Orange IoT Connect Express
M2M API

Services overview

Version: 1.2

1 INTRODUCTION

1.1 m2m connectivity services

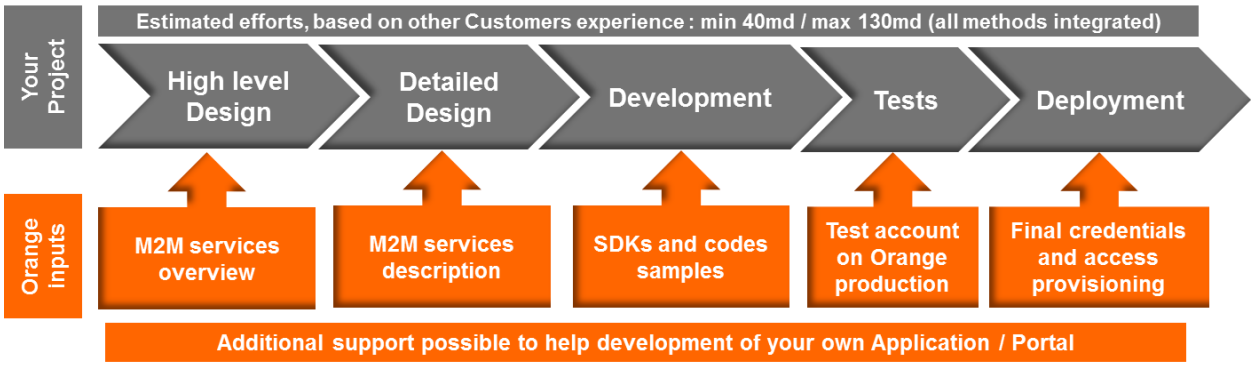
Orange Mobile Enterprise M2M API empowers your applications with visibility and control over your M2M communications services, seamlessly and globally. The API environment is fully part of the service delivery cycle.

The Orange Mobile Enterprise API is built upon common web services standard, keeping integration efforts to a minimum and allowing you to immediately control key aspects of connected solutions: SIMs inventory, Offers selection, SIM lifecycle management, Usage information, fleet monitoring and alarm.

The Orange Mobile Enterprise API (Application Programming Interface) provides you the freedom to develop the integration of your choice: business logic and enterprise security standards ensure your communications data are only available for you.

1.2 m2m API

The services listed above are available through an API (Application Programming Interface), which groups SOAP web services. These services can be directly integrated in your software applications. They allow automating deployment and daily management of your machines fleets.



The Orange Mobile Enterprise API online documentation and support, as well as code samples and step by step tutorials, will help you to develop integration, test it safely and put it into production very quickly and securely.

1.3 Document content and purpose

This document provides an overview of the m2m Orange m2m API services. It helps to understand the features and actions associated with these services.

