Oracle® Communications Session Monitor

Fraud Monitor User Guide

Release 5.1

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Contents

About This Guide

This guide describes how to install, configure, and use Oracle Communications Fraud Monitor.

The Oracle Communications Session Monitor product family includes the following products:

- Operations Monitor
- Enterprise Operations Monitor
- Fraud Monitor
- Control Plane Monitor

Documentation Set

Table 1   Documentation Suite for OCSM 5.1

Document Name	Document Description
Backup and Restore Guide	Provides instructions for backing up and restoring Session Monitor.
Developer Guide	Contains information for using the Session Monitor SAU Extension.
Fraud Monitor User Guide	Contains information for installing and configuring Fraud Monitor to monitor calls and detect fraud.
Installation Guide	Contains information for installing Session Monitor.
Mediation Engine Connector User Guide	Contains information for configuring and using the Mediation Engine Connector.
Operations Monitor User Guide	Contains information for monitoring and troubleshooting IMS, VoLTE, and NGN networks using the Operations Monitor.
Release Notes	Contains information about the Session Monitor 5.1 release, including new features.
Security Guide	Contains information for securely configuring Session Monitor.
Upgrade Guide	Contains information for upgrading Session Monitor.

Revision History

This section provides a revision history for this document.

Date	Description
April 2023	Initial release.

1

Overview of Fraud Monitor

This chapter provides an overview of Oracle Communications Fraud Monitor.

About Fraud Monitor

Oracle Communications Session Monitor captures network traffic, correlates it in real time, and stores it in an indexed format for reporting by the browser interface. A multi-layered architecture ensures scalability, reliability and cost-effectiveness.

Figure 1-1   OCSM Architecture
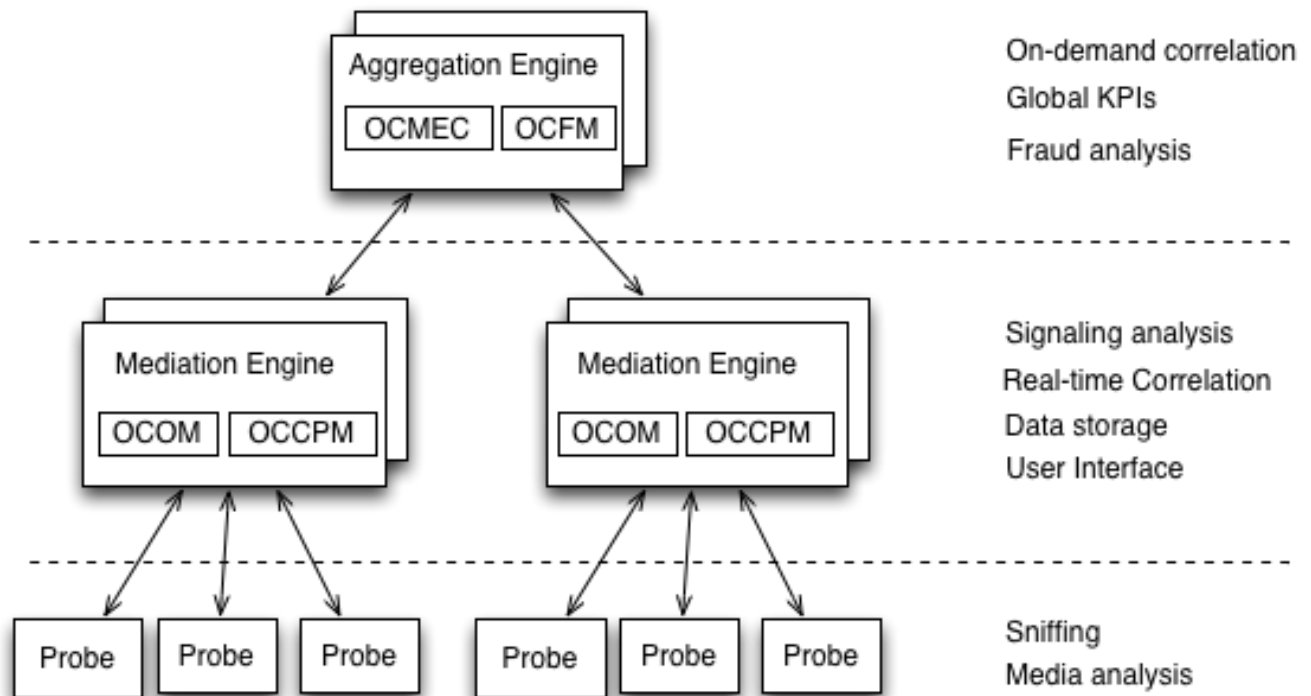
The architecture has three layers:

- The Probe layer captures network traffic and performs Media Quality analysis.

- The Mediation Engine (ME) layer correlates network traffic and stores it for future reference. This layer also measures, manages and stores the KPIs. While there is usually one ME per geographic site, one site may have multiple MEs or probes from multiple geographical sites may send traffic to a single ME.

- The Aggregation Engine (AE) layer aggregates the global KPIs, with on-demand call correlation and global search features. In a typical setup, there is only one AE for the whole network.

The Session Monitor architecture consists of the Probe layer, Mediation Engine layer, and the Aggregation Engine layer (see the discussion about Session Monitor architecture in *Session Monitor Installation Guide* for information about the functions performed in each layer).

Fraud Monitor runs on the Aggregation Engine (AE) machine, but relies on the data provided by the Mediation Engines (MEs) to detect fraud. For each established call, the ME that has correlated the call, sends a notification to the AE, when the call is established, then one notification every few minutes and finally a notification at the end of the call. This allows Fraud Monitor to be aware of the real-time state of all the calls in the system and use this state to apply the different behavioral rules.

Logging In to Fraud Monitor

The Login page allows you to access Fraud Monitor. Enter your user name and password into the indicated fields, then click **Sign in** to proceed to the application.

In case your user name or password are incorrect, a warning message is displayed and you will have the opportunity to retry.

> **Note:**
>
> After three incorrect attempts, your account will be suspend for fifteen minutes.

Figure 1-2   Fraud Monitor Login Page

About Using the Fraud Monitor User Interface

The Fraud Monitor user interface has several recurring elements. At the very top, you have the bar which gives access to admin settings. Below the bar on the right is the navigation menu that lets you navigate to the main pages: Overview page, Learning Period, Incidents page, Learning Page, Details page, and the Settings page.

The Overview page shows the current fraud status at a glance. It has big warning indicators as well as a table of the recent potential fraud incidents. From there you can further analyze the latest issues.

The Learning Period page displays information learned over time by Fraud Monitor.

The Incidents page displays the full table of recent incidents, with related rules, and from there you can pick an incident for further investigation.

The Details page shows a single user and his incidents. This page contains a short history of the potential fraud that might have occurred.

The Settings page of the Fraud Monitor user interface lets you configure the rules, manage the users, adapt the notifications, specify blocklists, Allowlists, ratelimit, redirect, import/export lists, and generate automatic lists required for a successful operation of Fraud Monitor

Overview Page

The Overview page is the landing page that appears automatically after you log in. The Overview page displays the status information on processed calls, incidents, users, as well as general information about how Fraud Monitor works. You use this page to check for recent incidents and then navigate to other pages to further investigate the user.

