INTELLIGENCE BRIEFING
Security Command Center
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Cyber Extortion Economy Decouples from Ransomware Encryption: Data-Theft Extortion Emerges as Primary Threat Vector

SECURITY ANALYSIS | HIGH | CVSS 9.5

SCC Item ID	SCC-STY-2026-0159
Type	Security Analysis
Severity	HIGH
CVSS Base Score	9.5
Affected Products	Oracle EBS, SaaS platforms (generic), CI/CD pipelines, cloud environments (cloud access tokens, SSH keys, Kubernetes secrets), open-source software ecosystems (npm via Shai-Hulud worm), AI development environments
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Discovery Source	Rss:T1 Threatintel

Executive Summary

The cyber extortion economy has undergone a structural shift: encryption dropped to 78% of ransomware cases in 2025, with pure data-theft extortion now averaging $5.08 million per victim, according to Unit 42's 2025 extortion economy report. Attackers no longer need to encrypt a single file to compel payment, regulatory exposure and reputational damage now do the work that operational downtime once did. This signals that organizations optimized entirely for backup-and-recovery resilience are exposed to an extortion model their defenses were never designed to stop.

Technical Analysis

Unit 42's 2025 cyber extortion analysis documents a market-level evolution: ransomware encryption is becoming one option among several, not the default. In 2021-2024, encryption appeared in roughly 90% or more of extortion cases. By 2025, that figure had fallen to 78%. The economic logic is straightforward, pure exfiltration is faster, leaves fewer forensic artifacts associated with active encryption operations, and leverages GDPR, HIPAA, and SEC disclosure obligations as a secondary payment mechanism. The $5.08 million average per data-theft victim reflects that leverage.

Three active threat clusters drive much of this activity. TGR-CRI-1135 and CL-CRI-1116, tracked by Unit 42, represent criminal extortion groups operating without the operational overhead of deploying encryptors. Bling Libra, documented in Unit 42's cloud credential abuse research, demonstrates the pivot to cloud-native attack

paths, specifically targeting cloud access tokens, SSH keys, and Kubernetes secrets to establish persistent access before exfiltration.

The Shai-Hulud worm (also referenced as Megalodon in CSA research) represents the most technically sophisticated element of this threat cluster. Operating in two waves against the npm ecosystem, Shai-Hulud targets AI development environments specifically, exploiting CWE-522 (insufficiently protected credentials) and CWE-798 (hardcoded credentials) to propagate through CI/CD pipelines. The first wave establishes access via compromised developer credentials; the second weaponizes hardcoded secrets discovered in CI/CD configurations to traverse cloud environments. This is a supply chain attack that exploits the implicit trust developers place in open-source packages and automated build systems.

The underlying CWE pattern, authentication bypass (CWE-287), missing authentication for critical function (CWE-306), insufficiently protected credentials (CWE-522), and hardcoded credentials (CWE-798), reflects a consistent attacker thesis: credential hygiene failures in developer and cloud environments are more reliably exploitable than most software vulnerabilities. MITRE ATT&CK techniques observed across these clusters include T1552 (Unsecured Credentials), T1552.001 (Credentials in Files), T1530 (Data from Cloud Storage), T1537 (Transfer Data to Cloud Account), T1195.002 (Compromise Software Supply Chain), and T1567.002 (Exfiltration to Code Repository).

Unit 42 and industry analysts project elevated risk in the near term as AI tools lower the skill threshold for initial access operations that feed exfiltration campaigns, with particular concern around AI-assisted social engineering at scale.

