USER MANUAL – RAN DASHBOARD

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Date	06/12/2017	24/01/2018	2018/01/25

HISTORY

Version	Modification	Author	Date
0.1	Creation	Mathieu THO Sylvain FAVÉ	06/12/2017
1.0	Validation	Stéphane TRICOT	25/01/2018

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INDEX

1. Authentication 13
1.1 Log in to access the platform 13
1.2 Session expired 14
1.3 Forgot password 14
1.4 Reset password 15
2. Main menu 16
2.1 BSC 16
2.2 RNC 16
2.3 LNS 16
2.4 Workflows 16
2.5 Administration 17
3. BSC 18
3.1 Consult and analyze the statistics on your fleets 18
3.2 Search and list the stations of your fleets 20
3.3 Manage your stations cart 22
3.4 Consult and manage the properties of a station 23
3.4.1 Station attributes 23
3.4.2 Station statistics 24
3.4.2.1 Link status 24
3.4.2.2 RAM 25
3.4.2.3 CPU 26
3.4.2.4 System and user disks 27
3.4.2.5 RSSI Wan 28
3.4.2.6 Temperature 29
3.4.2.7 Power supply voltage and source 30
3.4.2.8 Uplink 31
3.4.2.9 Downlink 32
3.4.2.10 Packet forwarder 33
3.4.3 Station remote 34

3.4.3.1 File explorer 34
3.4.3.2 Shell 35
3.4.3.3 Command 37
3.4.4 Station configurations 38
3.4.4.1 Supervision 38
3.4.4.2 Alarms 39
3.4.4.3 System 40
3.4.4.4 LAN 41
3.4.4.5 Clock 42
3.4.4.6 VPN 43
3.4.4.7 WAN 44
3.4.5 Station versions 45
3.4.5.1 Current version 45
3.4.5.2 Version history 46
3.4.5.3 Software update 47
3.4.6 Station tasks 47
3.4.7 Station SNMP logs 50
3.4.8 Station events 51
3.5 Consult the last alarms of your fleets 52
4. RNC 54
4.1 Analyze the radio frequency activity of your modems 54
4.1.1 Request a radio frequency activity analysis of your modem 54
4.1.2 Consult the results of a radio frequency activity analysis of your modem 55
4.2 Configure the radiopath and channel frequencies of your modems 56
4.3 Consult and analyze the statistics on your modems 58
4.3.1 Request a statistics chart 58
4.3.2 Read the statistics chart 59
5. LNS 61
5.1 List your clusters 61
5.2 List the stations 62
5.3 Consult the properties of a station 63

5.4 Search and list the endpoints of your clusters 64
5.5 Manage your endpoints cart 65
5.6 Consult the properties of an endpoint 66
5.6.1 Endpoint attributes 66
5.6.2 RX messages 68
5.6.3 TX messages 69
5.6.4 Messages 70
5.7 Consult the last alarms of your stations 71
5.8 Consult the last alarms of your endpoints 72
6. Cart management 73
6.1 Save your cart 73
6.2 Load the content of your carts 74
6.3 Manage your saved carts 75
7. Workflow 76
7.1 List workflow templates 76
7.2 Create a workflow template 77
7.3 Execute a workflow 78
7.4 Running workflows 79
7.4.1 List of running workflows 79
7.4.2 Details of a running workflow execution 80
7.4.3 Details of a running workflow execution for a specific equipment 81
7.5 Completed workflows 82
7.5.1 List of completed workflows 82
7.5.2 Details of a completed workflow execution 83
7.5.3 Details of a completed workflow execution for a specific equipment 84
8. Administration 85
8.1 Manage customers 85
8.2 Manage fleets 87
8.3 Manage stations 88
8.4 Manage clusters 89
8.5 Manage endpoints 91

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8.5.1 Create or import endpoints 91
8.5.2 Overriding RX parameters 92
8.6 Manage users 93
9. User profile 94
9.1 Update your profile 94
10. Settings 95
10.1 Dashboard 95
11. Logs 97
11.1 Application logs 97
11.2 Activity logs 98
12. About 100
12.1 Check services statuses 100
13. Documentations 101
13.1 Access the documentation in the dashboard 101
14. Annex 1: Supported browsers 102
15. Annex 2: Roles tables 103
15.1 BSC 103
15.2 RNC 103
15.3 LNS 104
15.1 Workflows 105
15.1 Administration 105
15.2 Settings 105
15.3 Logs 105
15.4 Profile 105
15.5 About and documentation 106
16. Annex 3: FAQ 107
16.1 How do I move a station from a fleet to another fleet? 107
16.2 How can I put a station in two fleets? 107
16.3 How can I put an endpoint in two clusters? 107
16.4 How can I deactivate a user or set an expiration date to a user's account? 107

FIGURES

Figure 1 - Login screen 13
Figure 2 - Session expired message 14
Figure 3 - Forgot password screen 14
Figure 4 - Reset password screen 15
Figure 5 - Fleets overview 18
Figure 6 – BSC Stations list 20
Figure 7 - Stations cart 22
Figure 8 – BSC station attributes 23
Figure 9 - Station link status 24
Figure 10 - Station RAM statistics 25
Figure 11 - Station CPU statistics 26
Figure 12 - Station disks statistics 27
Figure 13 – Station RSSI statistics 28
Figure 14 - Station temperature statistics 29
Figure 15 – Station power supply statistics 30
Figure 16 - Station uplink statistics 31
Figure 17 - Station downlink statistics 32
Figure 18 - Station downlink statistics 33
Figure 19 : Station file explorer 34
Figure 20 : Station remote shell login 35
Figure 21 - Station remote shell console 36
Figure 22 - Station remote command 37
Figure 23 : Station supervision configuration 38
Figure 24 - Station control configuration 39
Figure 25 : Station system configuration 40
Figure 26 : Station LAN configuration 41
Figure 27 : Station clock configuration 42
Figure 28 : Station VPN configuration 43
Figure 29 : Station WAN configuration 44
Figure 30 - Station current version 45
Figure 31 - Station versions history 46
Figure 32 - Station software update 47
Figure 33 - Station tasks 48
Figure 34 - Tasks messages and SNMP logs 49
Figure 35 - Station SNMP logs 50
Figure 36 - Station events 51
Figure 37 - BSC alarms 52
Figure 38 - Spectrum analysis acquisition 54
Figure 39 - Spectrum analysis viewer 55

Figure 40 - Station selection for radiofrequency configuration 56
Figure 41 - Radiofrequency configuration 57
Figure 42 - Modem selection for statistics display 58
Figure 43 : Modem statistics 59
Figure 44 - Clusters list 61
Figure 45 - LNS stations list 62
Figure 46 - LNS station properties 63
Figure 47 - Endpoints list 64
Figure 48 - Endpoints cart 65
Figure 49 - Endpoint attributes 66
Figure 50 - Endpoint RX messages 68
Figure 51 – Endpoint TX messages 69
Figure 52 – Endpoint messages 70
Figure 53 – Last alarms of LNS stations 71
Figure 54 - Last alarms of endpoints 72
Figure 55 - Save cart 73
Figure 56 - Load content of carts 74
Figure 57 - Saved carts management 75
Figure 58 - List workflow templates 76
Figure 59 - Import workflow template 77
Figure 60 – Execute a workflow 78
Figure 61 - Running workflows list 79
Figure 62 – Details of a running workflows 80
Figure 63 – Details of a running workflows for an equipment 81
Figure 64 - Completed workflows list 82
Figure 65 – Details of a running workflows 83
Figure 66 – Details of a completed workflows for an equipment 84
Figure 67 - Customers management 85
Figure 68 - Customer form 86
Figure 69 – Fleets management 87
Figure 70 – Stations management 88
Figure 71 - Clusters management 89
Figure 72 - Endpoints management 91
Figure 73 - Overriding RX parameters 92
Figure 74 – Users management 93
Figure 75 - Profile update 94
Figure 76 - Settings dashboard 95
Figure 77 - Application logs 97
Figure 78 - Users actions logs 98
Figure 79 - About page 100
Figure 80 - Documentations page 101
Figure 81 - Supported browsers 102

Figure 82 – BSC roles table 103
Figure 83 - RNC roles table 104
Figure 84 - LNS roles table 105
Figure 85 - Administration roles table 105
Figure 86 - Administration roles table 105
Figure 87 - Settings roles table 105
Figure 88 - Logs roles table 105
Figure 89 - Profile roles table 106
Figure 90 - About roles table 106

REFERENCES

Reference	Document / link	Description
[1]		
[2]		
[3]		

GLOSSARY

Abbreviation	Description
RAN	Radio Access Network
IOT	Internet Of Things
OSS	Operation System Support
BSC	Base Station Controller
RNC	Radio Network Controller
LNS	LoRa Network Server
TKM	Trusted Key Management

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INTRODUCTION

This user manual is intended for final users and administrators of the RAN Dashboard.

It explains how to connect to the platform and use the interfaces to:

- Read statistics and alarms.
- Communicate with equipment and endpoints.
- Administrate the application data.

This version of the manual is written and usable for the version 2.2 of the RAN Dashboard.

1. Authentication

1.1 Log in to access the platform

You can access the dashboard through web browsers. It can be accessed with both HTTP and HTTPS protocols. If you are not logged in, you will see the login screen:

Figure 1 - Login screen

(1) Fill your username and password.

(2) Click on the “Login” button. If your credentials are correct, you will be logged into the application. Otherwise, you will get an error message.

(3) In case you forgot your password, click on the “Forgot password” link to retrieve it.

1.2 Session expired

The time of your session is set and defined by the server. Two minutes before it expires, you will be informed by the following message:

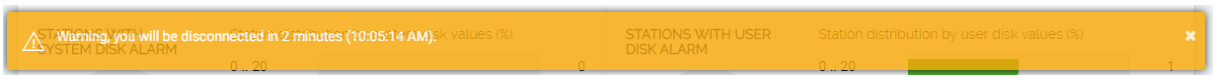


Figure 2 - Session expired message

So, you have to finish and save your current work otherwise you will lose it.

You can logout and reconnect yourself before the end of the current session to reinitiate the expired date. If not, you will be automatically redirected to the login page at the end of the session.

1.3 Forgot password

Figure 3 - Forgot password screen

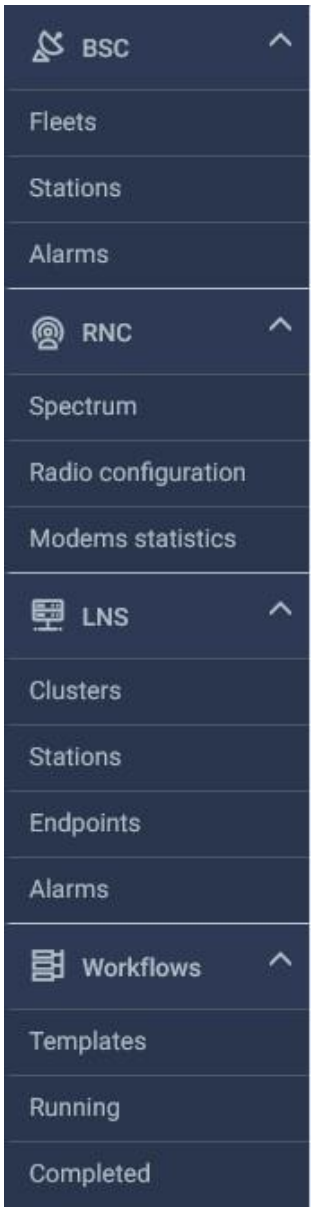
(1) To retrieve your password, enter the email set in your account and click “Continue”. You will get an email with a link, allowing you to reset your password.

1.4 Reset password

Figure 4 - Reset password screen

(1) Type your password twice and click “Change password” to reset your password. Once done, you will be logged in the dashboard and your password will be changed.

2. Main menu



2.1 BSC

- Fleet: Consult and analyze the statistics on your fleets.
- Stations: Search and manage your stations.
- Alarms: Consult the last alarms on your fleets.

2.2 RNC

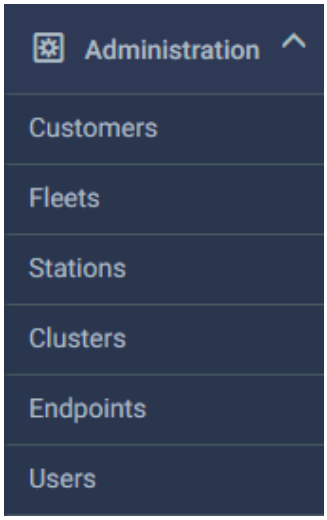
- Spectrum: Analyze the radio frequency activity of your modems.
- Radio configuration: Consult the radiopath and channel frequencies of your modems.
- Modem statistics: Consult and analyze the statistics of your modems.

2.3 LNS

- Clusters: List your clusters.
- Stations: Consult the stations.
- Endpoints: Search and manage your endpoints.
- Alarms: Consult the last alarms on your clusters.

2.4 Workflows

- Templates: List workflow templates and create new one
- Running: List workflows currently in progress
- Completed: List completed workflows



2.5 Administration

- Customers: Manage customers and attach/detach fleets and clusters
- Fleets: Create, update and delete fleets
- Stations: Create and import stations
- Clusters: Create, update and delete clusters
- Endpoints: Create and import endpoints
- Users: Manage users

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3. BSC

3.1 Consult and analyze the statistics on your fleets

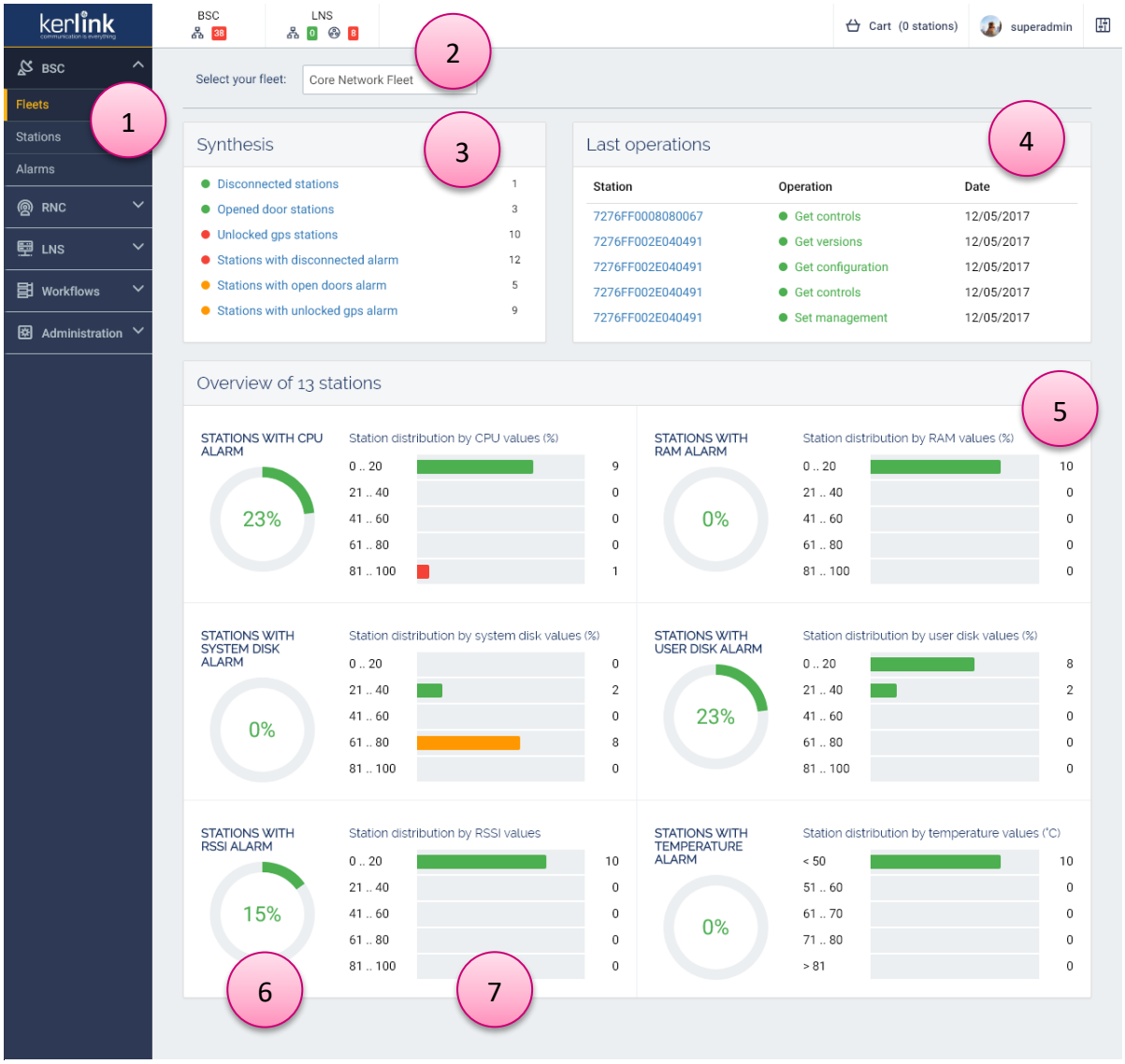

Figure 5 - Fleets overview

(1) Click on the “Fleet” button in the main menu to access to an overview of your fleets.

(2) Select one of your fleets.

(3) The “Synthesis” panel shows an overview of the stations with alarms on their connection, door or GPS. If you click on it, you will be redirected to the stations page with a preconfigured search form to get the list of stations with this kind of alarm.

(4) The “Last operations” panel shows the last operations of the stations in the selected fleet.

(5) The “Overview” panel shows an overview of alarms and values from stations in the selected fleet.

(6) Each “donut chart” represents the percentage of stations with an alarm. If you click on it, you will be redirected to the stations page with a preconfigured search form to get the list of stations with this kind of alarm.

(7) Each “bar chart” represents the distribution of the stations according to their values. If you click on one bar, you will be redirected to the stations page with a preconfigured search form to get the list of stations in this range of values.

3.2 Search and list the stations of your fleets

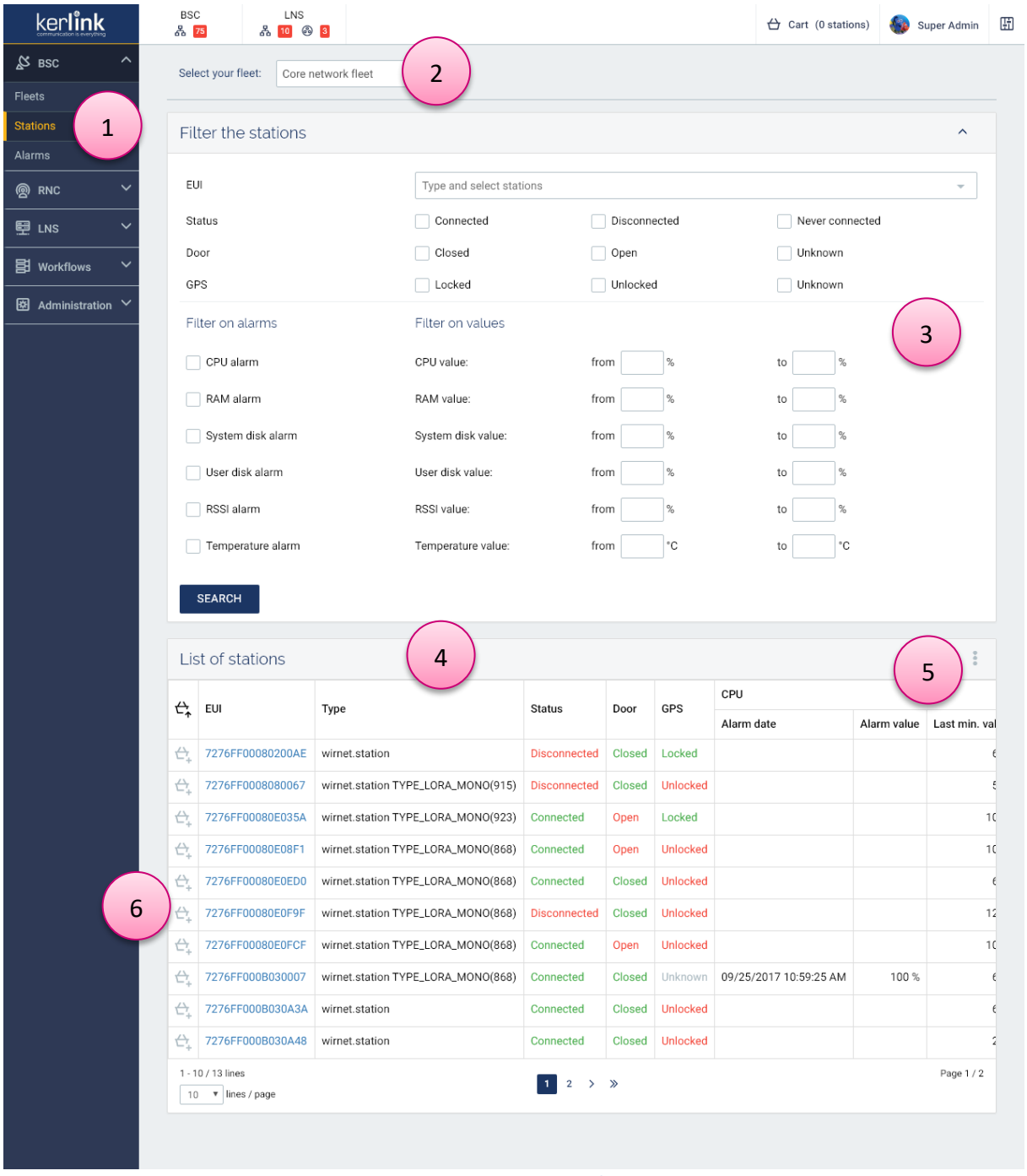

Figure 6 – BSC Stations list

(1) Click on the BSC "Stations" button to access to the list of stations.

(2) Select a fleet.

(3) The filter panel allows you to filter the stations according to several criteria.

(4) The list panel shows the result of the search. If no filter is set, it shows a list of all stations in the selected fleet.

(5) You can choose which data of the stations you want to display, and which values of the selected data you want to display. To do that, open the table menu and select “Show / hide columns”. A modal will list all available columns and allows you to select which one you want to show or hide.

(6) For each station in the list, you can:

- Add the station to the cart (or remove it).
- Go to the details page of the station.

3.3 Manage your stations cart

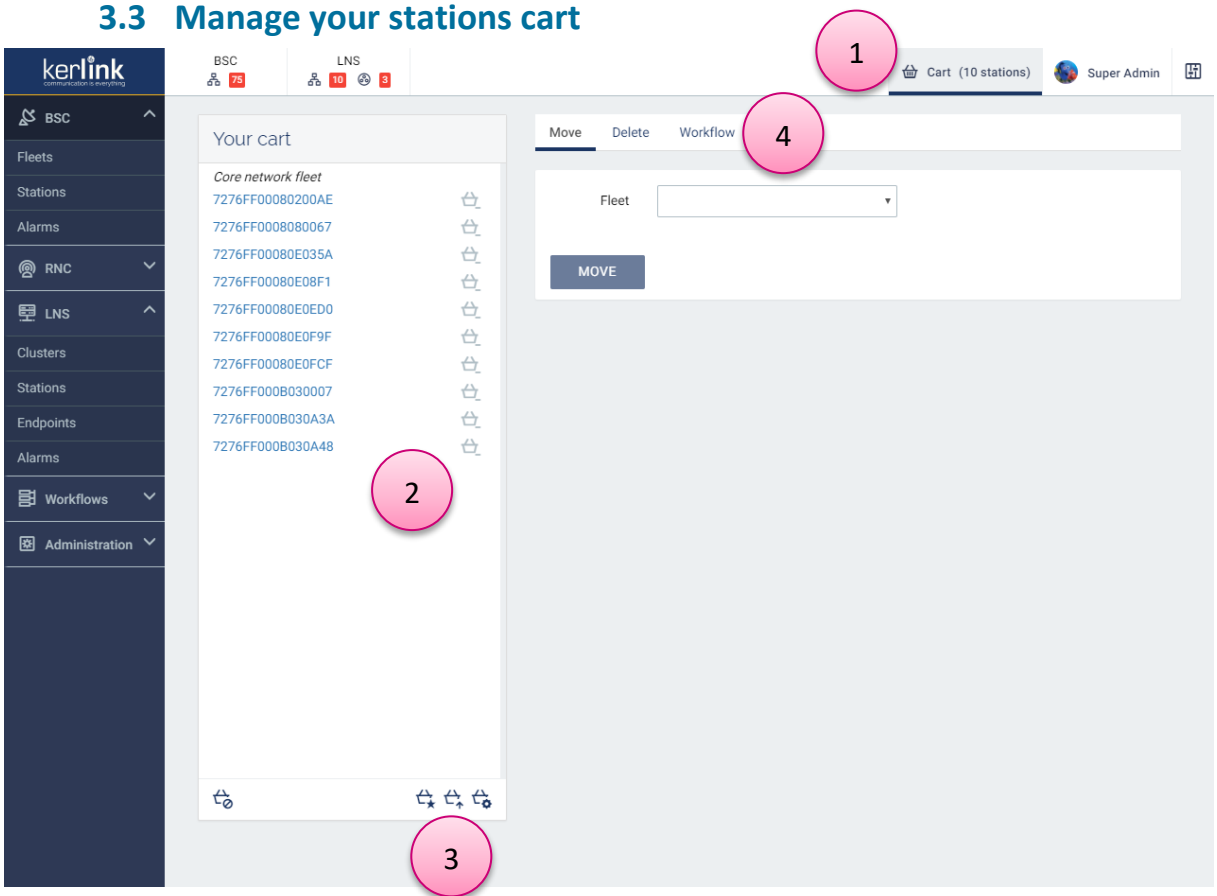

Figure 7 - Stations cart

(1) Click on the cart button.

(2) The panel “Your cart” shows the list of stations currently added in your cart. You can remove some stations or empty your cart by clicking on the respective buttons.

(3) These buttons allow you to respectively save the current cart, load stations of many previous saved carts and manage previous saved carts. These functionalities are described in the paragraph 6 - Cart management.

(4) The tabs correspond to all the actions you can perform on the stations in your cart.

3.4 Consult and manage the properties of a station

3.4.1 Station attributes

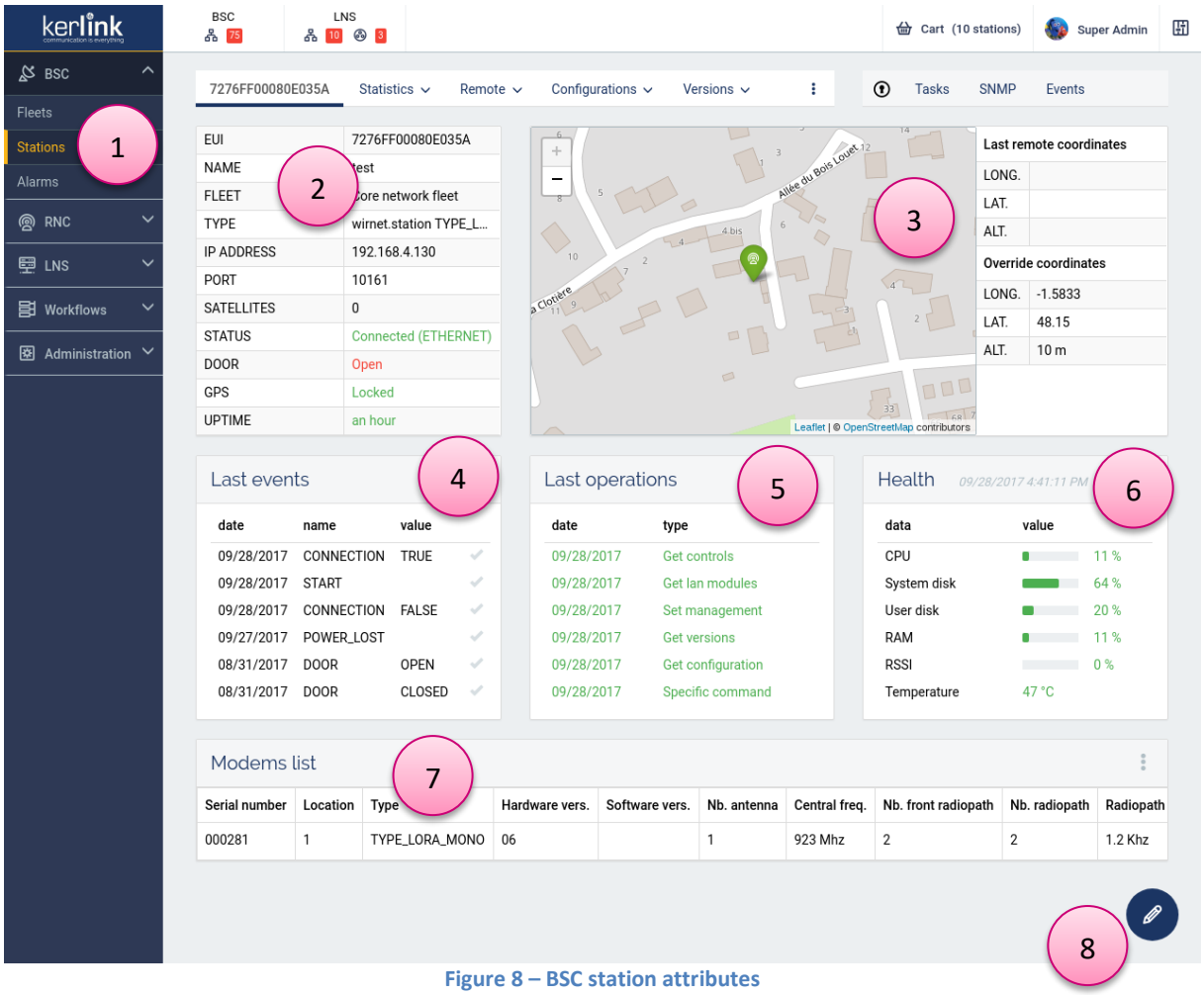

Figure 8 – BSC station attributes

(1) Click on the BSC "Stations" button to access to the list of stations then click on the EUI of the station you want to consult.

(2) This panel shows the attributes of the station.

(3) The map shows the position of the station. The first coordinates are retrieved from the station.

(4) The panel "Last events" lists the last events triggered by the station. You can mark an event as read by clicking on the check button next to the event.

(5) The panel "Last operations" lists the last operations executed on the station.

(6) The panel “Health” lists the current state values of the station.

(7) The panel “Modems list” lists the modems of the station.

(8) You can edit or move the station by clicking on the floating button.

