Sentrilite – Hybrid-Cloud Observability & Security Platform (Detection-As-Code)

Cloud-Native, eBPF-based Lightweight, Real-Time System Observability, Runtime Security, Cloud Security Posture Management & Threat Prevention in One Platform

Overview

Sentrilite is a **Detection-As-Code** (DAC), Hybrid-Cloud Programmable **Observability & Runtime Security** Platform and streams structured, real-time events to a web UI where custom rules drive risk scoring, alerting, and reporting. Hybrid & multi-cloud ready: Works the same across public clouds and on-prem—EKS, GKE, AKS, vanilla Kubernetes, bare-metal Linux Servers, and edge—so you get a consistent, low-overhead security and observability layer for entire infrastructure all managed from a single dashboard. In Kubernetes, Sentrilite runs as a **privileged DaemonSet** on every node (no app changes required). Each agent observes container processes and **enriches events with Kubernetes metadata** (namespace, pod, container, UID/PID) by correlating cgroups with the API server.

Problem: Runtime blind spots in Kubernetes & hybrid cloud

- Modern attacks increasingly unfold at runtime—after code is deployed—via process abuse, file access, container breakout attempts, and east-west network activity. Industry reports highlight rapid weaponization in cloud-native environments, where adversaries pivot quickly and live off the land inside containers and nodes. Sysdig+1

- Beyond container misconfigurations, defenders need visibility into what actually executes: processes (`execve`), file reads/writes of sensitive material, and socket connects/binds. This is reflected in both community guidance and adversary models (MITRE ATT&CK for Containers), which enumerate runtime techniques like credential dumping, cryptomining, and command-and-control over common ports. MITRE ATT&CK+1

- CNCF Cloud Native Survey (Linux Foundation Research) — broad adoption of containers/Kubernetes continues; orgs still report gaps around security/observability and skills—driving interest in standardized telemetry. MITRE ATT&CK

- Red Hat “State of Kubernetes Security” (2023/2024 series) — misconfigurations and human error are frequent root causes of K8s incidents; many orgs experienced security events tied to configuration and supply-chain issues. MITRE ATT&CK

- Sysdig 2024 Global Cloud Threat Report — runtime threats (cryptomining, misuse of credentials), excessive permissions, and noisy images are common; emphasizes need for real-time detection and least-privilege in Kubernetes. MITRE ATT&CK

- OWASP Kubernetes Top Ten — catalogs the most impactful K8s risks (e.g., insecure defaults, supply chain, inadequate logging/monitoring), reinforcing that visibility and policy are core to defense. ARMO

- CNCF Cloud Native Security Whitepaper — end-to-end guidance across build/deploy/run; calls for defense-in-depth with runtime detection, least privilege, and strong observability of workload behavior. MITRE ATT&CK

- AWS EKS Best Practices Guide — recommends enabling audit/metrics/trace pipelines, using IRSA/least-privilege IAM, and enforcing NetworkPolicies—i.e., observability + policy are required for secure EKS. MITRE ATT&CK

- Google (GKE) security best practices — emphasizes hardening nodes, enforcing identity/authorization, and collecting/acting on audit logs and workload telemetry at scale. MITRE ATT&CK

- Grafana OpenTelemetry report — sustained growth in OpenTelemetry interest/adoption; signals industry momentum toward standard, vendor-neutral telemetry for better visibility and cost control. Grafana Labs

Why runtime telemetry (eBPF-class) matters

Authoritative guidance emphasizes **workload-level monitoring** alongside hardening. NIST’s container security guide and the NSA/CISA Kubernetes Hardening Guide both call out the need to monitor process and network activity to detect abuse that slips past pre-deploy controls. NIST Computer Security Resource Center+1

In practice, open-source Falco popularized rules that trigger on syscall patterns (e.g., reading /etc/passwd or /etc/shadow, spawning shells in containers, or unexpected network opens). This model—observe syscalls and emit policy-driven alerts—is now a de-facto pattern for runtime defense. Falco

What to capture at runtime (signals that matter)

Processes: command + args (execve), user/UID, PID/PPID, executable/comm—and the Kubernetes context (namespace/pod/container/UID) for attribution. These align with ATT&CK (e.g., discovery, credential access, defense evasion) and Falco-style detections. MITRE ATT&CK+1

Files: reads of secrets/keys/tokens (e.g., service account tokens, SSH keys), config files, kube kubeconfigs, and credential stores. NIST and NSA/CISA note credential theft and secret exposure are common runtime objectives. NIST Computer Security Resource Center+1

Network: opens/connects/binds, destinations (IP/port/CIDR), and anomalous egress patterns that indicate exfiltration or C2. Threat research shows active campaigns (e.g., Kinsing) weaponize runtime access rapidly, often "living off the land" inside compromised containers. Forbes+1

Make it observable: consistent context and timelines

For usable forensics and SRE workflows, runtime events should be **enriched** with k8s identifiers (namespace, pod, container) and host/process metadata. This mirrors OpenTelemetry's semantic conventions (k8s.*, process.*, host.*) so events can correlate naturally with logs/metrics/traces and existing APM/SIEM pipelines.

What "good" looks like in a runtime platform

1. **Live stream & filtering:** per node/pod views with filters (namespace/pod/container), plus node health signals (e.g., OOMKilled) to speed root cause. Guidance from NSA/CISA and NIST stresses consolidating runtime signals for timely detection. CISA+1

2. **Rules & risk scoring:** declarative rules that tag and score events; high-risk findings become human-readable alerts (who/what/where in k8s). This follows Falco's proven approach to runtime policies. Falco