Action Checklist

1. Step 1: Assess exposure, audit your organization's use of npm packages in AI development pipelines, CI/CD systems, and cloud environments (AWS, GCP, Azure) for hardcoded credentials (CWE-798) and secrets stored in environment files (CWE-522); prioritize any pipelines that have write access to production systems or data stores
2. Step 2: Review controls, verify NIST AC-6 (Least Privilege) enforcement on cloud service accounts and CI/CD pipeline identities; confirm NIST IA-5 credential management practices are applied to SSH keys, API tokens, and Kubernetes secrets; validate CIS 5.4 (Restrict Administrator Privileges) is enforced for developer accounts with cloud access; enable automated credential rotation for all long-lived secrets and access tokens per NIST IA-4 and IA-5(1)
3. Step 3: Update threat model, add pure data-theft extortion as a primary attack scenario independent of ransomware encryption; register TGR-CRI-1135, Bling Libra, and CL-CRI-1116 in your threat register with TTPs mapped to T1552, T1530, T1537, and T1195.002; model Shai-Hulud/Megalodon as an active threat if you maintain npm dependencies in AI or DevOps toolchains
4. Step 4: Communicate findings, brief leadership that backup resilience does not mitigate data-theft extortion; the payment lever is now regulatory and reputational, not operational recovery time; quantify your organization's GDPR, HIPAA, or SEC disclosure obligations as the specific financial exposure to frame risk concretely
5. Step 5: Monitor developments, track Unit 42's cyber extortion economy report series (unit42.paloaltonetworks.com) and CSA's Shai-Hulud/Megalodon research note for updated IOCs, new npm packages flagged as compromised, and any law enforcement actions against CL-CRI-1116 or TGR-CRI-1135; watch for SEC or CISA advisories on AI-assisted extortion campaigns

IR / Forensic Enrichment

Triage Priority	URGENT
Escalation Criteria	Escalate immediately to CISO, legal counsel, and cloud security team if CloudTrail, GCP Audit Logs, or Azure Monitor show any `GetObject`, `ListBucket`, `CopyObject`, or equivalent data-access API calls originating from a CI/CD pipeline identity against buckets or storage accounts containing PII, PHI, or SEC-material financial data — as this pattern indicates active T1530/T1537 exfiltration by threat actors consistent with Bling Libra or TGR-CRI-1135 TTPs, triggering potential GDPR 72-hour and SEC 4-business-day disclosure obligations.
Recovery Notes	Post-containment, rotate all cloud credentials, SSH keys, API tokens, and Kubernetes secrets exposed to any CI/CD pipeline where a Shai-Hulud/Megalodon-linked npm package was installed — treat any secret that existed in a pipeline environment variable or .env file at the time of infection as fully compromised. Conduct a 90-day retroactive review of cloud data access logs for the specific storage buckets reachable by affected pipeline identities, using T1530 and T1537 access patterns, to determine the full scope of data potentially staged or exfiltrated before detection. Maintain heightened monitoring of newly provisioned cloud service accounts and npm package installs for a minimum of 90 days post-remediation, as Bling Libra and similar actors are documented to maintain persistence through secondary access paths established during initial compromise.
Forensic Artifacts	npm package cache and install logs from CI/CD pipeline runners (GitHub Actions: ~/.npm/_logs/ and runner job logs; Jenkins: build console output archived per job) — cross-reference installed package names and versions against Shai-Hulud/Megalodon IOC lists to establish whether and when a malicious package executed in the pipeline environment | AWS CloudTrail event history filtered for EventName in [AssumeRole, GetSecretValue, GetObject, ListBuckets, CopyObject, CreatePresignedUrl] with sourceIPAddress originating from CI/CD runner IP ranges — these are the specific API calls T1552, T1530, and T1537 TTPs produce when a Shai-Hulud-infected pipeline exfiltrates cloud credentials and stages data | Kubernetes audit log entries (`/var/log/kubernetes/audit.log` or cloud-managed equivalent) with `verb` in [get, list] and `resource=secrets` from non-system service accounts — indicative of T1552.007 (Credentials in Container API) access consistent with CI/CD pipeline credential harvesting | CI/CD pipeline environment variable exports and `.env` file snapshots from build artifact storage — these are the CWE-522 artifact class directly targeted by Shai-Hulud/Megalodon to harvest cloud access tokens, npm registry credentials, and SSH keys without touching encrypted files | Cloud provider data egress volume metrics and VPC Flow Logs (AWS) or VPC Flow Logs (GCP) or NSG Flow Logs (Azure) from CI/CD subnet to external IPs — anomalous outbound data volume to cloud storage endpoints outside the organization's known infrastructure is the primary network-layer artifact of T1537 data transfer to attacker-controlled cloud accounts, which leaves no encryption or ransom-note artifact on disk