3.4.2 Station statistics

3.4.2.1 Link status

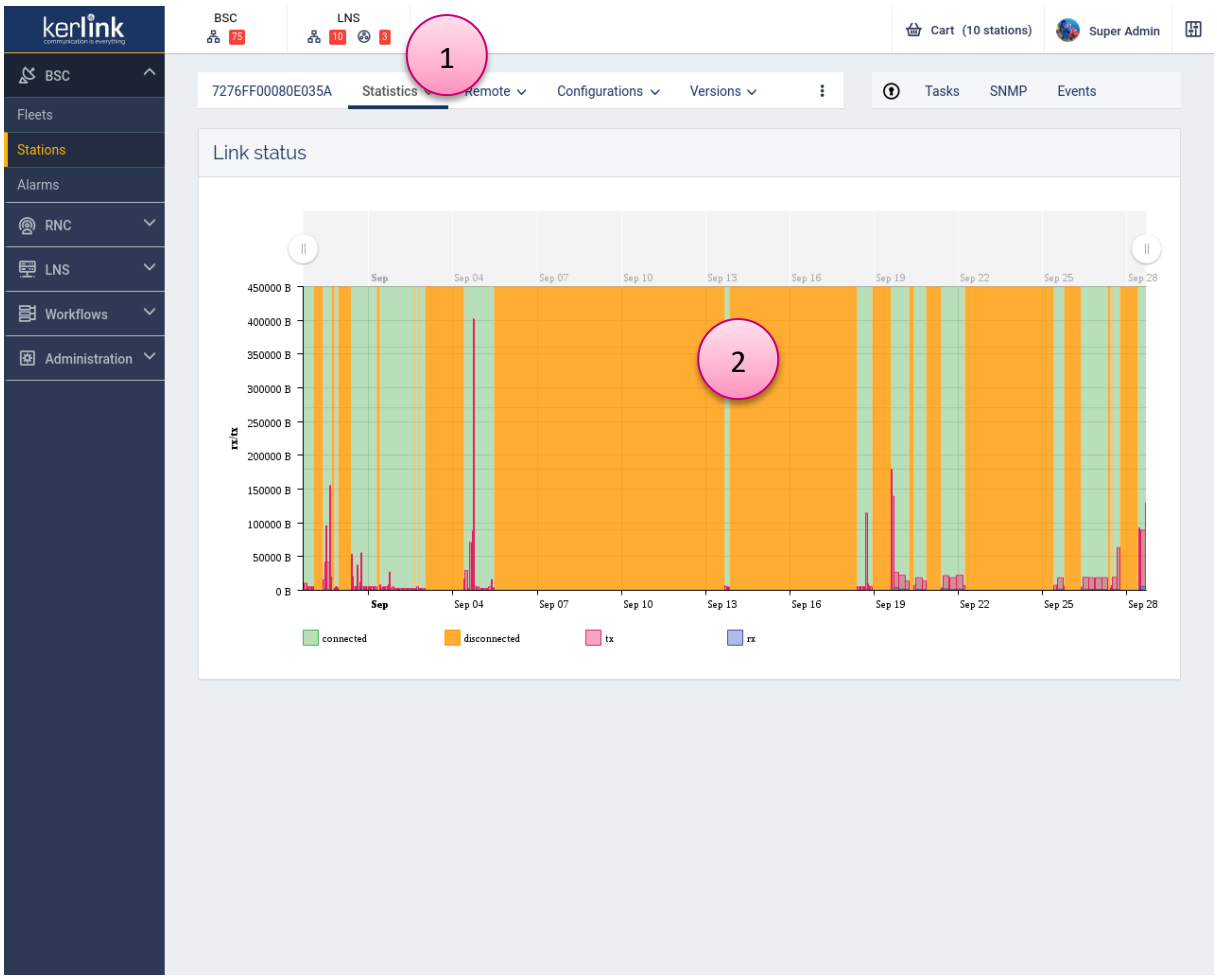

Figure 9 - Station link status

(1) Access to a station page then click on the “Statistics” menu and select “Link status”.

(2) The chart displays:

- The periods when the station was connected and disconnected.
- The number of bytes received (rx) and sent (tx) to the station.

3.4.2.2 RAM

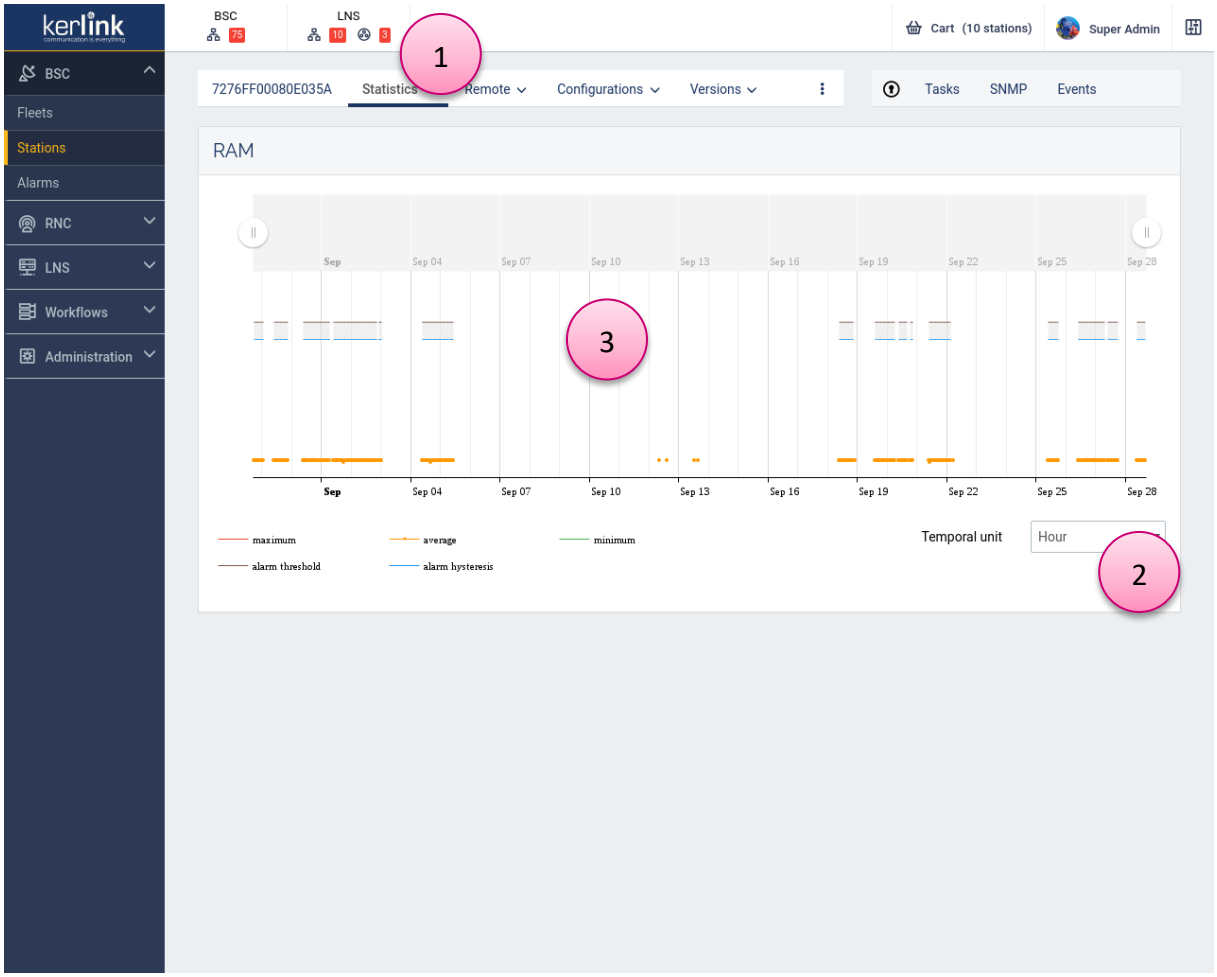

Figure 10 - Station RAM statistics

(1) Access to a station page then click on the “Statistics” menu and select “RAM”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays:

- The RAM percent utilization (minimum, average and maximum) by temporal unit.
- The alarms threshold.
- The alarms hysteresis.
- The triggered alarms with their values.

3.4.2.3 CPU

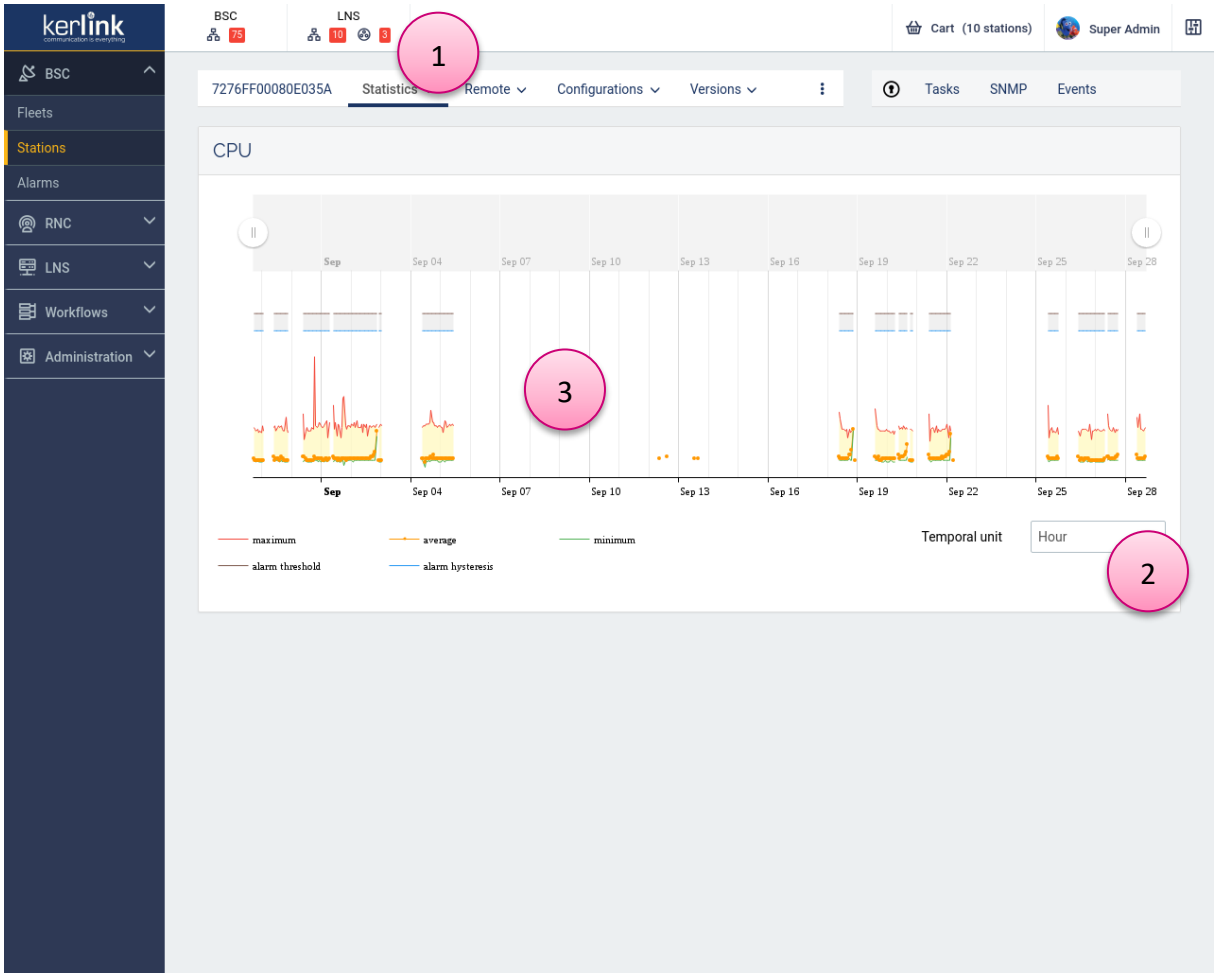

Figure 11 - Station CPU statistics

(1) Access to a station page then click on the “Statistics” menu and select “CPU”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays:

- The CPU percent utilization (minimum, average and maximum) by temporal unit.
- The alarms threshold.
- The alarms hysteresis.
- The triggered alarms with their values.

3.4.2.4 System and user disks

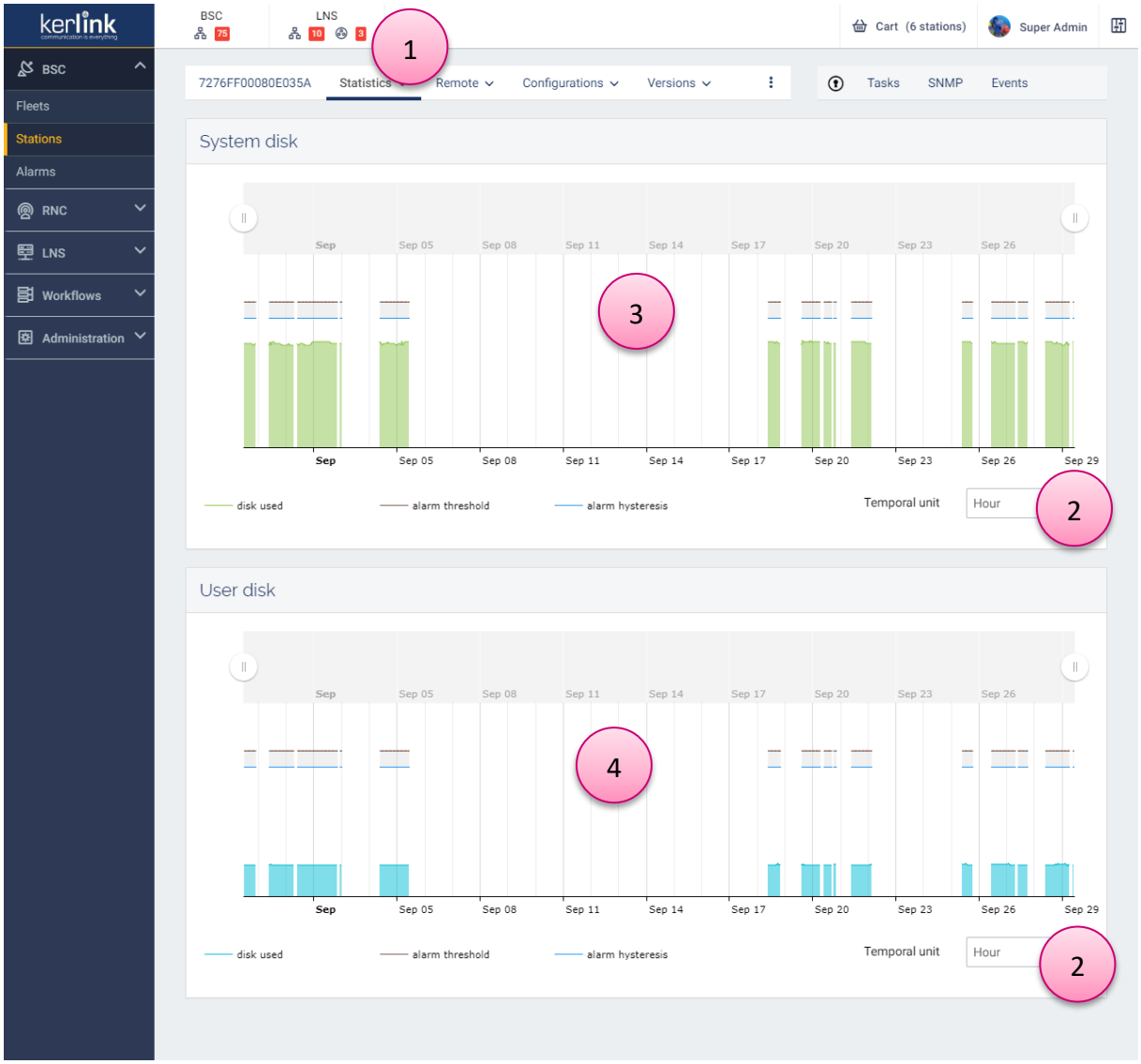

Figure 12 - Station disks statistics

(1) Access to a station page then click on the “Statistics” menu and select “Disks”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays for system disk (3) and user disk (4):

- A snapshot (for hour temporal unit) or an average (for other temporal units) of the system disk percent utilization.
- The alarms threshold.

- The alarms hysteresis.
- The triggered alarms with their values.

3.4.2.5 RSSI Wan

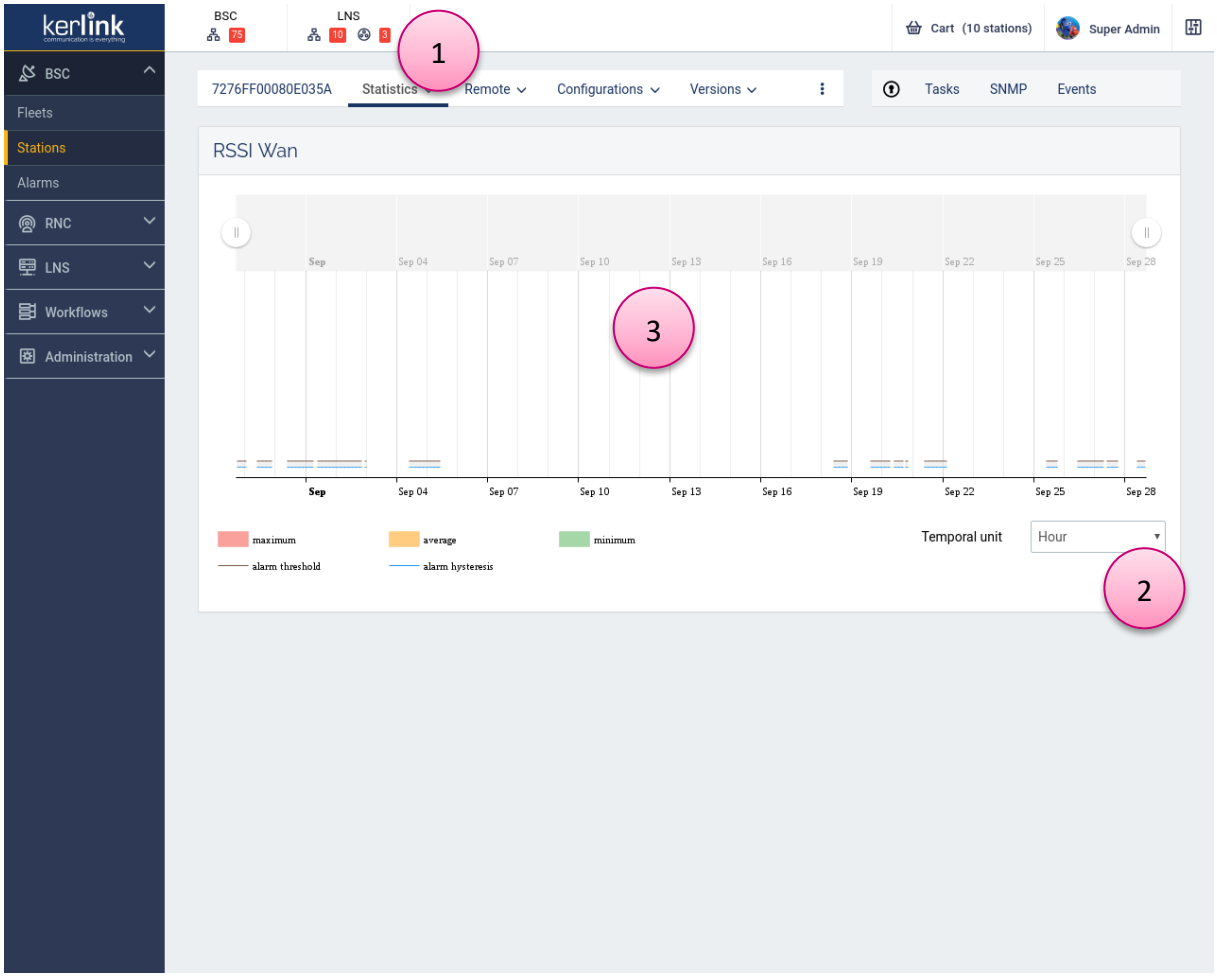

Figure 13 – Station RSSI statistics

(1) Access to a station page then click on the “Statistics” menu and select “RSSI Wan”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays:

- The RSSI (minimum, average, maximum) by temporal unit.
- The alarms threshold.
- The alarms hysteresis.

- The triggered alarms with their values.

3.4.2.6 Temperature

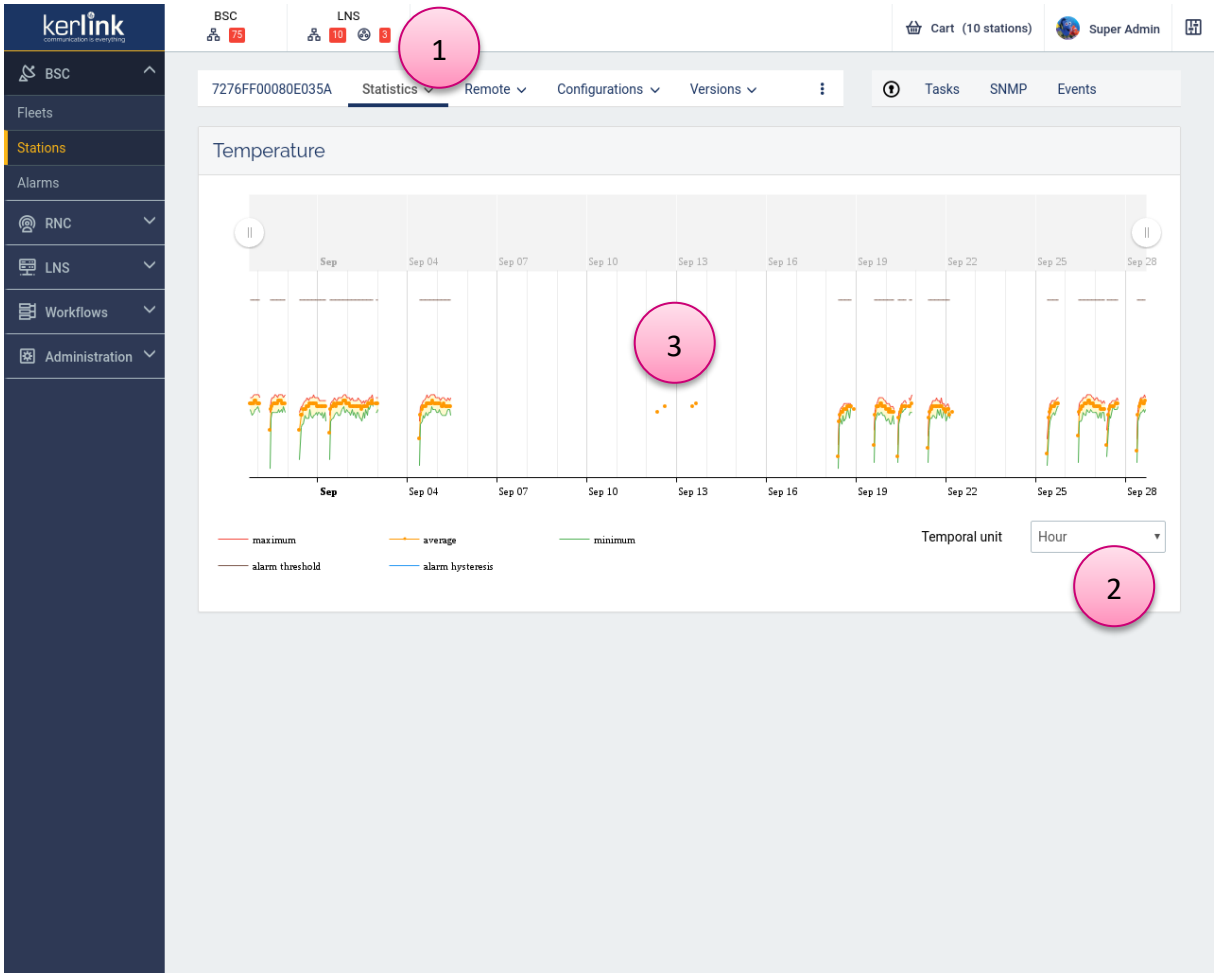

Figure 14 - Station temperature statistics

(1) Access to a station page then click on the “Statistics” menu and select “Temperature”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays:

- The temperature (minimum, average, maximum) by temporal unit.
- The alarms threshold.
- The alarms hysteresis.
- The triggered alarms with their values.

3.4.2.7 Power supply voltage and source

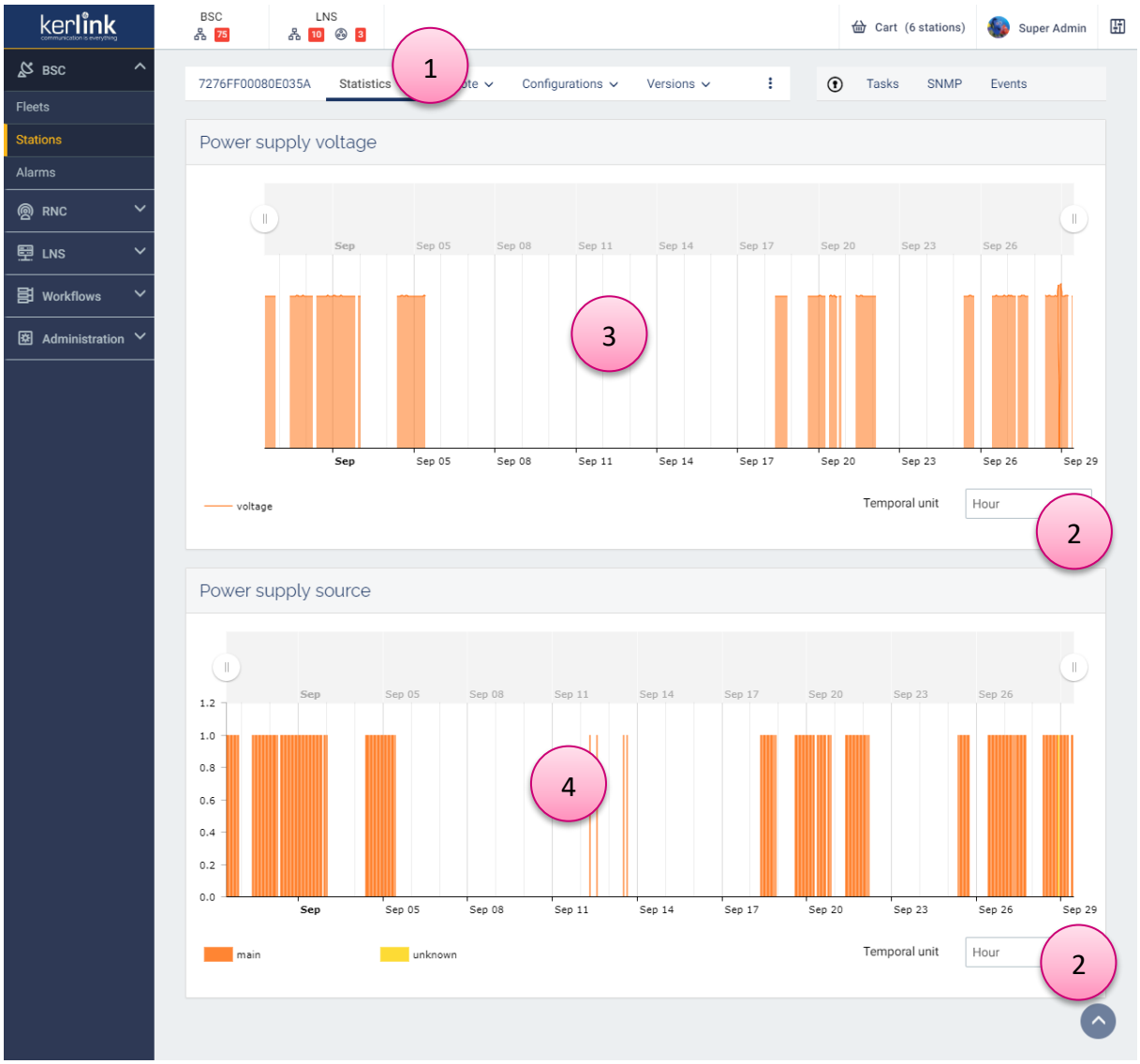

Figure 15 – Station power supply statistics

(1) Access to a station page then click on the “Statistics” menu and select “Power supply”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays the station power supply in millivolts.

(4) The chart displays the station power source.

3.4.2.8 Uplink

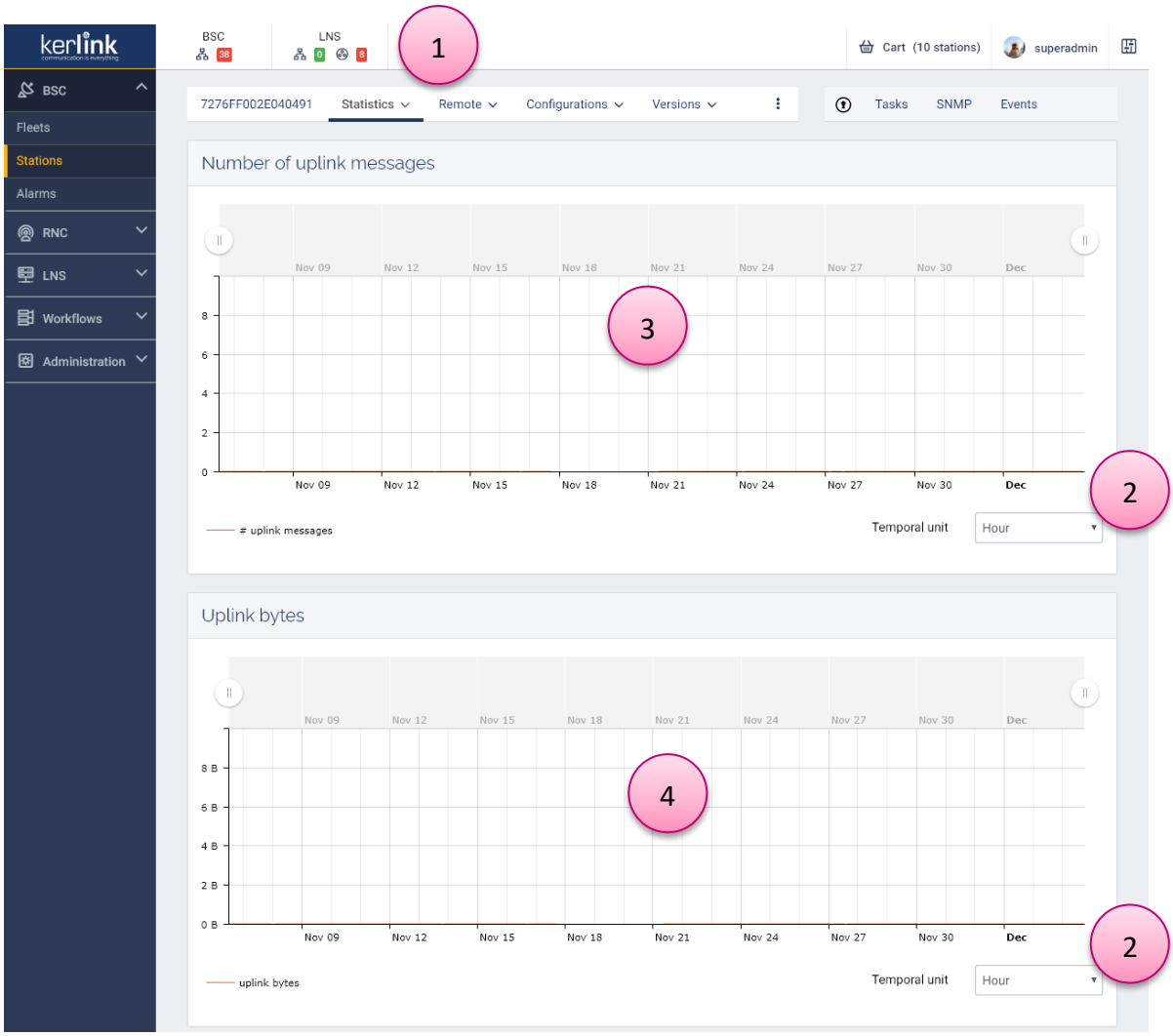

Figure 16 - Station uplink statistics

(1) Access to a station page then click on the “Statistics” menu and select “Uplink”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays the number of uplink messages.