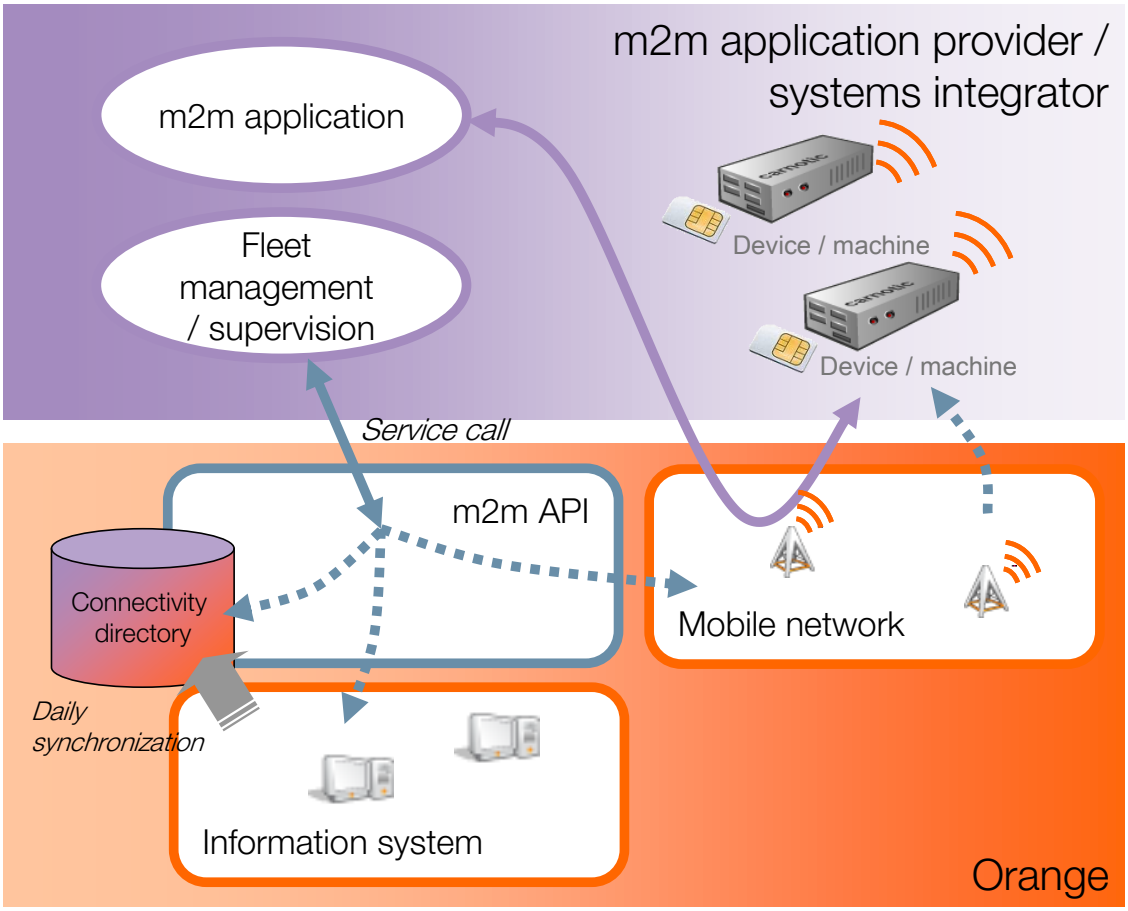
It is designed for **m2m systems integrators** and is an introduction to the services for developers before going further into the programming documentation.

Part 2 provides an overview of the services behaviour and the manipulated data.

Part 3 details the data and services provided.

2 OVERVIEW OF THE SERVICES

2.1 Operating pattern



The relevant SIM cards information is stored in a database: the **connectivity directory**. The data stored in this directory come from the Orange information system. They may be **completed by information from the m2m customer application** to be associated with the SIM cards (device, machine).

The m2m API services interact with this directory, but also with the information system and the mobile network.

2.2 Manipulated data

m2m API services allow to manage and to obtain information on:

- a SIM card,
- a subscription : a subscription or subscriber number relates to one SIM card.

As an option, the connectivity directory can be used as a repository for the identifiers of the device and/or the machine containing the SIM card; this machine and/or device identifiers can then be used to call the web services.

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2.3 SIM card and subscription status

The SIM status and the related offer will follow your business processes and adapt automatically and instantly to your expected manufacturing (test) and distribution processes, as well as to your targeted customer experience (device that works out of the box). The billing for example starts when the service is delivered and invoiced on your side, not before.

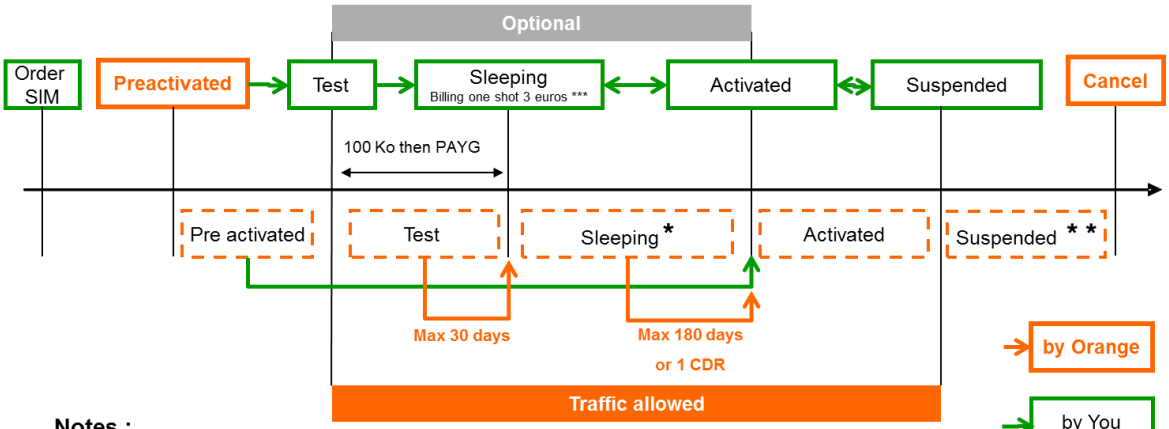
The SIM card status largely depends on the status of the associated subscription (subscription status in the Orange network and/or billing status). These status are modified by the **activation process, suspension and termination**.