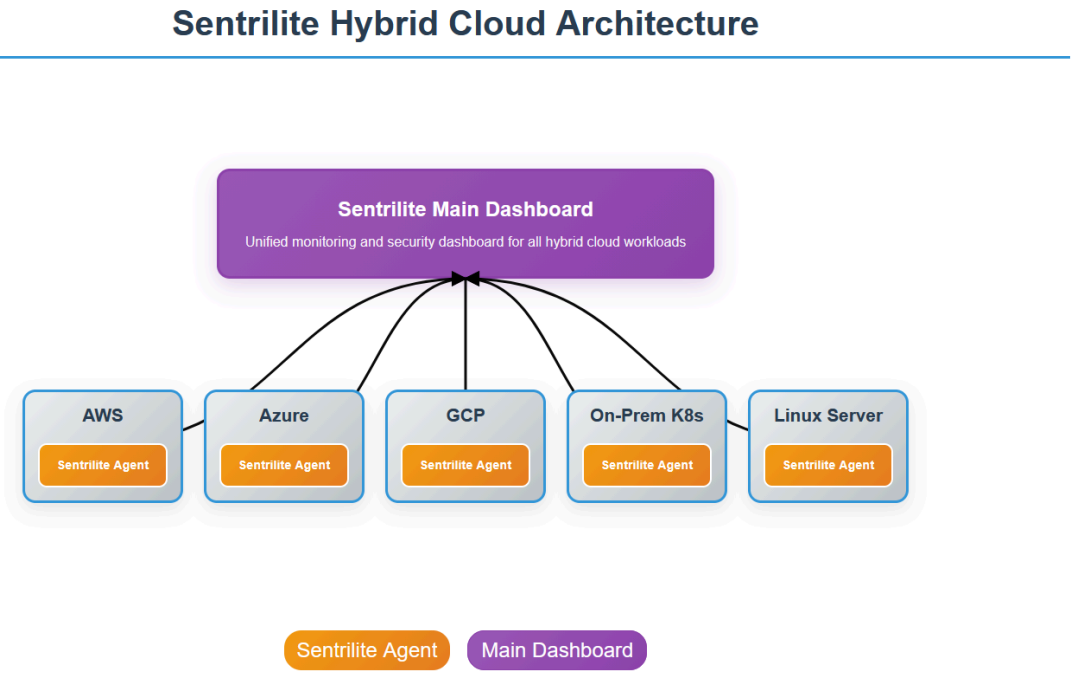
3. **Actionability:** PDF/CSV summaries and SIEM hand-off; align alerts to ATT&CK techniques to aid triage. MITRE ATT&CK

4. **Integrations:** ship to Alertmanager/PagerDuty for on-call; keep open standards for portability (Otel context, webhooks).

What Problems does Sentrilite solve ?

Category	Capability (high level)
Process Visibility	Capture every command real-time (execve) with user, PID/PPID, and container context. Example: trigger rules like "alert on cat /etc/passwd" or block high-risk binaries.
File Activity Monitoring	Detect access to sensitive files (keys, configs, tokens) and flag exfiltration or privilege-escalation attempts.
Network Activity Tracing	Observe socket connects/binds in real-time. Create CIDR-based rules such as "deny egress to 1.2.3.0/24:443".
Live Operations UI	Stream real-time events by node, namespace, or pod. Visualize node health, OOMKilled events, and container restarts.
Custom Rules & Risk Scoring	Declarative JSON rule engine tags, classifies, and scores events. High-risk detections automatically trigger alerts.
Audit & Reporting	Generate timeline reports (PDF/CSV) for compliance, audits, and incident reviews.
Rapid Response Controls	Optional iptables-based allow/deny rules for quick mitigation of suspicious network behavior.
Integrations	Supports external alerting with **Prometheus Alertmanager** and **PagerDuty** out of the box.
AI Insights	Embedded LLM engine summarizes anomalies, trends, and remediation recommendations directly from telemetry streams.

✨ Sentrilite Hybrid Cloud Architecture



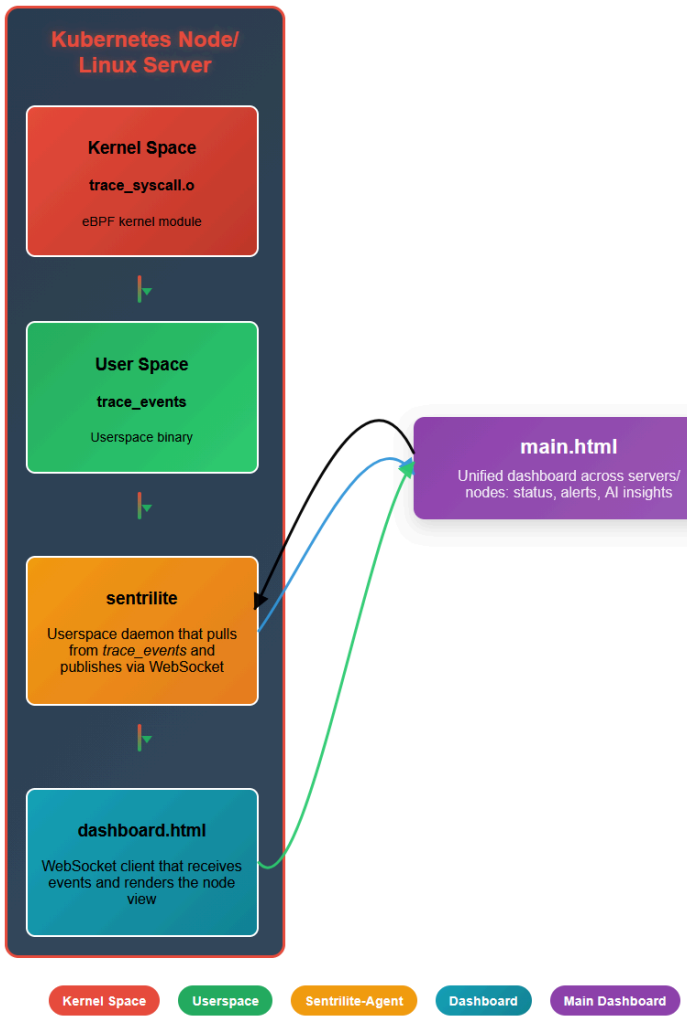
Hybrid Cloud Architecture Description

- **Public Cloud:** AWS, Azure, and GCP, On-Prem K8s, Linux Servers (bare-metal) — agents deployed per VM or node.

- **On-Prem:** On-premises infrastructure with Sentrilite agent Bare-metal or VMs with identical capabilities.