Figure 1-3   Overview Page
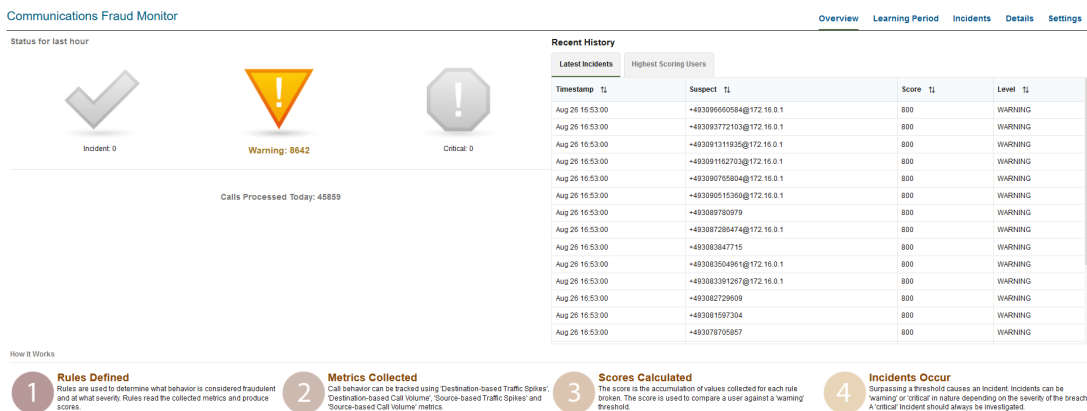
Viewing the Status for the Last Hour

The Status for the Last Hour section displays the total number of calls processed for the day and the number of incidents detected in the last hour. The incident counts are accompanied by large icons for quickly establishing overall status. If no incidents are detected, a large green tick image is displayed. If any warning incidents are detected, a large orange warning sign image is displayed. If any critical incidents are detected, a large red stop sign image is displayed. It's possible for warning incidents and critical incidents to be detected in the same time frame. When an icon is not being displayed, it remains faded grey in the background.

> **Note:**
>
> If the calls processed counter is not increasing, you may not have configured your Mediation Engine correctly.

Viewing the Latest Incidents

On the right-hand side of the page, the Latest Incidents section shows a small list of the most recently detected incidents. A more extensive list can be found on the Incidents page. Double-clicking on an incident will take you to the **Details** page for that particular offending user which shows information such as Timestamp, Suspect, Score, Level.

Viewing the Highest Scoring Users

On the right-hand side of the page, the Highest Scoring Users section shows a small list of the users with the highest scores. Double-clicking on a user will take you to the Details page for that particular offending user.

How it Works

On the bottom of the page, the How it Works section outlines how Fraud Monitor works in four steps. You might refer back to this anytime you need to be reminded how the components of Fraud Monitor inter-relate.

Learning Period Page

The **Learning Period** page displays information learned over time by Fraud Monitor.

Accessing the Learning Period Page

You can access the **Learning Period** page using the Learning Period link on the Fraud Monitor Home Page.

The **Learning Period** page is visible only to Admin users and displays user information for the following dynamic rules:

- Destination-based call volume
- Destination-based traffic spikes
- Source-based traffic spikes
- Source-based call volume

Figure 1-4   User Listing on the Learning Period Page
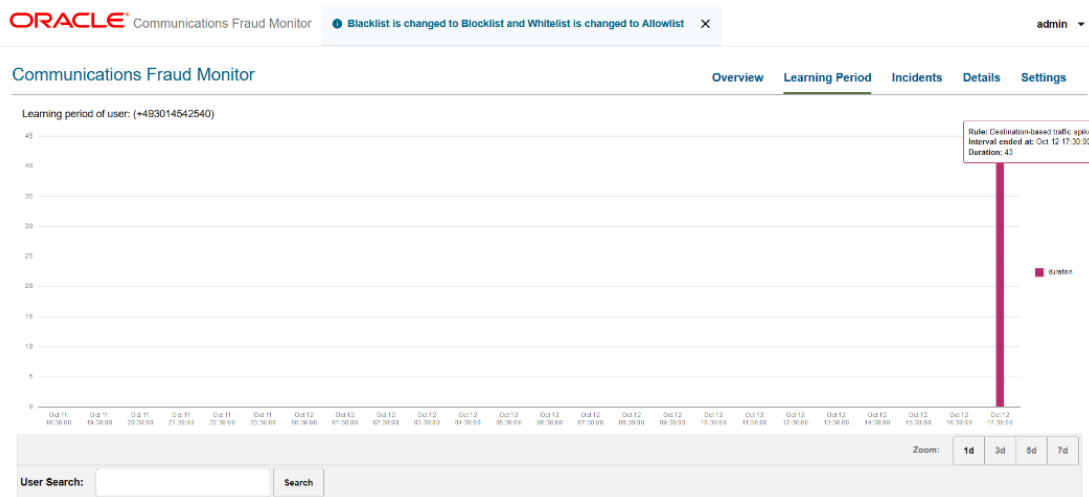
You can view 50 users and search dynamically learned user data for specific users. For each selected user, Fraud Monitor displays 7 days of previously captured user activities.

On hovering over the graph, you can see the name of the rule, the value for the user, and the interval ended at.

You can also search for a specific user using the **User Search** option.

Searching for Users in the Learning Period Page

The Learning Period Page displays user information and metric type rules.

To search for a user:

1. In the **Learning Period** page, type the user name in the **User Search** box. For example, 98765332333.

2. Click **Search**.

    The search results displays all such users that exactly match the query, and also a count of the all matches in shown.

> **Note:**
>
> The **User Listing** section displays data relevant for the last 7 days only.

Viewing the Learning Period Graph

You can view the Learning Period graph for a specific user.

To view the graph:

1. Select a user from the **User Listing** section.

    The Learning Period graph is shown in first section of the page.

- The X-axis of the graph shows time in hours.
- The Y-axis of the graph displays the average duration of the call for destination-based-traffic-spikes and source-based-traffic-spikes. For source-based-call-volume and destination-based-call-volume the graph displays average calls per second and maximum active calls.

Figure 1-5   Learning Period graph

2. To adjust the period reflected in the graph, use the controls at the bottom of the graph.

Incidents Page

The **Incidents** page lists all the calls that have triggered incidents. This includes warning and critical incidents. See the **Settings** page to configure incident levels. As incidents are triggered they are added to the Incidents page in real-time.

The latest incidents are on top and incidents are not cleared; they stay forever unless you delete them yourself (see below). The **Suspect** column is the callers/callee number or IP address.

> **Note:**
>
> Fraud Monitor captures only the Phone number and not the call conversation.

The **Comments** column displays the comments added by the fraud detection team. Reviewing the comments helps team to know if an action has been taken on single/ multiple incidents. The comments help the team to prioritize and analyze incidents.

You can add, edit, delete comments using the **Edit Comment** button. To manage comments for multiple incidents, use the **Shift** key and click, or select the check box. You can also search for incidents based on the comments using the **Comment Search** option.

When a line is selected, the panel on the right - **Message** section shows the details of this incident including the comments. It displays the caller as well as which rule or rules caused the incident to be triggered.

Figure 1-6   Incidents page

Figure 1-7   Add/Edit Comments in the Incidents Page

The **Rule Broken** column displays the name of the rule that was broken or violated against an incident.

If you double-click on an incident, you will go to the **Details** page for that user. Selecting a row and clicking **Go to User Details** button does the same.

In the **Details** page, when you click **Incidents**, you will be redirected to the **Possible Incidents** page. In this page, you will be able to edit comments or delete the Incidents.

If a user first triggers a *warning* incident and later upgrades that to a *critical* incident, both will be listed.

You can delete a single incident or multiple incidents by selecting the check box next to it and clicking **Delete**. This removes the incident or incidents from the list.

To avoid a surge of incidents for the same suspect, Fraud Monitor notifies the user by raising an incident, once in every 10 minutes internally, although Fraud Monitor analyzes and records the user into the database every time the suspect is evaluated. When the user causes multiple incidents of the same level (warning or critical) within 24 hours, a new incident is not triggered. Deleting a row from the incident list will *not* reset that timer. Deleting an incident is useful when, after investigation, you conclude that an incident is not fraudulent.

Times are in the local time zone.

Details Page

The **Details** page shows information on a particular user. Also, the Allowlist for countries of this user can be maintained on this page and all records associated with this user may be deleted.