(4) The chart displays the size of uplink messages in bytes.

3.4.2.9 Downlink

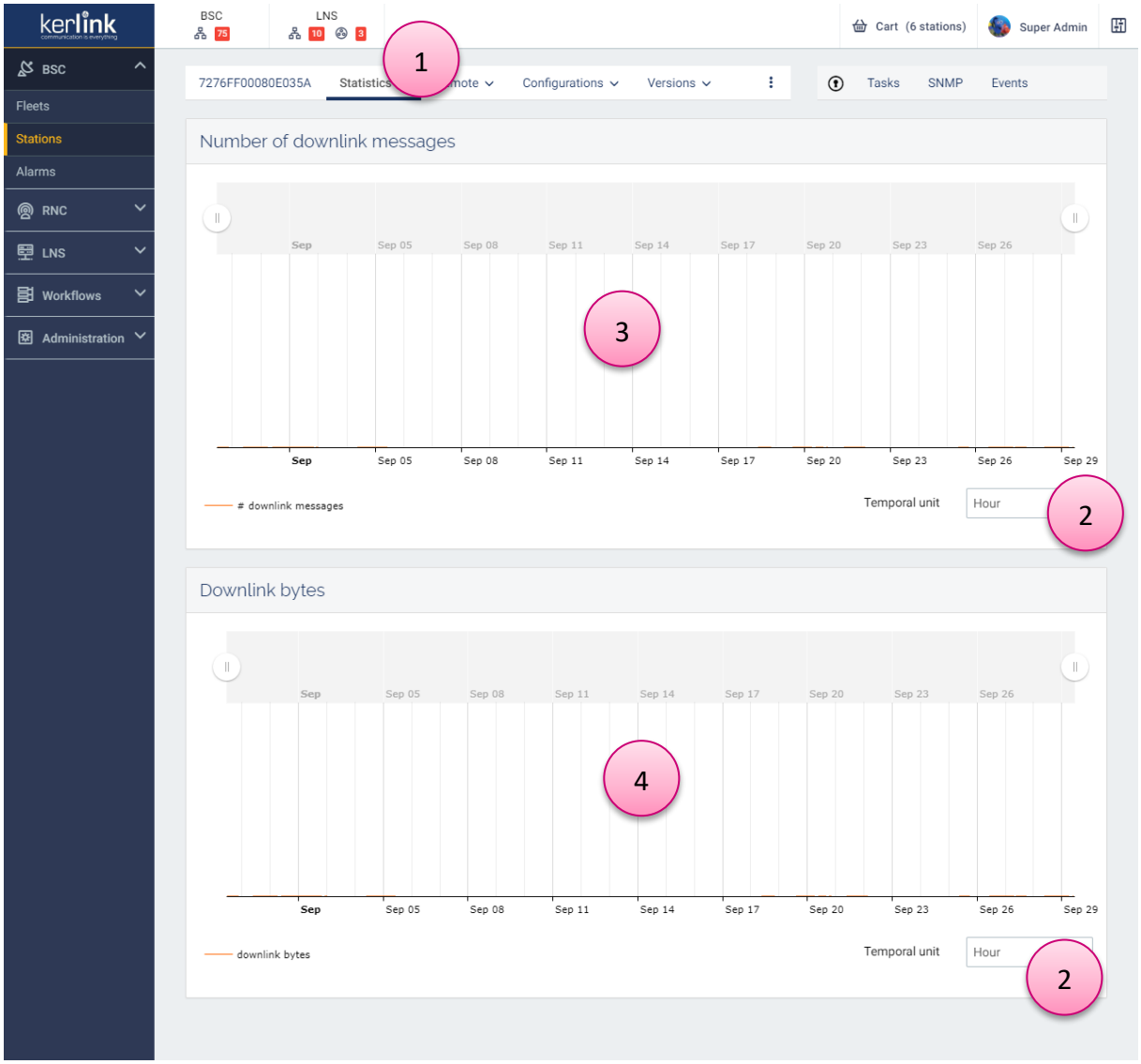

Figure 17 - Station downlink statistics

(1) Access to a station page then click on the “Statistics” menu and select “Downlink”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays the number of downlink messages.

(4) The chart displays the size of downlink messages in bytes.

3.4.2.10 Packet forwarder

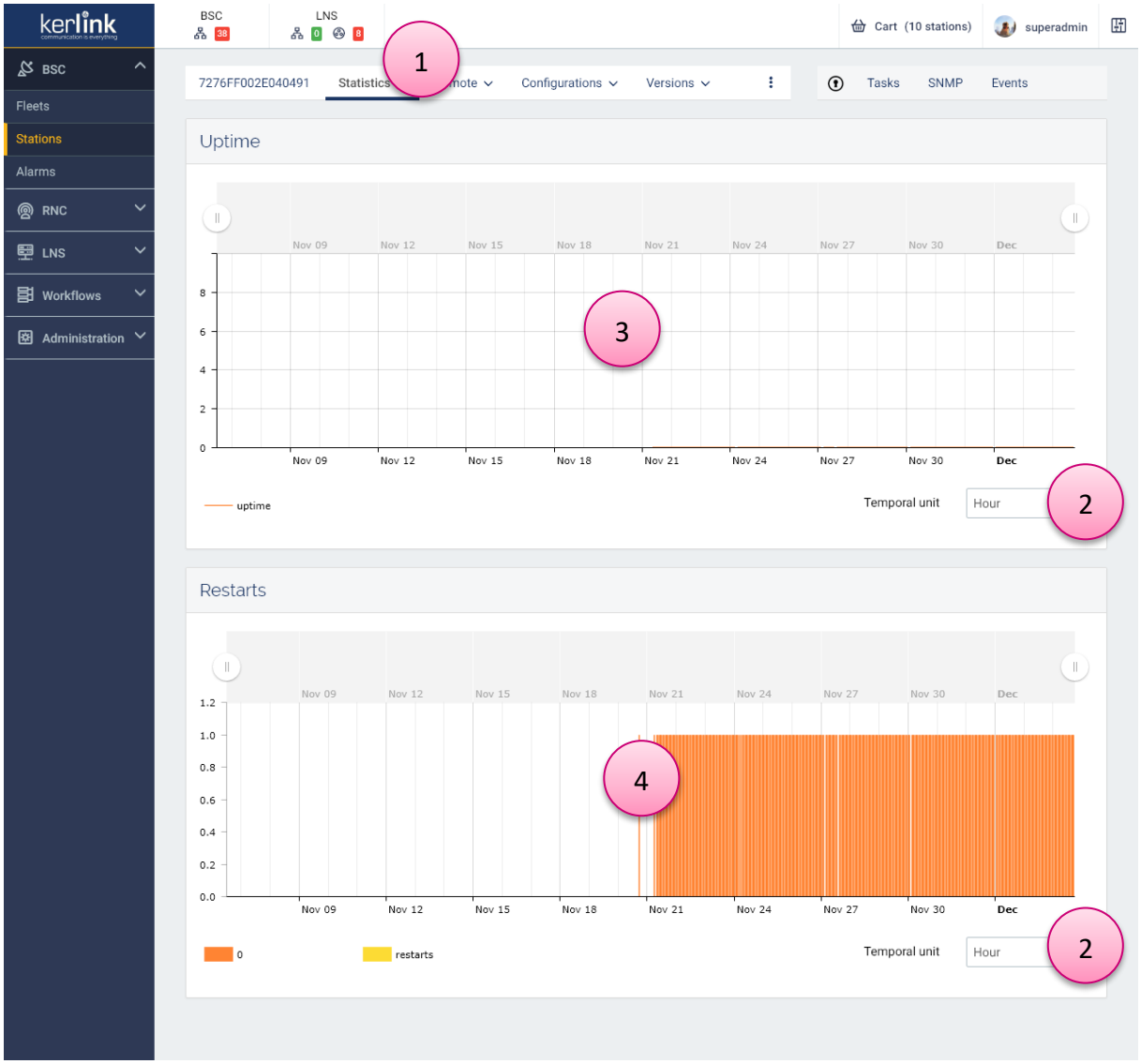

Figure 18 - Station downlink statistics

(1) Access to a station page then click on the “Statistics” menu and select “Packet forwarder”.

(2) Set the temporal unit (Hour, Day, Week, Month, Year) you want to use.

(3) The chart displays the uptime of the packet forwarder.

(4) The chart displays the number of restarts of the packet forwarder.

3.4.3 Station remote

3.4.3.1 File explorer

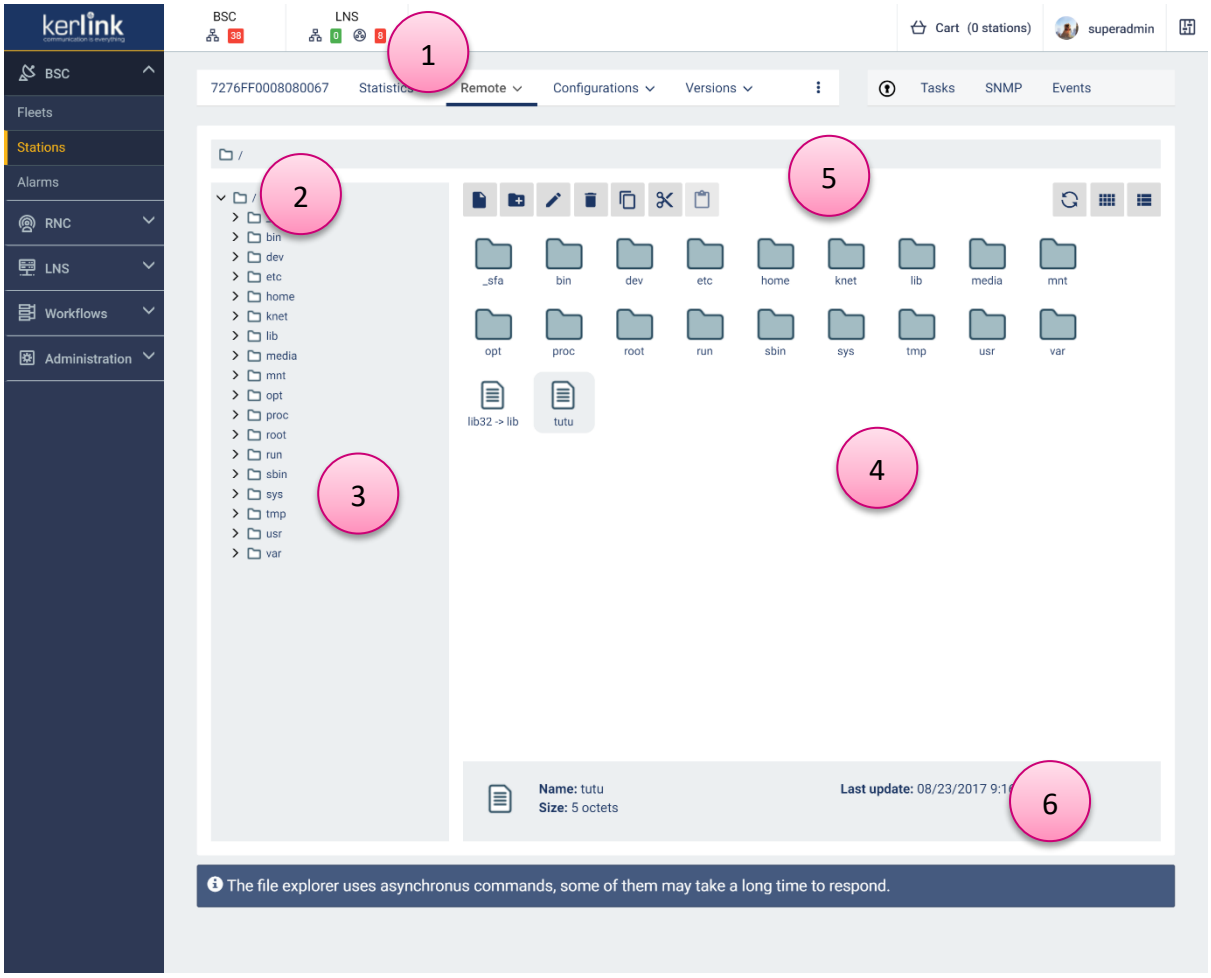

Figure 19 : Station file explorer

(1) Access to a station page then click on the “Remote” menu and select “File explorer”.

(2) This panel displays the path of the selected directory. You can click on any directory in order to explore it.

(3) This panel displays the tree view of directories. You can right click on a directory to execute several actions.

(4) This panel displays the content (directories and files) of the selected directory. You can right click on elements to execute several actions.

(5) The toolbar allows you to do several actions like upload a new file, create a new folder, copy/cut/paste elements or change the display of the content panel (4).

Note: the copy/cut/paste functions are only available for elements from the station itself. You cannot copy/cut an element from your computer to the station.

(6) This panel displays the details of the selected directory or file.

3.4.3.2 Shell

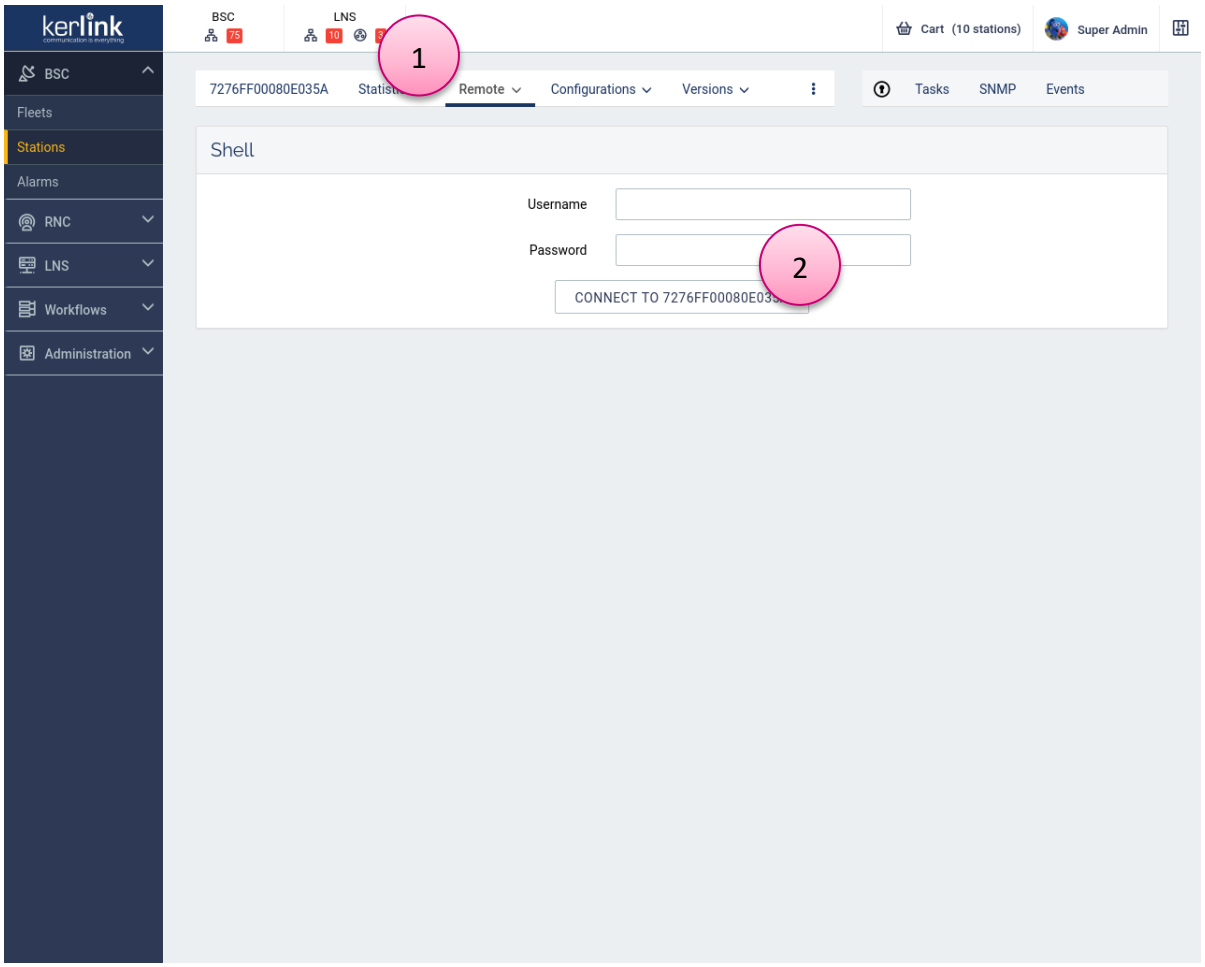

Figure 20 : Station remote shell login

(1) Access to a station page then click on the “Remote” menu and select “Shell”.

(2) Fill the SSH username and password then click on the “Connect” button. If your credentials are correct, you will be logged to the station and access to the following console. Otherwise, you will get an error message.

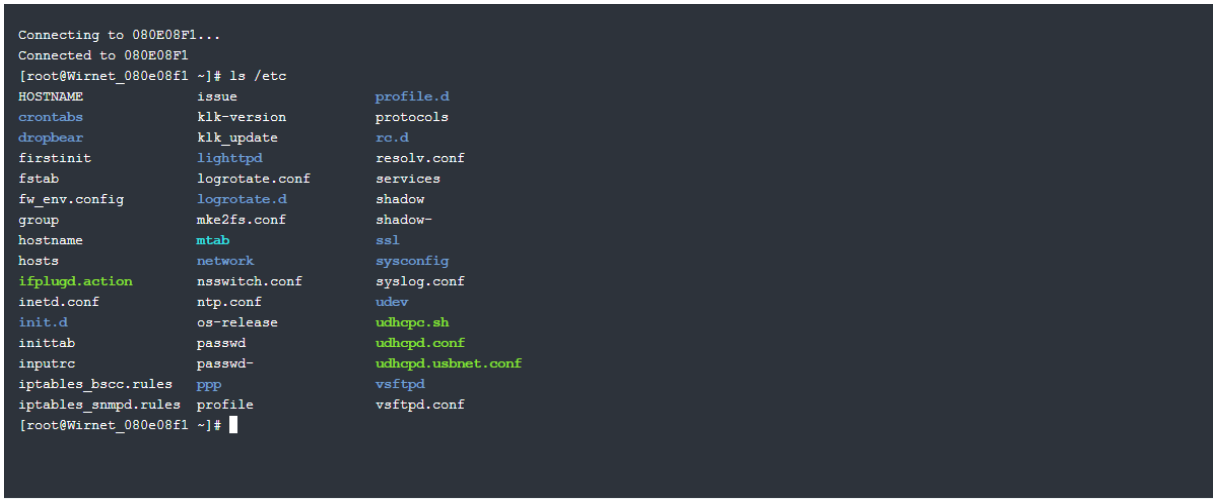

Figure 21 - Station remote shell console

The console works like a SSH client so you can execute instructions like “vi” or other context needed commands. Moreover, this functionality only works if the station is in the same network than the application server.

3.4.3.3 Command

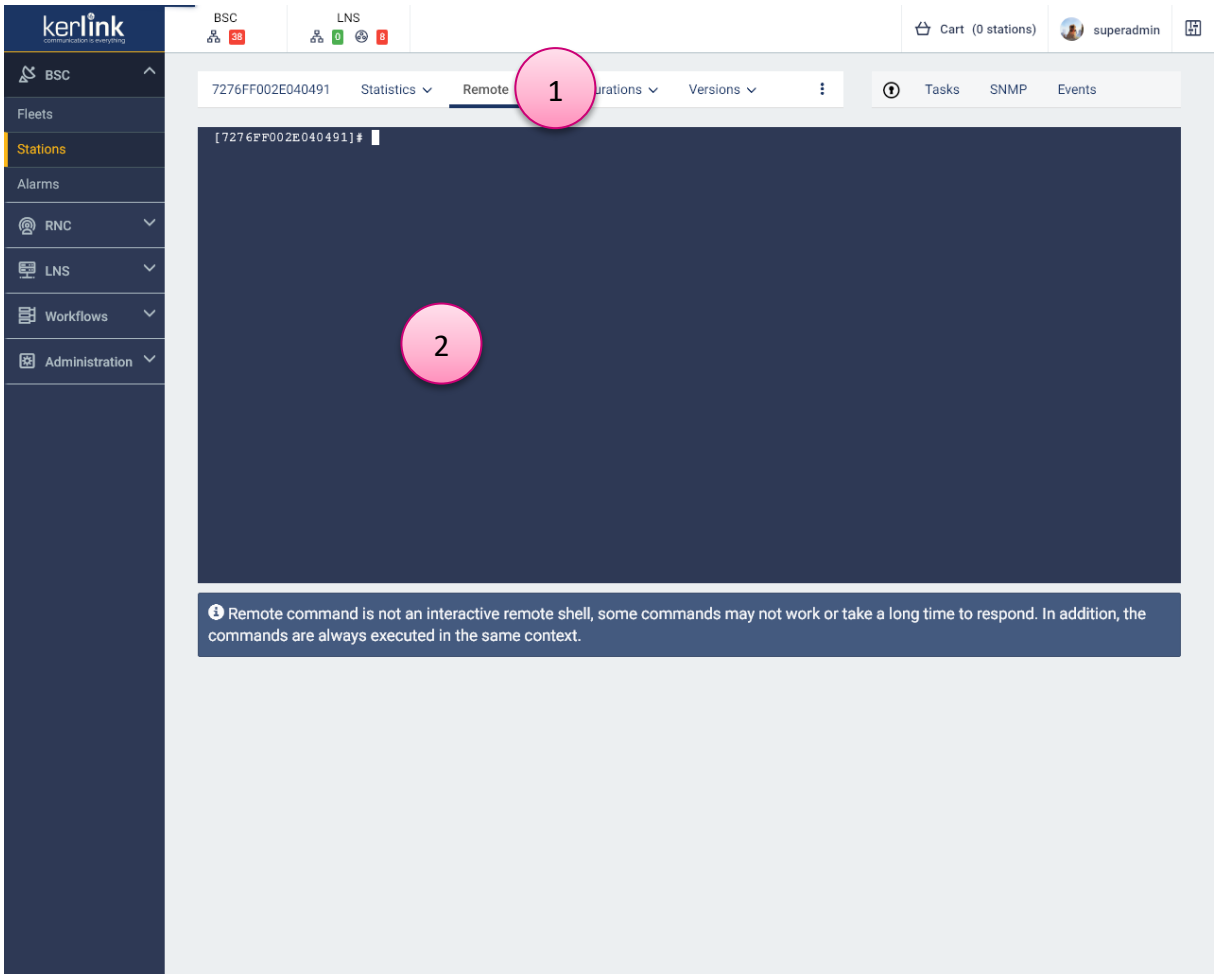

Figure 22 - Station remote command

(1) Access to a station page then click on the “Remote” menu and select “Command”.

(2) The console allows you to execute non-interactive and no context needed commands.

3.4.4 Station configurations

3.4.4.1 Supervision

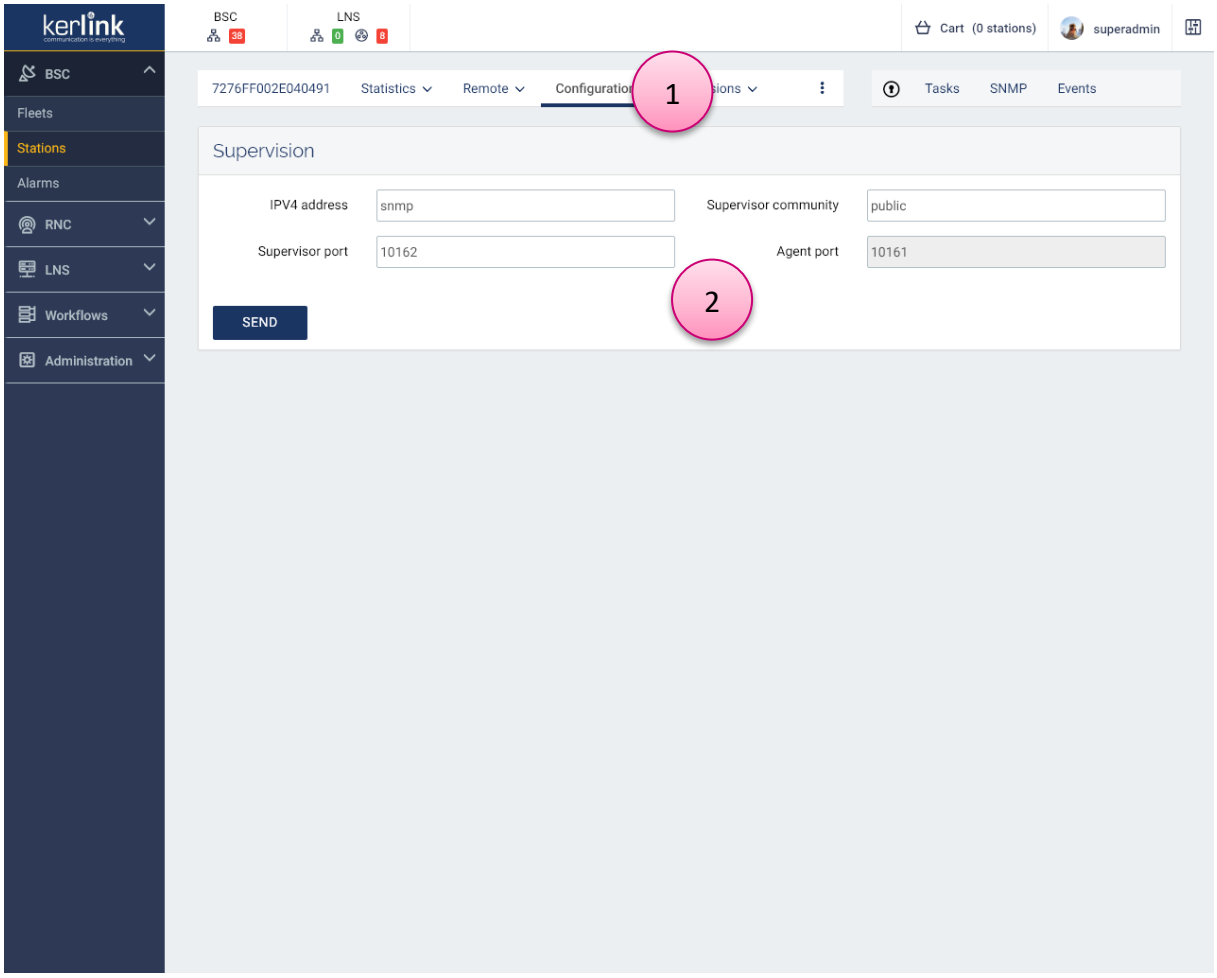

Figure 23 : Station supervision configuration

(1) Access to a station page then click on the “Configurations” menu and select “Supervision”.

(2) The “Supervision” panel allows you to configure the destination server of the station events.

Note: An update of the “Supervision” configuration will trigger a restart of the station. So, a message informs you that the station is rebooting and ask you to check that the modifications are well applied after the station is restarted.

3.4.4.2 Alarms

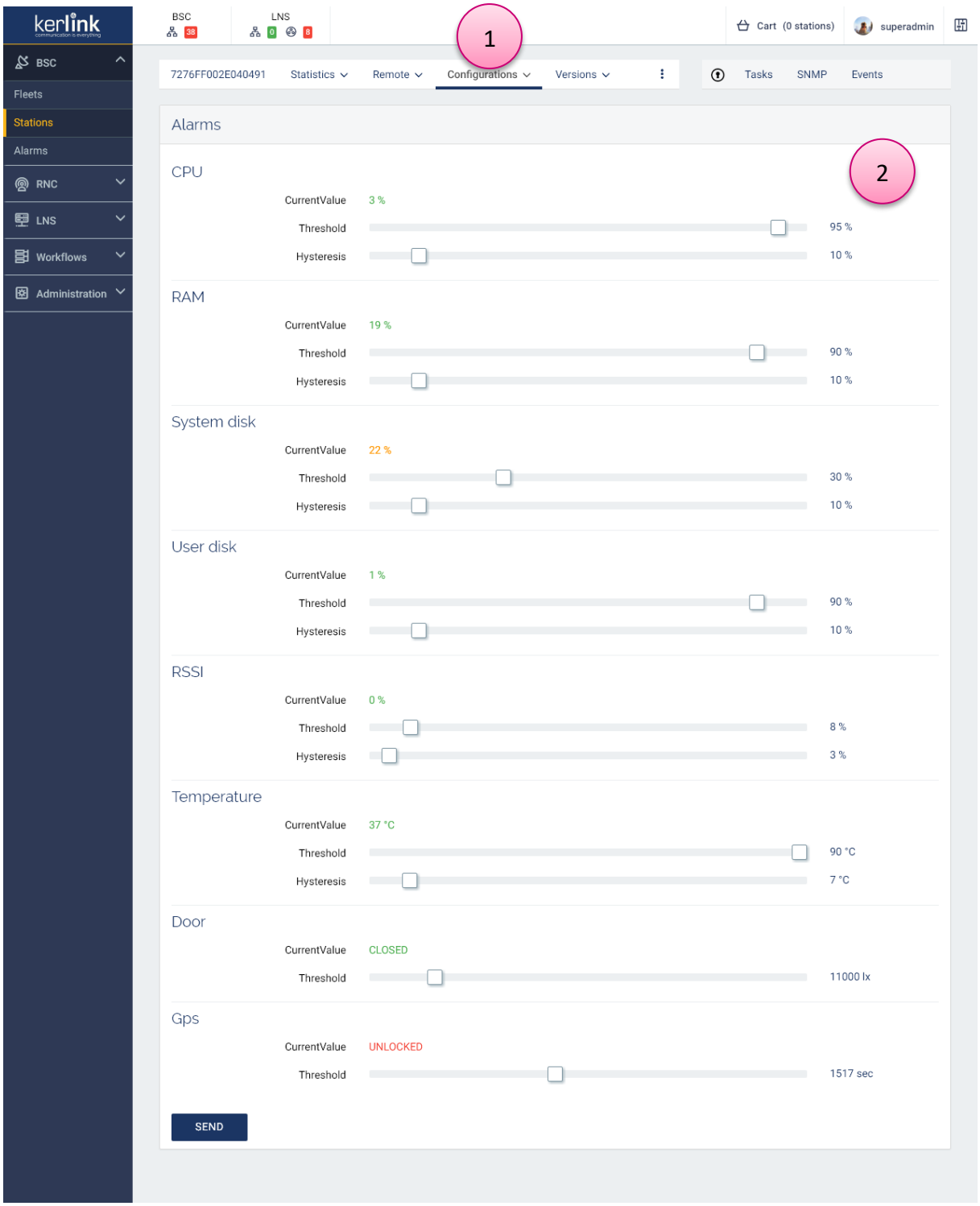

Figure 24 - Station control configuration

(1) Access to a station page then click on the “Configurations” menu and select “Alarms”.

