ PENDING</p> <ul style="list-style-type: none"> • No blocker — package + publish the deployable self-host bundle to a partner. 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Anyone runs an independent, sovereign Atlas trust node
L19 Global Agent Network		PROTOCOL NOW
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • Discovery + A2A + federation primitives all built • PROTOCOL.md drafted (the network spec) 	<p>■ PENDING</p> <ul style="list-style-type: none"> • Protocol spec + reference impl buildable NOW; "global" needs many participants (adoption). 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • Agents discover + trust each other across orgs worldwide
L20 Earth Trust Layer		EMERGENT
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • Defined as the measured outcome of L1–L19 live + federated • README + framing written 	<p>■ PENDING</p> <ul style="list-style-type: none"> • Not a code task — becomes true once L1–L19 are live and multiple orgs are federated. 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • The verified, trustworthy state of the global agent economy
L21 Trust Graph		2027 · DESIGN
<p>✓ COMPLETED</p> <ul style="list-style-type: none"> • Concept defined: a global trust-relationship layer (not another ledger) • Agent→agent, org→org, verifier→verifier trust edges 	<p>■ PENDING</p> <ul style="list-style-type: none"> • Network-effect layer — build AFTER real agents/orgs flow through L1–L20. 	<p>■ FUTURE</p> <ul style="list-style-type: none"> • PageRank-style trust score · trust paths · the internet of trust

L22 Autonomous Governance

2027 · DESIGN

✓ COMPLETED

- Concept defined: agents participate in governance, not just humans
- Voting · policy enforcement · treasury · protocol changes

■ PENDING

- Build after Trust Graph (L21) + real org activity.

■ FUTURE

- GitHub + DAO + AI for Atlas — agent-participated governance

L23 Global Coordination

2027+ · DESIGN

✓ COMPLETED

- Concept defined: thousands of agents coordinating toward one objective
- Supply chains · research · healthcare · education · government

■ PENDING

- The big one — only meaningful at real network scale.

■ FUTURE

- The operating system for an agent civilization