

AI-Enhanced Security Assessment and Forensic Analysis of GraphQL APIs in Drone Fleet Management Systems

Automated MSc Proof-of-Concept Assessment Report

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Scope: controlled local drone-fleet GraphQL prototype. No real drones, external networks or third-party services were attacked.

Executive security posture

Captured events	Detected anomalies	Denied/failed	Evidence chain
2	0	0	VERIFIED

Enforced controls include HMAC-signed authentication, resolver-level RBAC, AST-based depth and complexity analysis, operation-batch limiting, administrator-only introspection, rate limiting, automatic request logging and chained forensic evidence.

Forensic integrity

Source digests valid: 2/2. Invalid source records: none. Broken chain positions: none.

Each event stores a SHA-256 source digest and a chain digest derived from the previous event. This exposes modification, deletion or reordering within the ordered evidence set.

AI and machine-learning evaluation

No trained-model summary was available when this report was generated.

Metrics must be interpreted in the context of a controlled synthetic dataset. Strong test scores demonstrate implementation behaviour, not guaranteed real-world generalisation.

Suspicious-event timeline

The forensic timeline reconstructs GraphQL API activity from security logs. It links user role, operation, requested resource, authorisation result, anomaly score and evidence hash. This connects API security testing with forensic-ready logging.

Timestamp	Actor / role	Operation and target	Outcome / risk	Evidence hash
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Limitations and future work

This is an academic proof-of-concept using simulated events, synthetic labelled data, local SQLite storage and a single-node rate limiter. Production deployment would require managed identity, TLS, distributed enforcement, immutable central evidence storage, representative traffic evaluation, privacy governance and operational monitoring.