The different SIM card status are the following:

1. **Pre activated (ready for activation)** : everything has been configured by Orange for the use of the SIM card. Activation can be requested.
2. **Activated for test**: the subscription of the SIM card is activated on the network, the recurrent billing is not activated; the test is possible, without billing, for a pre-defined duration and volume of traffic.
3. **Sleeping**: the subscription of the SIM card is activated, but recurrent billing is not activated. The subscription billing will start only after exchanging a first message (and moving to the “activated” status)
4. **Activated**: the subscription of the SIM card is activated and the recurrent billing also.
5. **Suspended**: the SIM card cannot temporarily be used but can be reactivated at any time. Billing subscription continues.

The possible status changes are the following :

- Standard life cycle management



Notes :

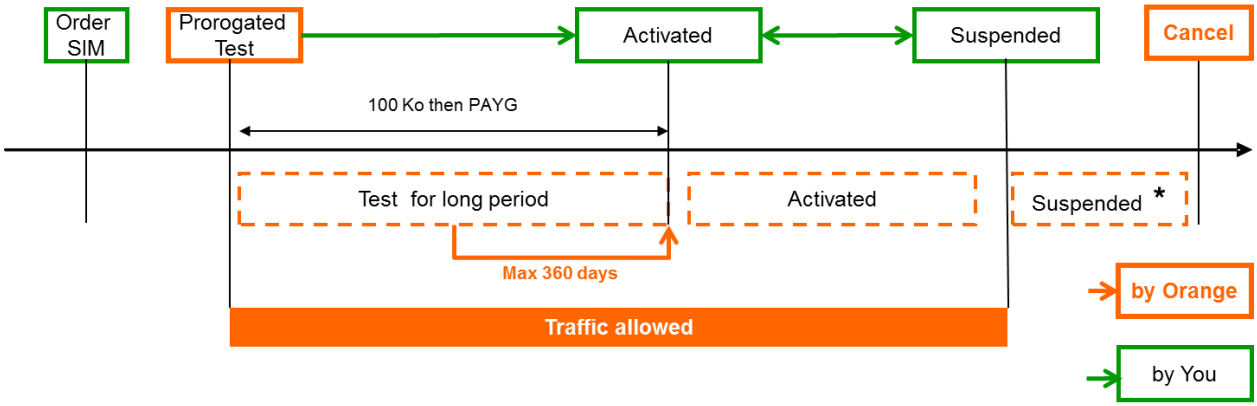
100 Ko it can be used in either Europe or the world (then PAYG)

* Whenever there is a first outgoing traffic (data, voice or SMS) between the first and the 180th day, Discounted subscription takes end.

** Suspended voluntary is incompatible from sleeping and test

*** can be discussed depending on commercial settlement

- Extended test mode (API mode only)



Notes:

100 Ko it can be used in either Europe or the world (then PAYG)

* Suspended voluntary is compatible with test long period

2.4 List of Services

The features and actions provided by the API through **computer methods** are **gathered into services** (technically corresponding to a WSDL (Web Services Description Language) file).

These services are:

1. **Connectivity directory**: the methods of this service provide access to the SIM cards information, stored in the **connectivity directory** and, allow adding attributes for the device and/or the machine.