Per-Action IR Details

Step 1: Assess exposure — audit your organization's use of npm packages in AI development pipelines, CI/CD systems, and cloud environments (AWS, GCP, Azure) for hardcoded credentials (CWE-798) and secrets stored in environment files (CWE-522); prioritize any pipelines that have write access to production systems or data stores

NIST Phase: Preparation

Reference: NIST 800-61r3 §2 — Preparation: establishing the capability to detect and respond before an incident occurs, including asset inventory and exposure assessment

Controls: NIST AC-6 (Least Privilege) — limit pipeline identities to minimum permissions required for their function, NIST IA-5 (Authenticator Management) — enforce lifecycle controls on SSH keys, API tokens, and npm registry credentials, NIST RA-3 (Risk Assessment) — document the likelihood and impact of secrets exposure in CI/CD pipelines feeding production, NIST SA-15 (Development Process, Standards, and Tools) — require secure development practices that prohibit hardcoded credentials in build toolchains, CIS 1.1 (Establish and Maintain Detailed Enterprise Asset Inventory) — enumerate all CI/CD pipeline identities, npm dependencies, and cloud service accounts with production write access, CIS 7.1 (Establish and Maintain a Vulnerability Management Process) — include npm dependency audits and secret scanning as standing pipeline checks

Compensating: Run `npm audit` across all package.json files to identify known-malicious or high-risk packages. Use `truffleHog` (free, open-source) or `git-secrets` to scan repository history for hardcoded AWS keys, GCP service account JSON, and .env files: `trufflehog filesystem --directory=. --json`. For CI/CD pipeline review, use `gitleaks detect --source=. --report-format=json` to scan committed secrets. List all IAM roles and service accounts with production write permissions using `aws iam get-account-authorization-details` (AWS) or `gcloud projects get-iam-policy [PROJECT_ID]` (GCP) and manually review for over-permissioning. Cross-reference installed npm packages against the CSA Shai-Hulud/Megalodon compromised package list.

Evidence: Before remediating, preserve: (1) Full npm dependency trees (`npm list --all --json > npm_tree_snapshot.json`) to document which packages were installed at time of assessment, specifically flagging any packages matching Shai-Hulud/Megalodon IOCs. (2) CI/CD pipeline execution logs from GitHub Actions, GitLab CI, or Jenkins showing which pipeline identities ran with production cloud credentials — capture AWS CloudTrail `AssumeRole` events or GCP Cloud Audit Logs `SetIamPolicy` entries tied to pipeline service accounts. (3) Snapshot of all `.env`, `.npmrc`, and `config.yml` files present in pipeline working directories before any rotation, as these represent the specific CWE-522 artifact class exploited by Shai-Hulud. (4) Current IAM policy JSON exports for all cloud service accounts used by CI/CD systems, timestamped as a pre-remediation baseline.

Step 2: Review controls — verify NIST AC-6 (Least Privilege) enforcement on cloud service accounts and CI/CD pipeline identities; confirm NIST IA-5 credential management practices are applied to SSH keys, API tokens, and Kubernetes secrets; validate CIS 5.4 (Restrict Administrator Privileges) is enforced for developer accounts with cloud access; enable D3-CRO (Credential Rotation) for all long-lived secrets and access tokens

NIST Phase: Detection Analysis

Reference: NIST 800-61r3 §3.2 — Detection and Analysis: analyzing current control posture to determine whether existing defenses would detect or prevent credential theft and exfiltration by Bling Libra, TGR-CRI-1135, or CL-CRI-1116 TTPs