The Details page can be reached using the top menu or from the Incidents page.

Typically, in this view one will search a user, if none is selected yet, and then consider the metrics to determine if an incident is justified. In case no user has been chosen, one must be selected using the search field. Then the scores, the calls, and the geographical data for this user are displayed. Each of these topics is explained in the following sections.

Figure 1-8   Details Page
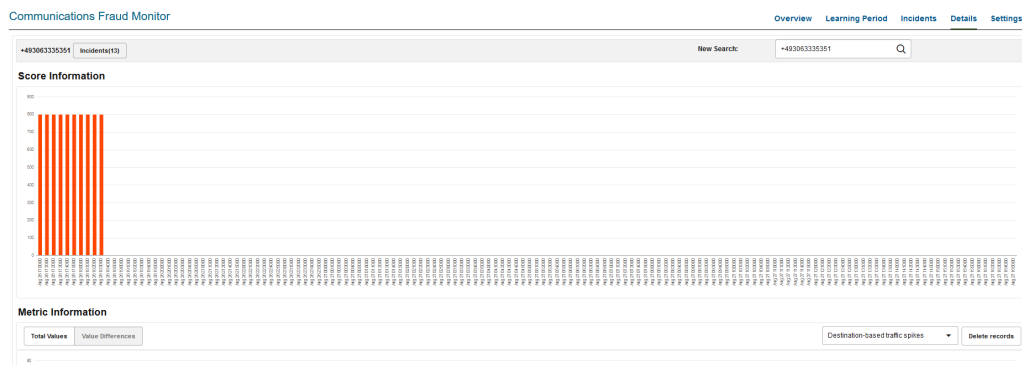
Performing a User Search

The **New search** field allows you to select a user for display by IP or phone number. After four characters matches are shown. Select one of the proposed matches, press return or click **Search** to display the user.

Deleting User-Specific Records

Click **Delete records** to remove all information regarding the user. This includes metric values, scores and incident related information.

Viewing Score Information

The Score Information diagram shows scoring information of all incidents for the last 24 hours, going back from the current time. It is not possible to go further back than 24 hours. For each incident measuring interval, a bar displays the score reached.

Viewing Metric Information

The Metric Information diagram show metrics of selected rules. For each ten minute interval, the values of the last 24 hours are shown in comparison to the average over the last two weeks.

The y-axis displays the number of minutes or calls, while the x-axis specifies the intervals. A red line displays the averages, while the bars show the current data.

By using the check boxes in the top right corner, you can choose what values to display.

- The traffic spikes

The alternative display modes in the top left corner, **Total Values** and **Value Differences**, toggle between displaying the current values as absolute values and as the difference to the average.

Settings Page

The Settings page of the Fraud Monitor user interface lets you configure the rules, manage the users, adapt the notifications, specify blocklists, Allowlists, ratelimit, redirect, import/export lists, and generate automatic lists required for a successful operation of Fraud Monitor.

Among the settings, rules is the most important setting. In the Rules section, you can enable and configure patterns that are used to detect fraud and trigger incidents.

Figure 1-9   Settings Page

User Menu

The User menu is located on the top right corner of the page on the header bar. A drop-down menu appears when you click on your user name.

Figure 1-10   User Menu
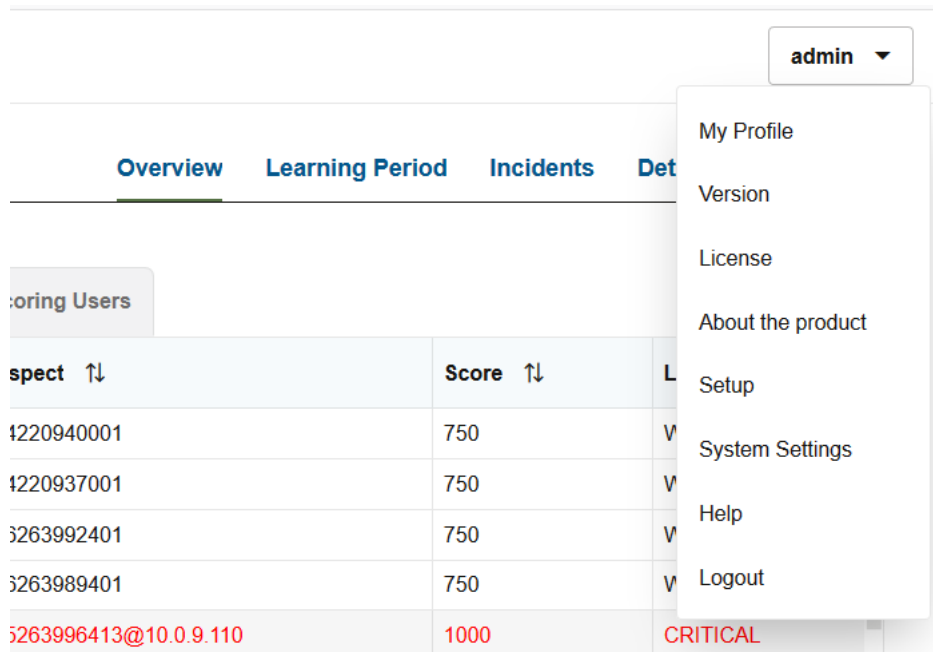
Editing the User Profile

You can edit your own profile details by selecting **My Profile** in the User menu. A dialog box appears giving you the option to change your user name, email and password. Fill out the new values for the details you would like to change and click **Finish** to save the changes. Click **Cancel** to exit the window without making changes.

Viewing System Information

You can view the current system information by selecting **System Settings** in the User menu.

Viewing License Information

You can view the product license terms and conditions by selecting **License** in the User menu.

Logging Out

You can logout of Fraud Monitor by selecting **Logout** in the User menu. This brings you back to the Login page.

2

Detecting Fraud

This chapter describes some of the common fraud scenarios and fraud detection rules.

How Fraud Monitor Detects Fraud

The Session Monitor probes and Oracle Communications Session Border Controllers with the embedded probes software enabled send monitoring information to the Mediation Engines. The Mediation Engine (ME) then feeds call state information to Fraud Monitor. Fraud Monitor analyzes every incoming call and applies various rules to them. A single rule or a combination of multiple rules may add enough points to trigger a fraud alert. Alerts are on two levels: *warning* and *critical*. Warning level alerts should be investigated while critical level alerts can be considered proven fraud incidents, for example, due to hits on the blocklist which contains known incidents.

> **Note:**
>
> A user (also known as a subscriber to distinguish between users of the system and participants in monitored calls) is identified either by his IP address or by the local part of his From SIP URI. If the SIP URI is sip:2125551234@example.com, then the user is shown as 2125551234 in the GUI.

About Fraud Scenarios

The following sections describe some of the common fraud scenarios.

PBX Fraud

Scenario

Users on the internal side (for example, inside an enterprise) may conduct outbound calls and also receive calls. When looking from the outside (visible to Session Monitor or an SBC), the PBX receives calls for a limited set of numbers (for example, the number range of the enterprise) and makes phone calls to almost any number. Depending on the customer, the outbound calls may be directed to a restricted area (for example, mostly local calls).

Detection Method

Whenever possible, multiple metrics should be used to identify fraud. Calls bound to the PBX (as seen from Session Monitor or an SBC) are not subject to fraud in this context but may be part of a fraud scheme (for example, when representing the inbound leg of a forwarded call). In fact, an attacker might bypass the Session Monitor or the SBC monitoring points so that inbound calls are not. Fraud might be detected by observing a change in the daily distribution of calls as well as the geographical restrictions.

International Revenue Share Fraud

International Revenue Share Fraud (IRSF), Domestic Revenue-Share Fraud (DRSF), and Premium Rate Fraud are closely linked. The detection methods for all three scenarios are similar and all covered in this section.