2. **Subscription status**: the method of this service recalculates and gets the current status of a SIM card, from Orange information system. The call of this method causes the update of the SIM card status in the connectivity directory.
3. **SIM life cycle management**: the methods of this service allow acting on the activation process of SIM cards, by changing their status.
4. **Session history**: the methods of this service allow obtaining the communication history exchanged by **one** machine / SIM card, for a given period of time in order to analyze traffic.
5. **Traffic tracking**: the methods of this service will let you obtain the aggregated value of the messages exchanged by one or several machines / SIM cards for a maximal period running from the first day of the current month to the current date.
6. **Connectivity monitoring** : the methods of this service will let you obtain :
    - Country and operator on which the SIM is attached;
    - The location of the mobile cell on which SIM is attached, and the last location requested;
    - The unique identifier of the device (IMEI), and the last IMEI requested..
7. **Alarms**: the methods of this service enablers alarms definition, in order to warn when abnormal behaviours occur in the field.

The alarms can be set for one specific SIM card or for your whole fleet.

Your applications can be automatically alerted through URLs , when the following incidents occur :

- detected traffic on a non-desired period of time;
- detected traffic on a non- desired country (operator as an option);
- detected traffic on one non- desired communication type (MMS, voice, …);
- no traffic detected during a defined period of time (at least 3 days);
- traffic below or above a defined threshold, during a period of time (at least 3 days);
- detected traffic with a different IMEI (the SIM card has been moved from its original device to another one);
- SIM subscription status or option change.

There are also methods to consult alarms whenever you want by their identification or by the search criteria on the fleet (line or account identification)

3 DATA AND SERVICES DESCRIPTION

3.1 Main data details

Legend:

- Highlighted attributes, if initialized, can be used as identification criteria of a SIM card, when calling a service.
- *Italic* attributes can be initialized and modified through the m2m API service

Orange data:

Orange data are information from Orange information system and network.

SIM Card:

serialNumber	SIM card serial number
Imei	International Mobile Equipment Identity, (IMEI) of the device associated to the SIM card
puk1	SIM PUK (Personal Unblocking Key): 8 digits code for unblocking the SIM card
puk2	Second PUK code when the first one has been blocked
Status	Current status of a SIM
suspensionReason	Reason of suspension, when this one takes place
lastStatusRefreshDate	Date of the last refresh of the SIM card status, in the connectivity directory
lastStatusChangeDate	Date of the last modification of the SIM card status in the Orange information system
requestedStatus	SIM card status required when a status modification has been requested
statusChangeRequestDate	Date of the SIM card status modification request

Subscription:

identifier	Subscriber identifier (also called subscriber number)
description (label)	Subscription characteristics
value	Subscribed offer name
user	Subscriber name
userRef	Reference provided by the subscriber, at the subscription
services – service []	Subscribed options list
creationDate	Subscription creation date
msisdnData	Calling number (data)
msisdnVoice	Calling number (voice)
msisdnFax	Calling number (fax)

m2m solution provider / systems integrator data:

The m2m solution provider, can link to each SIM card, in the connectivity directory, his own business data.

Device:

uniqueIdentifier	Unique device identifier
serialNumber	Device serial number
contact	Name & address of the person in charge of the device
name	Name of the machines operator
email	Email of the machines operator
phone	Phone number of the machines operator
communicationModule	Information about the communication module
model	Communication module model
brand	Communication module brand
category	Device type
description	Device description
address	Device installation address
deviceLocation	Device installation position (additional address)
deviceHolder	Contact name to physically reach the device
updateDate	Last device update

Machine (machine):

serialNumber	Machine serial number
name	Machine name
description	Machine description
updateDate	Last machine update

3.2 Connectivity directory

The methods of this service provide synchronous (*) access to the SIM cards information, stored in the **connectivity directory** and allow adding potential attributes concerning associated device and/or machine.

Synchronous (*)

(*): *Synchronous* means that the result comes back with the method response.

This feature consolidates and provides you with all the relevant data concerning the SIM card, its related subscription and offer, as well as all device oriented information that you may have uploaded to manage your business. This is a complete inventory to get all the information you need.

SIM cards information (and possibly that of associated machines) are stored in a database: the **connectivity directory**. Some of these directory data come from the Orange information systems and some can be managed and updated by the customer. Orange data are updated regularly but can also be refreshed on-demand.

getConnectivityDirectory	Get the information associated with one or several SIM cards, using their IDs.
searchInConnectivityDirectory	Get the information associated with one or more SIM cards, using search criteria.
updateConnectivityDirectory	Update the machine or device information associated with one or more SIM cards.

