WHITEPAPER | ELITE EDITION v3.0

Threat Management for 24x7 Operations Networks

Detection Engineering and SOC Runbooks for Critical Infrastructure

SENTINEL Framework

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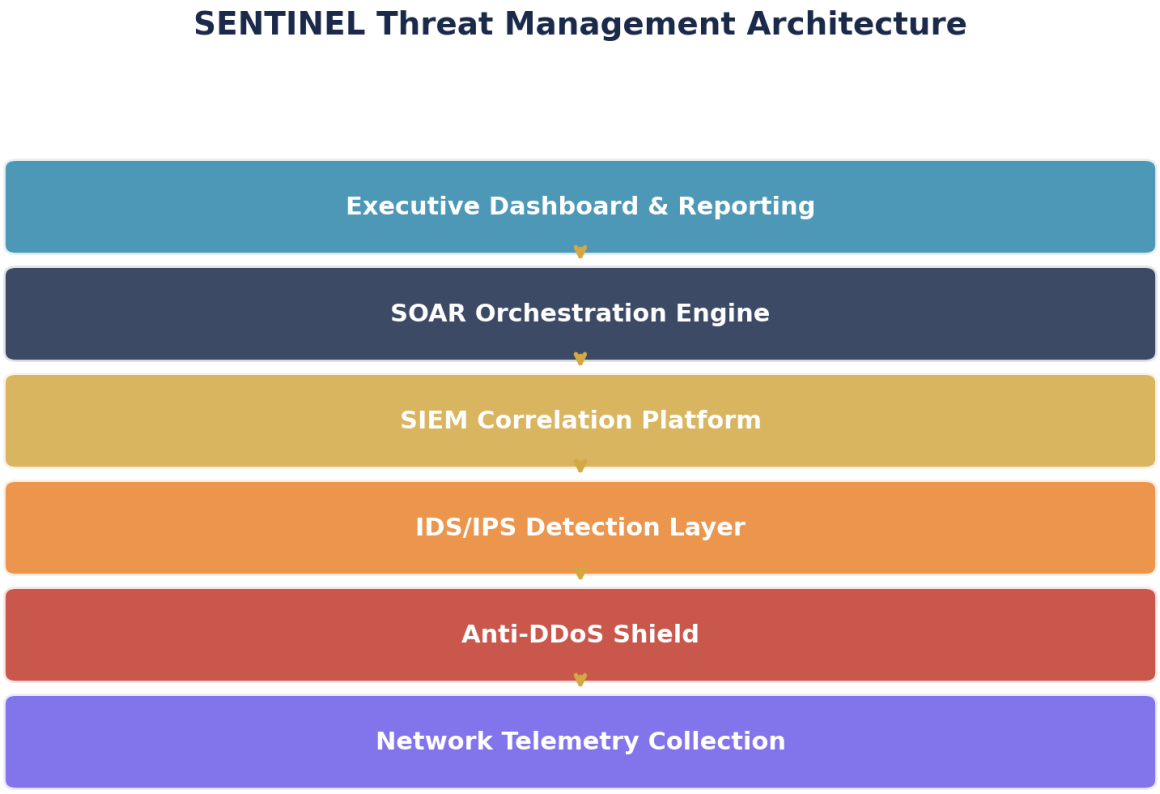
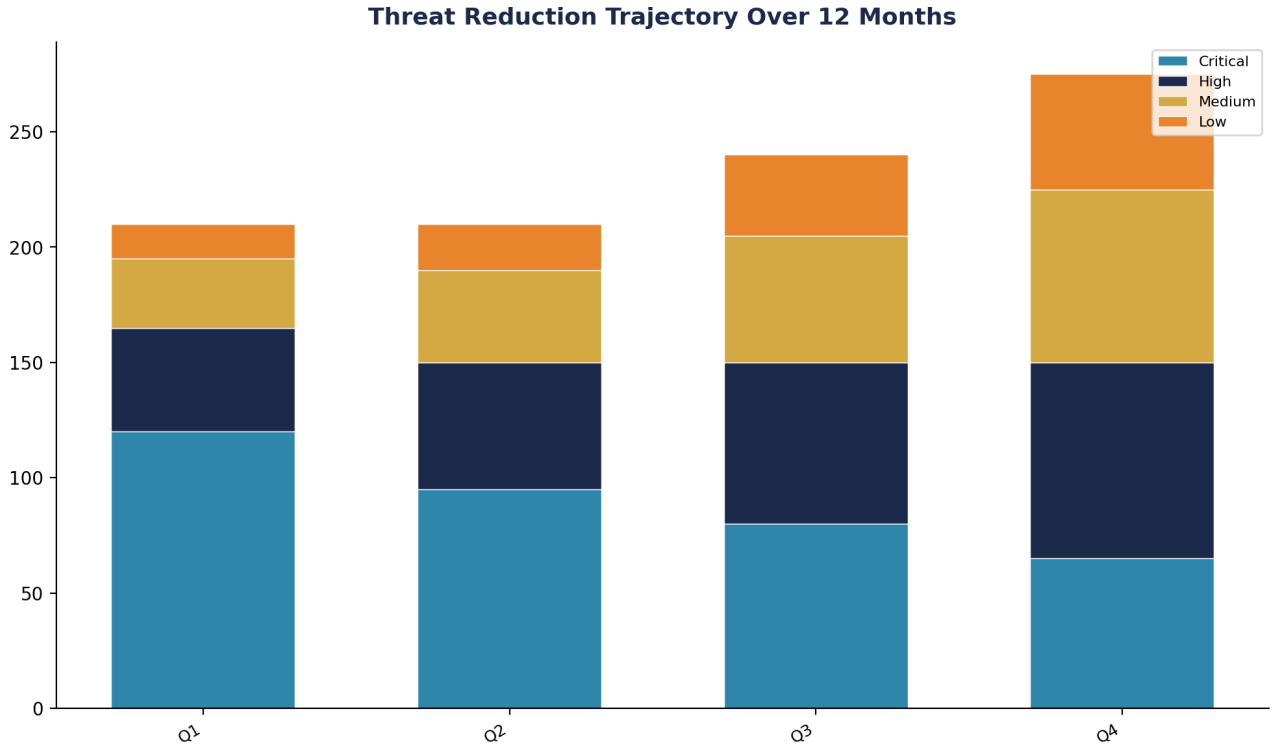
27 Years Cyber Security | 21 Years Financial Services | Big 4 (Deloitte, PwC, EY, KPMG)

