

INFRASTRUCTURE AI · PILLAR 1 WHITE PAPER

Building the Control Plane for Autonomous  
Infrastructure

# Agentic Operating System.

The runtime and control plane that coordinates AI agents  
across real-world infrastructure.

# 01

## The runtime and control plane for autonomous infrastructure.

The Galaxy Agentic Operating System, or GAOS, is the runtime and control plane that coordinates AI agents across real-world infrastructure systems. It enables digital workers to operate buildings, factories, utilities, campuses, and cities through a common environment for orchestration, policy enforcement, secure communication, and auditable execution.

GAOS is designed to solve a critical infrastructure problem: specialized intelligence is useful only if it can be coordinated. In operational environments with many stakeholders, many systems, and many decision layers, autonomous agents need a governing framework that can allocate tasks, manage conflicts, enforce permissions, escalate exceptions, and document outcomes. GAOS provides that framework.



Within Infrastructure AI's broader platform, GAOS is the layer that turns a collection of specialized agents into a functioning digital workforce.

# 02

## From isolated intelligence to multi-agent coordination.

Infrastructure operations are inherently distributed. A single facility or portfolio may involve building systems, energy assets, compliance workflows, maintenance schedules, capital projects, external vendors, occupants, safety requirements, and financial constraints. These systems rarely share one operating logic, and the result is fragmented decisions, slow response times, and high coordination overhead.

As AI becomes more capable, the challenge shifts from isolated intelligence to multi-agent coordination. One agent may identify a fault, another may evaluate urgency, another may optimize the solution, another may source providers, and another may validate the outcome. Without a control plane, those agents can conflict, overstep, or fail to produce an auditable chain of action.

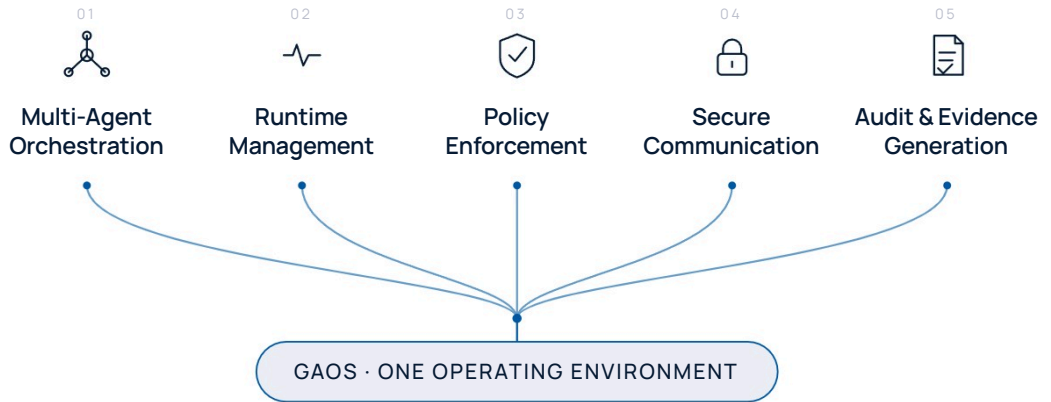


GAOS addresses this by creating a governed runtime for digital work — allowing organizations to deploy many agents while preserving coherence, policy control, and accountability.

# 03

## Five core functions, one operating environment.

GAOS is built around five core functions – together they form the governed runtime in which autonomous capabilities are hosted, sustained, and held accountable.



GAOS does not just coordinate autonomy. It produces the evidence that makes autonomy legible and governable.

