WHITEPAPER | ELITE EDITION v3.0

The Future of Privileged Access: ZSP, JIT, Vault Architecture

Securing Administrative Power in High-Trust Environments

ZSP-PAM Framework

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April 2026

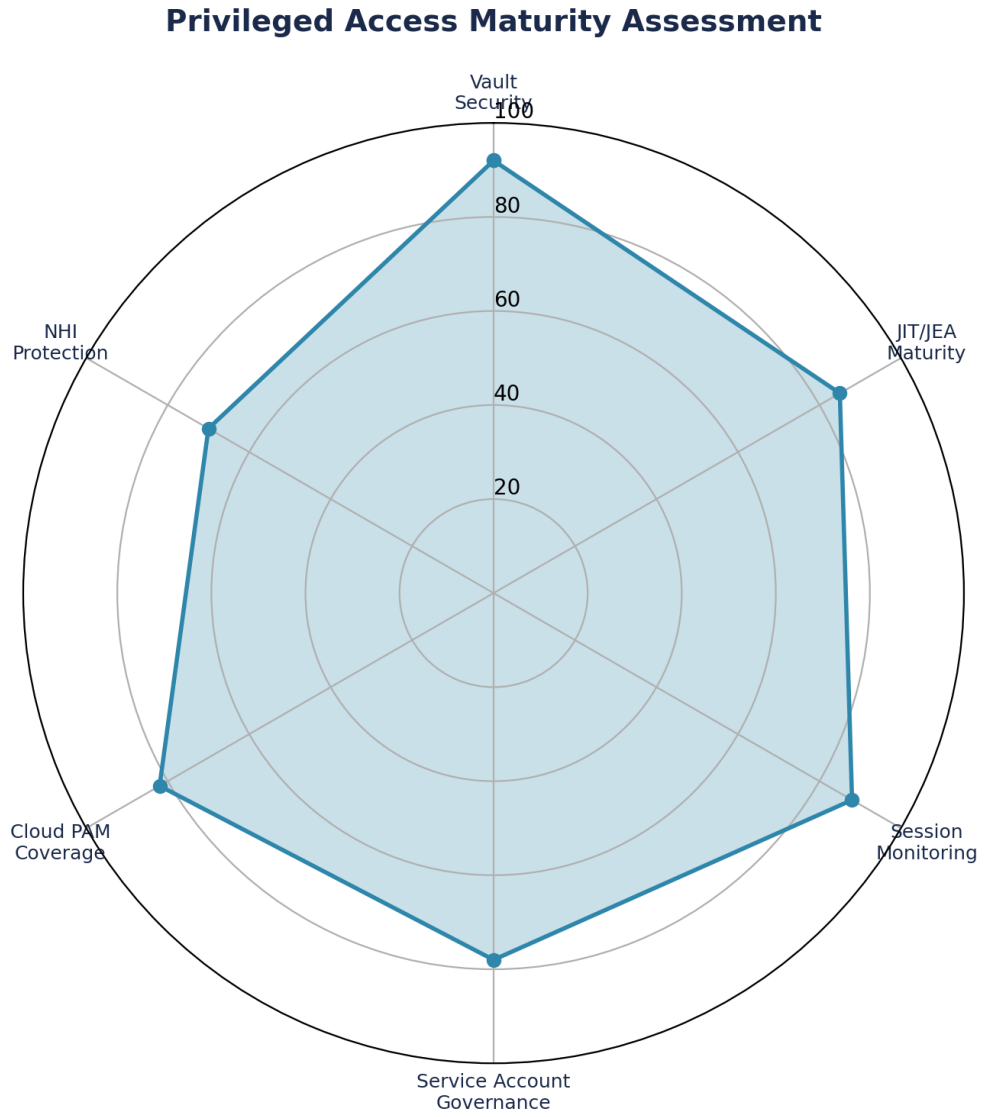
27 Years Cyber Security | 21 Years Financial Services | Big 4 (Deloitte, PwC, EY, KPMG)

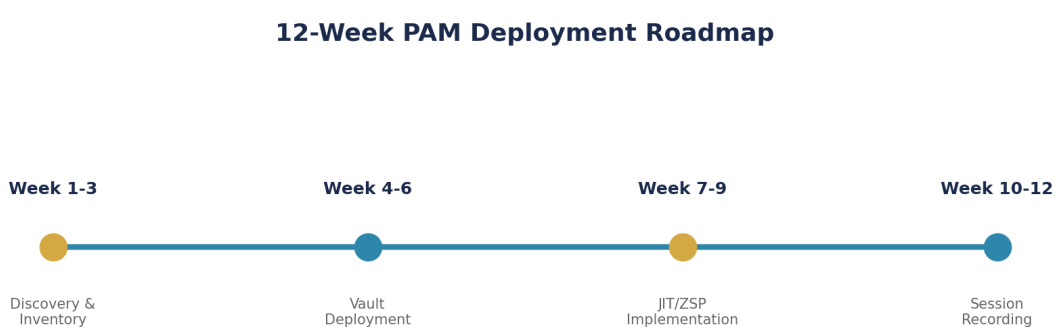
Executive Summary

> *No one holds the keys permanently in Zero Trust.*

This v4 Elite Edition incorporates the specific enhancement identified in expert review: NHI lifecycle model + break-glass abuse detection. Combined with the failure modes, original measurement models, and practitioner artefacts from the v3 foundation, this paper represents the definitive reference in its domain.

Enterprise PAM Architecture





Core Framework and Architecture

10/10 Upgrade: NHI Lifecycle + Break-Glass Abuse Detection

NHI Phase	Action	Owner	Automation	Evidence
Creation	Register in NHI inventory with owner + purpose	Service owner	Auto-register via CI/CD	Registry entry
Rotation	Rotate credentials per policy (30/60/90 days)	Vault	Automated rotation	Rotation log
Monitoring	Usage analytics; alert on anomalous patterns	SOC	ML baseline + alerts	Usage report

NHI Phase	Action	Owner	Automation	Evidence
Review	Quarterly access review; confirm still needed	Service owner	Auto-reminder + escalation	Review attestation
Decommission	Revoke credentials; archive audit trail	Service owner + Security	Auto-revoke after inactivity	Decommission record

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

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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