- **Linux Servers:** Individual Bare-Metal or VM Linux servers with Sentrilite agents.
- **Sentrilite Main Dashboard:** Centralized monitoring and security dashboard that aggregates data from all agents.
- **Data Flow:** All Sentrilite agents stream telemetry data to the main dashboard for unified observability.

Sentrilite Components



Workflow Description

- **trace_syscall.o** runs in kernel space and captures system calls and events directly from the kernel
- **trace_events** is a userspace application that communicates with the eBPF program to retrieve captured events
- **sentrilite** daemon processes the events from trace_events and makes them available via WebSocket connections
- **dashboard.html** provides a real-time view of events for individual nodes/servers
- **main.html** provides a unified view across multiple servers/nodes with AI insights and alert management

✨Data Flow

- System calls and events are captured at the kernel level by the eBPF module.
- Events are processed and enriched with metadata (PID, command, arguments, etc.)
- Processed events are streamed to WebSocket clients in real-time.
- Multiple dashboard interfaces can connect to monitor different aspects of the system.
- AI insights and alerting are generated based on the streamed events.

✨ Key Features

- Multi-Cloud/On-Prem visibility and management from a single dashboard
- eBPF syscall & network visibility
- Real-time dashboards (Nginx + WebSocket server)
- Custom rules with risk scoring and alerting
- Kubernetes enrichment (namespace/pod/container/UID) when running as a DaemonSet
- OOMKilled alerts and pod watchers (best effort if K8s APIs available)
- Seamlessly integrate with prometheus alert-manager/pagerduty

⚙️ System Requirements

Minimum Requirements

- **Linux Kernel with eBPF support** (Linux 5.8+ recommended)
- **Root privileges** (for loading eBPF programs)
- **Ports:** 80 (dashboard), 8765 (WebSocket)
- **Kubernetes** (optional): Cluster access with ability to run a privileged DaemonSet

General Requirements

- **bpftool:** Load eBPF programs and manage maps
  sudo apt install bpftool # Ubuntu

- **libbpf & headers:** Required by the kernel loader (trace_events)
  - Pre-installed on most modern distros (use bundled binary)
- **nginx:** Required to view dashboard
  sudo apt install nginx

🛠️ Third-Party Integrations (PagerDuty & Alertmanager)

Kubernetes Configuration

Add URLs in a ConfigMap (e.g., `ALERTMANAGER_URL`, optional `PAGERDUTY_EVENTS_URL`) and the PagerDuty routing key in a Secret (`PAGERDUTY_ROUTING_KEY`).

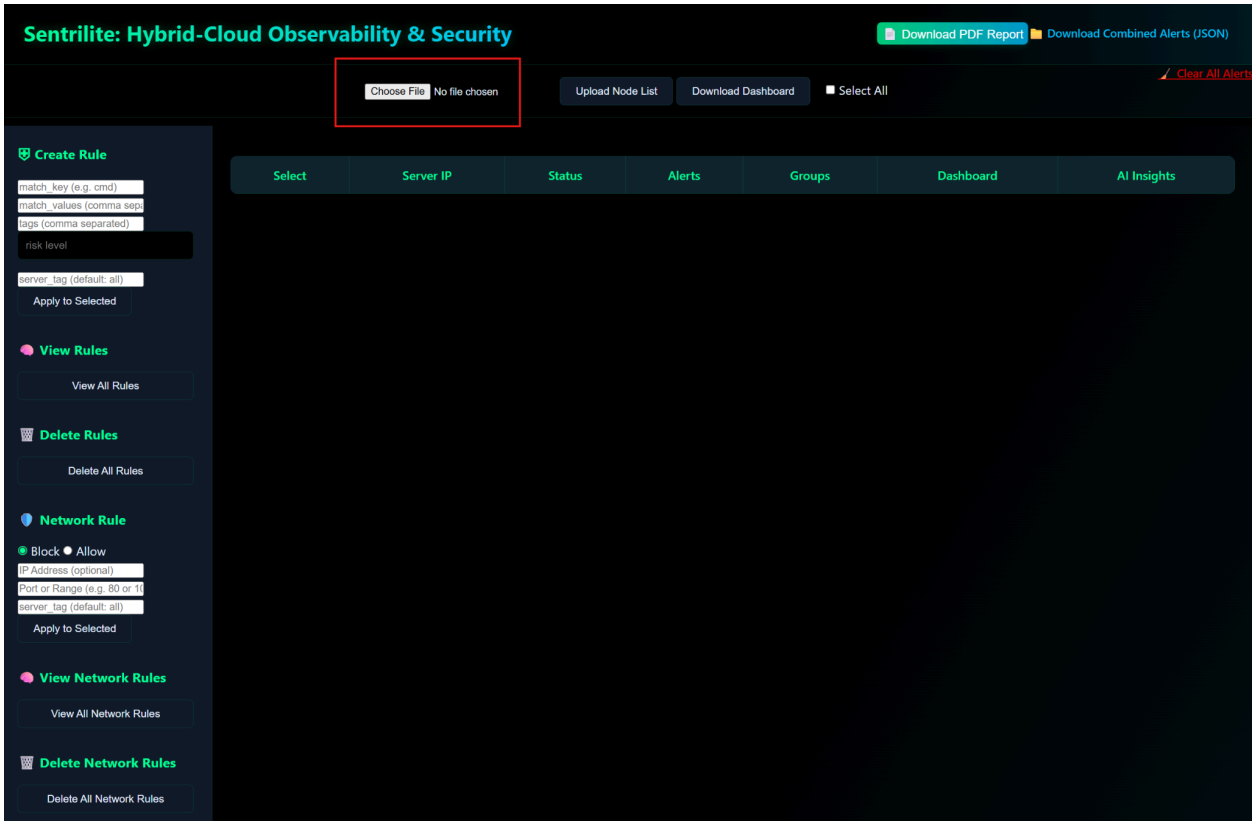
Standalone Linux Configuration

Set the same keys in `sys.conf` (e.g., `ALERTMANAGER_URL=http://...`, `PAGERDUTY_ROUTING_KEY=...`.