(2) The “Control” panel allows you to configure the thresholds and hysteresis for several alarms (CPU, System disk, User disk, Door …). The current values are displayed next to each property. The colour shows the state of the value according to the threshold and hysteresis.

3.4.4.3 System

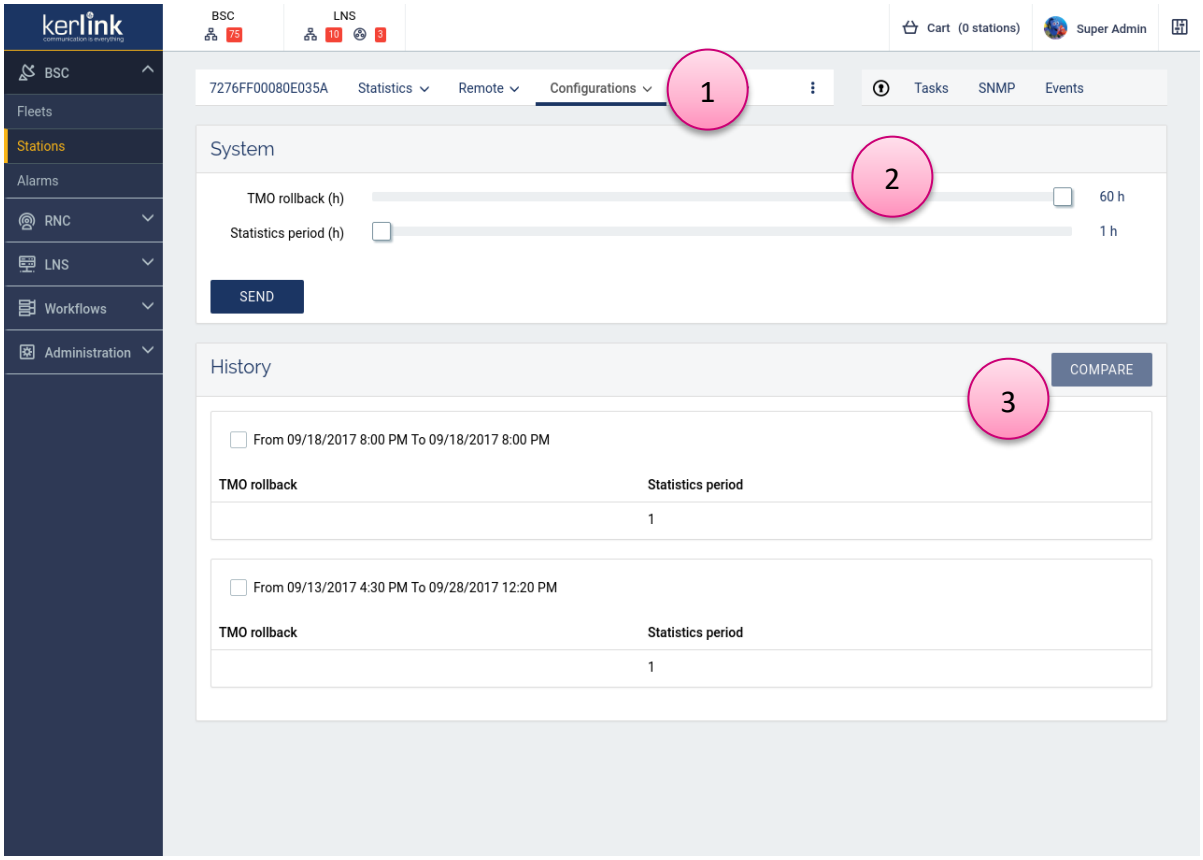

Figure 25 : Station system configuration

(1) Access to a station page then click on the “Configurations” menu and select “System”.

(2) The “System” panel allows you to configure the system properties of the station.

The “TMO rollback” is the number of minutes to rollback after losing WAN connectivity following a configuration.

(3) The “History” panel displays all the modifications of the properties. You can select many rows and click on the “Compare.” button to view the changes.

3.4.4.4 LAN

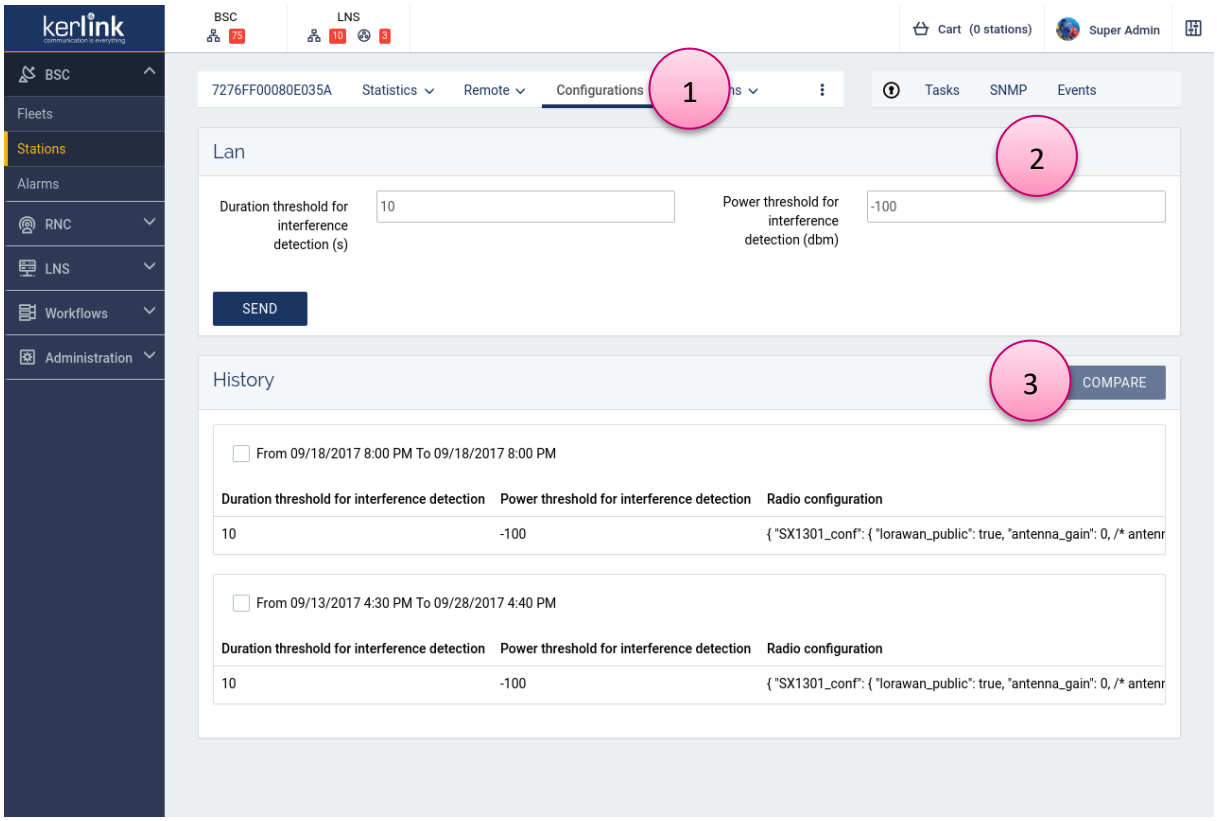

Figure 26 : Station LAN configuration

(1) Access to a station page then click on the “Configurations” menu and select “Lan”.

(2) The “Lan” panel allows you to configure the interferences detection properties of the station.

(3) The “History” panel displays all the modifications of the properties. You can select many rows and click on the “Compare.” button to view the changes.

3.4.4.5 Clock

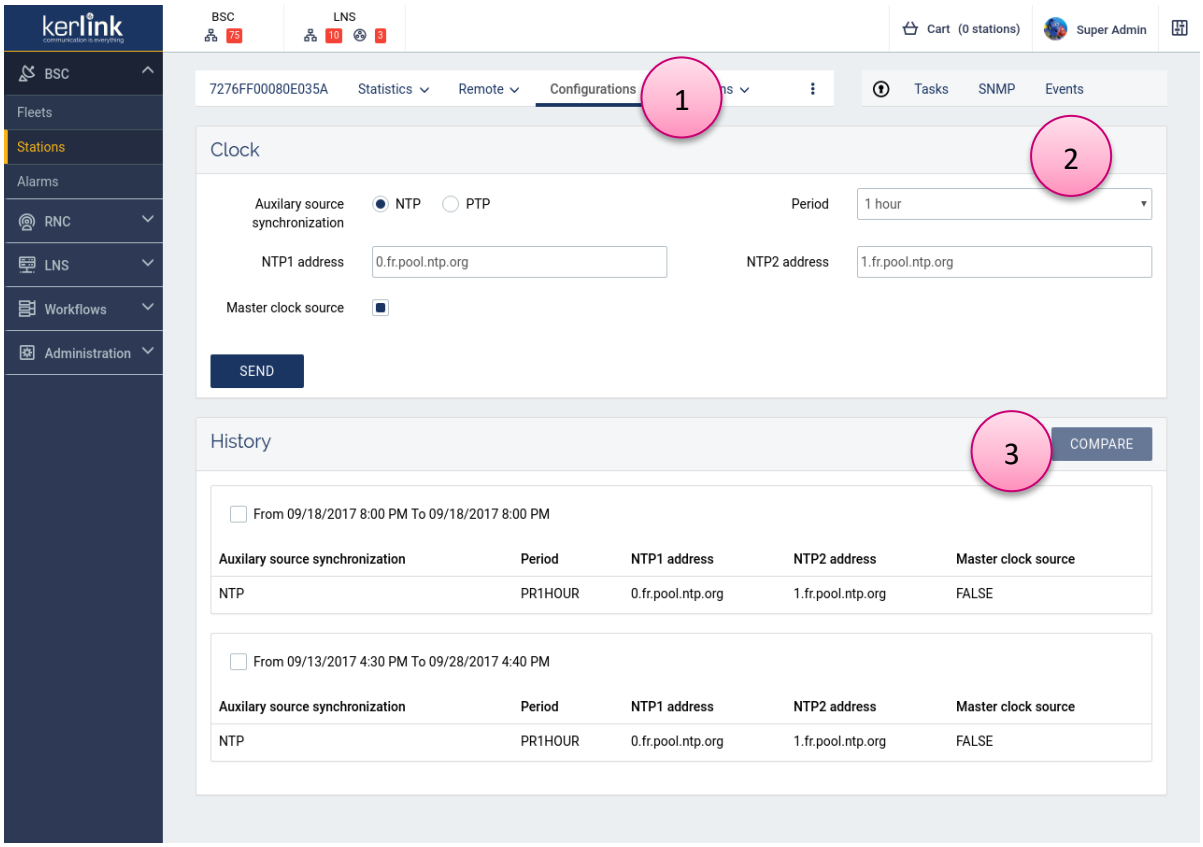

Figure 27 : Station clock configuration

(1) Access to a station page then click on the “Configurations” menu and select “Clock”.

(2) The “Clock” panel allows you to configure the clock properties of the station.

(3) The “History” panel displays all the modifications of the properties. You can select many rows and click on the “Compare.” button to view the changes.

3.4.4.6 VPN

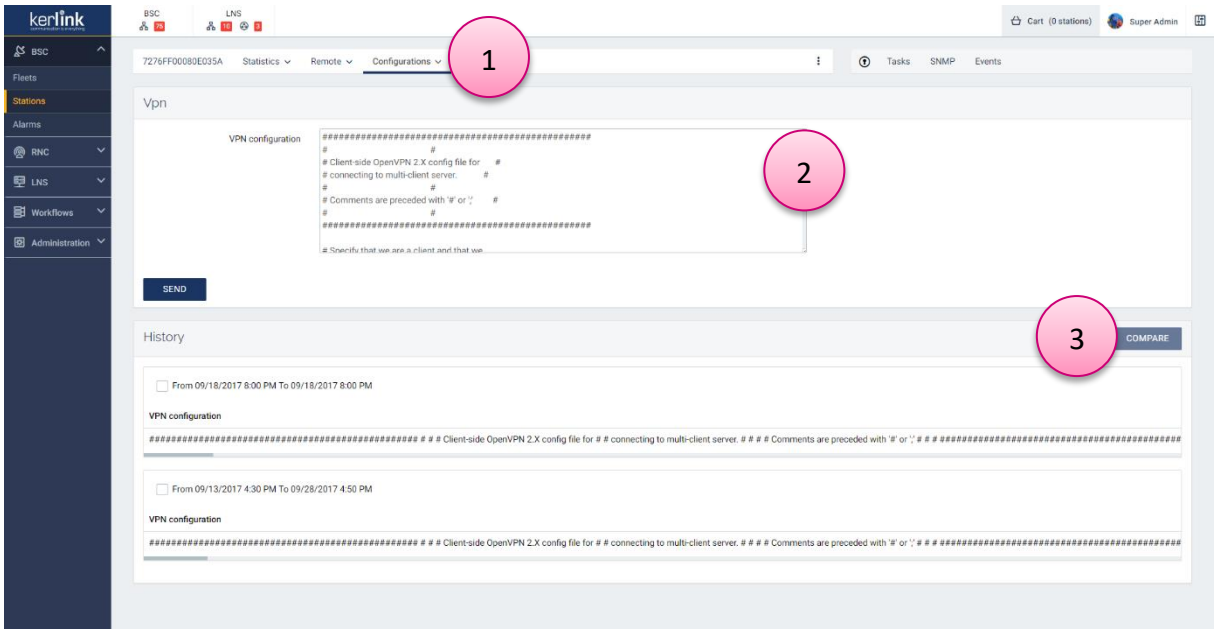

Figure 28 : Station VPN configuration

(1) Access to a station page then click on the “Configurations” menu and select “VPN”.

(2) The “Vpn” panel allows you to configure the VPN property of the station.

(3) The “History” panel displays the previous modifications of the property. You can select many rows and click on the “Compare.” button to view the changes.

3.4.4.7 WAN

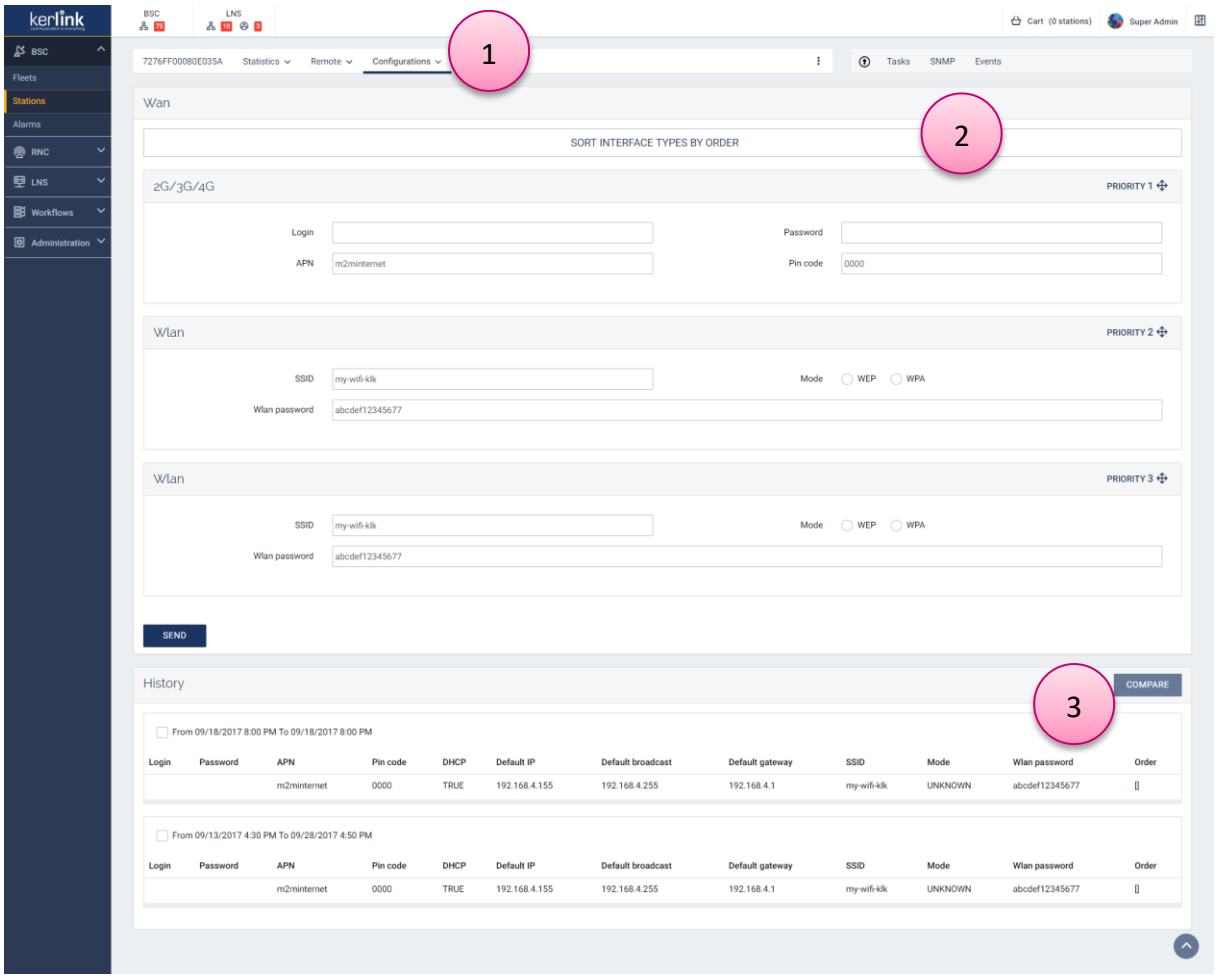

Figure 29 : Station WAN configuration

(1) Access to a station page then click on the “Configurations” menu and select “Wan”.

(2) The “Wan” panel allows you to configure the network properties of the station. You can drag and drop each interface to order them by priority.

(3) The “History” panel displays all the modifications of the properties. You can select many rows and click on the “Compare.” button to view the changes.

3.4.5 Station versions

3.4.5.1 Current version

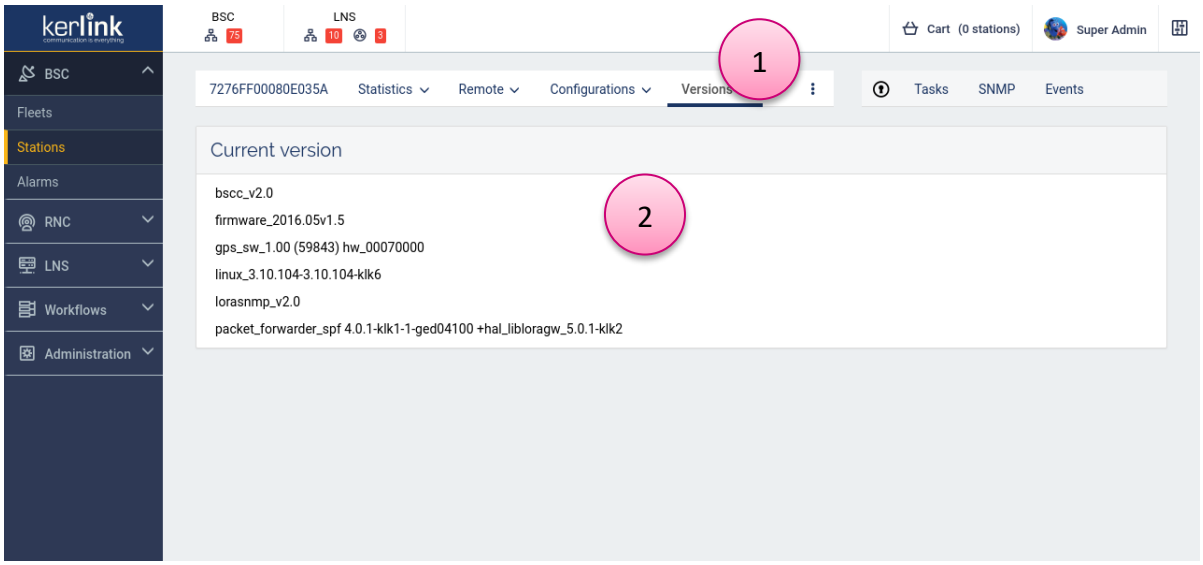

Figure 30 - Station current version

(1) Access to a station page then click on the “Versions” menu and select “Current version”.

(2) The “Current version” panel displays the installed version of the software in the station.

3.4.5.2 Version history

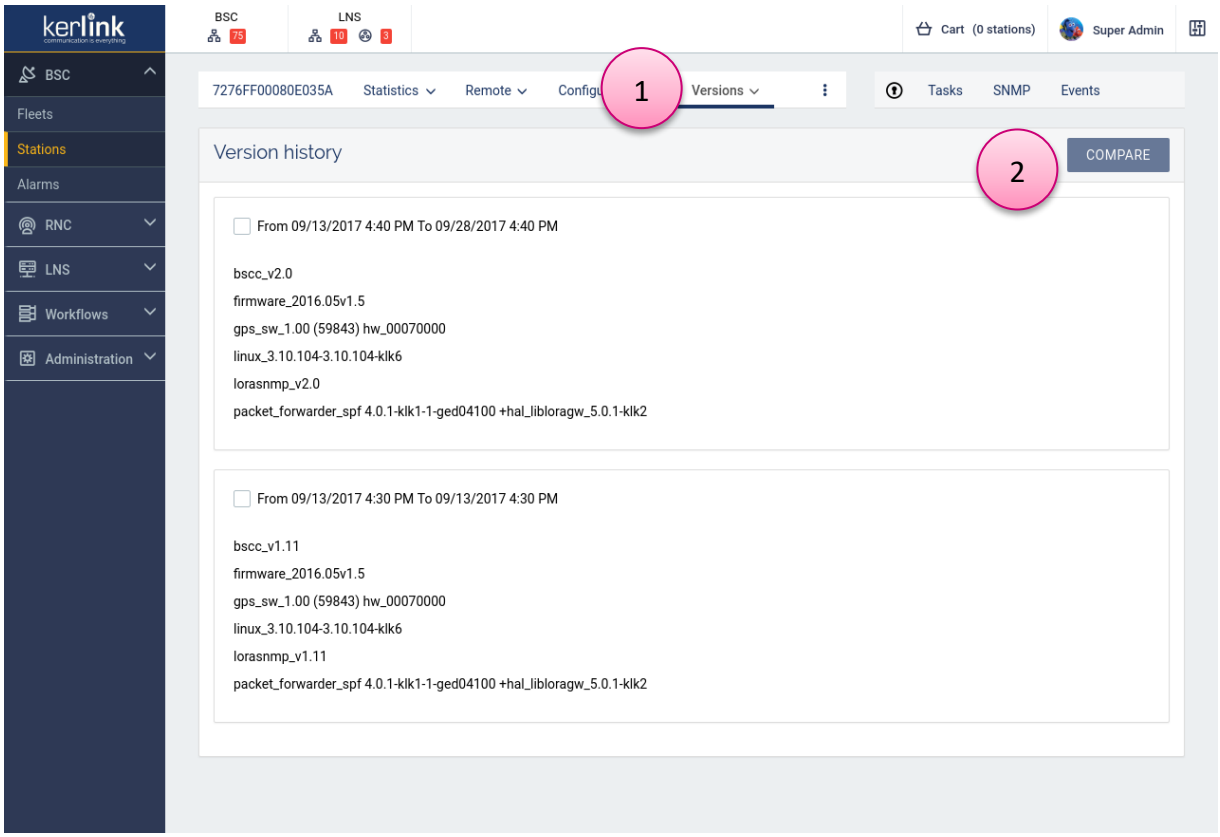

Figure 31 - Station versions history

(1) Access to a station page then click on the “Versions” menu and select “Version history”.

(2) The “Version history” panel displays all the versions installed in the station. You can select many rows and click on the “Compare.” button to view the changes.

3.4.5.3 Software update

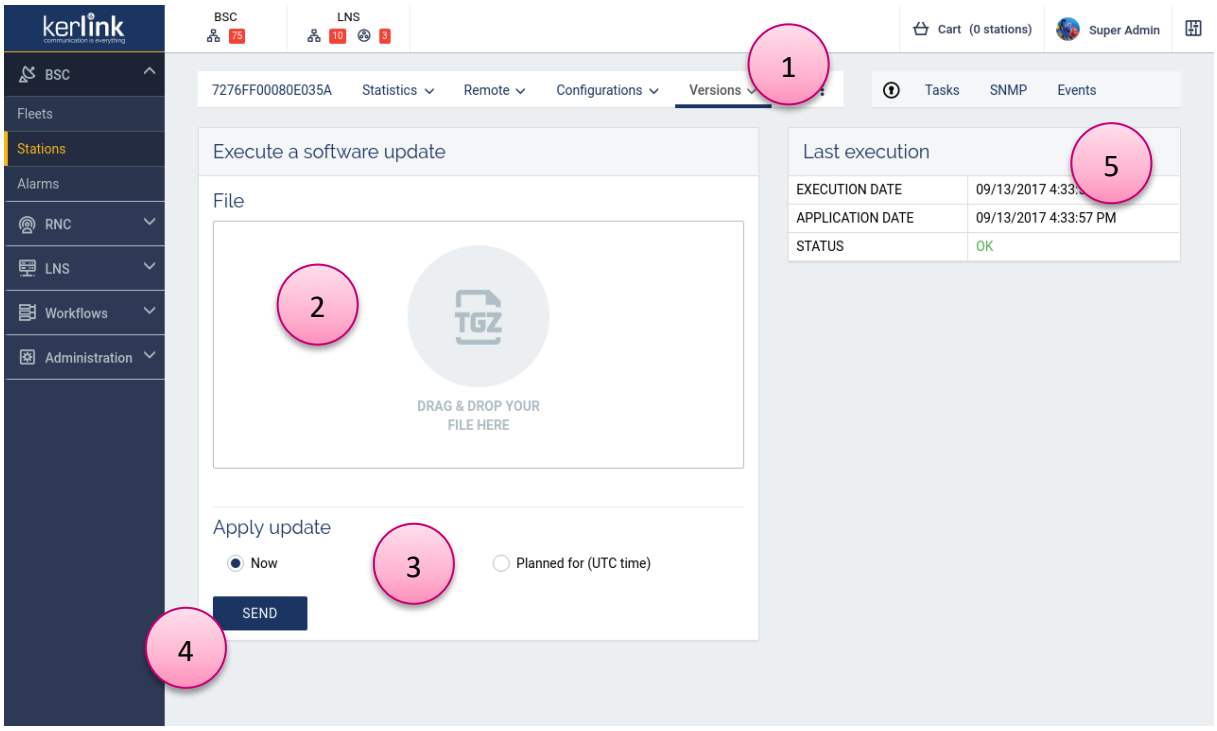

Figure 32 - Station software update

(1) Access to a station page then click on the “Versions” menu and select “Software update”.

(2) Click on the panel and choose a TAR.GZ file or drag and drop it from your computer.

(3) Choose the time you want the station to apply the update.

(4) Click on the “Send” button. The station will proceed the update asynchronously.

(5) This panel displays the information of the last update execution task refreshed every 15 minutes. You can also see all the executions on the “Tasks” tab.

3.4.6 Station tasks

The tasks tab is an advanced feature. It lists all tasks that were run on the station and allows you to debug issues by checking the tasks status and details: when clicking on a task, you can see all its messages and SNMP logs.

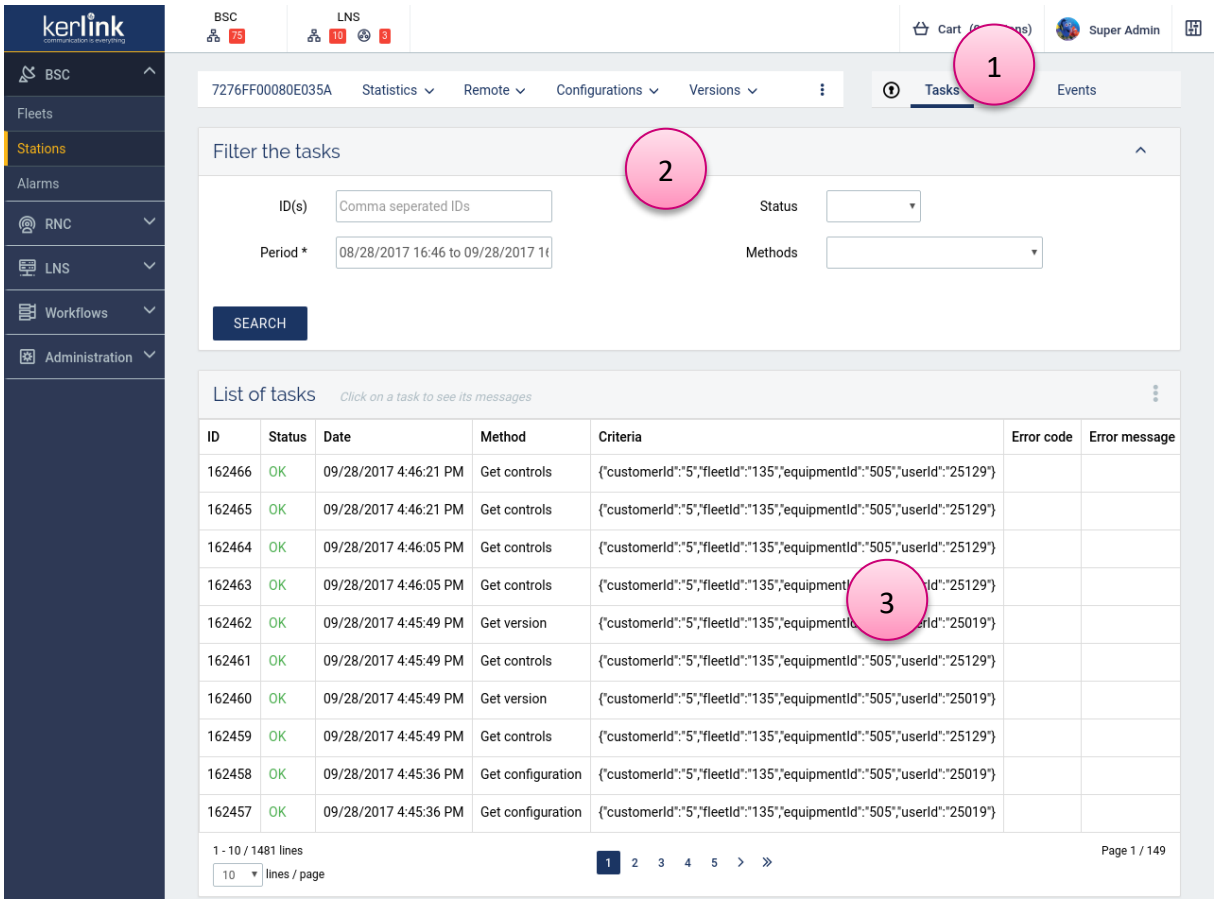

Figure 33 - Station tasks

(1) Access to a station page then click on the “Tasks” tab.

