Oracle Communications Fraud Monitor

Oracle Communications Fraud Monitor is a rule-based, scalable solution to help network operators detect phone fraud and prevent it before damage is done. It is part of the Oracle Communications Session Monitor product family, an end-to-end network visibility and monitoring software system that increases the return on investment (ROI) of Long Term Evolution (LTE), IP Multimedia Subsystem (IMS), and Voice over IP (VoIP) deployments, and provides an unprecedented view of the network for both operations management and in-depth troubleshooting.

Overview

Oracle Communications Session Monitor product family allows enterprises and service providers to quickly and securely migrate to Internet Protocol (IP) networks, reduce operational costs, generate additional revenue, prevent voice fraud, and minimize churn. Oracle Communications Session Monitor Family of Products is a proven, carrier-grade solution for enterprise networks and fixed and mobile service providers with hundreds of deployments globally, including many tier-1 service providers.

To identify fraudulent calls, Oracle Communications Fraud Monitor builds on end-to-end correlated, network-wide application-layer data to perform a real time analysis of user behavior and compare it with the individual behavioral patterns that are automatically captured by the system for each subscriber. Passive, software-based Oracle Communications Fraud Monitor probes can be deployed throughout the network. Additionally, Oracle embeds Oracle Communications Fraud Monitor probes into its network session delivery portfolio. This combination of active and passive probes allows network operators to optimize their IP communications networks while reducing network cost and complexity. The probes collect real-time information about all users, customers, trunks, and IP addresses. Based on this passive monitoring system, the solution is undetectable by potential attackers and imposes no performance burden on the network.

Fraud incidents are identified and alerted within a matter of seconds, potentially even while the sessions are being set up. Network operators can leverage these alerts to disable users, trunks, and subscribers on their session border controllers (SBCs), application servers, core network elements, or provisioning servers. Other responses to fraud cases include redirecting users (for example, to a voicemail system) or rate limiting the amount of traffic. Utilizing Oracle Communications Session Monitor product family, network operators can further analyze and document the attack vector, install appropriate detection methods, and prevent future similar attacks.

Easy deployment and integration

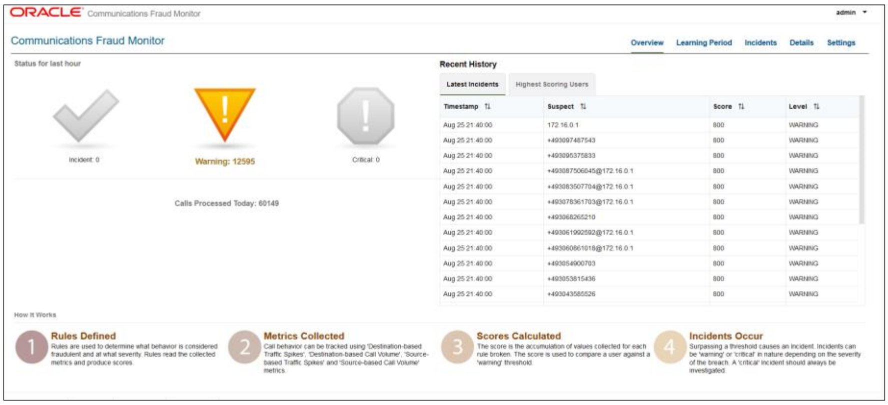
There is no need to deploy new or additional network elements in the path of the calls; Oracle Communications Fraud Monitor can extend existing infrastructures to efficiently detect and prevent phone hacking and toll fraud. Existing Oracle Communications Session Border Controllers can serve as embedded probes through a simple software upgrade, eliminating the need for additional network equipment. Because Oracle Communications Fraud Monitor probes are passive, they do not add any potential for service quality degradation or impose any risk of negative impact on network availability.

No configuration needed

Oracle Communications Fraud Monitor comes with a set of predefined rules available for immediate use. If needed, it is also possible to extend the existing configuration with customized sets of rules. Fraud can be detected by triggering a single rule or a combination of multiple rules across source and destination based traffic analyses, such that when several fraud metrics are combined to effectively indicate a previously unseen fraud incident.