## 03

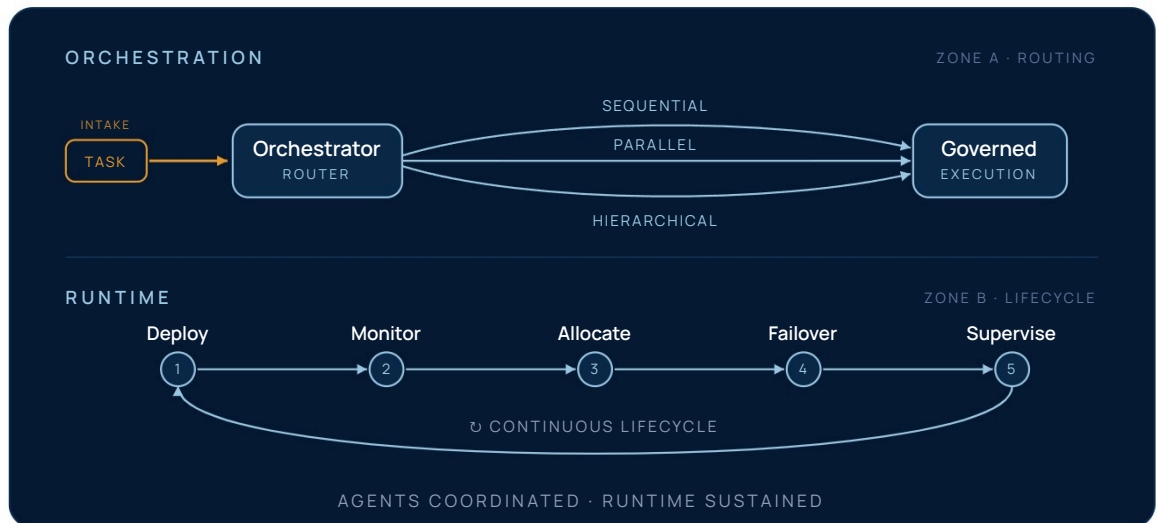
# Coordinating agents and sustaining them in production.

## Multi-Agent Orchestration

GAOS coordinates agents across sequential, parallel, and hierarchical workflows. It routes tasks to the right specialized agents, manages dependencies, resolves overlaps, and ensures that actions are executed in the proper order. This orchestration function is essential in infrastructure because outcomes often span diagnosis, planning, approval, execution, validation, and settlement.

## Runtime Management

GAOS provides lifecycle management for agents, including deployment, monitoring, resource allocation, failover handling, and performance supervision. It ensures agents can operate continuously in production environments while maintaining service quality and operational resilience.



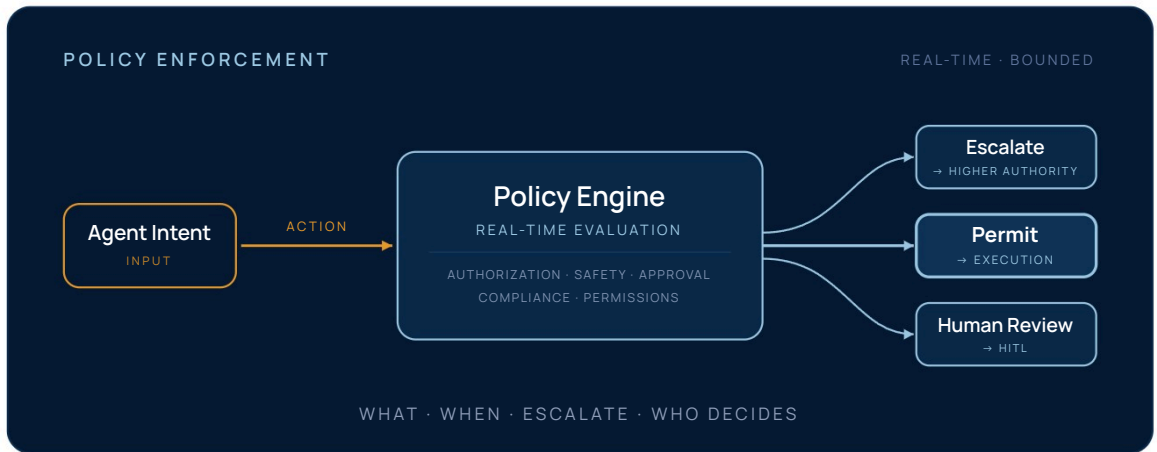
GAOS is more than a workflow engine. It is the operational environment in which autonomous capabilities are hosted, governed, and sustained.