(2) Select criteria then click on the “Search” button to filter the tasks. Let empty criteria to get all of them.

(3) The list displays the tasks according to your filters. You can click on a task row to display the task messages and the SNMP logs below the list:

Task messages: OK - 63266 - 04/19/2017 11:59:53 AM - GET_VERSION

ID	DATE	PROGRESS STATUS	LOCATION	MESSAGE	CONTINUE?
AVuFp21VLKlJBE6X77AV	04/19/2017 11:59:53 AM	Received from application	Service.getCurrentVersion()		Yes
AVuFp21_LKlJBE6X77AW	04/19/2017 11:59:53 AM	Routing to equipment	Router.routingToEquipment()		Yes
AVuFp22xLKlJBE6X77AX	04/19/2017 11:59:54 AM	Routing to equipment	Queue.pushedToQueueAfterCompletion()		Yes
AVuFp22yLKlJBE6X77AY	04/19/2017 11:59:54 AM	Send to equipment	Queue.sendingToEquipment()		Yes
AVuFp25VLKlJBE6X77AZ	04/19/2017 11:59:54 AM	Routing to application	RequestSender.returnStatusMessage()		Yes
AVuFp26NLKlJBE6X77Aa	04/19/2017 11:59:54 AM	Send to equipment	RequestSender.returnEquipmentResponse()		Yes
AVuFp260LKlJBE6X77Ab	04/19/2017 11:59:54 AM	Send to equipment	RequestSender.snmpRequestSent()		Yes

Snmp logs: OK - 63266 - 04/19/2017 11:59:53 AM - GET_VERSION

Display oid names

ID	ORIGIN	DATE	CONTENT
2318268000184	To equipment	04/19/2017 11:59:54 AM	GET[requestID=0, errorStatus=Success(0), errorIndex=0, VBS[1.3.6.1.4.1.46911.50.1.1.0 = Null; 1.3.6.1.4.1.46911.50.1.2.0 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.1 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.1 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.2 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.2 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.3 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.3 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.4 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.4 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.5 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.5 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.6 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.6 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.7 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.7 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.8 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.8 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.9 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.9 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.10 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.10 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.11 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.11 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.12 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.12 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.13 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.13 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.14 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.14 = Null; 1.3.6.1.4.1.46911.50.1.3.1.1.15 = Null; 1.3.6.1.4.1.46911.50.1.3.1.2.15 = Null]]
2318269000184	From equipment	04/19/2017 11:59:54 AM	RESPONSE[requestID=270005484, errorStatus=Success(0), errorIndex=0, VBS[1.3.6.1.4.1.46911.50.1.1.0 = 40:38:24:3a:60:0e:14:52:c3:71:8a:f8:32:c9:bf:2f; 1.3.6.1.4.1.46911.50.1.2.0 = 6; 1.3.6.1.4.1.46911.50.1.3.1.1.1 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.1 = 6c:69:6e:75:78:5f:33:2e:31:30:2e:31:30:34:2d:33:2e:31:30:2e:31:30:34:2d:6b:6c:6b:36:00; 1.3.6.1.4.1.46911.50.1.3.1.1.2 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.2 = 66:69:72:6d:77:61:72:65:5f:32:30:31:36:2e:30:35:76:31:2e:35:00; 1.3.6.1.4.1.46911.50.1.3.1.1.3 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.3 = 67:70:73:5f:73:77:5f:31:2e:30:30:20:28:35:39:38:34:33:29:20:68:77:5f:30:30:30:37:30:30:30:30:00; 1.3.6.1.4.1.46911.50.1.3.1.1.4 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.4 = 62:73:63:63:5f:76:31:2e:37:2d:33:2d:67:32:32:35:31:30:30:63:00; 1.3.6.1.4.1.46911.50.1.3.1.1.5 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.5 = 6c:6f:72:61:73:6e:6d:70:5f:76:31:2e:37:2d:32:2d:67:30:35:62:63:30:33:61:00; 1.3.6.1.4.1.46911.50.1.3.1.1.6 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.6 = 70:61:63:6b:65:74:5f:66:6f:72:77:61:72:64:65:72:5f:73:70:66:20:33:2e:31:2e:30:2d:6b:6c:6b:31:31:20:2b:68:61:6c:5f:6c:69:62:6c:6f:72:61:67:77:5f:34:2e:31:2e:33:2d:6b:6c:6b:32:00; 1.3.6.1.4.1.46911.50.1.3.1.1.7 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.7 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.8 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.8 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.9 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.9 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.10 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.10 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.11 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.11 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.12 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.12 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.13 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.13 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.14 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.14 = noSuchInstance; 1.3.6.1.4.1.46911.50.1.3.1.1.15 = noSuchObject; 1.3.6.1.4.1.46911.50.1.3.1.2.15 = noSuchInstance]]

1 - 2 / 2 lines

10 lines / page

1

Page 1 / 1

Figure 34 - Tasks messages and SNMP logs

3.4.7 Station SNMP logs

The SNMP tab is an advanced feature. It lists all SNMP requests that were made on the station and allows you to debug issues by checking the requests details.

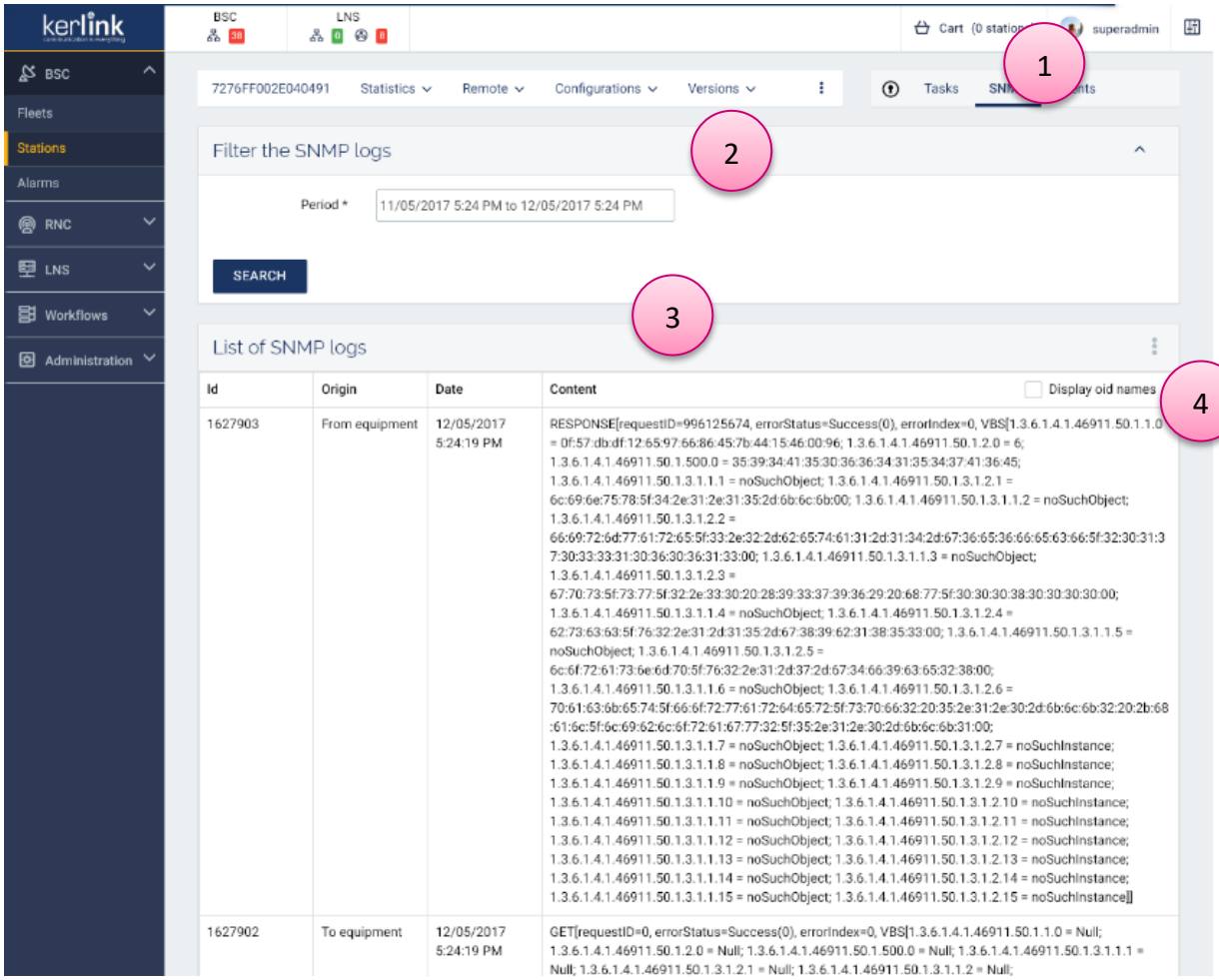

Figure 35 - Station SNMP logs

(1) Access to a station page then click on the “SNMP” tab.

(2) Select criteria then click on the “Search” button to filter the SNMP logs.

(3) The list displays the SNMP logs according to your filters.

(4) You can switch to the oid values or the oid names by checking / unchecking this checkbox.

3.4.8 Station events

The events tab is an advanced feature. It lists all events that were triggered on the station and allows you to debug issues by checking the events details. Events can be alarms (high CPU value for instance) or simple events (station start, door open/closed…).

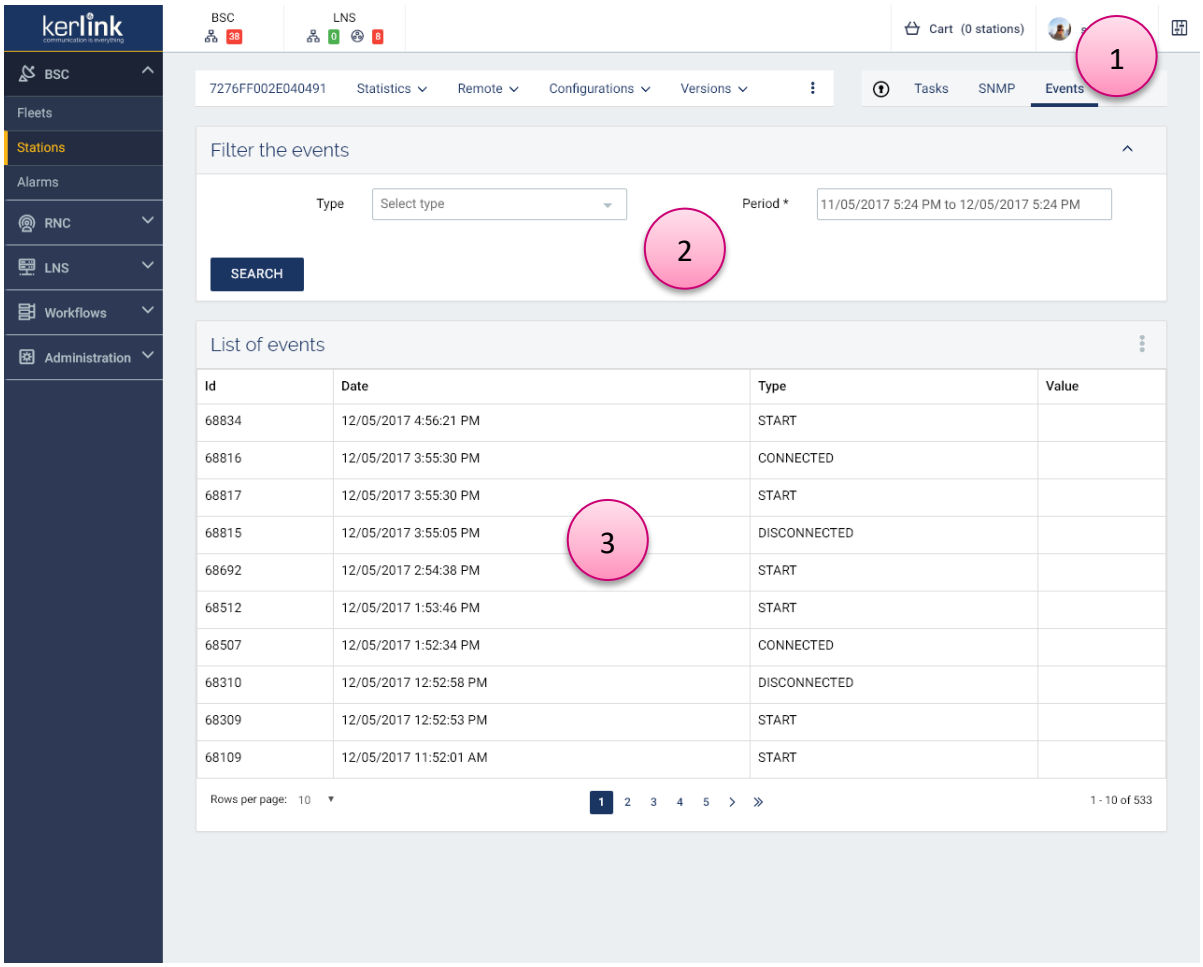

Figure 36 - Station events

(1) Access to a station page then click on the “Events” tab.

(2) Select criteria then click on the “Search” button to filter the events.

(3) The list displays the events according to your filters.

3.5 Consult the last alarms of your fleets

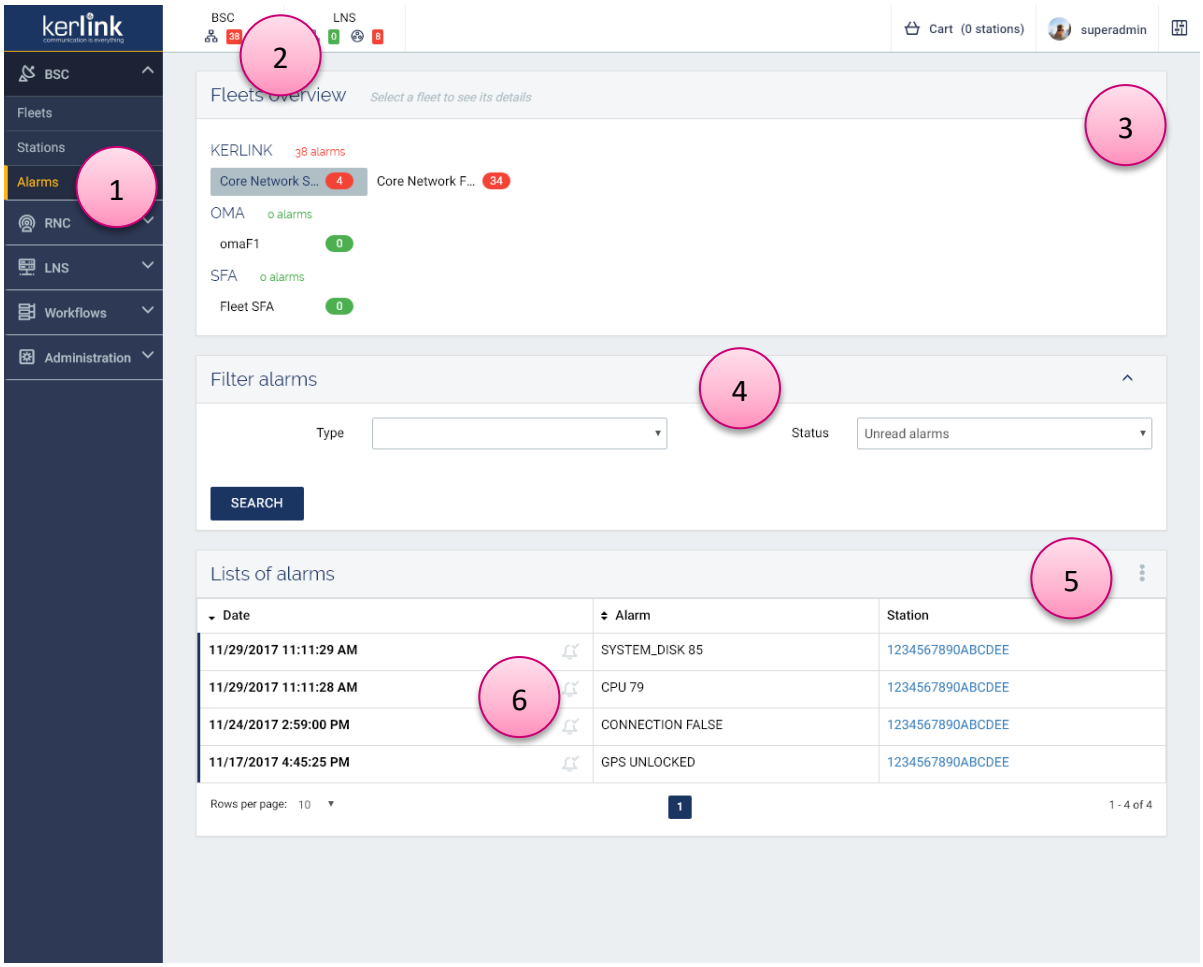

Figure 37 - BSC alarms

(1) Click on the “Alarms” button to navigate to the BSC alarms screen.

(2) The “BSC” button is a shortcut to the same screen. It displays the number of BSC alarms of all fleets.

(3) The “Fleets overview” panel lists all the fleets with their number of alarms. To see the details of a fleet, click on it.

A super admin will see all fleets of all customers. Other roles will only see the fleets of their customer.

(4) Select criteria then click on the “Search” button to filter the alarms.

(5) The “Details” panel lists all alarms of the selected fleet.

(6) You can click on the “read” button to mark an alarm as read.

4. RNC

4.1 Analyze the radio frequency activity of your modems

4.1.1 Request a radio frequency activity analysis of your modem

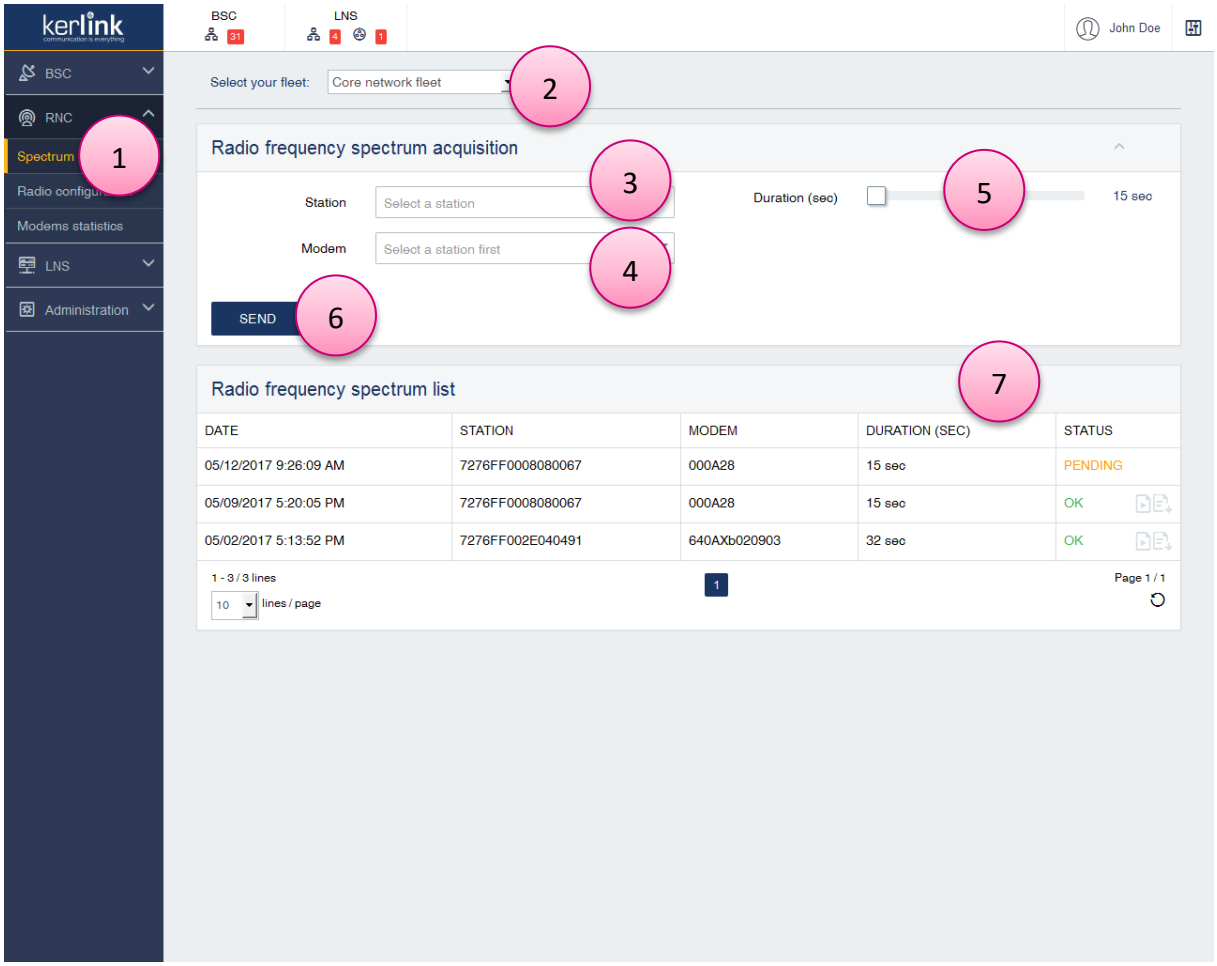

Figure 38 - Spectrum analysis acquisition

(1) Click on the “Spectrum” button to access to the radio frequency analysis page.

(2) Select a fleet.

(3) Select a station.

(4) Select a modem.

(5) Select the duration of the analysis.

(6) Click on the “Send” button.

(7) The “list” panel displays all requests. When a spectrum succeed (status is “OK”), two buttons appear next to it:

- Play: Visualize the spectrum with the 3D viewer.
- Download: Download the spectrum as a text file.

4.1.2 *Consult the results of a radio frequency activity analysis of your modem*

In order to visualize a spectrum with the 3D viewer, click on the “Play” button next to the “OK” status of a request in the panel “Radio frequency spectrum list”.

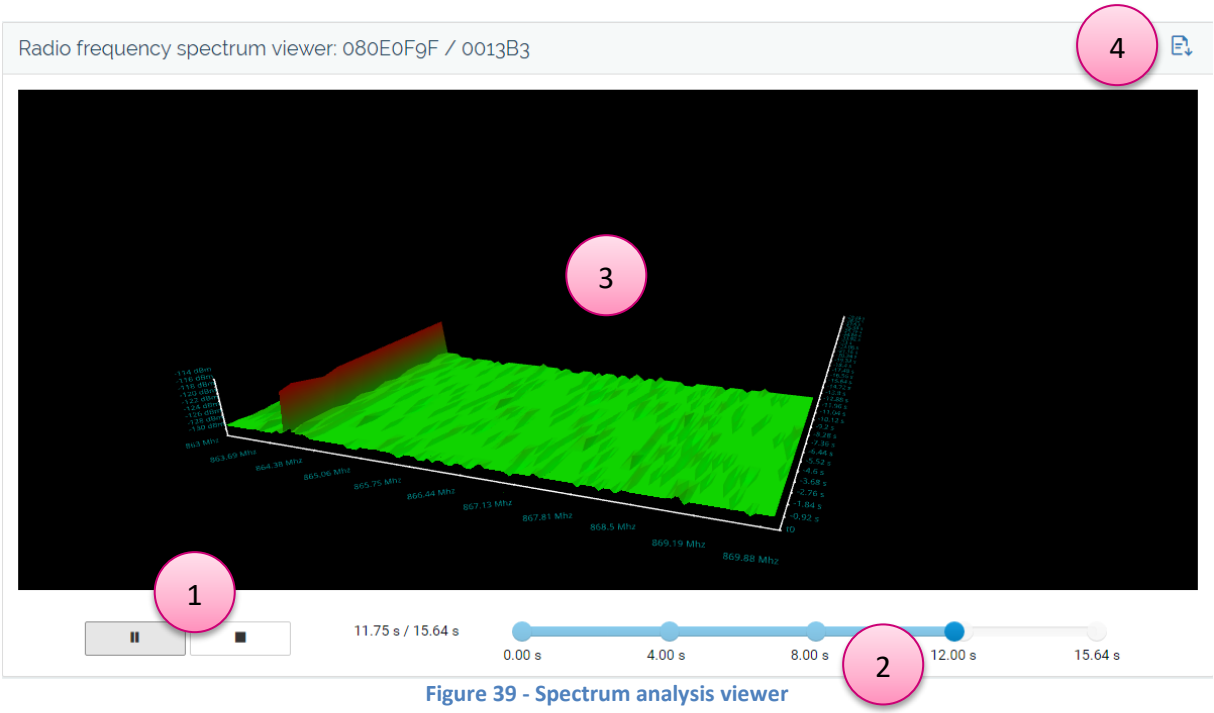

Figure 39 - Spectrum analysis viewer

(1) Click on the “Play/Pause” button to start/pause the animation. Click on the “Stop” button to stop and reset the animation to the beginning.

(2) The time bar shows the progress of the animation. You can reach a specific moment by clicking or moving the cursor.

(3) You can zoom and change the position of the camera by scrolling or clicking and moving the mouse. On pause mode, you can highlight a point on the spectrum to display its values on a tooltip.

(4) Click on the “Download” button to download the spectrum as a text file.

4.2 Configure the radiopath and channel frequencies of your modems

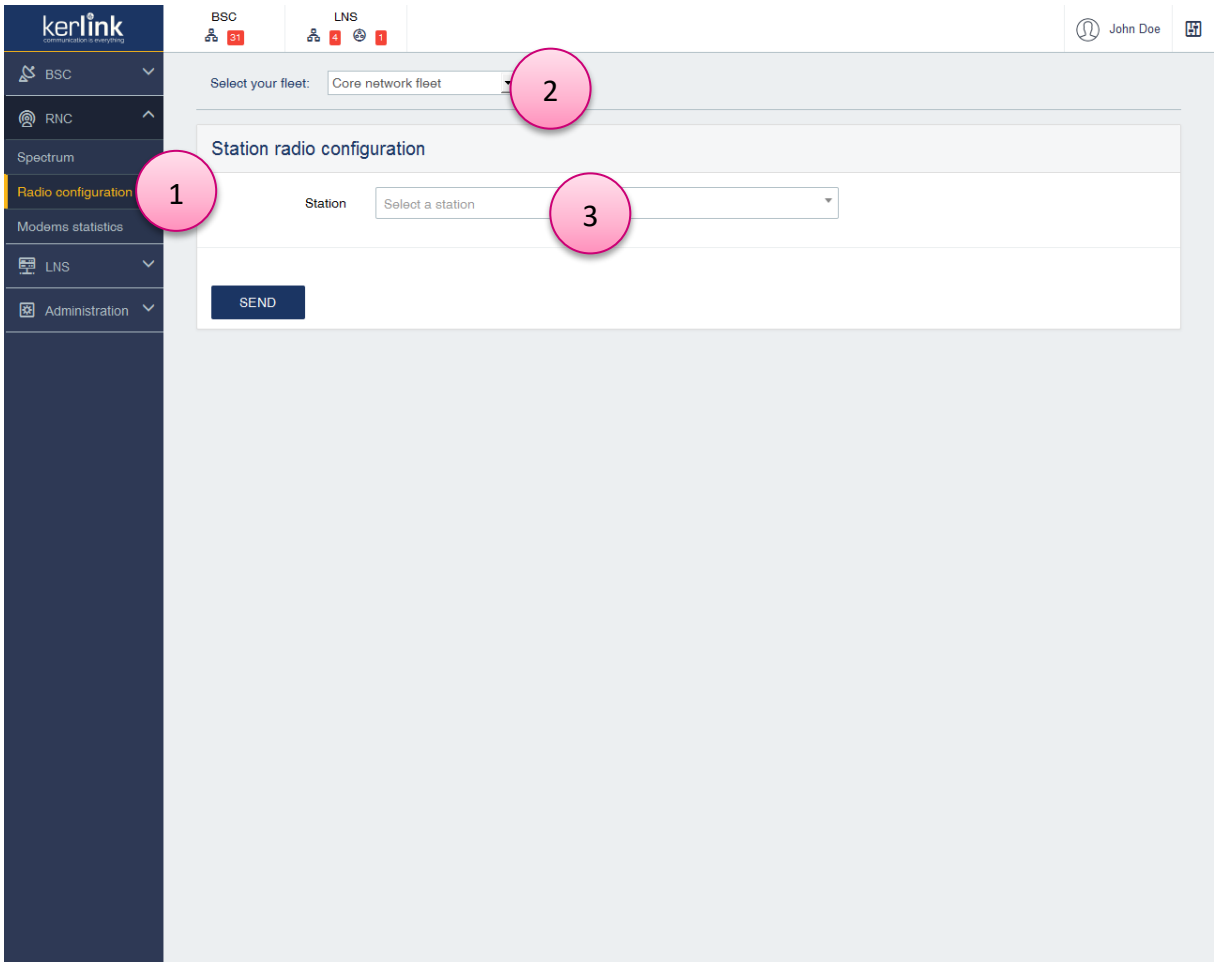

Figure 40 - Station selection for radiofrequency configuration

(1) Click on the “Radio configuration” button.

(2) Select a fleet.

(3) Select a station. After that, the radiofrequency configuration appears below.