Collaborative blocklisting

Fraudsters don't limit themselves to individual networks, but often try to abuse multiple international networks at the same time. The Oracle Communications Fraud Monitor system allows an automated and manual update of the blocklisting information, including IP addresses, phone numbers, and Session Initiation Protocol (SIP) user agents used for fraud. This information originates from verified fraud cases and allows for fast and accurate alerting even if a new fraud scenario has not been seen in the monitored network.



Timestamp	Suspect	Score	Level
Aug 25 21:40:00	172.16.0.1	800	WARNING
Aug 25 21:40:00	+493097487543	800	WARNING
Aug 25 21:40:00	+493095375833	800	WARNING
Aug 25 21:40:00	+493087506045@172.16.0.1	800	WARNING
Aug 25 21:40:00	+493083507704@172.16.0.1	800	WARNING
Aug 25 21:40:00	+493078361703@172.16.0.1	800	WARNING
Aug 25 21:40:00	+493068265210	800	WARNING
Aug 25 21:40:00	+493061992592@172.16.0.1	800	WARNING
Aug 25 21:40:00	+493060861018@172.16.0.1	800	WARNING
Aug 25 21:40:00	+493054900703	800	WARNING
Aug 25 21:40:00	+493053815436	800	WARNING
Aug 25 21:40:00	+493043585526	800	WARNING

1 **Rules Defined** Rules are used to determine what behavior is considered fraudulent and at what severity. Rules read the collected metrics and produce scores.

2 **Metrics Collected** Call behavior can be tracked using 'Destination-based Traffic Spikes', 'Destination-based Call Volume', 'Source-based Traffic Spikes' and 'Source-based Call Volume' metrics.

3 **Scores Calculated** The score is the accumulation of values collected for each rule broken. The score is used to compare a user against a 'warning' threshold.

4 **Incidents Occur** Surpassing a threshold causes an incident. Incidents can be 'warning' or 'critical' in nature depending on the severity of the breach. A 'critical' incident should always be investigated.

Figure 1. Oracle Communications Fraud Monitor has an easy-to-use, web-based interface for simplifying configuration, management, monitoring, and operations. The left hand of the dashboard shows the overall count of alerts and incidents from the network, whereas on the right you can view the recent list of flagged incidents and drill down into their details.

Real-time analysis of user behavior

Oracle Communications Fraud Monitor monitors all calls in the VoIP network and learns the behavioral patterns of each subscriber over time. It uses rules to calculate values from multiple metrics such as number of concurrent calls, time-based traffic patterns, unusual source IP addresses, or call sources and destinations, enabling a more accurate assessment of the situation. The rule-based learning feature saves time by combining the gathered values into a score for each user and for each user group, with no per-user configuration required. Metric rules can be classified into call duration and call volume. Traffic spikes can be measured based on call duration. Call volume can be measured in number of calls per second and maximum active calls. If needed, exceptions can be configured on a per-user basis.

Attack agnostic

There are countless ways to start an attack, such as hacking into an enterprise's IP private branch exchange (PBX) or voicemail system, using standard passwords on web graphical user interfaces (GUIs) of VoIP phones, or abusing leaks in enterprise voicemail systems. Oracle Communications Fraud Monitor looks at the one thing all attacks have in common—the deviation of the current behavior from the user's normal behavioral pattern. This enables the software to both cover the current attack scenarios and detect future ones.

Stopping fraud as it happens

The real-time data capture of user behavior enables better, faster identification and prevention of fraudulent behavior. The entire process, from detecting an attack to stopping it, is shortened to just a few minutes—or immediately, as with blocklists. The system keeps a dynamic list of subscribers that have recently been sources of attacks in any of the connected networks. If the corresponding blocklist feature is enabled, then attacks can be stopped immediately.

Unique approach to stopping fraud

Oracle Communications Fraud Monitor takes into consideration calls that have not yet finished, which allows prevention of fraud while it is in progress, rather than having to wait for call detail records (CDRs) to be written or billing cycles to finish.

Further prevention of fraud attacks

When Oracle Communications Fraud Monitor calculates scores beyond safe thresholds, it provides immediate alerting in case of known fraud scenarios.