3.3 Subscription status

The method of this service recalculates and gets the current status of a SIM card, **from the Orange information system**. The call of this method causes the update of this status in the directory connectivity.

Synchronous (*)

(*): *Synchronous* means that the result comes back with the method response.

getSubscriptionStatus	Recalculates, relying on the information system data, the current status of **one** SIM card. It is a way to refresh connectivity directory on demand for one dedicated line.

3.4 SIM life cycle management

The methods of this service allow acting on the activation process of SIM cards, by changing their status.

Asynchronous (*)

(*): *Asynchronous* states that the execution is launched (ticket is sent to the requestor), but another method must be called later on (with the ticket), to get the result. Status change *can take some minutes, to some hours.*

submitUpdateSimStatusRequest	Submits an update request of the status of one or more SIM cards.
getUpdateSimStatusResult	Gets the in-progress result of a status change request. Gets the final result provided by the service

3.5 Session history

The method provides you with the detailed history of all communications and sessions for each SIM card, within a given period of one month, and allows you to analyze the associated traffic in depth.

Asynchronous (*)

(*):*Asynchronous* states that the execution is launched (ticket is sent to the requestor), but that another method must be called later on (with the ticket), to get the result. Result can be ready in a few seconds to a few minutes. The result relies on CDRs (Call Detailed Reports) processing, performed every 2 hours, but some CDR may be received later-on by Orange from roaming Partners (from a few hours to few days).

submitSessionHistoryRequest	Submits a communication history/log request.
getSessionHistory	Gets the on-going processing information Gets the final result of a communication history/log request.

3.6 Traffic tracking

The methods of this service provide the aggregated value of the messages exchanged by one or several machines / SIM cards **by lines or for a set of lines within your park, for or maximal period of time between the first day of the current month and the current date**.

Asynchronous (*)

(*):*Asynchronous* states that the execution is launched (ticket is sent to the requestor), but that another method must be called later on (with the ticket), to get the result (with the ticket). Result can be ready in a few seconds to a few minutes. The result relies on CDR (Call Detailed Reports) processing, performed every 2 hours, but some CDR can be received later-on by Orange from roaming Partners (some hours to few days).

submitTrafficTrackingRequest	Submits a request to monitor communication (aggregated value of exchanged messages) of one or several SIM cards.
getTrafficTracking	Gets the in-progress result of a communication monitoring request, including the number of communications, the amount of information exchanged. This information is grouped per type of communication (WLAN, GPRS, voice, UMTS) and origin (roaming or local or both).