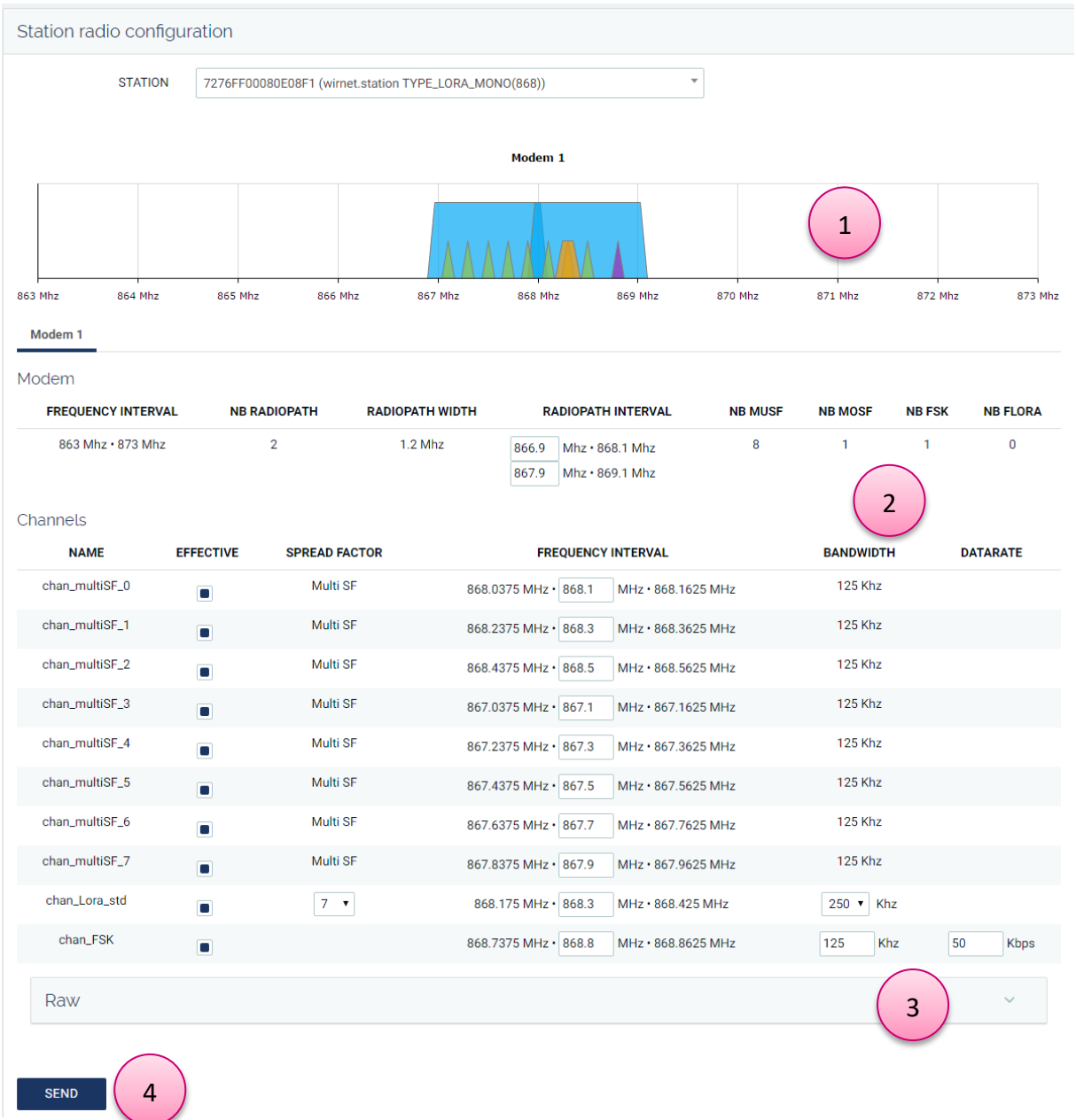

Figure 41 - Radiofrequency configuration

(1) The chart displays the radio paths and channels (only for configuration formats supported by the application). It is a read-only visualization.

(2) Form edition of the radio paths and channels frequencies (only for configuration formats supported by the application). The values are checked with the following rules:

- The radio path interval frequencies are included into the range interval frequency.

- The effective channels interval frequencies are included into at least one of the radio path interval frequency.

(3) Text “raw” area contains the radiofrequency configuration as raw string.

(4) Click on the “Send” button to apply the new radiofrequency configuration.

4.3 Consult and analyze the statistics on your modems

4.3.1 Request a statistics chart

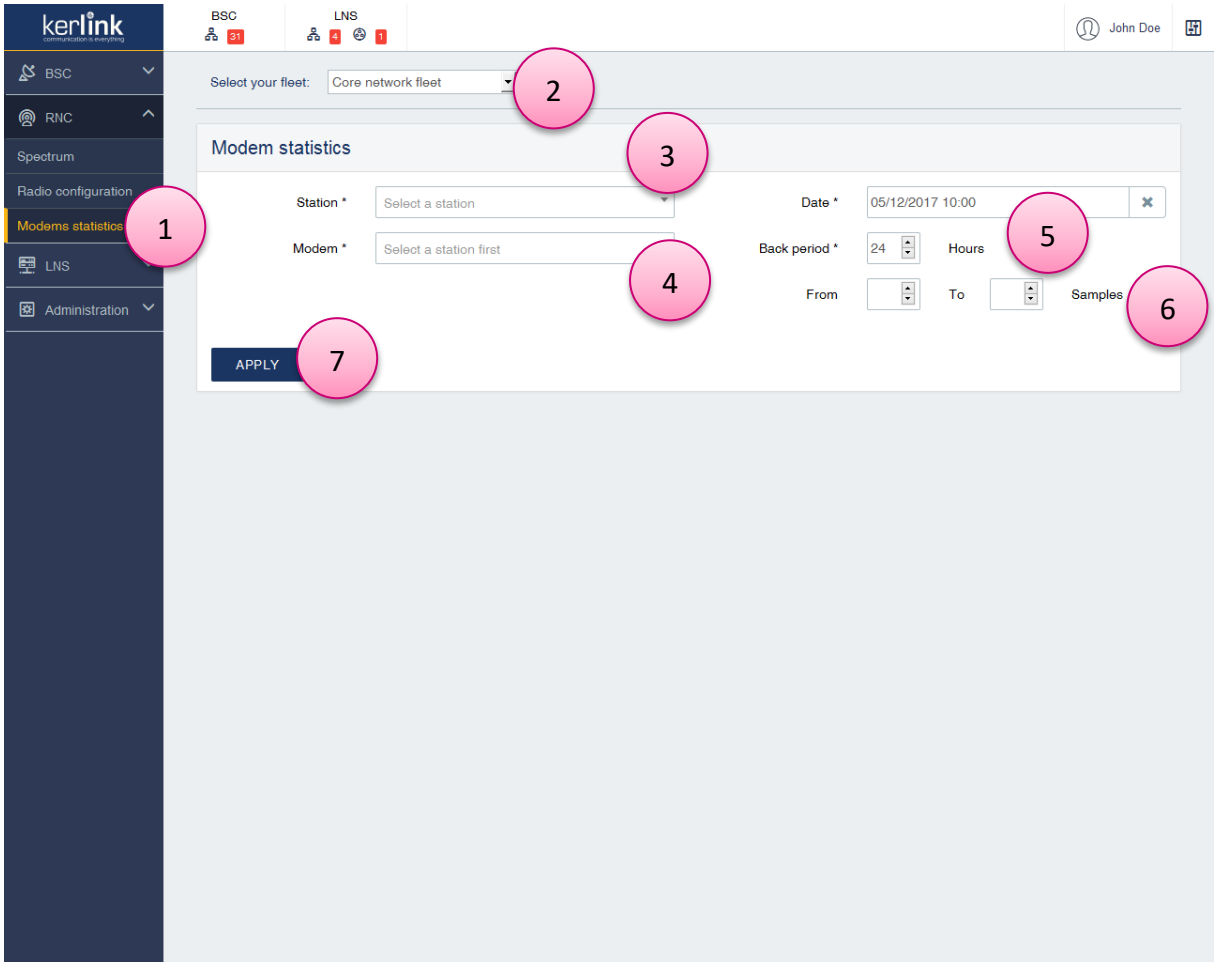

Figure 42 - Modem selection for statistics display

(1) Click on the “Modems statistics” button.

(2) Select a fleet.

(3) Select a station.

(4) Select a modem.

(5) Set the date and the back-hour period.

(6) Set the filter of samples number by frequency.

(7) Click on the “Apply” button to see statistics. The 3D chart statistics appears below.

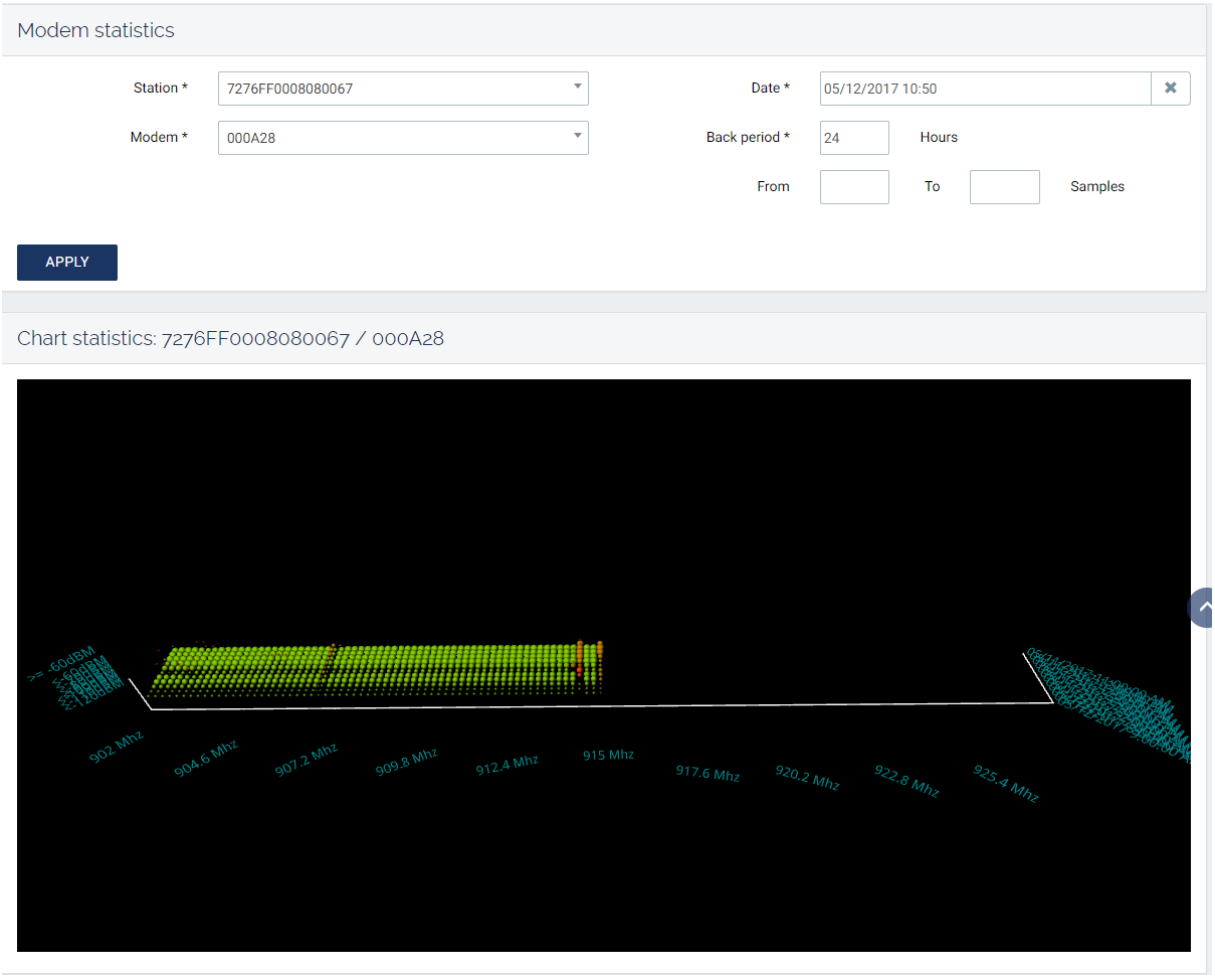

Figure 43 : Modem statistics

You can zoom and change the position of the camera by scrolling or clicking and moving the mouse. You can hover over a sphere to display the details in a tooltip.

4.3.2 Read the statistics chart

The chart shows a scan result of the modem RSSI. The radio frequencies are sampled and grouped on three axes:

- Frequency (X axis)
- RSSI range (Y axis with color: green < -120 dBM to red >= -60 dBm)
- Hour (Z axis)

The size of the spheres is proportional to the sample count.

5. LNS

5.1 List your clusters

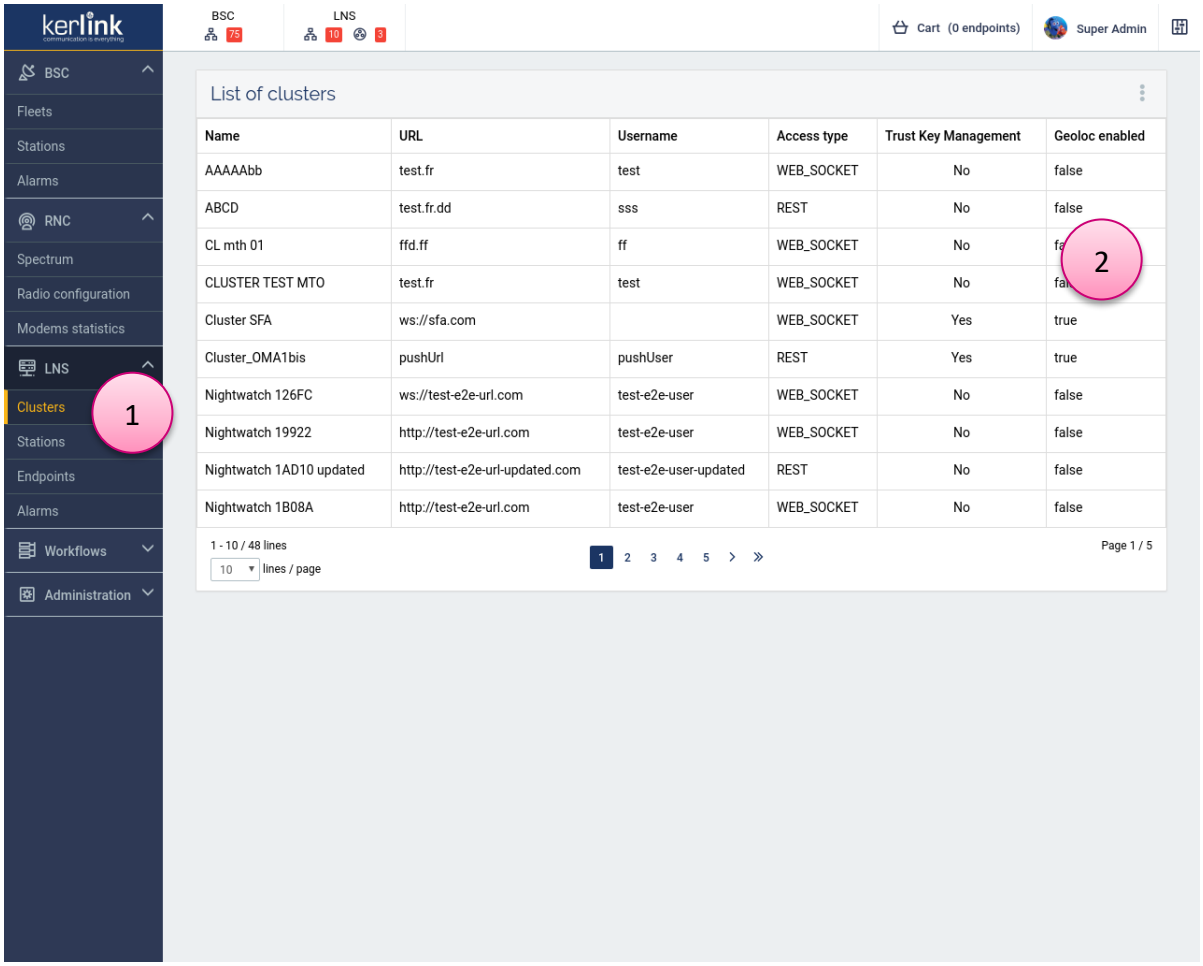

Figure 44 - Clusters list

(1) Click on the “Clusters” button.

(2) List of your clusters.

5.2 List the stations

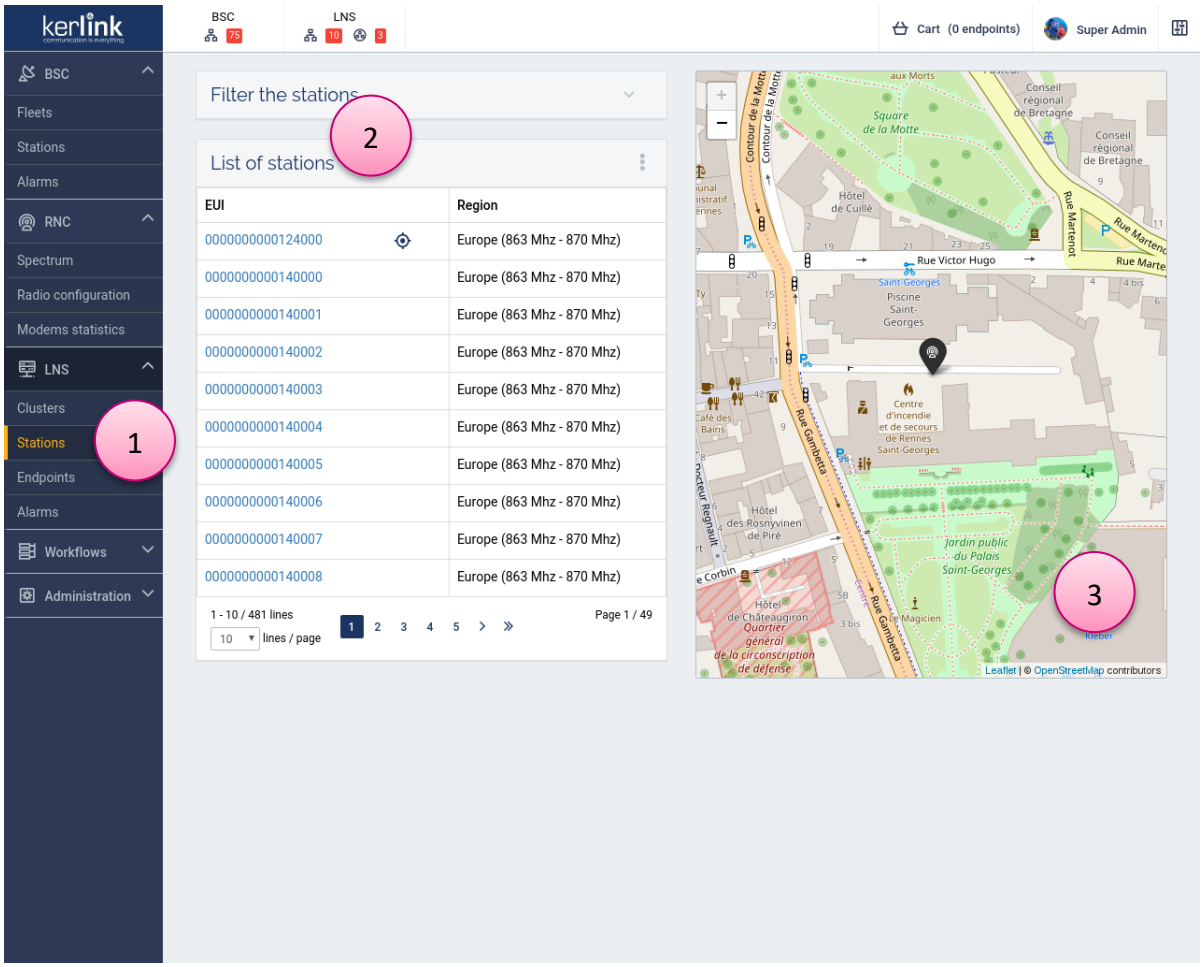

Figure 45 - LNS stations list

(1) Click on the LNS “Stations” button.

(2) List of the stations (your stations or public stations). You can click on the ID of a station to access to its details page. You can filter the station with the “Filter stations” panel.

(3) Map of the stations positions. You can click on the marker of a station to see its ID and click on it to access its details page.

5.3 Consult the properties of a station

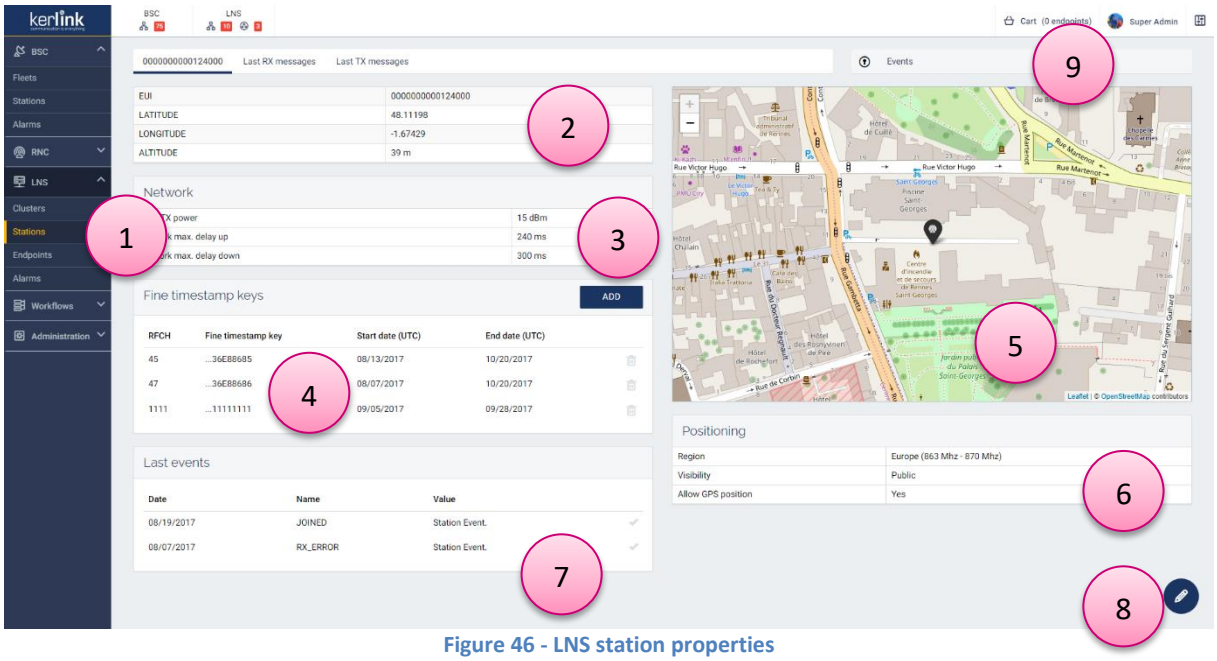

Figure 46 - LNS station properties

(1) Click on the LNS “Stations” button then click on the ID of a station.

(2) Attributes of the station.

(3) Network properties of the station.

(4) AES keys of the station.

(5) Position of the station.

(6) Positioning properties of the station.

(7) Last events of the station.

(8) The floating button allows you to edit some properties of the station

(9) The top menu bar allows you to see last RX messages, last TX messages and events of the station.

5.4 Search and list the endpoints of your clusters

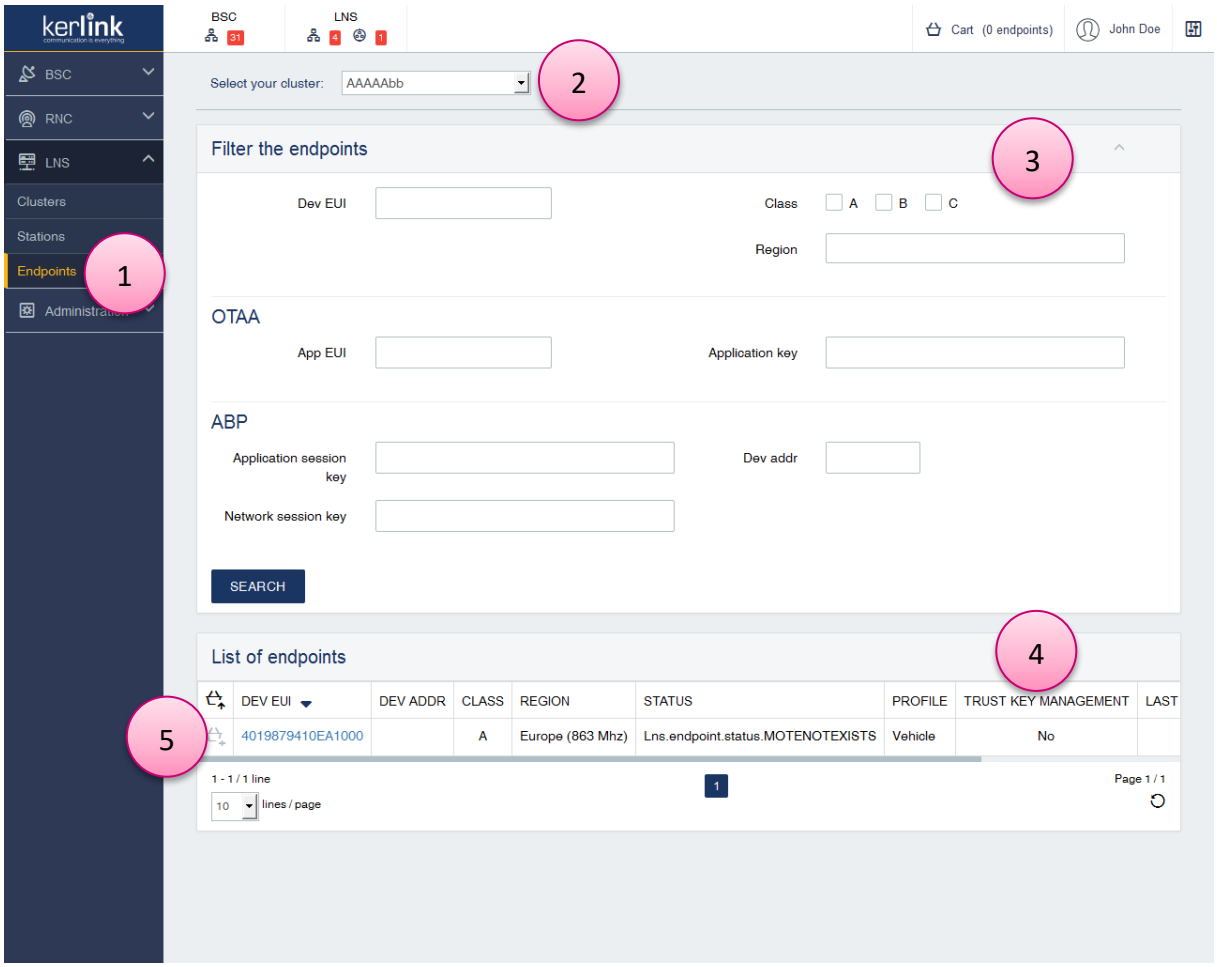

Figure 47 - Endpoints list

(1) Click on the “Endpoints” button.

(2) Select a cluster.

(3) The filter panel allows you to filter the endpoints according to several criteria.

(4) The list panel shows the result of the search. If no filter is set, it shows a list of all endpoints in the selected cluster.

(5) For each endpoint in the list, you can:

- Add the endpoint to the cart (or remove it).
- Go to the details page of the endpoint.

5.5 Manage your endpoints cart

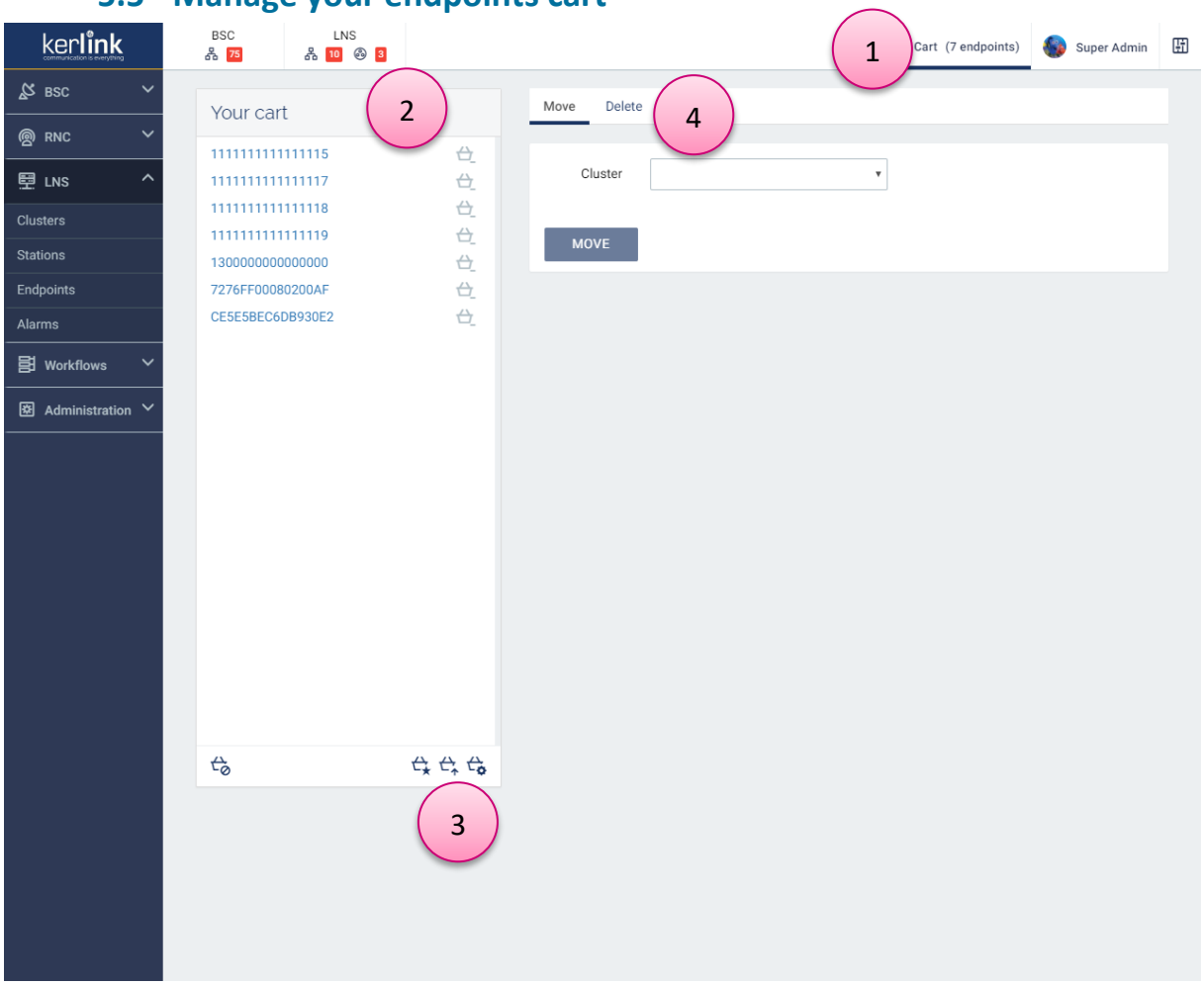

Figure 48 - Endpoints cart

(1) Click on the cart button.

(2) The panel “Your cart” shows the list of endpoints currently added in your cart. You can remove some endpoints or empty your cart by clicking on the respective buttons.

(3) These buttons allow you to respectively save the current cart, load endpoints of many previous saved carts and manage previous saved carts. These functionalities are described in the paragraph 6 - Cart management.

(4) The tabs correspond to all the actions you can perform on the endpoints of your cart.