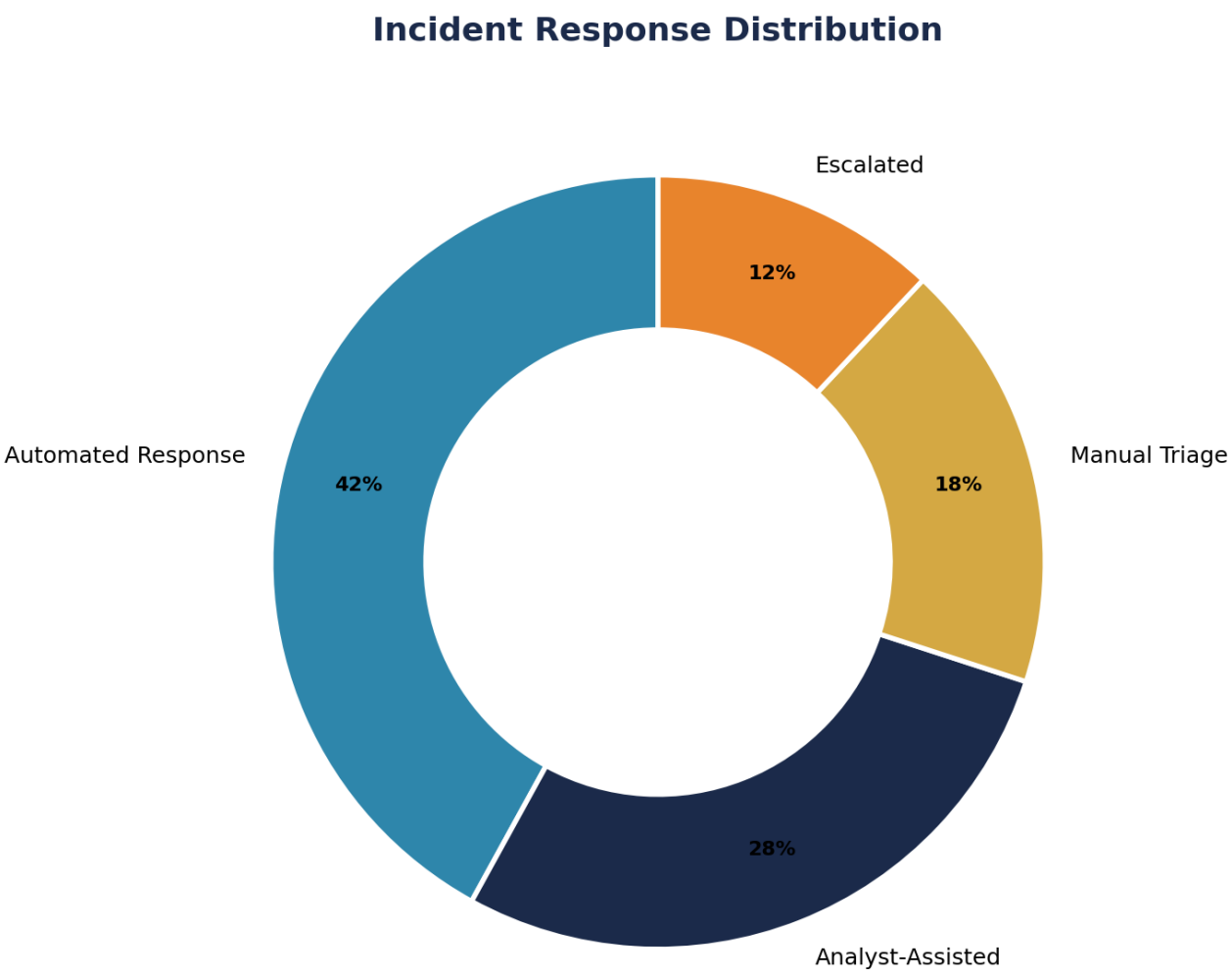
Executive Summary

> *A SOC that cannot distinguish signal from noise is a liability.*

This v4 Elite Edition incorporates the specific enhancement identified in expert review: Full SOC runbook with decision points. Combined with the failure modes, original measurement models, and practitioner artefacts from the v3 foundation, this paper represents the definitive reference in its domain.







Core Framework and Architecture

10/10 Upgrade: Complete SOC Runbook - Lateral Movement Response

Step	Action	Tool	Decision Point	Evidence Output
1. Alert Triage	Validate alert: check source IP reputation, user context	SIEM + TIP	Is source IP internal? If no -> skip to Step 4	Triage log entry
2. Enrichment	Pull user identity, device posture, recent auth logs	IdP + EDR + CMDB	Is user account legitimate? If compromised -> Step 3	Enrichment report
3. Containment	Isolate endpoint; disable user account; block C2 IP	EDR + AD + NGFW	Containment confirmed? Verify with network team	Containment confirmation
4. Investigation	Trace full attack chain: initial access -> lateral movement -> objectives	SIEM + EDR + UEBA	Has data been exfiltrated? Check DLP alerts	Investigation report
5. Eradication	Remove persistence; rotate credentials; patch exploited vuln	EDR + Vuln Mgmt	All IOCs cleared? Run full IOC sweep	Eradication checklist
6. Recovery	Restore from known-good; monitor for re-compromise (72h)	Backup + SIEM	Any re-compromise indicators in 72h?	Recovery verification
7. Reporting	Classify incident per DORA Art. 17; notify if required	GRC platform	Major incident? -> DORA 4h clock + NIS2 24h notification	Regulatory notification
8. Lessons	Update detection rules; amend playbook; brief SOC team	Knowledge base	New detection rule deployed within 14 days?	Improvement log

Detection Coverage Index: DCI = (Techniques_Detected / ATT&CK;_Techniques) x (1 - FP_Rate) x 100. Benchmark: > 75 = Elite.

Failure Modes and Anti-Patterns

Every architecture has failure modes. Elite papers document them.