Controls: NIST AC-6 (Least Privilege) — enforce on all cloud service accounts and Kubernetes service accounts; pipeline identities must not hold standing admin or data-export permissions, NIST IA-5 (Authenticator Management) — apply rotation schedules: SSH keys ≤90 days, API tokens ≤30 days, Kubernetes secrets managed via a secrets manager rather than static YAML manifests, NIST AC-2 (Account Management) — audit all developer accounts with cloud console or CLI access; identify accounts with S3/GCS/Blob Storage read permissions that could facilitate T1530 (Data from Cloud Storage), NIST AU-2 (Event Logging) — verify that cloud provider audit logs (CloudTrail, GCP Audit Logs, Azure Monitor) capture `GetObject`, `ListBucket`, and `CopyObject` API calls — the specific actions used in T1530-based data exfiltration, CIS 5.4 (Restrict Administrator Privileges to Dedicated Administrator Accounts) — developer accounts used for daily coding must not hold cloud admin roles; verify separation, CIS 6.3 (Require MFA for Externally-Exposed Applications) — enforce MFA on all cloud console access and CI/CD platform logins (GitHub, GitLab, CircleCI) to prevent credential reuse from stolen npm-pipeline tokens

Compensating: For Kubernetes secrets audit without enterprise tooling: `kubectl get secrets --all-namespaces -o json | jq '.items[] | {name: .metadata.name, namespace: .metadata.namespace, type: .type}'` — flag any secrets of type `Opaque` storing long-lived cloud credentials. For SSH key age audit on Linux: `find /home /root /etc/ssh -name 'authorized_keys' -exec stat --format='%n %y' {} \;`. For AWS access key age: `aws iam generate-credential-report && aws iam get-credential-report --query 'Content' --output text | base64 -d | csvtool col 1,4,9,10 -` to identify access keys older than 90 days. Use `osquery` with the `aws_iam_access_key` table if deployed. For credential rotation enforcement without a secrets manager, implement a weekly cron job that queries key age and pages on-call if thresholds are exceeded.

Evidence: Before rotating credentials, capture: (1) AWS CloudTrail `LookupEvents` filtered for `EventName=AssumeRole` and `EventName=GetSecretValue` for the 90 days preceding assessment — these are the specific API calls TGR-CRI-1135 and Bling Libra use when leveraging stolen CI/CD tokens for cloud pivot (T1537, T1530). (2) Kubernetes audit log (`/var/log/kubernetes/audit.log` or cloud provider equivalent) filtered for `get secrets` and `list secrets` verbs from non-controller service accounts — anomalous access here indicates T1552.007 (Container API) exploitation. (3) Export current Kubernetes secret manifests (`kubectl get secret [name] -o yaml`) before rotation, retaining as forensic baseline to establish what was exposed. (4) GitHub/GitLab audit log exports showing which pipeline tokens were used, from which IPs, and at what times — correlate against known Shai-Hulud C2 infrastructure IOCs from the CSA research note.

Step 3: Update threat model — add pure data-theft extortion as a primary attack scenario independent of ransomware encryption; register TGR-CRI-1135, Bling Libra, and CL-CRI-1116 in your threat register with TTPs mapped to T1552, T1530, T1537, and T1195.002; model Shai-Hulud/Megalodon as an active threat if you maintain npm dependencies in AI or DevOps toolchains

NIST Phase: Preparation

Reference: NIST 800-61r3 §2 — Preparation: updating threat models and playbooks to reflect the structural shift in extortion economics, ensuring detection and response capabilities are aligned to data-theft-only scenarios where no encryption event will trigger existing ransomware detection logic

Controls: NIST RA-3 (Risk Assessment) — formally document pure data-theft extortion as a distinct risk scenario; quantify likelihood given Unit 42 finding that encryption dropped to 78% of cases in 2025, NIST IR-4 (Incident Handling) — update IR plan to include a data-theft extortion playbook that does not depend on detecting encryption activity as the trigger condition, NIST SI-5 (Security Alerts, Advisories, and Directives) — ingest Unit 42 2025 extortion economy report and CSA Shai-Hulud/Megalodon research note as formal threat intelligence inputs; register IOCs in detection tooling, NIST PM-16 (Threat Awareness Program) — brief security team on Bling Libra, TGR-CRI-1135, and CL-CRI-1116 actor profiles; document their known initial access vectors (compromised npm packages via T1195.002, credential harvesting via T1552) in the threat register, CIS 7.1 (Establish and Maintain a Vulnerability Management Process) — extend vulnerability management scope to include supply chain risk from npm packages used in AI development and DevOps pipelines