Scenario

An attacker operates a premium number with a revenue share provider in a foreign country. For each call or call minute conducted to this number the attacker receives part of the revenue. The attacker's goal is to inflate the traffic to this number to increase his revenue. The services provided via this number may range from random announcements to call-through services. To redirect traffic to his number, the attacker may place calls (no connect, just creating a missed call entry) with a spoofed number to victims leading them to call him back. In a more sophisticated scenario, the attacker introduces his premium number into his victims' communication as a call-through service. He may modify VoIP endpoints (PBXes, VoIP enabled routers, and so on.) to carry his number as prefix. A Bluetooth-based attack has been used to replace phone numbers in mobile phones and prefix them with a premium number. This not only increases the revenue for the attacker, but (as above) also allows the attacker to eavesdrop on the phone calls. The most common approach to inflate traffic to the fraudsters phone number is to break into PBX or voicemail systems and call his own number knowing that this costs the PBX or voicemail operator significant amounts of money.

Typically the fraudster can collect revenue from the premium number quicker (for example, each day or each week) than the billing cycle on the originating side (for example, once a month). This allows the fraudster to extract money from the system before the bill hits him on the originating side if he decides to increase the traffic on his own.

Detection Method

The Amount of Traffic to the fraudulent number(s) increases. A hit on the disallowed entries may also be triggered.

About Fraud Detection Rules

The metrics described in this section are based on the fraud scenarios above. Multiple rules may be combined to detect a single fraud scenario. Throughout this section the term subscriber relates to either a single IP address or a single phone number.

Traffic Profile

Once a few days of call data for a single subscriber is available a graph with the time of the day on the x-axis may be generated. The y-axis shows the number of calls or call minutes conducted. Once a fraud attack happens the shape of the graph will change.

Blocklist and Allowlist Entries

A list of specifically allowed and disallowed phone numbers or phone number prefixes can be used to identify fraudulent calls. In case international entries are disallowed by

a company policy, an international entry may be an indicator of fraud. The customer may add individual entries to a customer-specific list of disallowed entries.

Depending on whether the system observed an exact entry hit or a prefix match the scores assigned may differ. A prefix match on its own may not directly trigger a critical alarm but when combined with other metrics (for example, the amount of traffic to the suspicious entry) it may generate a critical alarm.

Rules in Fraud Monitor

Fraud Monitor uses rules to detect fraudulent calls. A rule uses multiple metrics and define how values are attributed to each user. Fraud Monitor provides four rules:

- Destination-based traffic spikes
- Destination-based call volume
- Source-based traffic spikes
- Source-based call volume

Destination-based Traffic Spikes

This rule monitors traffic spikes based on absolute amounts (static rule) or deviations from the typical traffic pattern (dynamic rule).

The destination-based traffic spikes rule can be used to detect fraudulent calls based on traffic spikes. This rule is based on the threshold calculated on the basis of call duration (in minutes). If the parameters of the call match the parameters configured in the rule filter, and if the threshold is crossed, then the destination user of the particular call accumulates points. Once the user-accumulated points cross the threshold, an incident is raised, and an alert is sent to the user by email or SNMP.

In order to receive an email or SNMP notification, the email recipient or SNMP notification must be configured. For more information, see Setting Up Email Notifications.

Destination-based Call Volume

This rule monitors destination traffic spikes based on deviations of Calls per Second (CPS) and Maximum Active Calls (MAC) from a typical traffic pattern (static and dynamic rule).

For each call, Fraud Monitor, monitors the **Success Calls Per Second** that the destination user has received and compares it to its historical average (Success Calls are when 200OK for INVITE is received).

Simultaneously, it also monitors the Active Calls for that user.

If a configurable threshold is exceeded for either Calls per second OR Max Active Calls, both the source and destination users accumulate points.

Once the user-accumulated points cross the threshold, an incident is raised, and an alert is sent to the user by email or SNMP. To receive an email or SNMP notification, the email recipient or SNMP notification must be configured. For more information, see Setting Up Email Notifications.
This rule can be used to identify possible candidates for blocklisting or redirecting destination numbers.

Source-based Traffic Spikes

This rule monitors traffic spikes based on absolute amounts (static rule) or deviations from the typical traffic pattern (dynamic rule). Fraud Monitor can raise an incident if a specific source user generates unusually high traffic measured by call duration. If a threshold is exceeded, both the source and destination users accumulate points. This rule can be used to identify possible candidates for blocklisting source numbers.

The source-based traffic spikes rule is based on the threshold calculated on the basis of call duration (in minutes). If the parameters of the incoming call match the parameters configured in the rule filter, and if the threshold is crossed, then the source user of the particular call accumulates points. Once the user-accumulated points cross the notification threshold, an incident is raised, and an alert is sent to the user by email or SNMP. In order to receive an email or SNMP notification, the email recipient or SNMP notification must be configured. For more information, see Setting Up Email Notifications. You can define metric rules using call duration to measure the traffic spike.

Source-based Call Volume

This rule monitors traffic spikes based on deviations of Calls per Second (CPS) and Maximum Active Calls (MAC) from the typical traffic pattern (static and dynamic rule).

Fraud Monitor can raise an incident if a specific source user generates unusually high call volume. If a threshold is exceeded, both the source and destination users accumulate points. This rule can be used to identify possible candidates for blocklisting source numbers. The source-based call volume rule is based on the threshold that is calculated on the number of calls per second and the maximum number of active calls. If the parameters of an incoming call match the parameters configured in the rule filter, and if a configurable threshold is crossed, then the source user for that particular call accumulates the point. Once the user-accumulated points cross the notification threshold level, an incident is raised and an alert is sent by email or SNMP. For more information, see Setting Up Email Notifications. In order to receive an email or SNMP notification, the email recipient or SNMP notification must be configured.

3
Installing Fraud Monitor

This chapter describes how to install Oracle Communications Fraud Monitor.

Hardware Requirements

The following minimum requirements must be met to install Fraud Monitor:

- 2.6 GHz Intel Xeon processor, 64-bit with 8 processing threads
- 8 GB RAM
- 70 GB storage on a hardware RAID controller
- 2 Ethernet ports

> **Note:**
>
> For production use, Oracle recommends a more thorough sizing exercise completed with your Oracle sales engineer. Higher performance hardware may be required, for example, in cases with:
>
> - High levels of monitored traffic
> - High numbers of concurrent users
> - High volumes of historical information

Installing Fraud Monitor

To install Fraud Monitor:

1. Install Session Monitor using RPM. Refer to Installing Session Monitor using RPM in the *Session Monitor Installation Guide*.

2. Login to Platform Setup Application (PSA) and configure the machine as Fraud Monitor. Refer to the section, About the Platform Setup Application in *Session Monitor Installation Guide*.

   a. On the Machine Type screen, select **Aggregation Engine**.

   b. Select **Fraud Monitor**.

Follow the steps in the Installation wizard.

After successful installation, the user should be able to login to the application with Default credentials. Contact your Oracle Sales Representative.

4

Configuring Fraud Monitor

This chapter provides information for configuring Oracle Communications Fraud Monitor.

About Configuring Fraud Detection Rules

The Settings page of the Fraud Monitor user interface lets you configure the rules, manage the users, adapt the notifications, specify blocklists, Allowlists, ratelimit, redirect, import/export lists, and generate automatic lists required for a successful operation of Fraud Monitor.

The Rules section enables you to configure the patterns that are used to detect fraud and trigger incidents. If the current settings do not trigger any incidents, you may need to change the patterns or raise the points.

> **Note:**
>
> Go to the Platform Setup Application and refer to *Session Monitor Installation Guide* for settings (for example, network interfaces, DNS, or SMTP) that affect the server running Fraud Monitor.