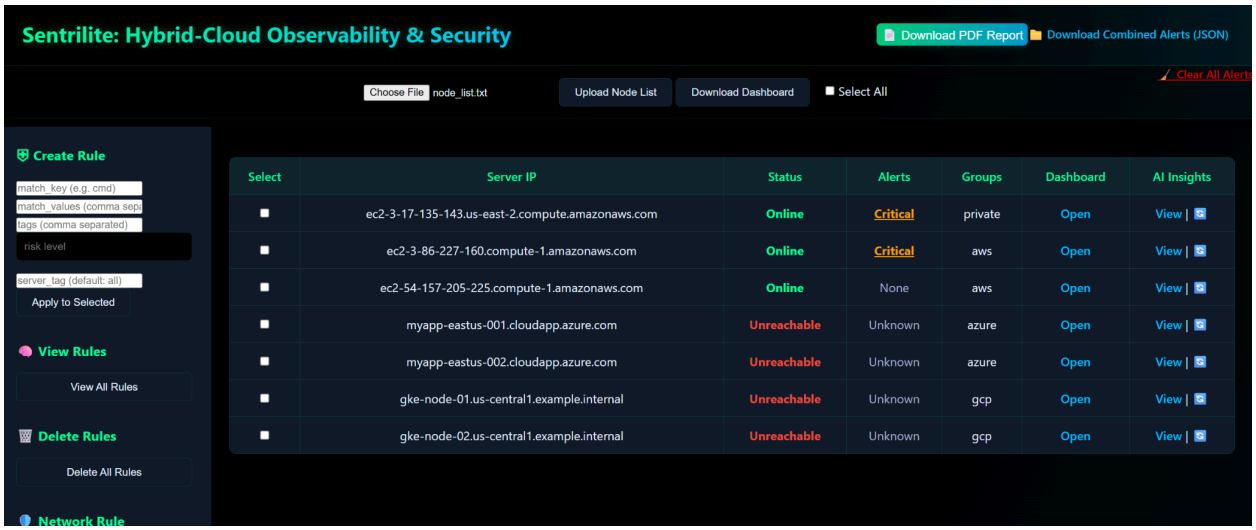
Note: Sentrilite prefers env vars (K8s) and falls back to `sys.conf` (bare metal). Alertmanager must be reachable and supports v2 API (`/api/v2/alerts`). PagerDuty uses Events v2.

✨ Sentrilite: Getting Started

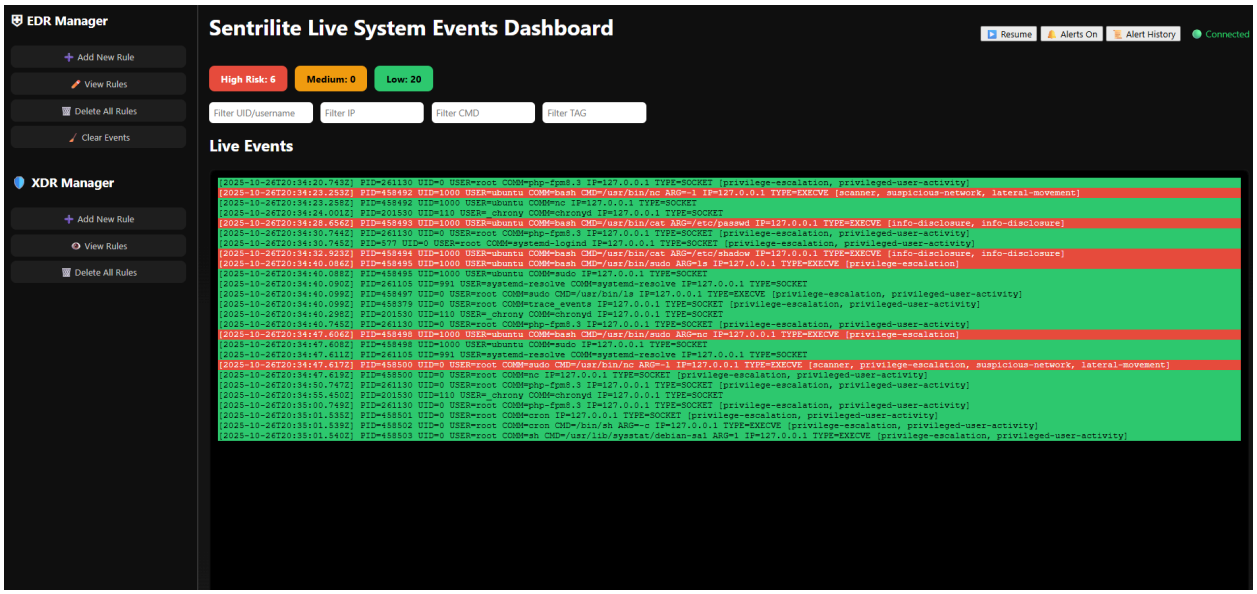
On the Main Dashboard, upload a csv file (nodes, group) and click upload File:



Upon Clicking Upload, the nodes are automatically added as follows:



Upon clicking the ‘Open’ Link under the Dashboard of any Node, it will point to the Live dashboard of that Node like the following screenshot:



🔒 Runtime-Security & Activity Detection Rules

Sentrilite continuously monitors system activity and commands to identify potentially dangerous or suspicious behavior using eBPF kernel hooks.

Each rule has a **risk level** (1 = High, 2 = Medium, 3 = Low / Informational).

🟥 High-Risk (Level 1): Routed to PagerDuty/AlertManager

Actions that can immediately compromise system integrity or indicate active attacks:

- **Privilege escalation:** Detects attempts to gain elevated rights using commands like `sudo`, `su`, or `pkexec`.
- **Suspicious network tools:** Flags utilities such as `nc`, `ncat`, `netcat`, and `socat` often used for backdoors or lateral movement.
- **Reconnaissance scans:** Monitors use of `nmap` or `masscan` for network probing and port scanning.
- **Firewall or network-policy modification:** Watches `iptables`, `ip6tables`, and `nft` changes that can open unauthorized access.
- **Kernel manipulation:** Alerts on `insmod` or `modprobe` commands that insert or remove kernel modules.
- **Cryptocurrency mining:** Detects miners such as `xmrig`, `minerd`, `ethminer`, `lolMiner`, or `teamredminer`.