Compensating: Create MITRE ATT&CK Navigator layers (free, browser-based at attack.mitre.org/workbench) mapping TGR-CRI-1135 and Bling Libra TTPs: T1195.002 (Compromise Software Supply Chain), T1552 (Unsecured Credentials), T1530 (Data from Cloud Storage), T1537 (Transfer Data to Cloud Account). Export the layer as JSON and attach to your threat register entry. Write a 1-page threat scenario document: attacker compromises npm package → Shai-Hulud worm executes in CI/CD → harvests cloud credentials from environment → exfiltrates data to attacker-controlled cloud storage → extortion demand arrives with no encryption event. Use this scenario to gap-test your current detection rules — specifically, would your current alerting fire on T1530 and T1537 without a preceding ransom note or file encryption event?

Evidence: Before updating the threat model, document the current state as a baseline: (1) Export your current SIEM or detection rule set and identify any rules that require file encryption indicators (e.g., high-volume file renames, shadow copy deletion) as preconditions for ransomware alerting — these rules will produce zero alerts for pure data-theft scenarios and represent a documented detection gap. (2) Pull network flow logs or proxy logs for outbound data transfers to cloud storage endpoints (S3, GCS, Azure Blob, Mega.nz) over the prior 30 days — establish a baseline of normal volume so anomalous exfiltration (T1537) can be detected going forward. (3) Document all npm packages currently in use across AI and DevOps toolchains as the supply chain inventory baseline against which Shai-Hulud/Megalodon IOCs will be matched.

Step 4: Communicate findings — brief leadership that backup resilience does not mitigate data-theft extortion; the payment lever is now regulatory and reputatory, not operational recovery time; quantify your organization's GDPR, HIPAA, or SEC disclosure obligations as the specific financial exposure to frame risk concretely

NIST Phase: Post Incident

Reference: NIST 800-61r3 §4 — Post-Incident Activity: translates to a proactive lessons-learned and risk communication function here, used pre-incident to reframe executive risk posture before a data-theft extortion event occurs and to ensure leadership understands that the traditional backup-and-recover mitigation narrative no longer applies to this threat class

Controls: NIST IR-4 (Incident Handling) — ensure IR plan includes a pre-drafted executive communication template for data-theft extortion scenarios that quantifies regulatory exposure, not just operational downtime, NIST RA-3 (Risk Assessment) — document the financial exposure delta: pure data-theft extortion averaging $5.08M per Unit 42 2025 data, versus the organization's current cyber insurance coverage and regulatory fine exposure under GDPR (up to 4% global annual turnover), HIPAA (up to $1.9M per violation category per year), or SEC cybersecurity disclosure rules (material incident reporting within 4 business days), NIST IR-6 (Incident Reporting) — brief legal and compliance on the SEC 4-business-day material incident disclosure obligation and GDPR 72-hour breach notification requirement as the specific regulatory levers attackers are now weaponizing, NIST PM-11 (Mission and Business Process Definition) — map which business processes handle data subject to GDPR, HIPAA, or SEC materiality thresholds; this is the blast radius definition for data-theft extortion scenarios, CIS 3.2 (Establish and Maintain a Data Inventory) — data inventory is the prerequisite for quantifying regulatory exposure; without knowing what sensitive data exists and where, the financial exposure calculation is impossible

Compensating: For teams without a formal GRC platform: build a one-page risk quantification worksheet in a spreadsheet with four columns — (1) Data type (PII, PHI, financial records), (2) Volume/records count, (3) Applicable regulation and maximum fine, (4) Estimated reputational cost based on comparable breach settlements. Use the HHS breach portal (ocrportal.hhs.gov/ocr/breach) and the GDPR enforcement tracker (enforcementtracker.com — search-verified resource, recommend human validation) as reference points for realistic fine estimates. Present this to leadership as the 'regulatory payment floor' that attackers are betting on when they skip encryption and go straight to extortion. This reframes the conversation from 'we have backups' to 'we have $X in regulatory exposure that backups cannot address.'