5.6 Consult the properties of an endpoint

5.6.1 Endpoint attributes

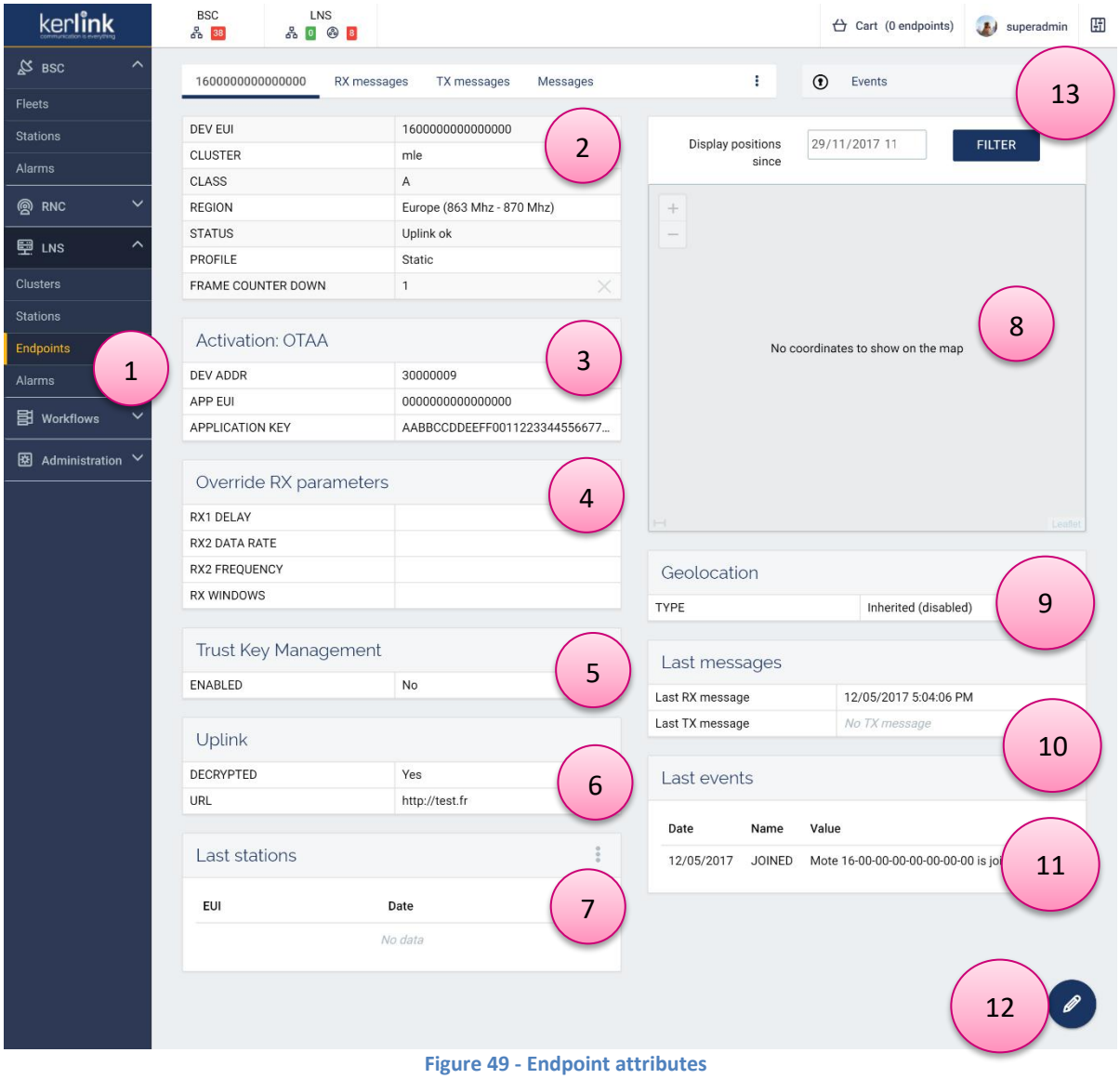

Figure 49 - Endpoint attributes

(1) Click on the "Endpoints" button to access to the list of endpoints then click on the dev EUI of the endpoint you want to consult.

(2) This panel shows the attributes of the endpoint. You can reset the frame counter down by clicking on the reset button.

(3) The panel "Activation" lists the activation parameters of the endpoint (OTAA or ABP).

(4) The panel “Override RX parameters” lists the override RX parameters of the endpoint.

(5) The panel “TKM” lists the trust key management parameters of the endpoint cluster. These values are set when creating the endpoint (see paragraph 8.5).

(6) The panel “Uplink” lists the push parameters of the endpoint cluster.

(7) The panel “Last stations” shows the last stations the endpoint has communicated with.

(8) The map displays the positions of the endpoint and the positions of the stations who has communicated with it after the “Start date” value.

(9) The panel “Geolocation” displays the geolocation properties of the endpoint.

(10) The panel “Last messages” displays the last RX and TX messages of the endpoint.

(11) The panel “Last events” displays the last events of the endpoint.

(12) Click on the floating button to edit the endpoint.

(13) The top menu bar allows you to see last RX messages, last TX messages and events of the endpoint.

5.6.2 RX messages

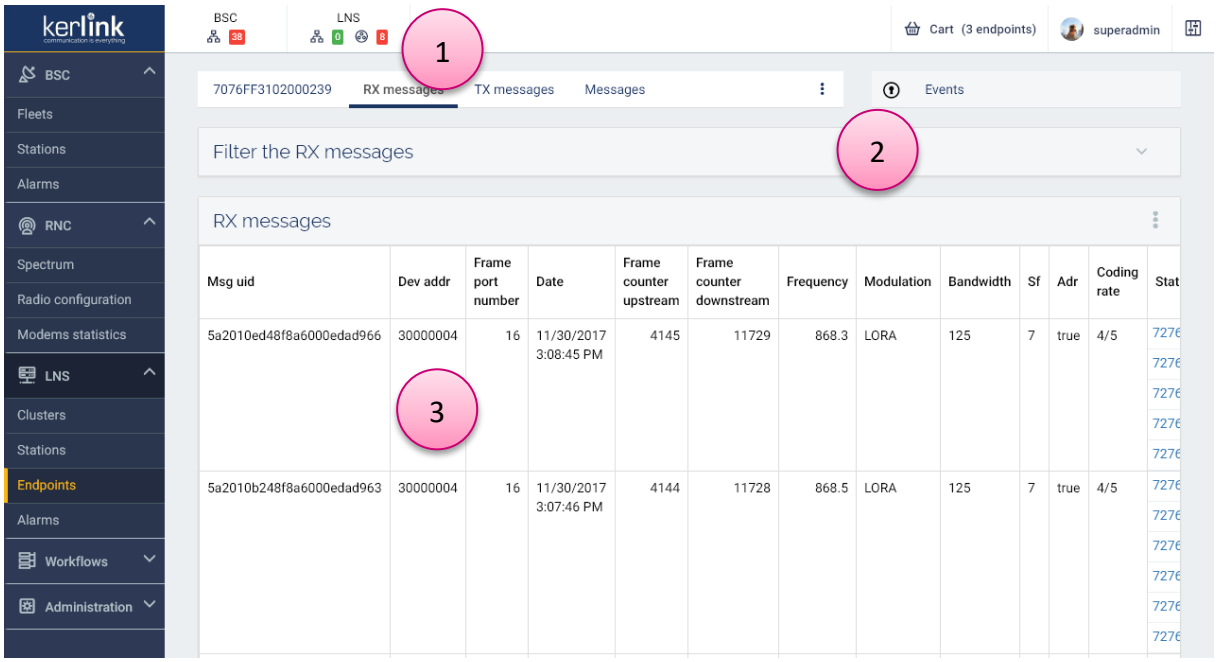

Figure 50 - Endpoint RX messages

(1) Access to an endpoint page then click on the “RX messages” tab.

(2) The filter panel allows you to filter the list of RX messages.

(3) The panel “RX messages” list the messages sent by the endpoint and received by the stations. You can click on a message row to display its details.

5.6.3 TX messages

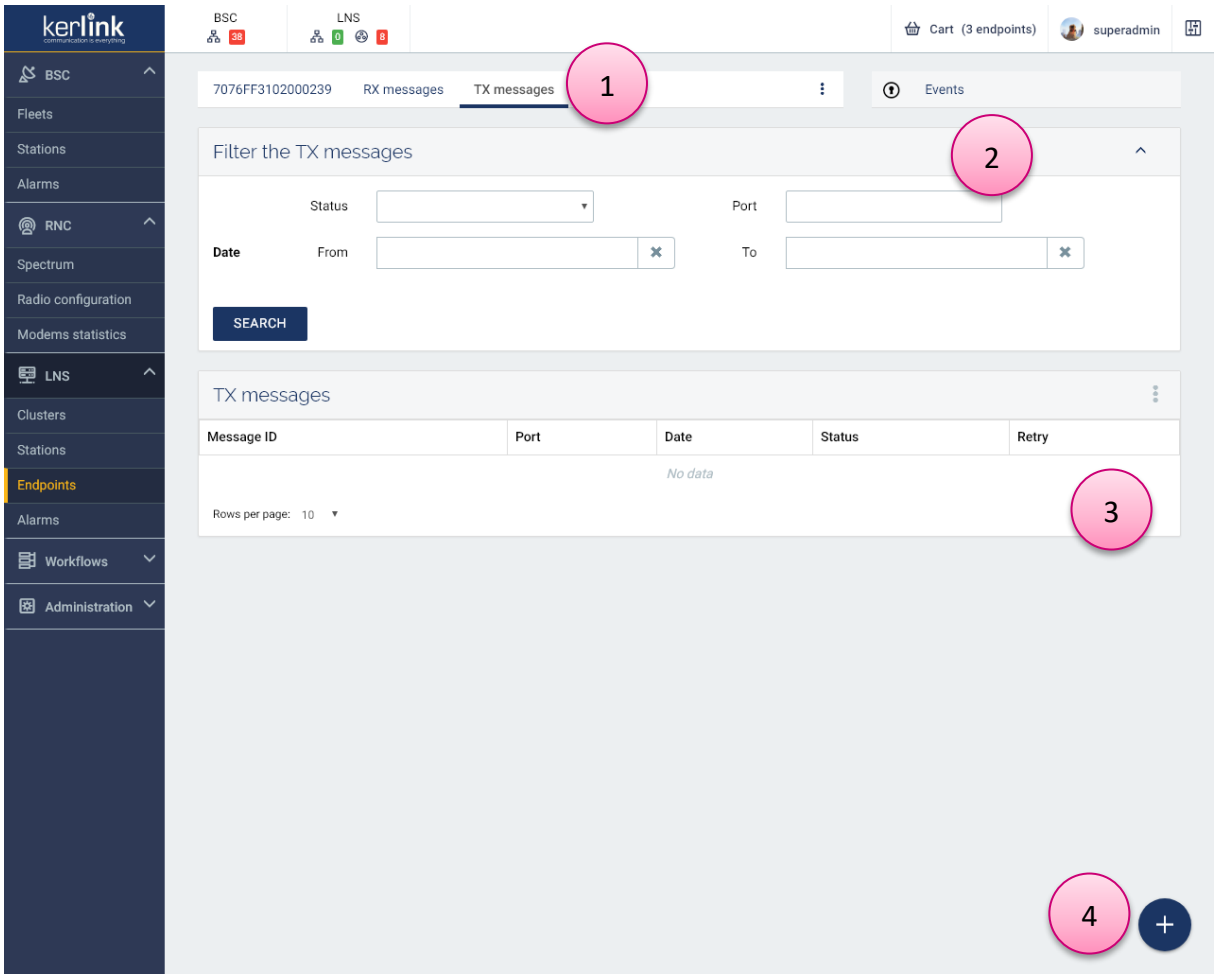

Figure 51 – Endpoint TX messages

(1) Access to an endpoint page then click on the “TX messages” tab.

(2) The filter panel allows you to filter the list of TX messages.

(3) The panel “TX messages” lists the messages received by the endpoint. You can click on a message row to display its details in a popup.

(4) The floating button allows you to send a message to the endpoint.

5.6.4 Messages

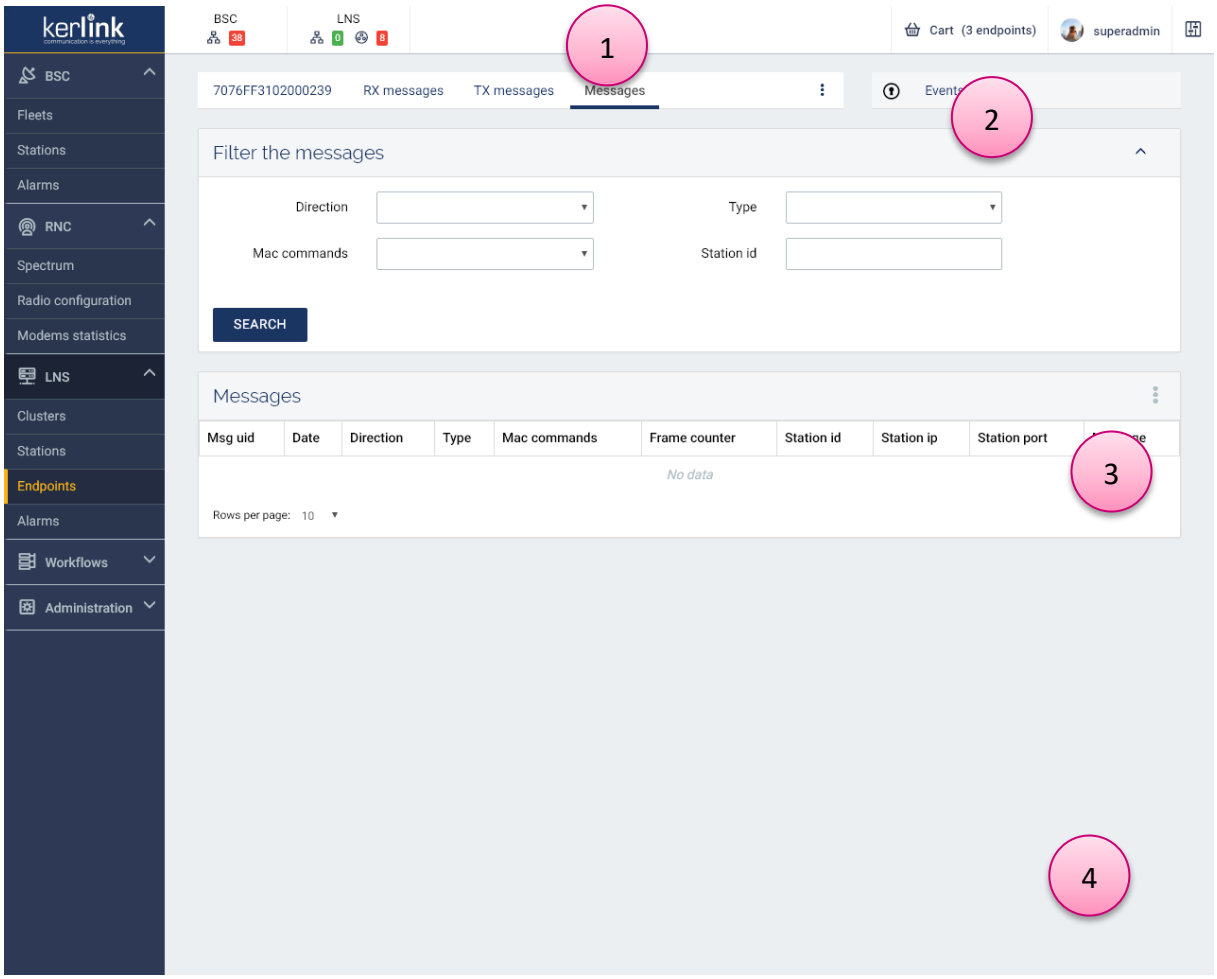

Figure 52 – Endpoint messages

(1) Access to an endpoint page then click on the “Messages” tab.

(2) The filter panel allows you to filter the list of messages.

(3) The panel “Messages” lists the messages received by the endpoint. You can click on a message row to display its details in a popup.

5.7 Consult the last alarms of your stations

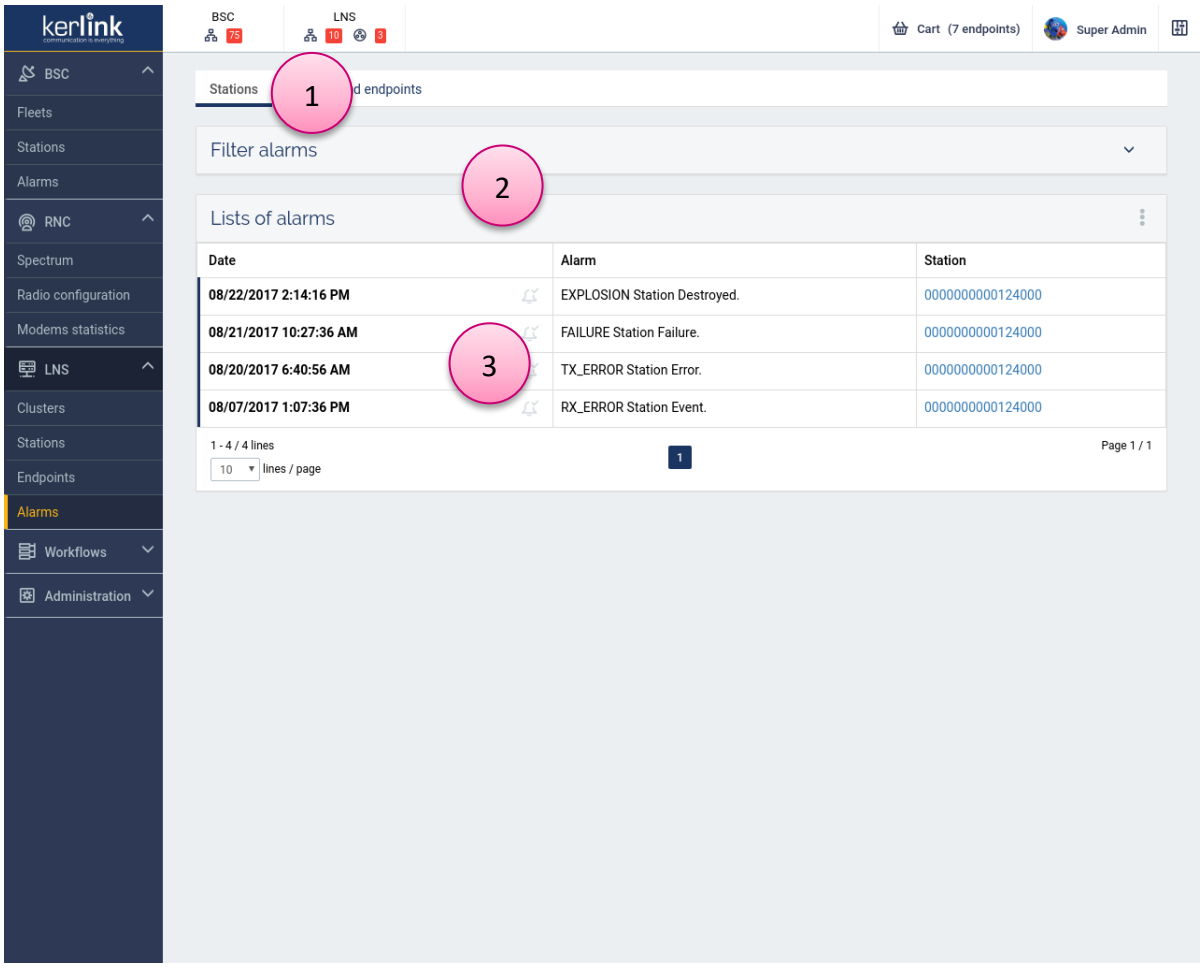

Figure 53 – Last alarms of LNS stations

(1) Click on the “Alarms” button to navigate to the LNS station alarms screen.

(2) The list displays the LNS station alarms. You can filter on a specific alarm type with the “Filter alarms” panel.

(3) You can click on the “read” button to mark an alarm as read.

5.8 Consult the last alarms of your endpoints

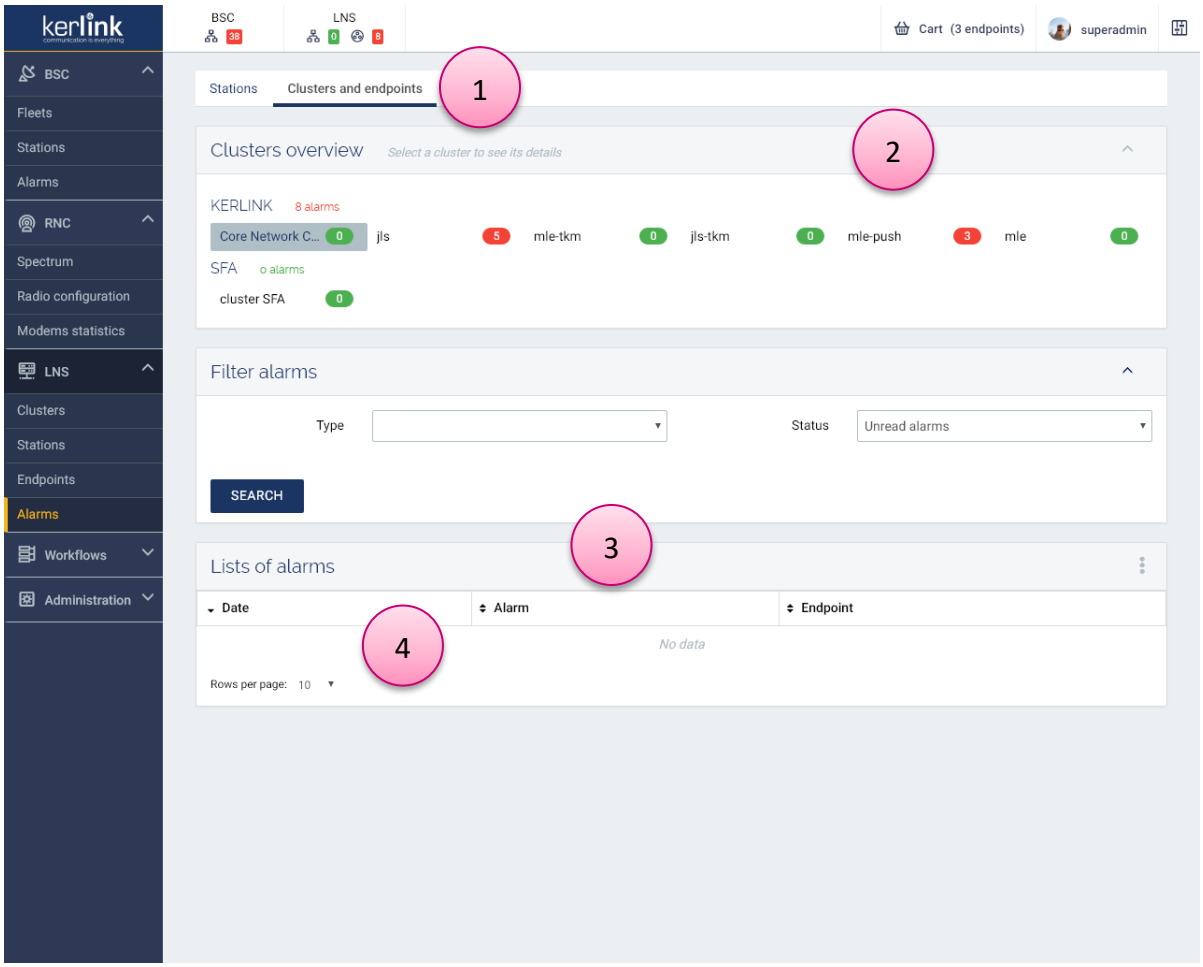

Figure 54 - Last alarms of endpoints

(1) Click on the “Alarms” button to navigate to the LNS endpoint alarms screen.

(2) The “Clusters overview” panel lists all the clusters with their number of alarms. To see the details of a cluster, click on it.

A super admin will see all clusters of all customers. Other roles will only see the clusters of their customer.

(3) Select criteria then click on the “Search” button to filter the alarms.

(4) The “Details” panel lists all the endpoints of the selected cluster with their current alarms.

(5) You can click on the “read” button to mark an alarm as read.

6. Cart management

6.1 Save your cart

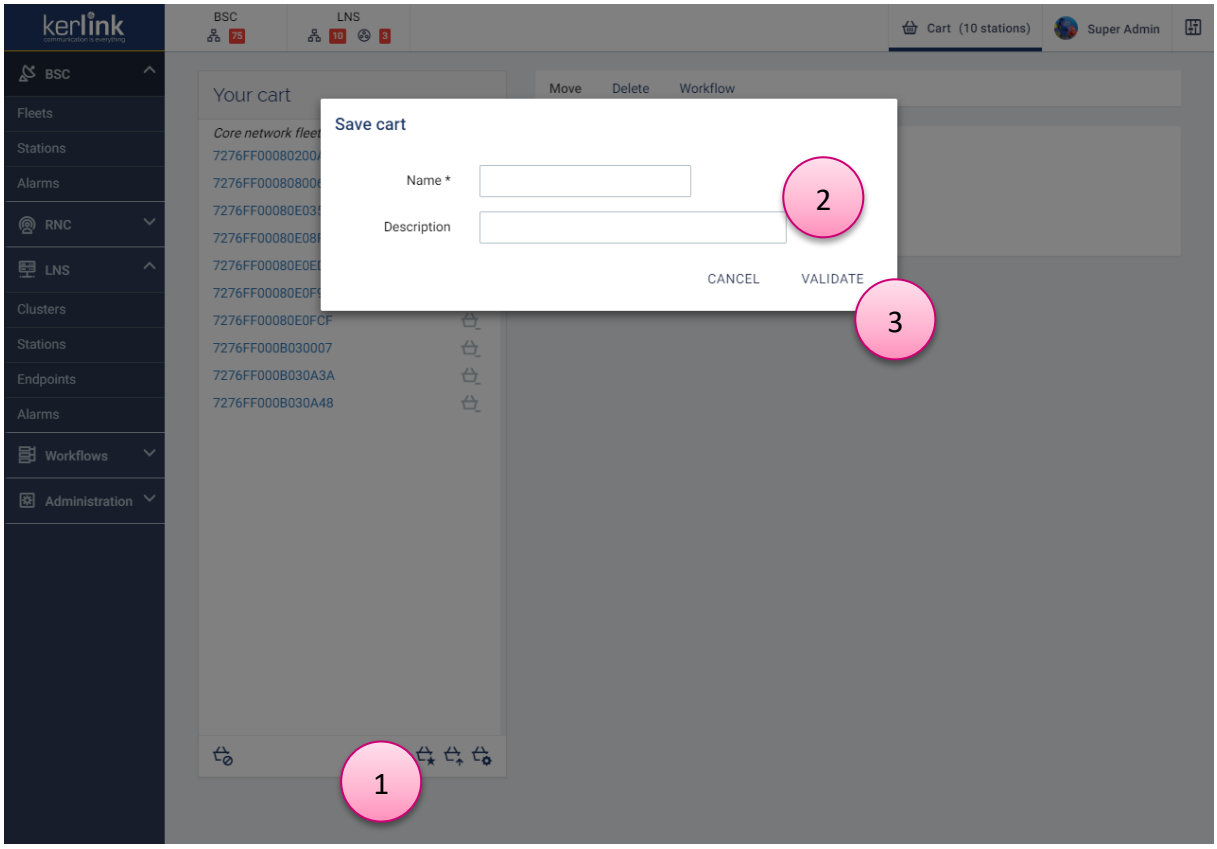

Figure 55 - Save cart

(1) Click on the “Save” button. A modal appears.

(2) Enter a name and optionally a description.

(3) Click on the “Validate” button to save your cart. The modal disappears and your cart is saved.

6.2 Load the content of your carts

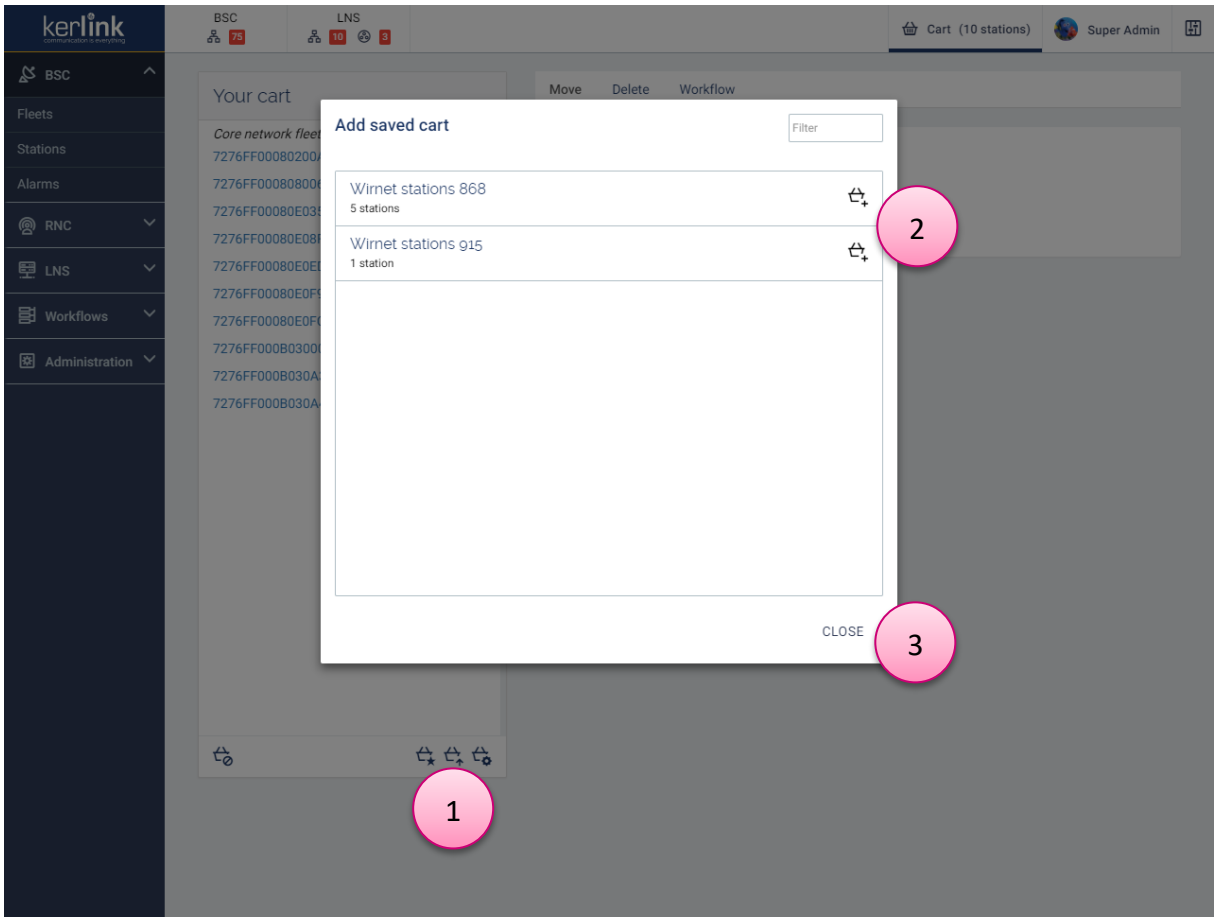

Figure 56 - Load content of carts

(1) Click on the “Load” button. A modal appears with your previous saved carts.

(2) Click on the “Add” button of the saved carts you want to load the content. The content is added to your cart.

(3) Click on the “Close” button. The modal disappears.