Configuring Rules

Fraud Monitor uses configurable rules to find call patterns which are considered fraudulent and classify the severity of the incident with a points system. On the **Rules** section, you can decide which rules are used, configure them, and restrict their use.

To configure metric rules:

1. Click **Settings**.

2. Click the navigation bar on the left-hand side of the page that lists the set of rules you can use.

Figure 4-1   Configuring Fraud Monitor Rules
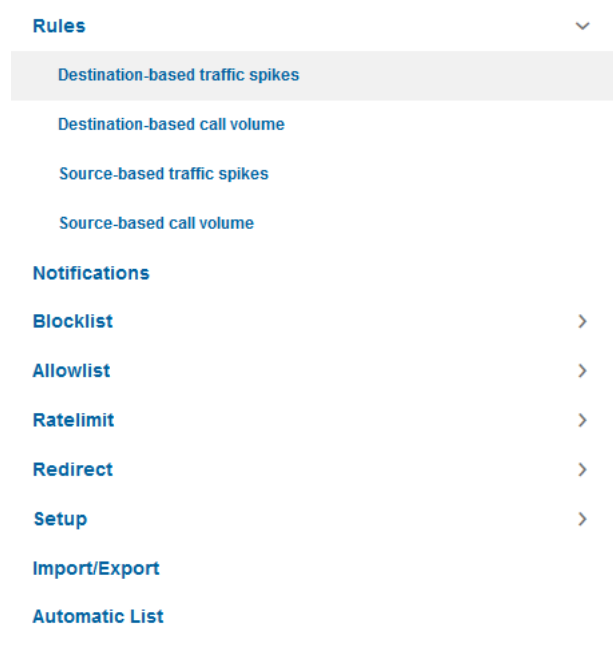
3. Click on a rule to open up its configuration panel in the left panel.

    Every configuration panel has **Add**, **Edit** and **Delete**, which you can use to configure a specific rule.

4. Use the check box next to the rule name in the left panel to enable or disable the rule. The check-box is enabled by default.

Figure 4-2   Example of Rules Configuration
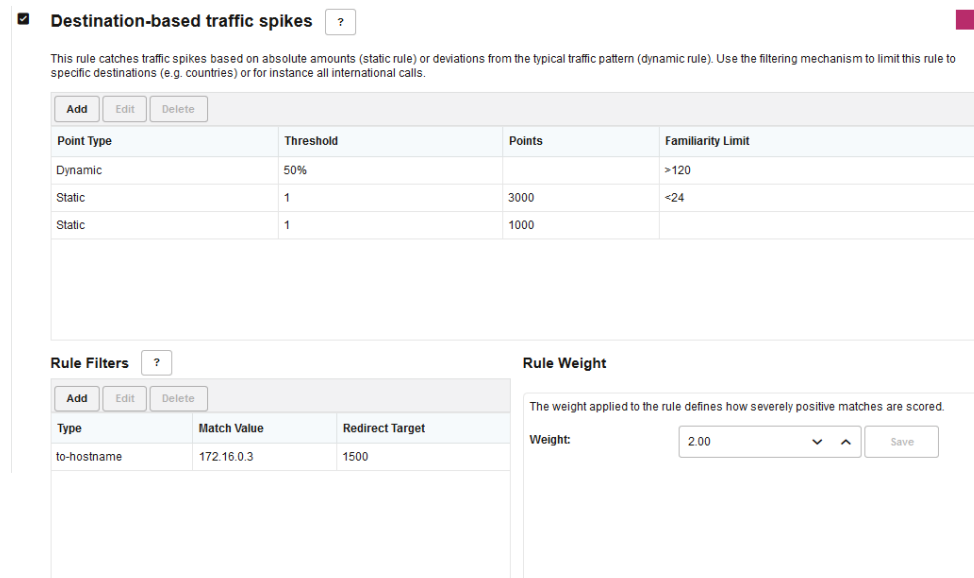
5. Click **Add** to add the rule definition. The **Add Rule** window is displayed.

6. In the **Add Rule** window, define the rule using the threshold, point type, and Familiarity limits fields.

Field	Description
Point Type	Select Dynamic or Static. For more information, see Configuring Points Accumulation.
Threshold	Threshold is the limit. If the threshold is crossed, then users accumulate points. Enter it in terms of percentage for a dynamic metric, or an integer for a static metric.
Points	Points assigned.
Familiarity limit	Familiarity is the difference in time relative to the time when the network user was seen by Fraud Monitor for the first time. Use the > or < prefixes to specify an upper or lower limit. For example, if you enter > 2, it means that a rule is only applicable if the user's timestamp is at least less than 2 hours in the past.
	if you enter "<2", it means that a rule is only applicable if the timestamp for a given user is not yet 2 hours in the past.
	If you do not specify the familiarity limit, then the rule is always applicable.
	This is optional.

7. Assign a **Rule Weight** The default is value **1.00**. The rule weight can be used to make some rules more important than others.

   Based on the Alert settings configured, if any user crosses the notification threshold on any rule, an incident is raised and a notification is sent to the user.

Configuring Points Accumulation

Points are scores that a user accumulates when a threshold is crossed.

You can configure user points accumulation based on two methods:

- Dynamic
- Static

Dynamic Method of Points Accumulation

Dynamic points are the percentage points that a measured value deviates from a recorded average.

Total points is calculated as:

(((value - average) * 100) / average) * weight.

Dynamic points and percentage thresholds require a period of at least 24 hours for any user to compare a newly recorded value against a historic average. The minimum for the historical period is 24 hours.

Static Method of Points Accumulation

Users accumulate points if the call duration, or calls per second, or max active calls crosses the threshold value. You can configure the threshold in minutes for traffic spike rules. When the user crosses the threshold, points are assigned to the user. Points are calculated as:

Score = total points * weight.

Add Rule Filter

A rule filter is used to apply a rule to a subset of network calls. You can define a rule filter to filter calls based on phone numbers, Hostnames, Usernames, and User-agent headers. For phone numbers filter type (from-phone-number and to-phone-number) you can define as regular expressions also, e.g. 00xxxxxxxxx, 00[00-24]xxxxxxx, +[00-26]xxxx(xxxxxx), 927*, +91*. Currently, regular expressions are not supported in other filter types.

To add a rule filter

1. In the window for configuring rules, click **Add** in the **Rule Filters** section. For example, if you want to add rule filter for Source-based traffic spike rule, click **Add** in the **Rule Filters** section. The **Add Rule Filter** window is displayed.

Figure 4-3   Rule Filters

2. Configure the rule filter using the Type, Match Value, and Redirect Target fields.

Field	Description
Type	Lists the data type for the user.
Match Value	Use to specify the value for the Type selected above. For example, if you select the Type as from-phone-number, specify the phone number in the Match Value field.
Redirect Target	Add the IP address to which the call has to be redirected. This field is optional.

3. Click **Save**.

Setting Up Email Notifications

When Fraud Monitor detects an incident, it notifies the users by email.

shows an example of the notification settings.

To send e-mail notifications, click on **Add recipient...** In the window that appears, enter the following settings:

- **Name:** A name to identify the new entry in the list of recipients

- **Email:** The email address to which notifications will be sent

- **Incident level:** Select:

    – **WARNING + CRITICAL** - To receive all notifications.

    – **CRITICAL** - To only receive notification on critical incidents

    – **Do not receive updates** - To not receive any notifications on incidents.

- **Prefix:** Emails from the system will contain this prefix in the **Subject:** field of the recipient inbox

- **Expiry Updates**:

    – **Receive Updates**: Information on expired subscribers from different lists is sent on the configured email address.

    – **Do not Receive Updates**: Select this option to not receive any updates about the expiry of subscriber entries.

Figure 4-4   Notification Settings for an Email Recipient

Add Email Recipient   ✕

Recipient Information
Please provide name, email, a minimum notification level and an optional email subject prefix.