Evidence: This step is primarily a communication and risk framing action, but the following evidence should be assembled before the leadership brief: (1) Current data inventory showing where GDPR-covered, HIPAA-covered, or SEC-material data resides — specifically in the cloud environments (AWS S3, GCP Storage, Azure Blob) and CI/CD systems identified as exposed in Steps 1 and 2, since these are the specific exfiltration targets for Bling Libra and TGR-CRI-1135. (2) Any prior cloud access log anomalies from Step 3's baseline review that suggest reconnaissance or data staging activity consistent with T1530. (3) Documentation of current cyber insurance coverage limits and any exclusions for regulatory fines, to quantify the uninsured exposure gap that the $5.08M average demand is designed to exploit.

Step 5: Monitor developments — track Unit 42's cyber extortion economy report series (unit42.paloaltonetworks.com) and CSA's Shai-Hulud/Megalodon research note for updated IOCs, new npm packages flagged as compromised, and any law enforcement actions against CL-CRI-1116 or TGR-CRI-1135; watch for SEC or CISA advisories on AI-assisted extortion campaigns in the projected 3-5 month acceleration window

NIST Phase: Detection Analysis

Reference: NIST 800-61r3 §3.2 — Detection and Analysis: continuous threat intelligence integration to update detection logic as new Shai-Hulud/Megalodon npm package IOCs are released, new Bling Libra or TGR-CRI-1135 infrastructure is identified, and the extortion campaign's AI-assisted acceleration phase materializes

Controls: NIST SI-5 (Security Alerts, Advisories, and Directives) — establish a formal process to ingest CISA advisories and Unit 42 threat reports as authoritative intelligence feeds; assign an owner responsible for translating new IOCs into detection rules within 24 hours of publication, NIST AU-6 (Audit Record Review, Analysis, and Reporting) — schedule weekly review of cloud provider audit logs (CloudTrail, GCP Audit Logs, Azure Monitor) filtered for data access patterns consistent with T1530 and T1537, updated as new Shai-Hulud IOCs are published, NIST IR-4 (Incident Handling) — update the data-theft extortion playbook each time Unit 42 releases updated actor TTPs for TGR-CRI-1135 or Bling Libra; treat playbook currency as a standing IR readiness metric, CIS 7.1 (Establish and Maintain a Vulnerability Management Process) — add newly flagged Shai-Hulud/Megalodon npm packages to the unauthorized software list (CIS 2.3) within 24 hours of CSA or Unit 42 publication; re-run `npm audit` across all pipelines after each IOC update, CIS 8.2 (Collect Audit Logs) — ensure npm package install/update events are logged

in CI/CD pipeline logs with package name, version, and installing identity, so newly flagged packages can be retroactively searched in existing log data

Compensating: Create a free RSS or email alert for CISA (cisa.gov/news-events/cybersecurity-advisories) and subscribe to the Unit 42 threat intelligence blog. For npm IOC monitoring without a commercial threat intel platform: maintain a local blocklist file of compromised package names from Shai-Hulud/Megalodon advisories and run a daily bash script — `npm list --all --json | python3 -c "import json,sys; pkgs=[p for p in json.load(sys.stdin).get('dependencies',{})]; [print(p) for p in pkgs if p in open('blocklist.txt').read().split()"` — against all active pipeline package trees. Write a YARA rule targeting the Shai-Hulud/Megalodon npm package payload pattern (exfiltration beacon to attacker-controlled cloud storage) and run it against npm package cache directories. Use Sigma rules (free, community-maintained at github.com/SigmaHQ/sigma) to detect T1530 and T1537 in cloud audit logs via manual log grep if no SIEM is available.

Evidence: Maintain the following as ongoing evidence sources for this monitoring step: (1) A timestamped log of all npm package installs across CI/CD pipelines (`~/.npm/_logs/`, GitHub Actions runner logs, or Jenkins build console output) — when a newly flagged Shai-Hulud package IOC is published, this log enables retroactive determination of whether and when the package was installed. (2) Cloud provider data egress logs filtered for transfers to cloud storage endpoints outside the organization's known infrastructure — specifically AWS S3 `GetObject` and `CopyObject` to external bucket ARNs, GCP `storage.objects.get` to non-organizational buckets, or Azure Blob `GetBlob` to external storage accounts — as the specific artifact class that T1537 exfiltration by TGR-CRI-1135 and Bling Libra would produce. (3) DNS query logs for CI/CD build hosts resolving domains associated with Shai-Hulud C2 infrastructure — query your DNS resolver logs or `/var/log/syslog` for `dnsmasq` entries from build servers, and cross-reference against IOC lists as they are updated by CSA and Unit 42.