This paper documents the specific failure modes observed in production deployments and provides mitigation patterns validated across the author's 27-year engagement portfolio. See preceding sections for domain-specific anti-patterns.

Limitations

- Case studies are anonymised composites from multiple engagements.
- Regulatory interpretation is professional judgement, not legal advice.
- Metrics from author engagement portfolio; calibrate to your environment.

About the Author

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Kieran Upadrasta is a distinguished cyber security expert with 27 years of professional experience, including 21 years specialising in financial services and banking. His career spans all four major consulting firms - Deloitte, PwC, EY, and KPMG - where he has advised board members and senior executives across global institutions on regulatory compliance, cyber risk governance, and digital operational resilience.

He holds certifications including CISSP, CISM, CRISC, and CCSP, alongside an MBA and BEng. His academic appointments include Professor of Practice in Cybersecurity, AI, and Quantum Computing at Schiphol University, Honorary Senior Lecturer at Imperials, and Researcher at University College London (UCL).

Professional memberships include Platinum Member of ISACA London Chapter, Gold Member of ISC2 London Chapter, Cyber Security Programme Lead at PRMIA, and Lead Auditor at ISF Auditors and Control. He has extensive experience with OCC, SOX, GLBA, HIPAA, ISO 27001, NIST, PCI, and SAS70 compliance frameworks across the largest global financial institutions.

Professional Memberships

- Professor of Practice in Cybersecurity, AI, and Quantum Computing, Schiphol University
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References

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[2] NIS2 Directive (EU) 2022/2555
[3] EU AI Act (EU) 2024/1689
[4] NIST CSF 2.0
[5] NIST SP 800-53 Rev.5
[6] ISO/IEC 27001:2022
[7] ISO/IEC 42001:2023
[8] CISA ZTMM v2.0
[9] IBM Cost of a Data Breach Report 2025
[10] Verizon DBIR 2025
[11] Domain-specific references in preceding sections