🟧 Medium-Risk (Level 2)

Behaviors that can aid data theft, persistence, or internal reconnaissance:

- **Remote movement:** Flags `ssh`, `scp`, and `sftp` usage for potential lateral movement.
- **External data transfer:** Monitors `curl` and `wget` for possible data exfiltration or inbound malware.
- **Packet sniffing:** Detects network capture tools (`tcpdump`, `tshark`).
- **Filesystem operations:** Observes `mount` and `umount` commands that may expose sensitive storage.
- **Container or runtime admin actions:** Tracks administrative utilities like `kubectl`, `ctr`, `crictl`, `docker`, and `runc`.
- **Traffic shaping or interception:** Alerts on `tc` commands altering network performance or routing.
- **Bulk I/O or disk cloning:** Flags `dd` for potential data duplication or exfiltration.

🟩 Low-Risk / Informational (Level 3)

Benign but noteworthy behavior for audit and trend analysis:

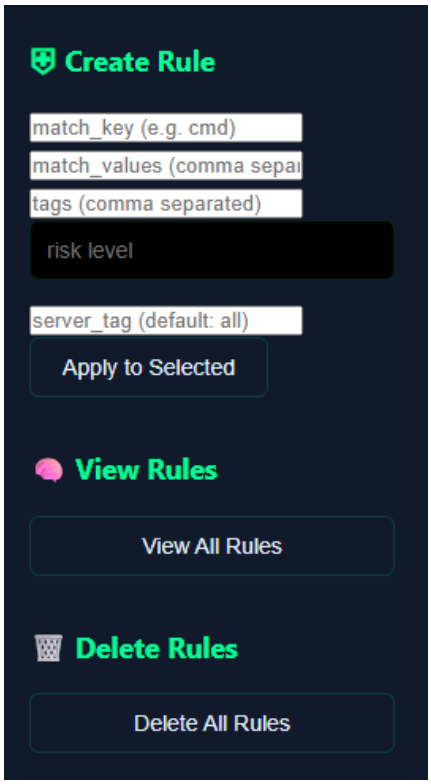
- **Script interpreters:** Notes usage of `python`, `perl`, `ruby`, or `node` which can run arbitrary code.
- **Encoding or compression tools:** Observes commands like `base64`, `xxd`, `tar`, or `zip` that may hide or pack data.
- **Package installation:** Monitors `apt`, `yum`, `dnf`, `zypper`, and `apk` installs for potential software changes.
- **Privileged user actions:** Flags activities performed by the `root` user (UID 0) for accountability.

✅ Purpose:

These rules form Sentrilite's baseline behavioral detection layer. They identify high-impact commands, suspicious network activity, and system-level modifications — helping security teams catch misuse or compromise early.

In addition to this, Users can also create custom Alert Rules from the Main Dashboard which are hot-reloaded. Once a rule is submitted, sentrilite automatically picks it up without restart.

Custom Rule Creation: On the side panel, we have the rule manager:



The keys and their corresponding values can be one of the following:

1. **cmd** => command or process like ls/sudo/nc
2. **arg** => The first argument of any command ls "`abc.txt`" . So any command using abc.txt will raise an alert.
3. **ip** => ipv4 address
4. **pid** => process id
5. **iid** => user id (for example uid = 0 for root user)
6. **user** => user name (for example: root, ubuntu)

🔒 Pre-Defined Security Posture Management Rules

Overview

Sentrilite evaluates **312 security rules** across Kubernetes pods and Linux hosts to surface misconfigurations, risky behaviors, and policy drift.

Coverage

- **Pod rules:** 98 (Kubernetes security posture)
- **Host rules:** 214 (OS/network hardening, services, kernel & TCP/IP)

What matters most (at a glance)

- **Privilege & Auth:** default service accounts, token automount, running as root, privileged/allow-priv-esc.
- **Isolation:** hostPID/IPC/Network, host ports, shared process namespaces.
- **Filesystem & sockets:** hostPath mounts to `/etc`, `/root`, `/proc`, `/sys`, Docker/containerd sockets.
- **Capabilities:** flags >30 sensitive Linux capabilities (e.g., `SYS_ADMIN`, `NET_ADMIN`, `SYS_MODULE`).
- **Runtime hygiene:** seccomp missing, read-only rootfs disabled, probes/limits/requests missing.
- **Network & kernel posture:** firewalls inactive, SELinux not enforcing, risky sysctl/TCP settings.
- **Exposure:** public listeners, permissive iptables, IPv6/ICMP settings, reverse-path filtering off.

Pod Rules (98)

Service Account & Auth

- Detects default/no service account or token **automount** → risk of privilege escalation.

Namespace & Isolation

- Workloads in **default** namespace; **hostNetwork/hostPID/hostIPC**; **shared process namespace**.

Networking

- **hostPorts** used; default **DNS policy** that may break isolation.

HostPath Mounts (high risk)

- Mounts of `/`, `/etc`, `/root`, `/var/lib`, `/var/run`, `/proc`, `/sys`, `/dev`, `/dev/shm`.
- Docker/containerd sockets → potential **container escape**.

Container Security Context

- **Privileged**=true; **runAsNonRoot** missing/false; **allowPrivilegeEscalation**=true.
- **Writable** root filesystem; running as **UID 0**.

Linux Capabilities (37 checks)

- Ensures **cap drop all**; flags dangerous adds (e.g., `SYS_ADMIN`, `NET_ADMIN`, `SYS_PTRACE`, `SYS_MODULE`, `SYS_TIME`, `SYS_RAWIO`, `DAC_*`, `FOWNER`, `SETUID/GID`, `NET_RAW`, etc.).

Seccomp & Profiles

- Seccomp profile missing at **container** or **pod** level.

Health Probes

- Missing **liveness/readiness/startup** probes.

Resources

- Missing **limits/requests** (CPU, memory, ephemeral storage).

Image Hygiene

- Image **without digest**; using **latest** tag.

Pod Security Context

- Security context missing; **runAsGroup=0**; **fsGroup** not set; supplemental groups; default `/proc` mount.

Config & Secrets

- Secrets in env, plaintext env, mounted ConfigMaps/Secrets (visibility & handling checks).