Detection Guidance

Priority detection focuses on three threat surfaces:

Cloud credential abuse (Bling Libra / T1530, T1537): Review cloud access logs (CloudTrail, GCP Audit Logs, Azure Monitor) for anomalous data access patterns, specifically large-volume reads from S3 buckets, GCS, or Azure Blob Storage by service accounts or IAM roles that do not typically perform bulk reads. Flag any exfiltration to cloud storage accounts outside your organization's known tenants (T1537). Enable comprehensive logging per NIST AU-2 (Audit Events) and review user and service account permissions per NIST AC-2 (Account Management).

CI/CD and supply chain (Shai-Hulud / T1195.002, T1552.001): Audit CI/CD pipeline configurations (GitHub Actions, Jenkins, GitLab CI) for hardcoded secrets using tools such as truffleHog or GitLeaks, this directly addresses CWE-798 and CWE-522. Monitor npm install logs for unexpected packages or packages with typosquat names similar to commonly used AI development libraries. Enable event logging (NIST AU-2) and audit record generation (NIST AU-12) on all pipeline execution environments. Check for CWE-306 exposure: any CI/CD webhook or API endpoint accessible without authentication. Apply file integrity monitoring (NIST SI-7) to configuration files in build environments.

Exfiltration behavior (T1567, T1567.002): Alert on large data transfers to code repository services (GitHub, GitLab, Bitbucket) from non-developer systems or during off-hours (T1567.002). Monitor DNS and proxy logs for connections to newly registered domains or cloud storage endpoints not in your approved egress list (NIST SC-7, boundary protection). CIS 8.2 (Collect Audit Logs) compliance is a prerequisite, verify logging is enabled across all cloud, CI/CD, and SaaS environments before hunting.

AI-assisted social engineering precursor (T1566.001, T1566.004): In advance of elevated threat from AI-assisted attacks, audit inbound email and voice communication screening controls. Establish a baseline of normal vendor and partner communication patterns now, so AI-generated impersonation attempts are detectable against that baseline.

Indicators of Compromise

Type	Value	Context	Confidence
TOOL	`Shai-Hulud / Megalodon worm`	Two-wave npm supply chain worm propagating through CI/CD pipelines via compromised developer credentials and hardcoded secrets discovered in build configurations; targets AI development environments specifically	HIGH
URL	`Pending — refer to Unit 42 (https://unit42.paloaltonetworks.com/npm-supply-chain-attack/) for published npm package indicators`	Specific malicious npm package names, payload hashes, and C2 infrastructure associated with Shai-Hulud/Megalodon published in Unit 42 source report; values not available in provided item data	LOW
URL	`Pending — refer to CSA Research Note (https://labs.cloudsecurityalliance.org/research/csa-research-note-shai-hulud-megalodon-supply-chain-cascade/) for supplemental indicators`	CSA published a companion research note on the Shai-Hulud/Megalodon two-wave attack with additional technical indicators; specific values not available in provided item data	LOW

Framework Mappings

MITRE-ATTACK

- **T1498** — Network Denial of Service
- **T1567.002** — Exfiltration to Cloud Storage
- **T1552** — Unsecured Credentials
- **T1530** — Data from Cloud Storage
- **T1552.001** — Credentials In Files
- **T1213** — Data from Information Repositories
- **T1059** — Command and Scripting Interpreter
- **T1566.004** — Spearphishing Voice
- **T1491** — Defacement
- **T1078** — Valid Accounts
- **T1537** — Transfer Data to Cloud Account
- **T1657** — Financial Theft
- **T1195.002** — Compromise Software Supply Chain
- **T1588.002** — Tool
- **T1566.001** — Spearphishing Attachment
- **T1098** — Account Manipulation

- **T1567** — Exfiltration Over Web Service
- **T1195** — Supply Chain Compromise
- **T1199** — Trusted Relationship
- **T1486** — Data Encrypted for Impact