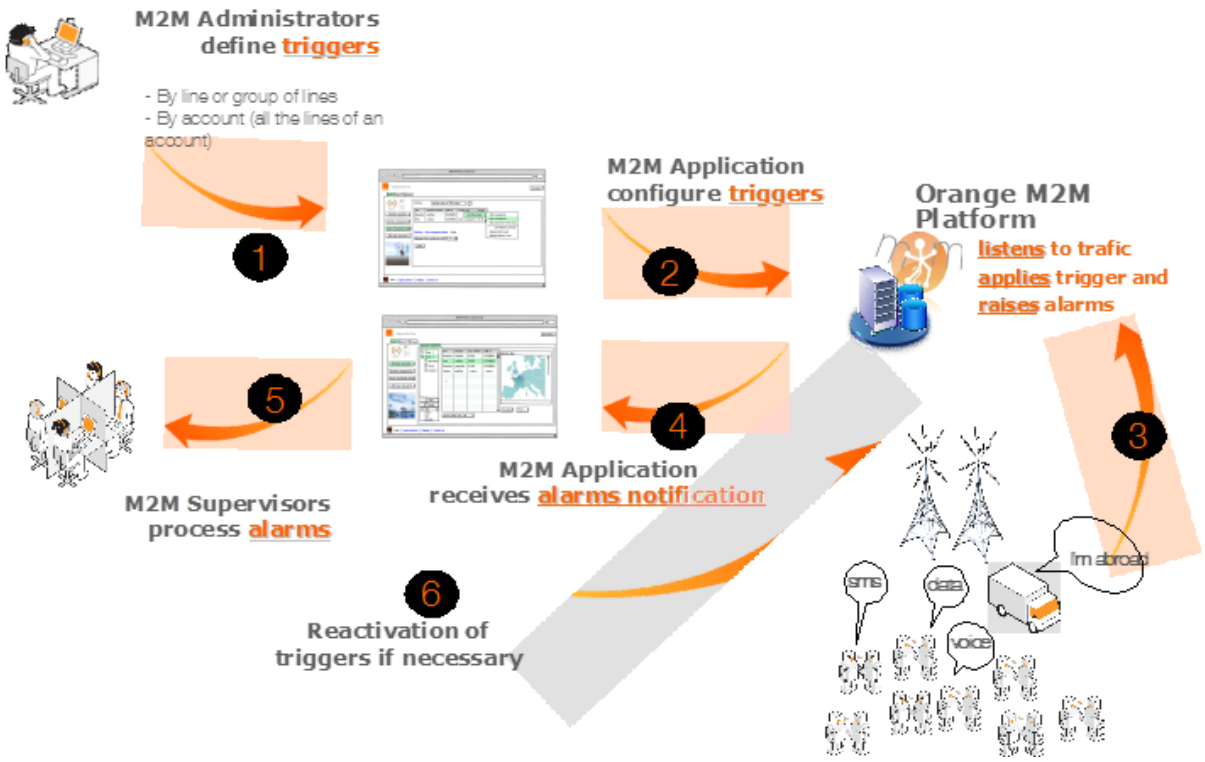
The communications aggregation are provided by call type and by call (roaming or local) origin. The different call types and the aggregation measurement unit are the following :

bearertype	unit
GPRS_EDGE	byte
UMTS_3G	byte
SMS	number
VOICE	second
MMS	number
CONSUMPTION_TRACKING (call to the consumption follow up server)	number
FAX	number
MULTIMEDIA_PURCHASE	number
WIFI	second
VALUE_BASED_COMMUNICATION	number
UNKNOWN (other kind of call)	number

3.7 Customers alarms

This feature allows you to define and configure alarms that raise notifications in case of specific event, for example to warn you about ***over-consumption, lower-consumption or lack of consumption,*** associated with a SIM or a group of SIMs. Another example could be the ***detection of undesired traffic*** for a given period of time, a specific country and / or operator, defined communication types (MMS, multimedia purchases…), or ***IMEI change*** (SIM is no longer in the paired device).

The alarm can either lead to a ***notification*** (raised directly to your application integrating this service, 12 times a day, by URL call or by email), or a ***consultation*** (made by your application using corresponding call in the service definition guidelines)

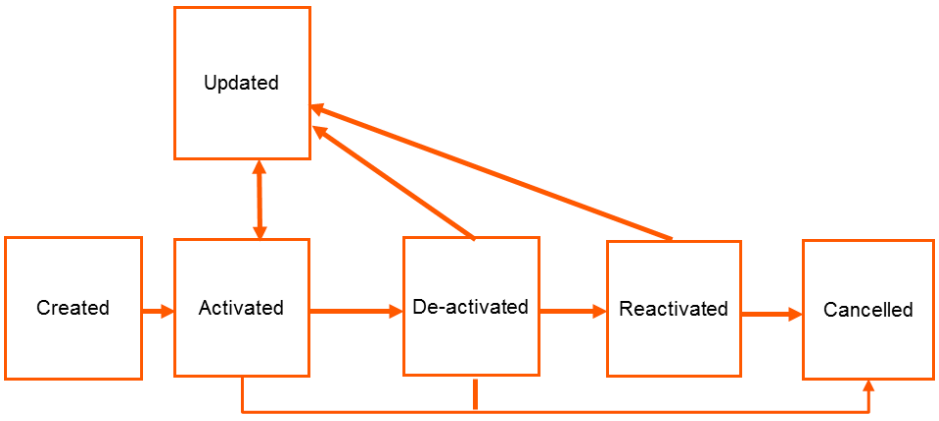


As indicated on the scheme, the customer application is in charge of configuring the triggers and receives associated notifications.
The notifications are URL calls, providing alarms when they are decteted, the URL to be used has been declared once when the service is first configured. The URL is provided by youto Orange.