# 03

## Intelligence with bounded authority.

GAOS enforces authorization rules, safety constraints, approval requirements, compliance policies, and stakeholder permissions in real time. It determines what an agent may do, when it may act, when it must escalate, and which decisions require higher authority or human review.

This is a defining requirement for real-world autonomy. In infrastructure, many actions affect safety, compliance, service continuity, or financial exposure. A platform must therefore combine intelligence with bounded authority.



GAOS is built to make those boundaries executable.

# 03

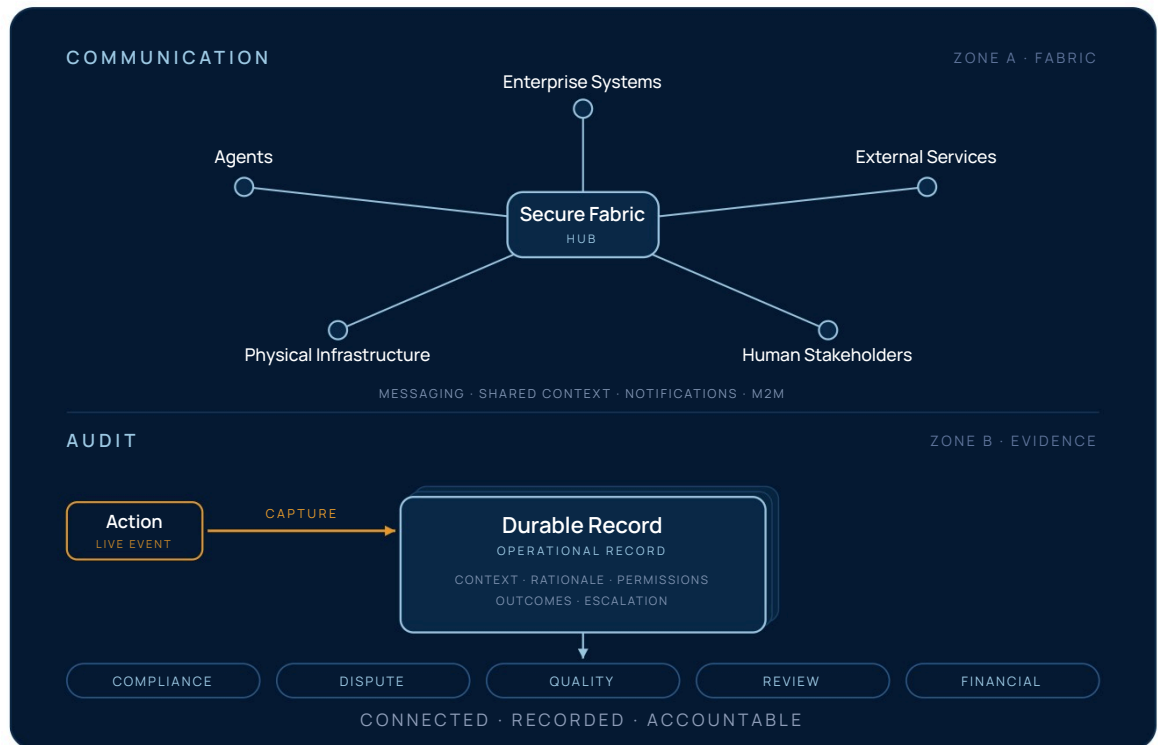
## Connecting agents – and recording what they do.

### Secure Communication

GAOS provides the communication fabric that links agents, enterprise systems, physical infrastructure, human stakeholders, and external services. It supports secure messaging, shared context, notifications, and machine-to-machine coordination across heterogeneous environments. This communication layer allows digital workers to collaborate not just with one another, but with the software and physical systems that infrastructure operations already depend on.