Volumes & Scheduling

- **Writable** mounts; `emptyDir`/`downwardAPI` usage; lifecycle hooks missing; long termination; priority/affinity/topology spread not set; tolerations/nodeSelector presence.

Advanced Settings

- Unsafe **sysctls**; imagePullPolicy not set to **Always**; custom DNS; host aliases; runtimeClass/overhead missing.

Host Rules (214)

Filesystem Hygiene

- **World-writable** files under `/etc`, `/home`, `/var`.

Exposure

- **Public TCP/UDP listeners**; permissive **iptables**; **UFW/firewalld** inactive; **SELinux** not enforcing.

Security Services

- **auditd** inactive; **AppArmor** disabled.

Kernel/System Config

- **Module autoload** enabled; **core dumps** enabled.

IPv6 & ICMP

- IPv6 on when unused; risky **ICMP** behaviors (redirects, broadcasts, bogus errors, high ratelimits).

Routing & Forwarding

- **Source routing** accepted; **IP forwarding** enabled on non-routers; (secure) redirects issues.

TCP/IP Hardening (100+ checks)

- **SYN flood** protections off; **RPF/log_martians** disabled; risky **timestamps/SACK/window scaling/ECN**.

- Connection hygiene: **retries/FIN timeout/keepalive** mis-tuned; **SYN backlog** too low; orphan/TIME_WAIT buckets too high.

- Retry & recovery, buffers/memory thresholds, congestion control, TSO/pacing/PMTU/MTU probing misconfigurations.

- Advanced toggles (e.g., **tw_reuse**, **abort_on_overflow**, fast open, key presence, ACK/backlog tuning).

UDP & Queues

- UDP early demux; **somaxconn** low; **netdev_max_backlog** low.

Misc IP

- Shared media, BOOTP relay, **accept_source_route**, **icmp_ratemask** issues.

Severity Levels

- **1 Critical** – urgent risk; fix immediately. Routed to PagerDuty/AlertManager
- **2 High** – significant risk; prioritize remediation.
- **3 Medium** – address in next hardening cycle.
- **4 Low** – minor; track and fix opportunistically.
- **5 Informational** – best-practice signal.

Tags & Filtering

- **k8s** (pod rules), **posture**, **network**, **security-context**, **capabilities**, **volume**, **host**.
  Use tags to filter dashboards, compliance reports, and CI/policy gates.

How to use this in practice

- **Baseline & drift:** Enforce a minimum bar (seccomp, non-root, RO rootfs, cap-drop-all) and watch for drift.
- **Prioritize by severity + blast radius:** Fix privileged/host* settings, sockets, and firewall posture first.
- **Automate remediation:** Apply PodSecurity standards/PSa, admission controls, and sysctl baselines.
- **Continuously update:** Rules evolve with kernel/K8s changes; keep the chart and rules ConfigMap up-to-date.

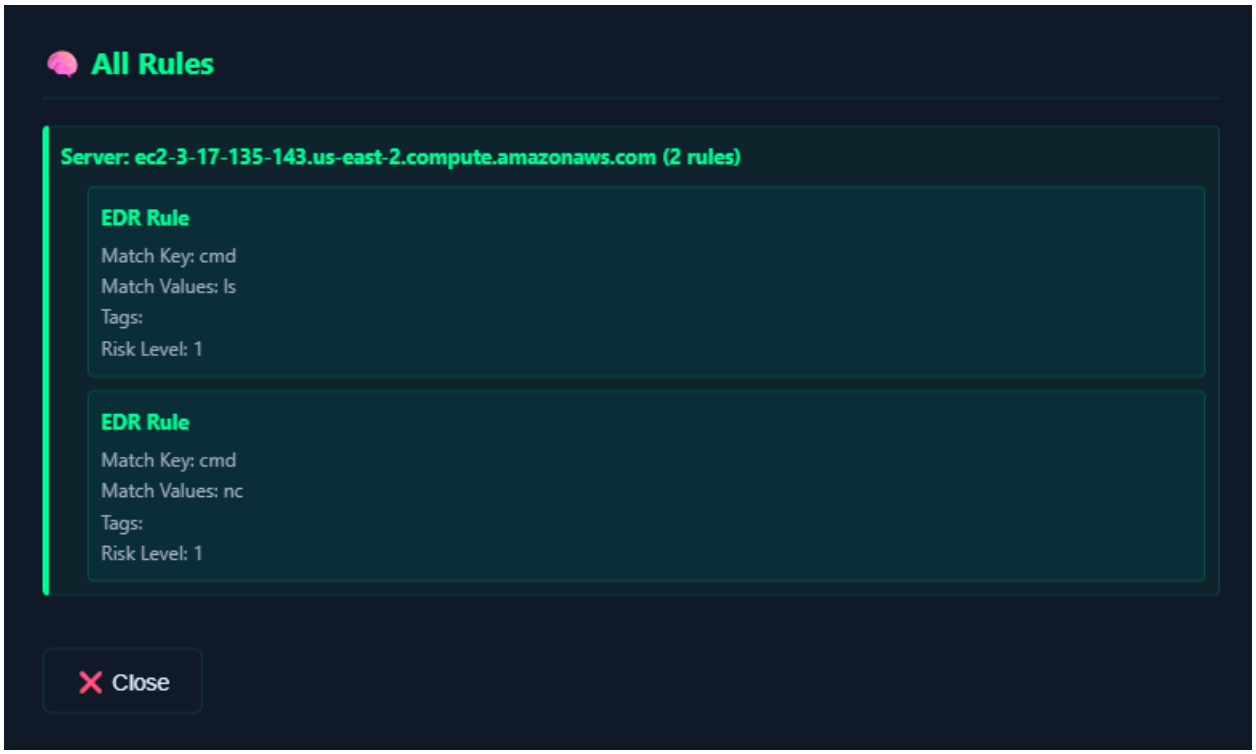
🔒 Sensitive Files Monitoring

Sentrilite also continuously monitors some system level sensitive files by default. The list of default files are as follows and stored on the node as sensitive_files.json . This file can be dynamically updated (hot-reload) and Sentrilite will automatically pick up the changes (without restart)

```
{
  "files": [
    "/etc/shadow",
    "/etc/sudoers",
    "/etc/sudoers.d/*",
    "/root/.ssh/*",
    "/home/*/.ssh/*",
    "/etc/ssh/ssh_host_*",
    "/etc/ssl/private/*",
    "/etc/pki/tls/private/*",
    "/etc/letsencrypt/live/*/*",
    "/etc/letsencrypt/archive/*/*",
    "/var/run/docker.sock",
    "/run/containerd/containerd.sock",
    "/var/run/secrets/kubernetes.io/serviceaccount/token",
    "/etc/kubernetes/admin.conf",
    "/etc/kubernetes/kubelet.conf",
    "/etc/kubernetes/pki/*",
    "/var/lib/kubelet/pki/*",
    "/var/lib/kubelet/kubeconfig",
    "/home/*/.aws/credentials",
```