Name:	test
Email:	test@example.com

Incident level:
- ◉ WARNING + CRITICAL
- ○ CRITICAL only
- ○ Do not receive updates

Prefix:	

Expiry updates:
- ◉ Receive updates
- ○ Do not receive updates

Finish   Close

Adjusting the Notification Levels

To receive more or less notifications, you can adjust the two levels, warning and critical, in number of Incident points. The rules specified in the **Rules** page assign points to each user of the network. If the number of points for a user exceeds the threshold warning (1000 by default), an email is sent to all recipients of level **WARNING**. If it exceeds the level critical (1500 by default), the notification is sent to all recipients.

This is a global sensitivity adjustment. You can choose the amount of points each single rule attributes in the Rules section.

Specifying Blocklist

The Blocklist contains phone numbers, IP addresses, and hostnames which have been identified and verified to be invloved in fraudulent activity.

Using the **Configuration** menu option, you can:

- Enable and disable the Blocklist feature for specific data types such as phone numbers, hostnames, usernames or user-agent headers.
- Configure the Expiry Timer Value. For more information, see Configuring the Expiry Timer

The Blocklist information provided by Oracle is in the international format. You can append a prefix to international numbers or provide a regular expression to transform the number.

Using the **Custom Blocklist** menu, you can add, edit, delete, and exempt individual entries.

> ✏️ **Note:**
>
> Exempting a subscriber entry removes the user from the global Blocklist. But it can still acuumulate points from other rules. Exempted users are shown in a seperate list in the main **Blocklist** page.

Adding a Custom Blocklist User

You can add a Blocklist user and specify the data type. Fraud Monitor captures the information for the user based on the data type. Click the **Custom Blocklist** menu option to view the custom entries that you have created.

To add a Blocklist user:

1. From the **Settings** screen, click **Blocklist**.

   The Blocklist screen appears.

2. click **Add**.

   Add a Custom Blocklist User screen appears.

3. From the **Type** drop-down list select the data type for the user.

4. In the **Match Value** field, enter the value of the type selected above. The value depends on the **Type**.

   For example, if you have selected, **from-phone-number** for the **Type**, then the **Match Value** must be a valid phone number.

5. In the **Comment** field, enter any additional information for the user.

6. Select the **Never Expire** option to make the expiry timer to be set to **Never** for this subscriber entry. Expiry timer value set in the Configuration page will be overwritten for this user.

7. (Optional) Select **User exempted from blocklist** to exempt from blocklist.

> ✎ **Note:**
>
> By selecting this option, you are exempting the user from the Blocklist. Fraud Monitor remains susceptible to accumulating points from other rules defined for the user.

8. Click **Save** to add the user or click **Cancel**.

Specifying Allowlist

Fraud Monitor does not raise incident alerts for users that are added to the Allowlist. You can add users to the Allowlist by adding their source/destination phone number or Hostnames.You can add and remove Allowlist entries. Both IP addresses and phone numbers are possible. After adding or removing Allowlist entries, click **Save**. The new rules will go into effect immediately.

Phone numbers or IP addresses matching a Allowlist entry are not used for point calculation. This filtering is done before any processing by any rule.

Calls which match a Allowlist entry can still raise incidents. For example, if you block a certain caller IP address a call can still trigger an incident if the callee phone number is on the Blocklist.

Both the phone number and the IP address of the caller and of the callee are tested against the list. The comparison is against the complete value, so there are no regular expressions or substring comparisons. If there are alphanumeric letters in the number, these will be treated as case sensitive.

Some rules only check against the caller's IP address or phone number. Filtering based on values you would expect in the callee won't significantly effect these rules.

You can configure the Expiry Timer Value using the Configuration menu. For more information, see Configuring the Expiry Timer.

Adding a Custom Allowlist User

You can add a Allowlist user and specify the data type. Fraud Monitor captures the information for the user based on the data type. Click the **Custom Allowlist** menu option to view the custom entries that you have created.

To add a Allowlist user:

1. From the **Settings** screen, click **Allowlist**.

   The Allowlist screen appears.

2. click **Add**.

   Add a Custom Allowlist User screen appears.

3. From the **Type** drop-down list select the data type for the user.

4. In the **Match Value** field, enter the value of the type selected above. The value depends on the **Type**.

   For example, if you have selected, **from-phone-number** for the **Type**, then the **Match Value** must be a valid phone number.

5. In the **Comment** field, enter any additional information for the user.

6. Select the **Never Expire** option to make the expiry timer to be set to **Never**. for this subscriber entry. Expiry timer value set in the Configuration page will be overwritten for this user.

7. Click **Save** to add the user or click **Cancel**.

Specifying Ratelimit List

The Ratelimit list allows you to add custom entries. You can add Phone numbers, IP addresses, User names and SIP User Agents. You can also exempt users by removing them from the global ratelimit.

Customers may either upload the ratelimit information provided through the import menu or they can manually enter the custom entries.

Global flag is marked as **True** for entries uploaded through import menu such as the phone numbers, usernames, hostnames, and SIP User Agents which have been identified and verified to be involved in fraudulent activity.

Use the **Configuration** menu to:

- Adjust the points awarded for prefix and exact match hits from this list.

- Configure the Expiry Timer Value. For more information, see Configuring the Expiry Timer.

Should you want to exempt a specific entry, check the corresponding flag while adding or modifying that entry. But that exemption does not work for other lists like blocklist or redirect. If you want to exempt an entry from all lists, add the same in Allowlist. The CPS or MAC entries are not taken into account for raising incidents from ratelimit list, only presence is checked.

Entry can also come in this list via Automatic Configuration: Subscribed flag would be true for such entries and also those entries cannot be used for raising further incidents.

The Ratelimit supports all the data types supported by SBC for processing the calls. Following are the available data types:

- from-hostname

- to-hostname

- from-phone-number

- to-phone-number

- from-username

- to-username

- user-agent-header

Figure 4-5   Creating the Ratelimit List

You can filter the data based on these data types. Click the required data type in the screen and data is displayed for the selected data type.

You can **Add**, **Edit**, **Delete**, **Exempt** users.

> **Note:**
>
> Exempting a subscriber entry removes the user from the global Ratelimit list. Exempted users are shown in a seperate list in the main Ratelimit list page. Exempted users are shown in a seperate list in the main **Ratelimit List** page

Adding a Ratelimit User

You can add a ratelimit user and specify the data type. Fraud Monitor captures the information for the user based on the data type.

To add a ratelimit user:

1. From the **Settings** screen, click **Ratelimit**.

   The **Ratelimit List** screen appears.

2. click **Add**.

   Add a Ratelimit User screen appears.

3. From the **Type** drop-down list select the data type for the user.

4. In the **Match Value** field, enter the value of the type selected above. The value depends on the **Type**.

   For example, if you have selected, **from-phone-number** for the **Type**, then the **Match Value** must be a valid phone number.

5. In the **Calls Per Second** field, enter the number of seconds that call shall be allowed.

6. In the **Max Active Calls** field, enter the number of calls allowed for the user from the **Type** selected.

7. In the **Comment** field, enter any additional information for the user.

8. Select the **Never Expire** option to make the expiry timer to be set to **Never** for this subscriber entry. Expiry timer value set in the Configuration page will be overwritten for this user.

9. (Optional) Select **User exempted from ratelimit** to exempt from ratelimit.

> **Note:**
>
> By selecting this option, you are exempting the user from the global ratelimit. Fraud Monitor remains susceptible to accumulating points from other rules defined for the user.

10. Click **Save** to add the user or click **Cancel**.

Configuring Ratelimit

Configuring Ratelimit screen allows you to enable and disable the Ratelimit feature for specific data types, such as Phone numbers, IP addresses, User Names or SIP User Agents. Disabling a data type has an effect on Ratelimit List. You may assign points for both prefix and exact hits for each data type.