NIST-800-53R5

- **CM-7** — Least Functionality
- **SI-3** — Malicious Code Protection
- **SI-4** — System Monitoring
- **SI-7** — Software, Firmware, and Information Integrity
- **AC-2** — Account Management
- **AC-6** — Least Privilege
- **IA-2** — Identification and Authentication (Organizational Users)
- **IA-5** — Authenticator Management
- **SA-9** — External System Services
- **SR-3** — Supply Chain Controls and Processes
- **AT-2** — Literacy Training and Awareness
- **SC-7** — Boundary Protection
- **SI-8** — Spam Protection
- **SR-2** — Supply Chain Risk Management Plan
- **CP-9** — System Backup
- **CP-10** — System Recovery and Reconstitution
- **IA-8** — Identification and Authentication (Non-Organizational Users)
- **IR-4** — Incident Handling
- **SC-13** — Cryptographic Protection

OWASP-TOP10-2021

- **A07:2021** — Identification and Authentication Failures
- **A04:2021** — Insecure Design

CIS-V8

- **6.3** — Require MFA for Externally-Exposed Applications
- **6.4** — Require MFA for Remote Network Access
- **6.5** — Require MFA for Administrative Access
- **16.10** — Apply Secure Design Principles in Application Architectures
- **5.2** — Use Unique Passwords
- **15.1** — Establish and Maintain an Inventory of Service Providers

SOC2-TSC

- **CC6.1** — The entity implements logical access security software, infrastructure, and architectures over protected information assets

- **CC9.2** — Manages risks associated with vendors and business partners

HIPAA-SECURITY

- **164.312(d)** — Person or Entity Authentication
- **164.308(a)(5)(ii)(D)** — Password Management
- **164.308(a)(7)(ii)(A)** — Data Backup Plan
- **164.312(e)(1)** — Transmission Security

ISO-27001-2022

- **A.8.28** — Secure coding
- **A.5.29** — Information security during disruption
- **A.5.21** — Managing information security in the ICT supply chain
- **A.8.24** — Use of cryptography
- **A.5.23** — Information security for use of cloud services

NIST-CSF-2

- **RS.MI-01** — Incidents are contained
- **GV.SC-01** — Cybersecurity supply chain risk management program

MITRE ATT&CK Mapping

Technique ID	Technique Name	Tactic
T1498	Network Denial of Service	Impact
T1567.002	Exfiltration to Cloud Storage	Exfiltration
T1552	Unsecured Credentials	Credential-Access
T1530	Data from Cloud Storage	Collection
T1552.001	Credentials In Files	Credential-Access
T1213	Data from Information Repositories	Collection
T1059	Command and Scripting Interpreter	Execution
T1566.004	Spearphishing Voice	Initial-Access
T1491	Defacement	Impact
T1078	Valid Accounts	Defense-Evasion
T1537	Transfer Data to Cloud Account	Exfiltration
T1657	Financial Theft	Impact
T1195.002	Compromise Software Supply Chain	Initial-Access

Technique ID	Technique Name	Tactic
T1588.002	Tool	Resource-Development
T1566.001	Spearphishing Attachment	Initial-Access
T1098	Account Manipulation	Persistence
T1567	Exfiltration Over Web Service	Exfiltration
T1195	Supply Chain Compromise	Initial-Access
T1199	Trusted Relationship	Initial-Access
T1486	Data Encrypted for Impact	Impact

Sources

Source	URL	Tier
Unit 42	https://unit42.paloaltonetworks.com/cyber-extortion-economy/	T3
	https://unit42.paloaltonetworks.com/evolution-of-iran-cyber-threats/	T3
	https://cybersecuritynews.com/ransomware-attack-2025-recap/	T3
"Shai-Hulud" Worm Compromises npm Ecosystem in Supply Chain ...	https://unit42.paloaltonetworks.com/npm-supply-chain-attack/	T3
Shai-Hulud/Megalodon: A Two-Wave AI Developer Supply Chain ...	https://labs.cloudsecurityalliance.org/research/csa-research-note-s...	T3

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