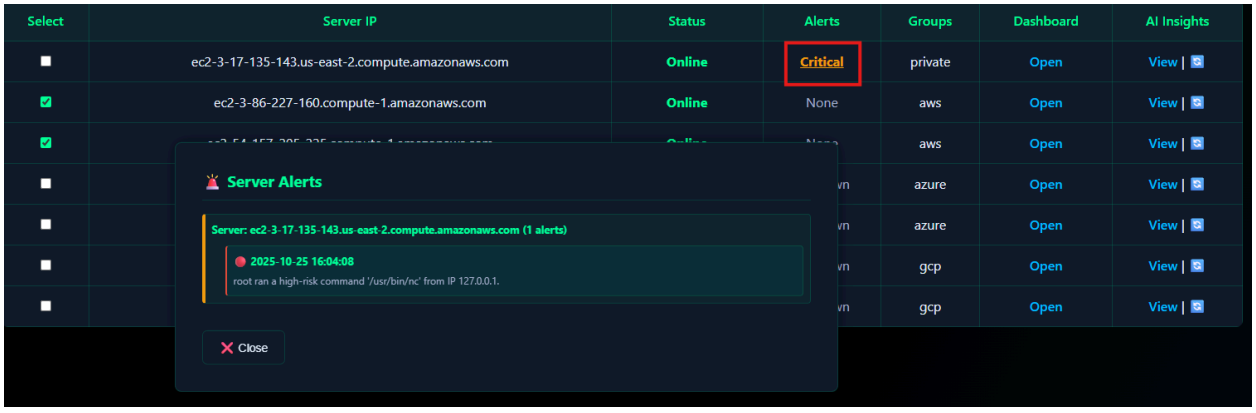
```
        "/home/*/.aws/config",
        "/home/*/.config/gcloud/*",
        "/home/*/.azure/*",
        "/home/*/.docker/config.json",
        "/home/*/.git-credentials",
        "/home/*/.netrc",
        "/etc/krb5.keytab",
        "/home/*/.gnupg/private-keys-v1.d/*",
        "/etc/openvpn/*.key",
        "/etc/wireguard/privatekey",
        "/etc/ipsec.secrets",
        "/etc/mysql/*.cnf",
        "/root/.my.cnf",
        "/home/*/.pgpass",
        "/etc/mongod.conf",
        "/etc/redis/redis.conf",
        "/etc/nginx/*.conf",
        "/etc/nginx/sites-*/**",
        "/etc/httpd/conf.d/*.conf",
        "/var/log/auth.log",
        "/var/log/secure",
        "/var/log/messages",
        "/var/log/syslog",
        "/var/log/journal/**",
        "/var/run/secrets/kubernetes.io/serviceaccount/ca.crt",

    "/var/run/secrets/kubernetes.io/serviceaccount/namespace",
        "/etc/passwd"
      ]
    }
```

Click “View Rules” to see existing rules:



Click Delete Rules to remove all the rules.

Once a rule is satisfied, an alert is triggered and the status of that server/node changes to Critical . Click the critical link to see the current alerts on any node like this:



The same alert is recorded on the server side in the json format with all the metadata in the file: `alerts.json`. It can be downloaded from the main dashboard):

Example Alert Message:


```
[
  {
    "time": "2025-10-25 16:04:08",
    "type": "high_risk",
    "message": "root ran a high-risk command '/usr/bin/nc' from IP
10.0.0.1.",
    "pid": "442651",
    "cmd": "/usr/bin/nc",
    "args": "-l",
    "ip": "10.0.0.1",
    "risk_level": 1,
    "tags": [
      "scanner",
      "privilege-escalation"
    ]
  }
]
```


These alerts (with risk_level = 1 or severity = 1 or sensitive_files) will also be routed to pagerduty and alertmanager if properly configured in the sys.conf (linux) or configmap/secrets (kubernetes) covered later in the installation steps.

The risk_level or severity or sensitive_files list can be changed at runtime (hot-reload) with helm.

Click the download pdf report button to generate the reports with alerts summary on all the servers:

(Note: For LLM insights, you need to install a local LLM server)