### Audit and Evidence Generation

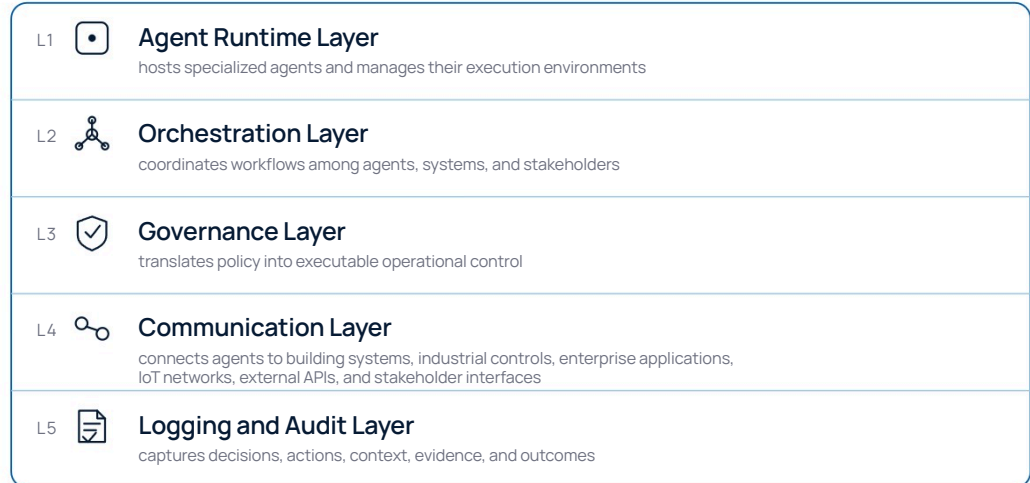
Every meaningful action inside GAOS can be recorded with context, rationale, permissions, outcomes, and escalation history. This creates a durable operational record that supports compliance, dispute resolution, quality control, performance review, and financial analysis.



## 04

## Five layers, one architecture.

GAOS · ONE ARCHITECTURE



- **Agent Runtime Layer** — hosts specialized agents and manages their execution environments; lifecycle control, performance monitoring, and supervision across large fleets of domain-specific digital workers.
- **Orchestration Layer** — coordinates workflows among agents, systems, and stakeholders; assigns roles, sequences actions, manages dependencies, and enforces escalation logic.
- **Governance Layer** — translates policy into executable operational control; permissions, constraints, approval thresholds, and exception handling.
- **Communication Layer** — connects agents to building systems, industrial controls, enterprise applications, IoT networks, external APIs, and stakeholder interfaces.
- **Logging and Audit Layer** — captures decisions, actions, context, evidence, and outcomes; supports traceability and creates the record needed for trust and review.

# 05

## A common operational fabric for the built world.

GAOS is designed to work across heterogeneous physical environments. It can integrate with building automation systems, industrial control systems, energy platforms, IoT infrastructure, maintenance software, enterprise applications, and external data services.