Figure 4-6   Ratelimit List Configuration

> **Note:**
>
> You have to modify **Current Notification Thresholds** from **Notifications** screen.

Specifying Redirect List

This Redirect List allows you to add custom entries to configure a redirect target for suspicious users. You can add Phone numbers, IP addresses, User names and SIP User Agents. You can also exempt users.

You can either upload the redirect information provided through the import menu or you can manually add the custom entries.

The **Global** flag is marked as **True** for entries uploaded through import menu such as the phone numbers/usernames, hostnames, and SIP User Agents which have been identified and verified to be involved in fraudulent activity.

You can **Add**, **Edit**, and **Delete** the users. Double-click a user to edit the details.

If you want to exempt a specific entry, select the **User exempted from Redirect** checkbox while adding or modifying a user entry. Exempted users are shown in a seperate list in the main **Redirect List** page. But the exemption will not work for other lists like Blocklist or Ratelimit. To exempt an entry from all lists, add the same in Allowlist.

Entry can also come in this list using Automatic Configuration: Subscribed flag is true for such entries and also those entries are not meant to be used for raising further incidents.

The Redirect List supports all the data types supported by SBC for processing the calls. The available data type are:

- from-hostname
- to-hostname
- from-phone-number
- to-phone-number
- from-username
- to-username
- user-agent-header

You can filter the data based on these data types. Click the required data type in the screen and data is displayed for the selected data type.

Figure 4-7   Redirect List

Use the **Configuration** menu to:

- Adjust the points awarded for prefix and exact match hits from this list.
- Configure the Expiry Timer Value. For more information, see Configuring the Expiry Timer.

Adding a Redirect User

You can add a redirect user and specify the data type. Fraud Monitor captures the information for the user based on the data type.

To add a redirect user:

1. From the **Settings** screen, click **Redirect**.

   The Redirect screen appears.

2. click **Add**.

   Add Redirect User screen appears.

3. From the **Type** drop-down list select the data type for the user.

4. In the **Match Value** field, enter the value of the type selected above. The value depends on the **Type**.

   For example, if you have selected, f**rom-phone-number** for the **Type**, then the **Match Value** must be a valid phone number.

5. In the **Redirect Target** field, enter the IP address to redirect the call.

6. In the **Comment** field, enter any additional information for the user.

7. Select the **Never Expire** option to make the expiry timer to be set to **Never** for this subscriber entry. Expiry timer value set in the **Configuration** page will be overwritten for this user.

8. (Optional) Select **User exempted from Redirect** to exempt from the Redirect List.

   > ✎ **Note:**
   >
   > By selecting this option, you are exempting the user from the Redirect List. Fraud Monitor remains susceptible to accumulating points from other rules defined for the user.

9. Click **Save** to add the user or click **Cancel**.

Configuring Redirect

The Redirect Configuration screen allow you to enable and disable the Redirect feature for specific data types, such as Phone numbers, IP addresses, User Names or SIP User Agents. Disabling a data type has an effect on Redirect list. You may assign points for both prefix and exact hits for each data type.

Figure 4-8   Configuring Redirect Screen

> **Note:**
>
> You have to modify **Current Notification Thresholds** from **Notifications** screen.

Automatic Deletion of Expired Entries

Fraud Monitor allows you to create various types of subscriber lists such as Blocklist, Allowlist, Ratelimit, and Redirect. A default expiry time of 48 hours is assigned to every subscriber entry in any list.

A subscriber entry expires 48 hours after its addition to a list. A warning or notification in the form of an email/SNMP trap is sent out at 03:23 everyday.

If the administrator has enabled **System Settings** > **Automatic Expiry Delete**, then 24 hours after the expiry, all subscriber entries that have expired are deleted from the specific list. If you have not enabled the **Automatic Expiry Delete**, then as the administrator user, you can review the expired entries and delete them manually.

Configuring Automatic Expiry Delete

The **Automatic Expiry Delete** option enables the automatic deletion of the expired entries in the Blocklist, Allowlist, Ratelimit, or Redirect lists. The expired subscriber entry is automatically deleted 24 hours after it's expiry.

To configure Automatic Expiry Delete:

1. Navigate to **admin** > **System Settings**.

2. In the **System Settings** dialog box, double-click **Automatic Expiry Delete**.

3. In the **Update System Setting** dialog box, select **Enabled** to enable the Automatic Expiry Delete setting. By default, it is disabled. If Automatic Expiry Delete is not enabled, then after the expiry, the entries are moved to the **Review Expired** tab, where you can manually review, delete or extend the expiry time.

Applying Automatic Expiry for Existing Entries

Verfiy the expiry time set for the existing subscribers of the previous release. When set to **True**, the existing entries follow the value set in the Expiry Timer Value.

To view the expiry time of existing entries in all lists:

1. Click **admin** > **System Settings**.

2. In the **System Settings** dialog box, verify that the **Apply Automatic Expiry for Existing Entries** is set to **True**. For more information on the Expiry Timer Value, see Configuring the Expiry Timer.

Configuring the Expiry Timer

You can configure the Expiry Timer Value which determines the expiry of a subscriber entry, and the deletion of the expired entries from the Blocklist, Allowlist, Ratelimit, and Redirect lists.

To configure the Expiry Timer Value:

1. Navigate to the required list for which the timer needs to be configured. For example, if you want to configure the timer for the Blocklist, go to: **Settings** > **Blocklist** > **Configuration**.

   You can configure the expiry time for each list separately. Subscribers of a list expire based on the Expiry Timer configuration of the list.

2. In the **Expiry Timer Value** section, add the value in terms of hours. The default value is 48 hours. This means that a subscriber entry expires 48 hours after its addition to the list. You can specify any value between 48 -1440 hours.

   A warning or notification in the form of an email/SNMP trap is sent out at 03:23 everyday. This notification contains a list expired subscribers. If you have enabled **admin** > **System Settings** > **Automatic Expiry Delete** , then 24 hours after the expiry, all expired entries are deleted from the list. When set to **True**, the Automatic Expiry Delete, the administrator can delete the expired entries from the list. This action cannot be performed by a non-admin user. For more information on verifying the status the Automatic Expiry Delete setting, see Configuring Automatic Expiry Delete.

3. Select the **Never Expire** option. This makes the expiry timer to be set to Never. Any subscriber newly added or edited will never expire. All existing entries will continue to have their expiry date as defined previously. The **Expiry Timer Value** field will be disabled. You will not be able to modify the expiry time. By default, the **Never Expire** option is disabled.

   > **Note:**
   >
   > You can also set the **Never Expire** option from the Add/Edit Custom Blocklist, Allowlist, Ratelimit, or Redirect pop-up window.
   > Selection of the **Never Expire** option from an **Add/Edit** window will be applicable for that particular user only. Any expiry value set from the Configuration page will be overwritten for this user.

Reviewing and Extending the Expiry Time of Expired Entries

You can review the expired entries of a list, and extend the expiry time of multiple expired entries.

To extend the expiry time of entries:

1. Navigate to the list. For example, **Settings** -> **Blocklist** -> **Custom Blocklist**.

2. Click **Review Expired**. For more information, see Information in the Review Expired Tab

3. Select the entries for which you need to extend the expiry time. You can select a maximum of 20 entries at one time.

4. Click **Extend Expiry Time**.

5. In the **Extend Expiry** dialog box, click **Yes** to confirm.

   The Expiry Date field for a subscriber is calculated based on the expiry timer value set for the subscriber entries. If the **Never Expire** option enabled, then the subscribers get an indefinite expiry value. This is valid for all lists.