Sentrilite One-Click Alert Summary PDF Report

Sentrilite Alert Summary Report

Generated on: 11/17/2025, 2:35:40 PM

Server: .amazonaws.com | Group: private

Timestamp	Message
2025-11-16T17:24:55Z	package-vuln: trivy not installed or not in PATH
2025-11-16 17:25:14	root ran a high-risk command '/usr/sbin/iptables' from IP 127.0.0.1.
2025-11-16 17:25:15	root ran a high-risk command '/usr/sbin/iptables' from IP 127.0.0.1.
2025-11-16T17:24:55Z	ww_files_home: /home/ubuntu/netsentrix/src/trace_socket.c
2025-11-16T17:24:55Z	ww_files_var: /var/www/html/bpf_trace.txt | /var/www/html/get_logs.txt | /var/www/html/load_module.txt
2025-11-16T17:24:55Z	public_tcp_listeners: LISTEN 0 511 0.0.0.0:80 0.0.0.0:* users:(("nginx",pid=261137,fd=5),("nginx",pid=261136,fd=5)) | LISTEN 0 4096 0.0.0.0:9093 0.0.0.0:* users:(("docker-proxy",pid=391827,fd=7)) | LISTEN 0 4096 127.0.0.53%lo:53 0.0.0.0:* users:(("systemd-resolve",pid=261105,fd=15)) | LISTEN 0 4096 127.0.0.54:53 0.0.0.0:* users:(("systemd-resolve",pid=261105,fd=17))
2025-11-16T17:24:55Z	public_udp_listeners: UNCONN 0 0 172.31.25.143%enX0:68 0.0.0.0:* users:(("systemd-network",pid=261147,fd=22)) | UNCONN 0 0 127.0.0.1:323 0.0.0.0:* users:(("chronyd",pid=201530,fd=5)) | UNCONN 0 0 127.0.0.54:53 0.0.0.0:* users:(("systemd-resolve",pid=261105,fd=16)) | UNCONN 0 0 127.0.0.53%lo:53 0.0.0.0:* users:(("systemd-resolve",pid=261105,fd=14))
2025-11-16T17:24:55Z	ufw_inactive: Status: inactive
2025-11-16T17:24:55Z	iptables_permissive: grep: invalid option -- ' ' | Usage: grep [OPTION]... PATTERNS [FILE]... | Try 'grep --help' for more information.
2025-11-16T17:24:55Z	kernel_modules_autoload_enabled: autoload_enabled
2025-11-16T17:24:55Z	core_dumps_enabled: core_dumps_enabled
2025-11-16T17:24:55Z	ipv6_enabled: ipv6_enabled
2025-11-16T17:24:55Z	log_martians_disabled: log_martians_disabled

🛠️ Installation Steps

For Kubernetes Cluster: EKS/AKS/GKE or Private Kubernetes Cluster

1. **Deploy Sentrilite DaemonSet on K8s:**

   Helm Installation: In the charts directory:

   ```
   helm upgrade --install sentrilite charts/sentrilite -n
   kube-system --create-namespace
   ```

   OR plain kubectl installation:

   ```
   kubectl apply -f sentrilite.yaml

   kubectl -n kube-system get pods -l app=sentrilite-agent -o wide

   kubectl get nodes | awk '!/NAME/{print $1,",K8s"}' > nodes.txt
   ```

   # Port forward : `POD=$(kubectl -n kube-system get pod -l app=sentrilite-agent -o name | head -n1)`

   ```
   kubectl -n kube-system port-forward "$POD" 8080:80 8765:8765
   ```

2. **Verify deployment:**
   `kubectl -n kube-system get pods -l app=sentrilite-agent -o wide`

3. **Create nodes list:**
   `kubectl get nodes | awk '!/NAME/{print $1,",K8s"}' > nodes.txt`

   The file format should like this: Node_ip,group:

   ```
   ec2-3-17-135-112.us-east-2.compute.amazonaws.com,private

   ec2-3-86-227-155.compute-1.amazonaws.com,aws

   ec2-54-157-205-222.compute-1.amazonaws.com,aws

   myapp-eastus-001.cloudapp.azure.com,azure,azure

   myapp-eastus-002.cloudapp.azure.com,azure,azure

   gke-node-01.us-central1.example.internal,gcp
   ```

```
gke-node-02.us-central1.example.internal,gcp
```

For Non-Kubernetes Linux based Cluster

Run it with Docker:

```
docker run --rm -it \
--privileged \
-v /sys/fs/bpf:/sys/fs/bpf \
-v /sys/kernel/debug:/sys/kernel/debug \
-p 8080:8080 \
sentrilite/local:1.0.0
```

It will auto-generate a PDF security report every 5 minutes, and you can view/download them at: http://localhost:8080

OR

Unzip the bundle:
unzip sentrilite_agent_bundle.zip

1. `cd sentrilite`

2. **Load the bpf program:**
   `sudo ./install.sh`

3. **Configure sys.conf:**
   LICENSE_KEY=./license.key

   PAGERDUTY_EVENTS_URL=""

   PAGERDUTY_ROUTING_KEY=""

   ALERTMANAGER_URL=""

4. **Launch the Server:**
   `sudo ./sentrilite`

5. **Open the Dashboard:**
   - Copy the `dashboard.html` to `/var/www/html` or web root directory
   - Open `dashboard.html` in your browser:
     `http://<YOUR-SERVER-IP>/dashboard.html`
   - You should see live events appear in real-time
6. **Log format in the Live Dashboard Web UI:**

```
 [2025-04-14T00:12:32.008Z] PID=1234 COMM=ssh CMD=/bin/bash
ARG= IP=127.0.0.1 TYPE=EXECVE
```

7. **Open the Main Dashboard on your control plane:**
    - Copy the `main.html` & `jspdf.umd.min.js` to `/var/www/html` on your main admin server
    - Open the `main.html` in your browser: `http://<YOUR-SERVER-IP>/main.html`
    - Click choose file and select a file containing your server lists

For more detailed information, refer to `dashboard.README`

Configuration

- **`license.key`** — place in the current directory (baked in image or mounted as Secret)
- **`sys.conf`** — network config, placed in the current directory (baked in image or mounted as ConfigMap)
- **Rule files** (`rules.json`, `sensitive_files.json`, `xdr_rules.json`, `alerts.json`) reside in the working dir; rules can be managed via the dashboard

Alerts & K8s Enrichment

- Events include (when available): `k8s_namespace`, `k8s_pod`, `k8s_container`, `k8s_pod_uid`
- OOMKilled alerts and pod watchers run best-effort when the agent can access K8s APIs

🛠️ Un-installation Steps

For Kubernetes Cluster: EKS/AKS/GKE or Private Kubernetes Cluster

kubectl -n kube-system delete ds/sentrilite-agent
(Optional) If pods hang in Terminating:

```
kubectl -n kube-system delete pod -l app=sentrilite-agent --force
--grace-period=0
```

For Non-Kubernetes Linux based Cluster

Run the following commands as root:

```
sudo ./unload_bpf.sh
```

🔐 Licensing

The project is currently using a trial `license.key`

Support

For licensing, troubleshooting, or feature requests:

- 📧 **Email:** info@sentrilite.com
- 🌐 **Website:** https://sentrilite.com