List of Trigger methods:

Trigger settings	
CreateTriggerRequest	Allows you to create a new alarm trigger on a line or on the whole fleet
UpdateTriggerRequest	Allows you to update an alarm trigger (trigger parameter modification/ trigger deactivation/ trigger reactivation, notification requested for alarms of this trigger, customer customisation information to organize triggers by group. Allows also trigger reactivation.
ListTriggersRequest	Allows you to consult existing alarms triggers (on the fleet or on dedicated lines)
DeleteTriggerRequest	Allows you to delete an existing alarm trigger
Alerts consultation	
GetAlarmsRequest	This service is available providing the alarms identifiers when detected, this method is recommended to consult the details of the alarms after a notification receipt (indeed the alarm identifiers are provided in the notification)
SearchAlarmsRequest	This service is available using following search criteria : SIM, account, trigger identifier. To limit the size of the answer, these identifiers could be added: - using customer customisation data used when creating the corresponding triggers: group of triggers, trigger type, trigger priority level - using customer customisation data used when creating the corresponding triggers: group, trigger type , priority of triggers.
Alert management	
ManageAlarms	When a trigger raises an alarm, this service allows to acknowledge it.

Trigger / alarm life cycle :



Depending on trigger types, de-activation and reactivation are managed automatically, without any action :

Trigger	Status after 1st alert raising	Automatic reactivation	Key parameters
Timestamp	✓ Stay active	✓ Yes - immediate	Authorized emission periods (2 max)
Traffic Location	✓ Stay active	✓ Yes - immediate	Authorized countries, operators (option)
Traffic type	× De-activated	× On demand	Authorized bearer types (voice, SMS, …)
IMEI Change	✓ Stay active	✓ Yes - Immediate	No
Overtraffic Unitary	× De-activated	✓ 1st of next month	Threshold per bearer per month
Overtraffic Cumulated	× De-activated	✓ 1st of next month	Threshold per bearer per month
Crazy Machine	× De-activated	✓ Next day	High threshold per bearer type, and period (>1 days)
Lazy Machine	× De-activated	✓ Next day	Low threshold per bearer type, and period (>1 days)
Silent Machine	× De-activated	✓ Next day	Sliding period (>3 days)
Status change	× Stay active	✓ Yes - immediate	Triggered status
Option change	× Stay active	✓ Yes - immediate	Option code, Add & / or remove trigger

Zoom on the alarms notification principle:

It is also possible to consult the alarms at any time using methods described for the search (various criteria are suggested)

In addition, alerts notifications are also possible by e-mail (CSV alerts reports, per alarm type). You can subscribe to this service by contacting your Orange Mobile Enterprise Support.

3.8 Connectivity monitoring (Device Info)

8. **Supervision (Device Info)** : the methods of this service will let you obtain the location of mobile cells on which SIMs is attached, the country, the operator, the signal strenght (if 2G), and the identifier of device (IMEI)

Asynchronous *

(*) : *Asynchronous* states that the execution is launched (ticket is sent to the requestor), but that another method must be called later on (with the ticket), to get the result. Result can be ready in a few seconds to a few minutes.

submitSimSupRequest	Submit a monitoring request to get, for one or several SIMs : ○ Country and operator ;

	○ Signal strenght (2G) ; ○ Unique identifier of device (IMEI) and the last IMEI requested;
submitSimSupLocRequest	Submit a monitoring request to get, for one or several SIMs : ○ Country and operator ; ○ Location of mobile cell on which SIM is attached, and the last location requested; ○ Signal strenght (2G) ; ○ Unique identifier of device (IMEI) and the last IMEI requested;
getSimReportResponse	Update the machine or device information associated with one or more SIM cards

This service is enabled under the following conditions :

- SIM cards profile must be « MP » ;
- SMS must be authorized ;
- Device must be attached to a mobile network.

Regarding location information, the accuracy of provided coordinates is not the accuracy of GPS. The coordinates are those of barycenter of mobile cell on which SIM is attached. The provided accuracy in not contractual : its depends on mobile network density.