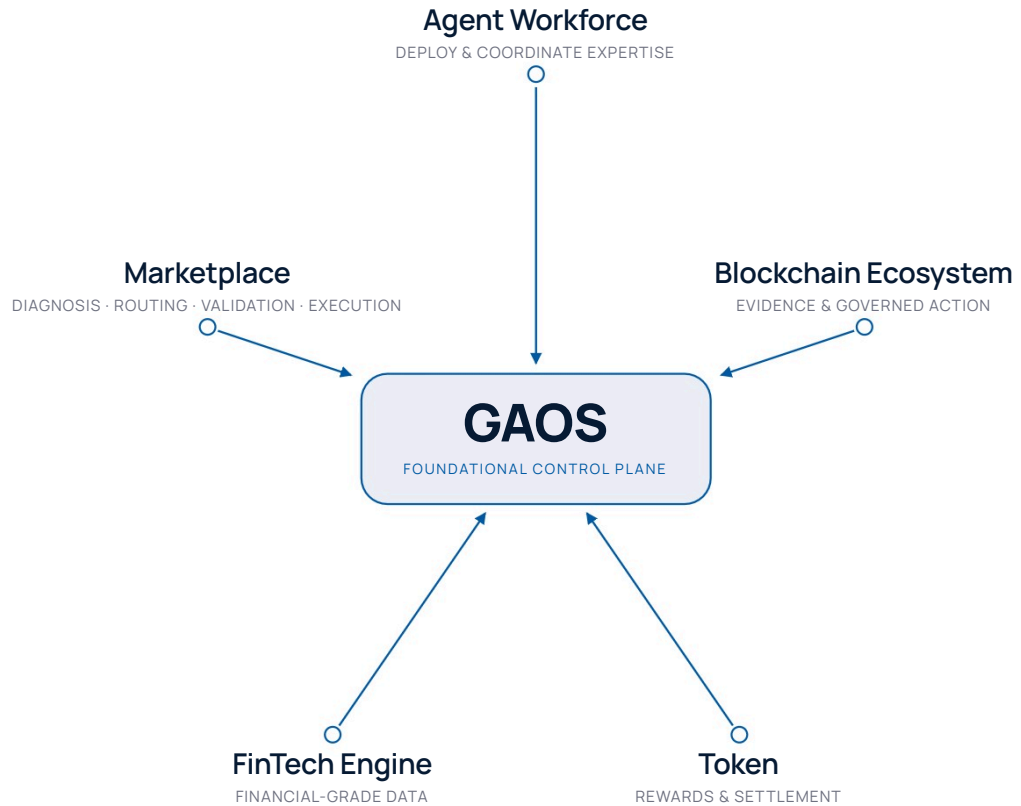
This abstraction layer is essential because physical infrastructure is rarely standardized. Assets differ by age, manufacturer, protocol, ownership model, and operational complexity. GAOS enables agents to operate across that diversity without requiring a new software stack for every site.



By bridging digital agents and physical systems, GAOS creates a common operational fabric for the built world.

# 06

## GAOS is foundational because every other pillar depends on controlled execution.



GAOS is the platform's central operating environment – where governed digital actors interact with governed physical assets in real time.

# 07

## Where GAOS delivers enterprise value.

VALUE 01

### Operational Consistency

Turns institutional policies and best practices into executable workflows. Apply the same operating logic across large portfolios instead of relying on local interpretation and manual coordination.

VALUE 02

### Scalable Autonomy

Allows many specialized agents to operate together without losing governance. Enterprises expand digital labor capacity without creating unmanaged complexity.

VALUE 03

### Faster Decisions & Execution

Coordinates detection, analysis, escalation, and action inside one control plane. Problems move from observation to intervention far more quickly than in traditional manual environments.

VALUE 04

### Stronger Trust & Accountability

Permissions, audit trails, and policy enforcement embedded in the operating model. Decision-making becomes reviewable, explainable, and defensible across operational, compliance, and financial stakeholders.

# 08

## Intelligence becomes action when agents share coherent rules.

Infrastructure does not become autonomous simply because intelligent agents exist. It becomes autonomous when those agents can operate together under coherent rules, against real systems, with clear authority boundaries and reliable records.

**That is the strategic importance of GAOS. It is the layer that transforms AI capability into governed operational execution.**

As Infrastructure AI grows, GAOS positions the company to become the standard control plane for autonomous infrastructure. In that role, it can sit at the center of how assets are operated, how agents are coordinated, how evidence is generated, and how value is created across the broader platform.



# 09

## The discipline layer that lets intelligence become action.

The Galaxy Agentic Operating System is the control plane for autonomous infrastructure. It brings together orchestration, runtime management, governance, communication, and auditable execution in one operating environment.

### What GAOS makes possible:

- **Coordinated** digital work across many specialized agents.
- **Policy-aware** execution within institutional rules.
- **Operationally reliable** autonomy at scale.

GAOS is the discipline layer that allows intelligence to become action across the physical world.