The expiry time for the entry is extended by the value configured in the **Expiry Timer Value**

Deleting Expired Subscriber Entries

You can review and delete the expired entries using the **Review Expired** tab,

To delete the expired entries:

1. Navigate to the list. For example, **Settings** -> **Blocklist** -> **Custom Blocklist**.

2. Click the **Review Expired** tab. For more information, see Information in the Review Expired Tab.

   You can view the expired entries in the deleted_entries_`mm-dd-yy` file that is created everyday with information on the expired entries. This file is available under the `/tmp/expired_entries/` folder.

3. Select the entries that you need to delete. You can a select a maximum of 20 entries at one time.

4. Click **Delete** .

   Only the Administrator can delete the expired entries.

Viewing the Automatically Deleted Expired Entries

You can view all expired entries that were automatically deleted from Fraud Monitor.

Accessing the File Containing Deleted Entries

The automatically deleted expired entries are available under the `/tmp/expired_entries/` folder. A file with the format `deleted_entries_mm-dd-yy` is created everyday with the information of the expired list entries that were deleted that day.

This file contains information on Fraud List type, Datatype and Subscriber information. For example, List of Expired Elements: Blocklist from-hostname 172.11.1.1

Information in the Review Expired Tab

This table lists the columns displayed in the Review Expired tab.

Information in the Review Expired Tab

Table 4-1   Review Expired Tab

Column Name	Description
Type	Data type of the subscriber
Match Value	Predicate value of subscriber
Date	Date when the subscriber was added to the list.
Expiry Date	Expiry Date of the subscriber
Subscribed	Boolean value if the subscriber is an automatic list
Global	Boolean value if the subscriber has been uploaded as a part of import functionality.
Comment	Description

Setting Up Notifications for Expiry Updates

Fraud Monitor sends notifications (Email/SNMP) to the user when it detects expiry of subscriber entries. If you do not want to receive such notifications, you can configure this in the **Notifications** page.

To set up notifications for Expiry updates:

1. Navigate to **Settings** > **Notifications**.

2. In the **Email Recipients** section, click **Edit**. to add or edit settings.

3. In the **Add email recipient** window, click: .

    *   **Receive updates** to receive notifications.

    *   **Do Not receive updates** to not receive notifications on the expiry of the entries.

4. Click **Finish**.

This configures Fraud Monitor not to send or to send notifications on the expiry of subscriber entries.

Configuring Mediation Engine

The configuration section under Setup lists the Mediation Engine connections. Fraud Monitor analyzes the data from the connected Mediation Engines.

The Fraud Monitor details needs to be configured for the Mediation Engine. See the Configuring Fraud Monitor chapter.

OCFM 4.4 supports connection to multiple Mediation Engines. This means that simultaneous connection to multiple Mediation Engines can be connected. The **Setup**

page displays the connection status of all Mediation Engines that are simultaneously connected. The number of Mediation Engines supported is limited to 10.

Once the connection is established between Mediation Engine and Fraud Monitor, the connection details are displayed in this configuration screen. You can also view the connection failures details on this page.

- **Name:** Indicates the machine name.

- **IP:** Indicates the IP address to which Fraud Monitor tries to connect for analyzing the data.

- **Status:** Indicates whether the Mediation is connected or disconnected.

- **Date:** Indicates the date and time when the Mediation Engine is connected or disconnected.

After adding or changing a connection, Fraud Monitor tests the connection. Any errors are displayed in a dialog box.

Figure 4-9   Connection to multiple MEs

Other System Settings

In the System Settings window, you will find these settings:

Table 4-2   System Settings Window

Settings	Description
Mediation Engine Connection	Not used.
Global Calls per sec	Sets the value for the **Calls Per Second** field for Ratelimit entries added using the Mediation Engine context menu.
Global Max Active Calls	Sets the value for the **Max Active Calls** field for the Ratelimit entries added using the Mediation Engine context menu.

Table 4-2   (Cont.) System Settings Window

Settings	Description
Global Redirect Target	Sets the value for the **Redirect Target** field for the Redirect list entries added using the Mediation Engine context menu.

Managing Users

You can manage users and assign permission for accessing the Fraud Monitor information. You can create user accounts to work with Fraud Monitor.

By default, only the *admin* account exists. The admin can **Add**, **Edit,** and **Delete** the users.

Figure 4-10   Users List

To add an user:

1. From **Settings** page, click **Setup**.

2. Click **Add**.

   The Add User screen appears.

3. In this screen, do the following:

   a. In the **Username** field, enter the user name for the new account.

   b. In the **Email** field, enter the e-mail address of the user.

   c. In the **New Password** field, enter the password for the user account.

   d. In the **Repeat Password** field, re-enter the password from the above step.

   Click **Next**.

   The Add User - Permission Settings screen appears.

4. Select the permissions for the user by clicking the checkbox. Alternatively, you can click **check all** and **uncheck all** options.

User is created successfully. You can edit user details by clicking the **Edit** button.

> **Note:**
>
> The new user will then be able to connect using the credentials you have chosen. It is recommended that the user change this password at the first connection.

Figure 4-11   Granting Capabilities to the New User

Configuring Import/Export

The Import/Export allows you to import/export data in CSV format for a particular list type (Blocklist/Ratelimit/Redirect).

> **Note:**
>
> You can only import/export files in .csv format. Maximum file size allowed is 10 MBytes.

Figure 4-12   Import Export Page

Import/Export
This page is used to import/export data in CSV format to particular list type(Blocklist/ Ratelimit/ Redirect) selected.
Note: Accepts only csv format & Maximum allowed file size is 10Mb.

Number Prefix
The Blocklist, Ratelimit & Redirect information is in the international format without a leading + or leading zeros. If you use a different numbering scheme in your network please provide the prefix to prepend to the international numbers or a regular expression to transform the numbers.

Enter prefixes:

`+,00`

☐ Keep original numbers (without prefix) in list

Save

Import
List Type: Blocklist ▾   Upload new file...   Select file +
                                                    Upload

Export
List Type: Blocklist ▾   Export

From this screen, you can:

- **Number Prefix**: You can enter prefixes of the phone numbers to save the data for exporting and importing. The Blocklist information is in the international format without a leading + or leading zeros.

  If you use a different numbering scheme in your network, provide the prefix to prepend to the international numbers or a regular expression to transform the numbers.

- **Import:** Import either Blocklist, Ratelimit, or Redirect lists. You can select the required option from the drop-down list and **Select file** from your system and click **Upload** for importing the file.

- **Export:** Export either Blocklist, Ratelimit, or Redirect lists. You can select the required option from the drop-down list and click **Export** for exporting the file.

A Note on Expire Column in the .csv File

During an import of user entries for a specific list from a .csv file, the value in the **Expire** column of the .csv file determines the expiry criteria for a user entry imported. Here is an extract of a .csv file being imported:

Figure 4-13   Expire Column in the .csv File

	A	B	C	D
1	field	predicate	date	expire
2	from-hostname	10.10.10.10	2/8/2020 16:57	Never
3	to-phone-number	9876543	2/8/2020 16:57	
4	from-username	alice100	2/8/2020 16:58	
5	to-hostname	1.1.1.1	1/29/2021 13:26	1/31/2021 13:26
6	user-agent-header	test	1/29/2021 13:26	1/31/2021 13:26

Configuring the Automatic List

Table 4-3   Entry in the Expire Column in the .csv File

Entry in the Expire Column in the .csv File	Interpretation for Expire Condition
Blank	The user entry in the .csv file takes in the Expiry timer value set in the Configuration page of the specific list.
Never	The user entry never expires.
Date in the format: 1/31/2021 13:26:26	The user entry expires on the date set in the .csv file.

Configuring the Automatic List

In Fraud Monitor, you can configure different thresholds for different lists (Blocklist, Ratelimit, and Redirect) based on the metric rules, Destination Based Traffic Spikes or Call Volume.

When the configured threshold is reached, the corresponding suspicious user/Phone number is moved automatically to the respective list as configured.