Easy to use

Oracle Communications Fraud Monitor generates an automatic alert if call patterns do not match the pattern of the corresponding user or user group, and a critical threshold has been reached. With Oracle Communications Session Monitor product family, fraud incidents can be analyzed in depth utilizing call history, message flow diagrams, PDF reports, and packet capture (PCAP) file exports.

How Oracle Communications Fraud Monitor works

Oracle Communications Fraud Monitor includes three major functions—passive monitoring of all subscribers/IP addresses, identification of their behavioral patterns, and assignment of scores and thresholds to trigger fraud risk alerts.

- **Monitoring**: All subscribers/IP addresses in the entire network are monitored, and reports can be visually displayed for each one via the web-based interface.
- **Dynamic patterns analysis**: Oracle Communications Fraud Monitor learns behavioral patterns of all subscribers and IP addresses over time with pre-defined set of configurable rules engine.
- **Score assignments and threshold**: Scores are applied to all calls and to all subscribers and IP addresses based on flexible rules. If scores are calculated that exceed predetermined thresholds, alarms are generated warning of fraud risks.
- **Extending the responsive actions to session border**: Once a fraud has been triggered, or a specific subscriber has been classified as a potentially fraudulent entity, the action to block this user / rate limit can be immediately passed on to Oracle Communications Session Border Controller via Oracle Communications Session Delivery Manager. This brings added value by leveraging the entire Oracle session delivery product portfolio and ensuring network border security.

Scoring

Any deviation from the user's behavioral pattern indicates that the network is facing a fraud attack. However, relying on just one metric can result in false alerts. Oracle Communications Fraud Monitor uses rules to calculate values from multiple metrics across source and destination traffic analysis, enabling a more accurate assessment of the situation. It combines these values into a score for each subscriber. It comes with a set of predefined rules available for immediate use, and offers the ability to extend the predefined rules with customized sets of rules.

- **Metrics**: Oracle Communications Fraud Monitor comes with a library of metrics to measure the basic attributes of subscriber behaviors, for example, minutes spoken, concurrent calls, unusual call destinations, and unusual source IP addresses.
- **Values**: The values are the result of the weightings attributed to each rule. Values are provided for the current moment and as an average for every hour.
- **Rules**: The rules are used to determine what call behavior is considered fraudulent and at what severity, according to a rating system. A rule can make use of any number of metrics.
- **Score**: The score is the accumulation of the values and is used to determine whether or not a user has surpassed a threshold.
- **Threshold**: Surpassing a defined threshold causes an alarm to be raised. Thresholds can either be static values or be dependent on a key performance indicator (KPI). The most-powerful thresholds are fully automatic and depend on deviations from previous behavioral patterns.

Summary

Oracle Communications Fraud Monitor is a rule-based, scalable solution that helps service providers and enterprises detect fraud and prevent it before damage is done. The software system is easy to deploy and can fully integrate with existing infrastructure. Oracle Communications Fraud Monitor monitors all calls in the VoIP network, performs real-time analysis of user behavior, and learns the behavioral patterns of each individual user and user group. Using predefined or customized rules from multiple metrics, it identifies deviations in user behavior and stops fraud attacks efficiently and effectively.

Key features

- ✓ **Fully agnostic to attack types**
- ✓ **Fully agnostic to monitored network**
- ✓ **Dynamic patterns analysis**
- ✓ **Near real-time fraud detection**
- ✓ **Automated behavioral analysis**
- ✓ **Historical per-subscriber data**
- ✓ **Easy and lightweight to deploy**
- ✓ **Flexible, scalable and extendable**
- ✓ **Define dynamic lists to ensure session border protection**

Key benefits

- ✓ **Extend existing infrastructure to detect and prevent phone fraud efficiently**
- ✓ **Reduce operational costs and network complexity**
- ✓ **Identify fraud incidents within seconds by collecting real-time information**
- ✓ **Apply predefined rules or customize your own set of rules**
- ✓ **Leverage fraud alerts to disable or redirect users, trunks, and subscribers**
- ✓ **Analyze and document attacks to prevent future fraud**

Related products

- Oracle Communications Operations Monitor
- Oracle Enterprise Operations Monitor
- Oracle Communications Session Border Controller
- Oracle Enterprise Session Border Controller
- Oracle Communications Session Delivery Manager

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