6.3 Manage your saved carts

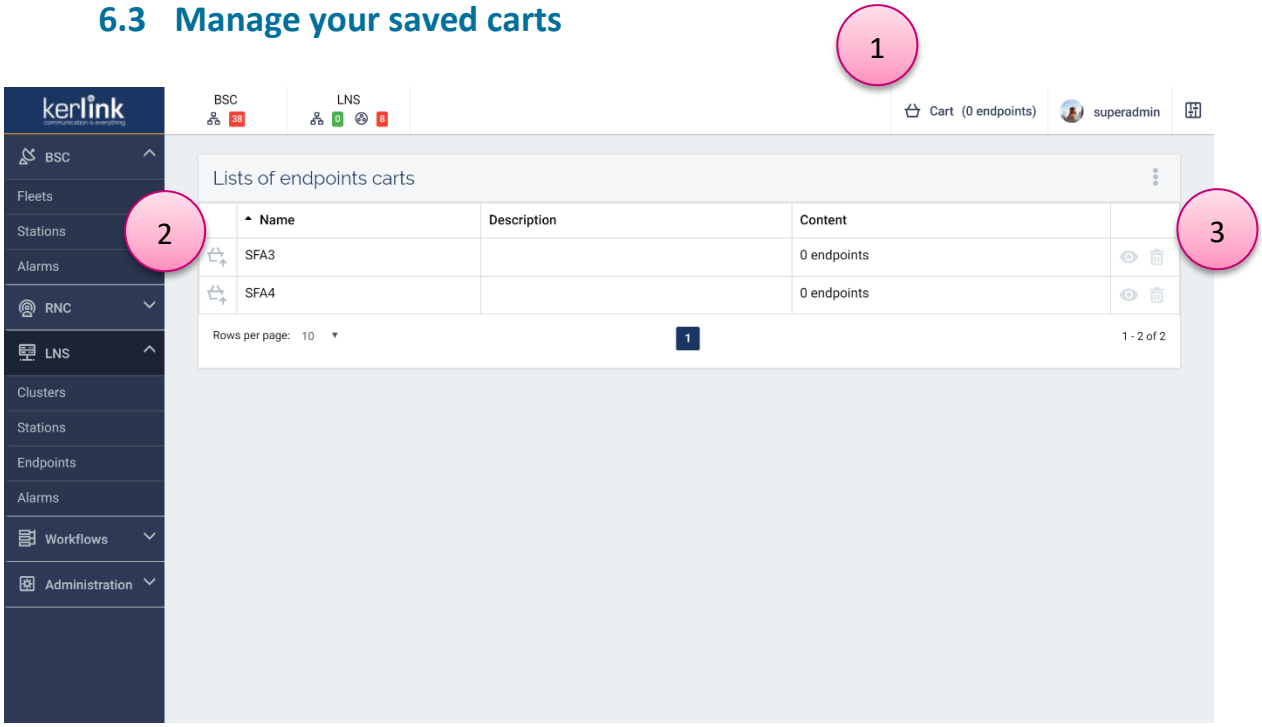

Figure 57 - Saved carts management

(1) Click on the “Cart” button and then click on the “Manage” button at the bottom of your cart list. The saved carts management page is loading.

(2) Click on the “Add” button of the saved carts you want to add. The content is added to your cart.

(3) Click on the “view” button to see the details of the saved cart. Click on the “delete” button to delete a saved cart.

7. Workflow

7.1 List workflow templates

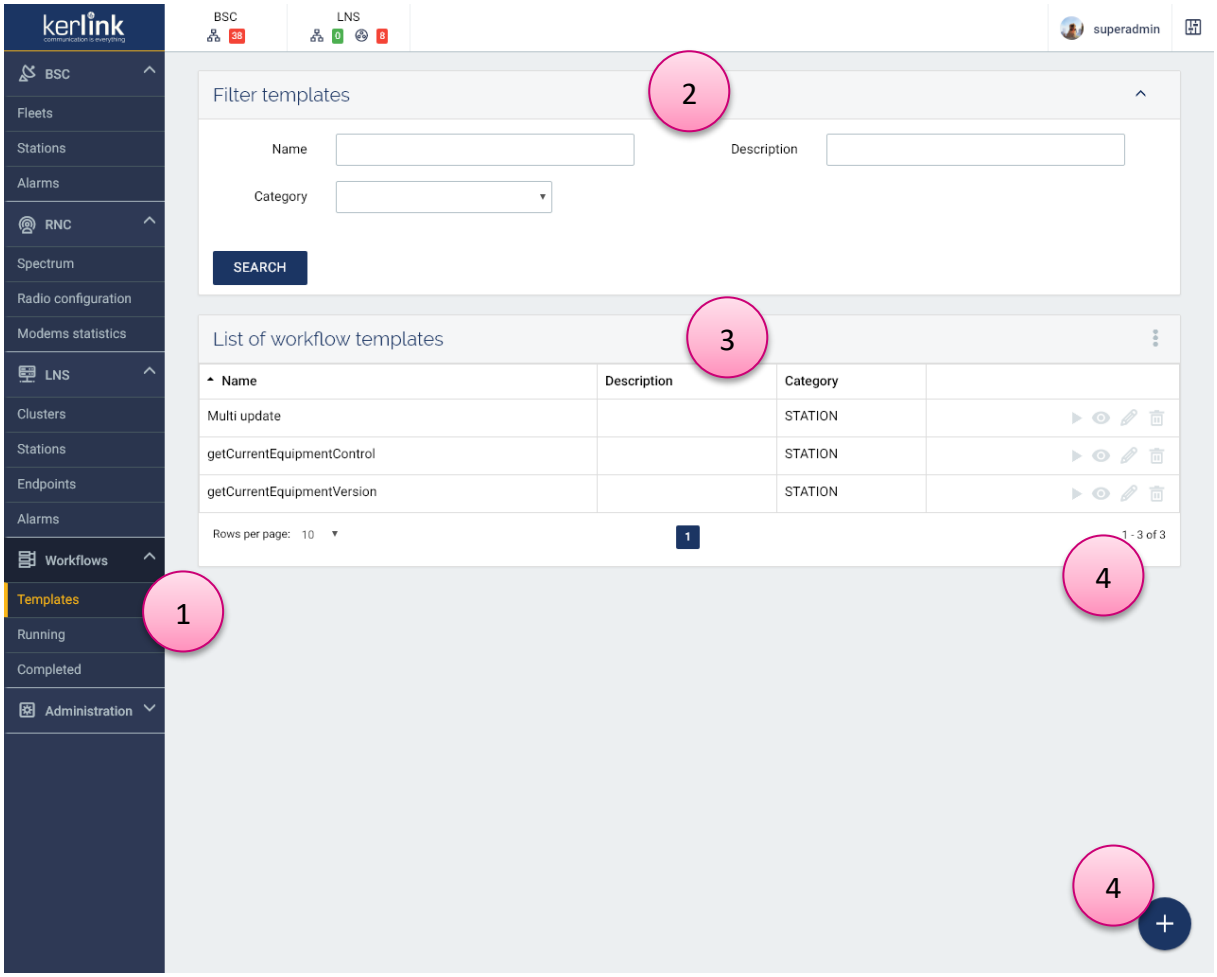

Figure 58 - List workflow templates

(1) Click the “Template” item in the “Workflows” menu

(2) Set filters and click on search to filter the templates

(3) List workflows templates

(4) The buttons allow you to execute, see, edit or delete a template

(5) The floating button allows you to create a new template

7.2 Create a workflow template

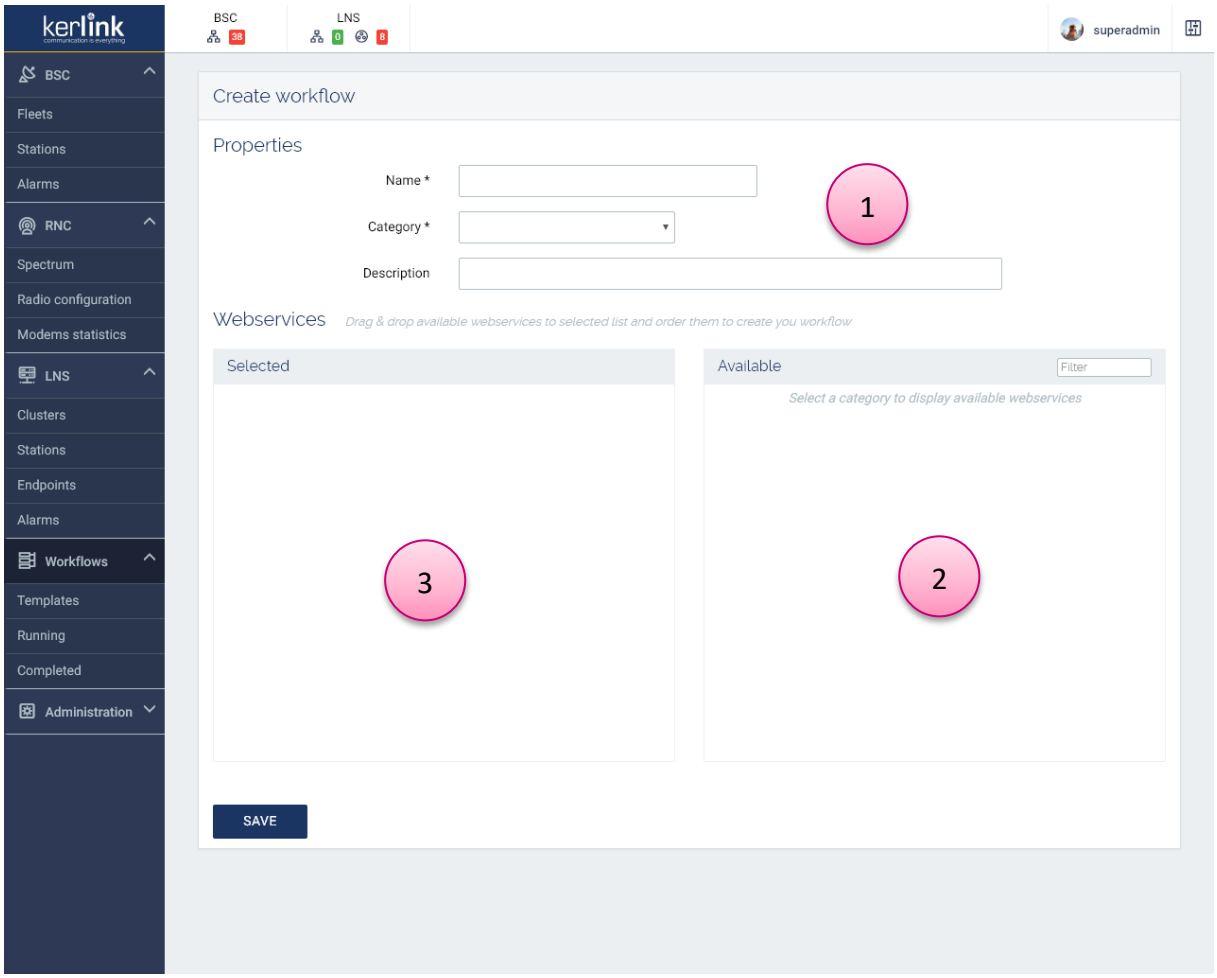

Figure 59 - Import workflow template

(1) The properties of the template, including the category (Station or Endpoint) which defines the list of available webservices.

(2) The list of available webservices that can be added to the template.

(3) Drag & drop a webservice from (2) to (3) to add a webservice to the template. Then, in the selected list (3), you can drag & drop webservices to order them.

7.3 Execute a workflow

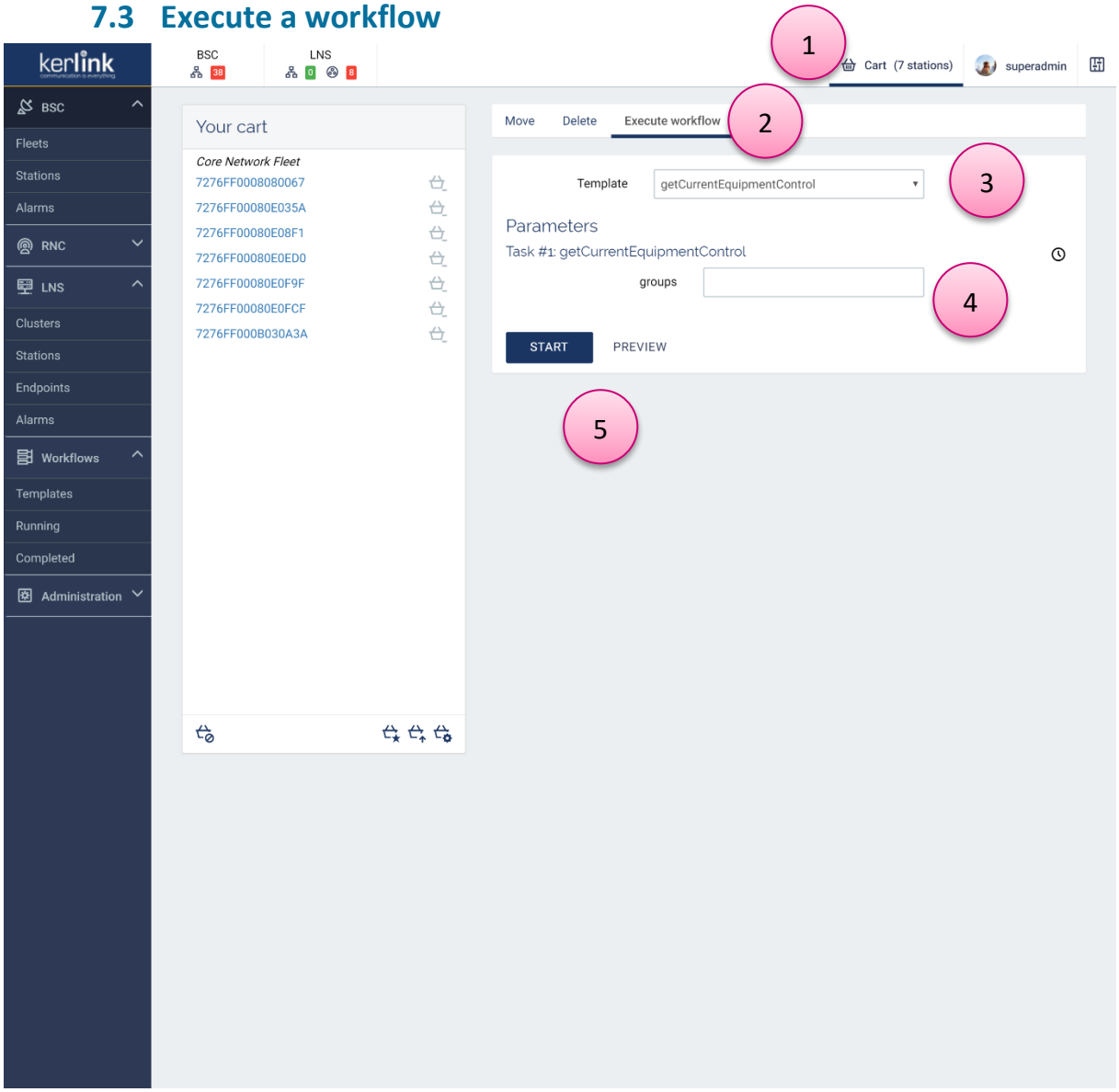

Figure 60 – Execute a workflow

(1) Click on the “Cart” button.

(2) Click on the “Workflow” tab.

(3) Select a template workflow.

(4) Enter the parameters of the workflow.

(5) The buttons allow you to:

- start a workflow

- preview the selected workflow
- go to the workflow progress page (this button is only visible when the workflow is started)

7.4 Running workflows

7.4.1 List of running workflows

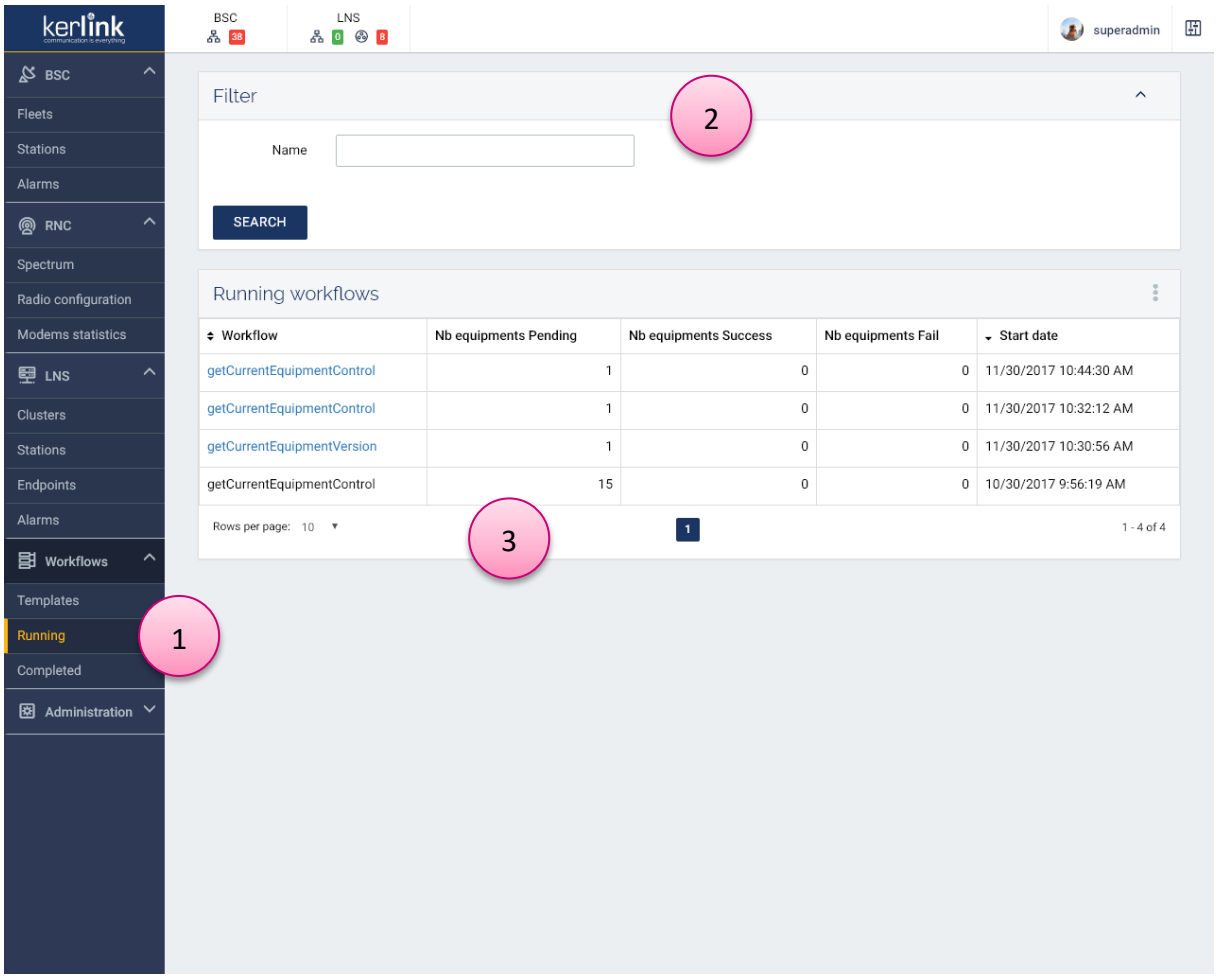

Figure 61 - Running workflows list

(1) Click on the “Running” item in the “Workflows” menu.

(2) Set the filters and click on search to filter workflows list.

(3) The panel lists the currently processing workflows.

Clicking on a workflow name will display the details of the execution.

7.4.2 Details of a running workflow execution

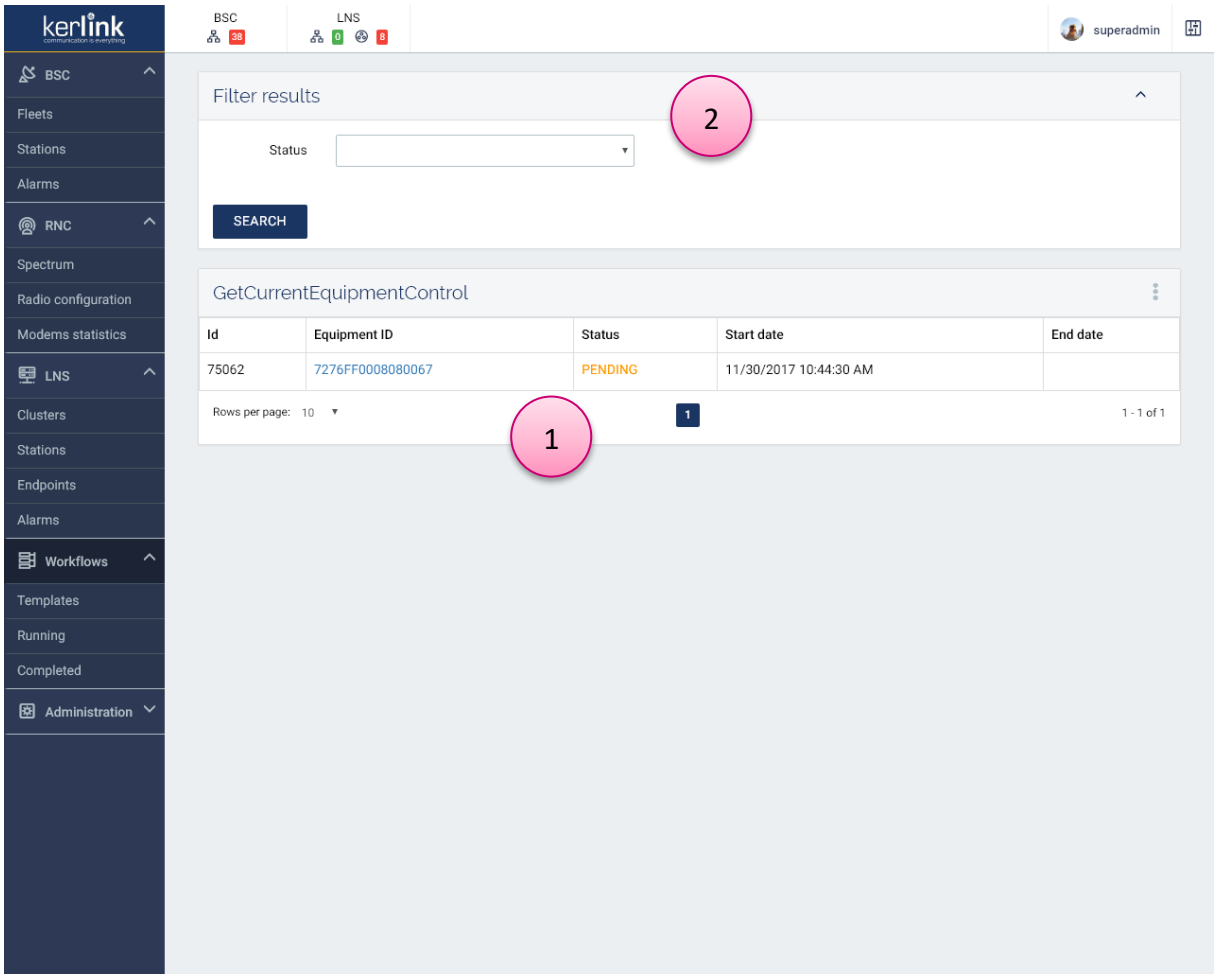

Figure 62 – Details of a running workflows

(1) The list shows all equipment on which the workflow has been executed and displays its status, start date and end date.

A workflow is considered as running if there is at least on equipment in PENDING status.

Clicking on an equipment ID will display the details of the execution for this equipment.

(2) Set the filters and click on search to filter the equipment list.

7.4.3 Details of a running workflow execution for a specific equipment

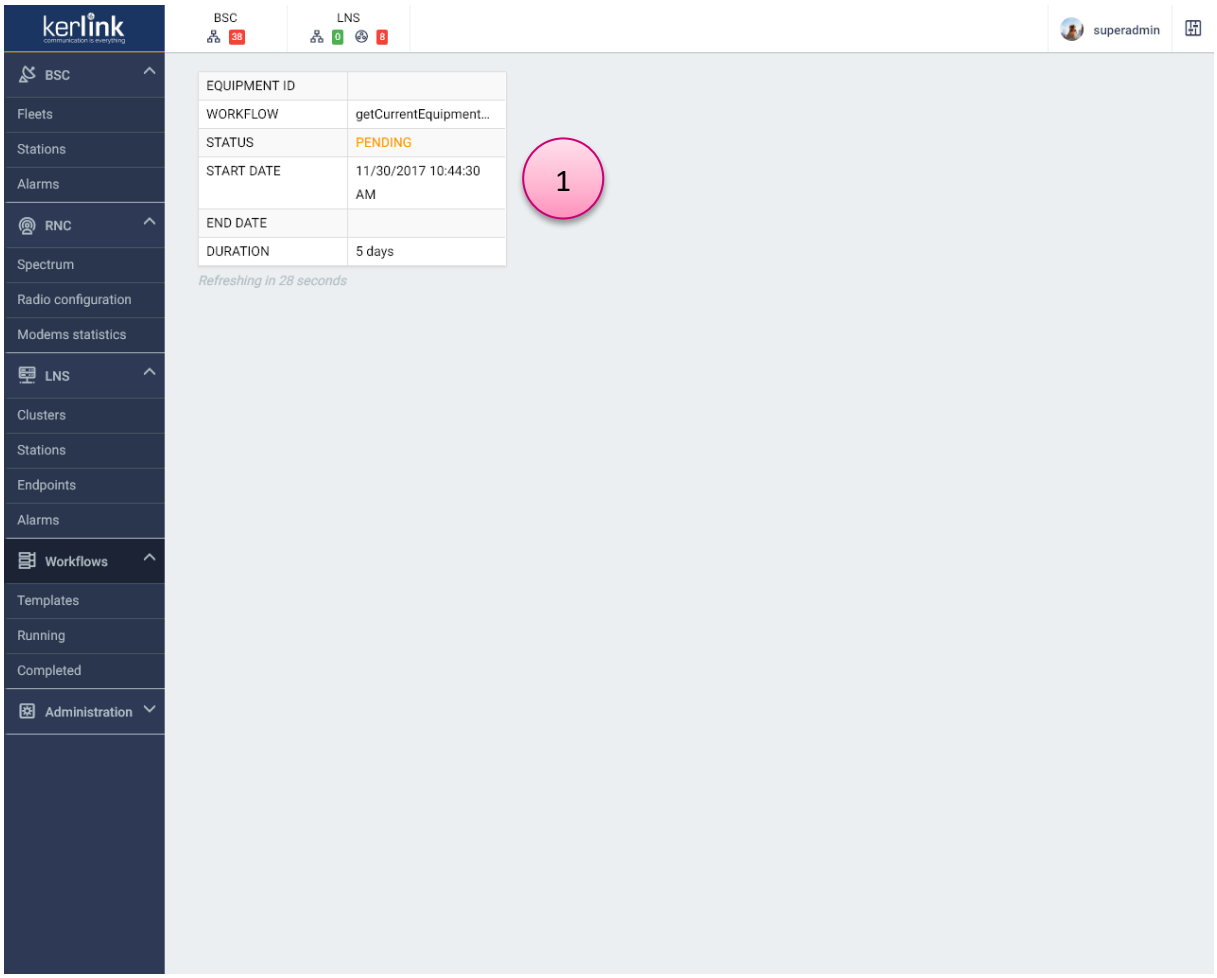

Figure 63 – Details of a running workflows for an equipment

(1) When in PENDING status, the details page shows only some attributes of the execution. The page is automatically refreshed every 30 seconds.

7.5 Completed workflows

7.5.1 List of completed workflows

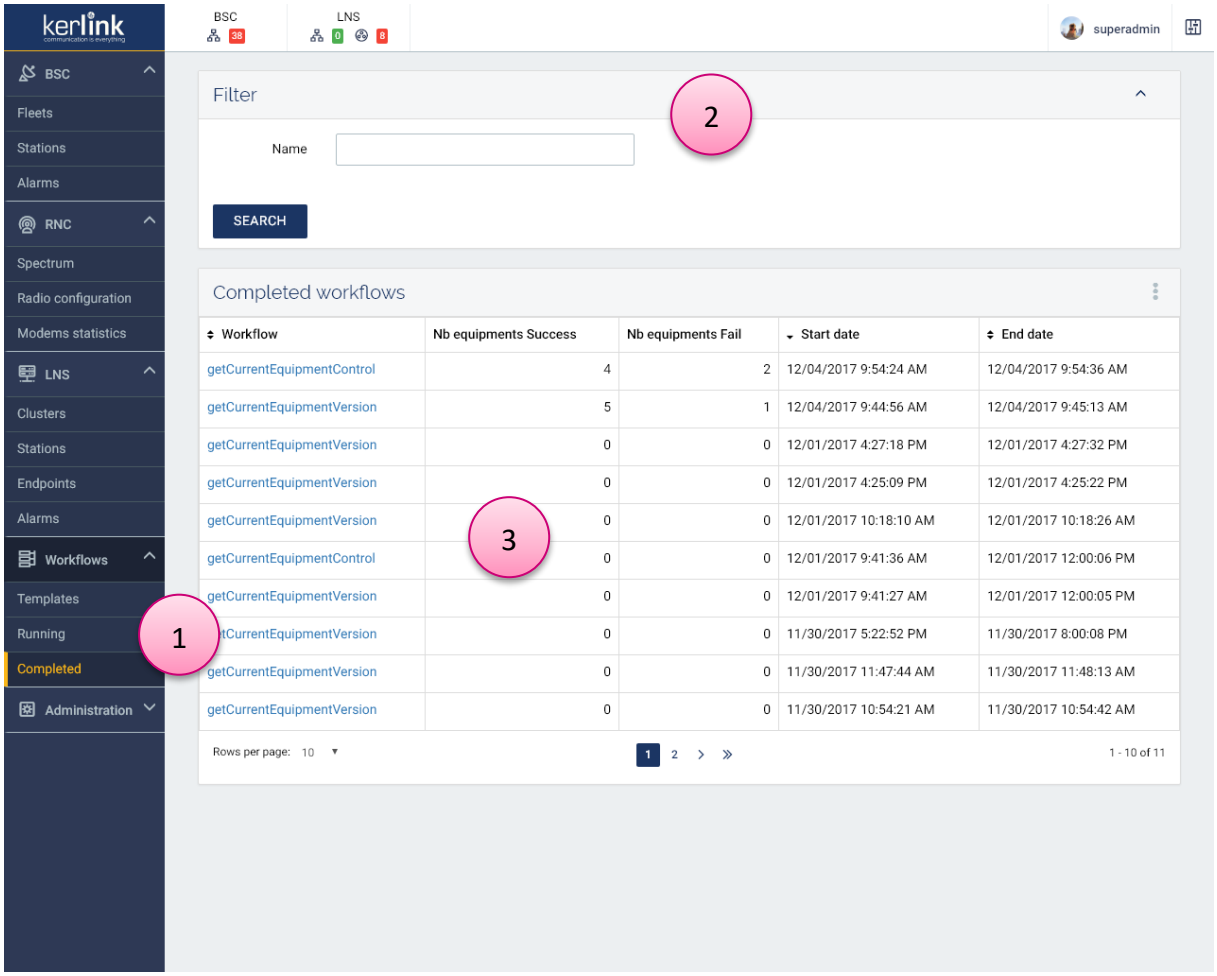

Figure 64 - Completed workflows list

(1) Click on the “Completed” item in the “Workflows” menu.

(2) Set the filters and click on search to filter workflows list.

(3) The panel lists the completed workflows.

Clicking on a workflow name will display the details of the execution.

7.5.2 Details of a completed workflow execution

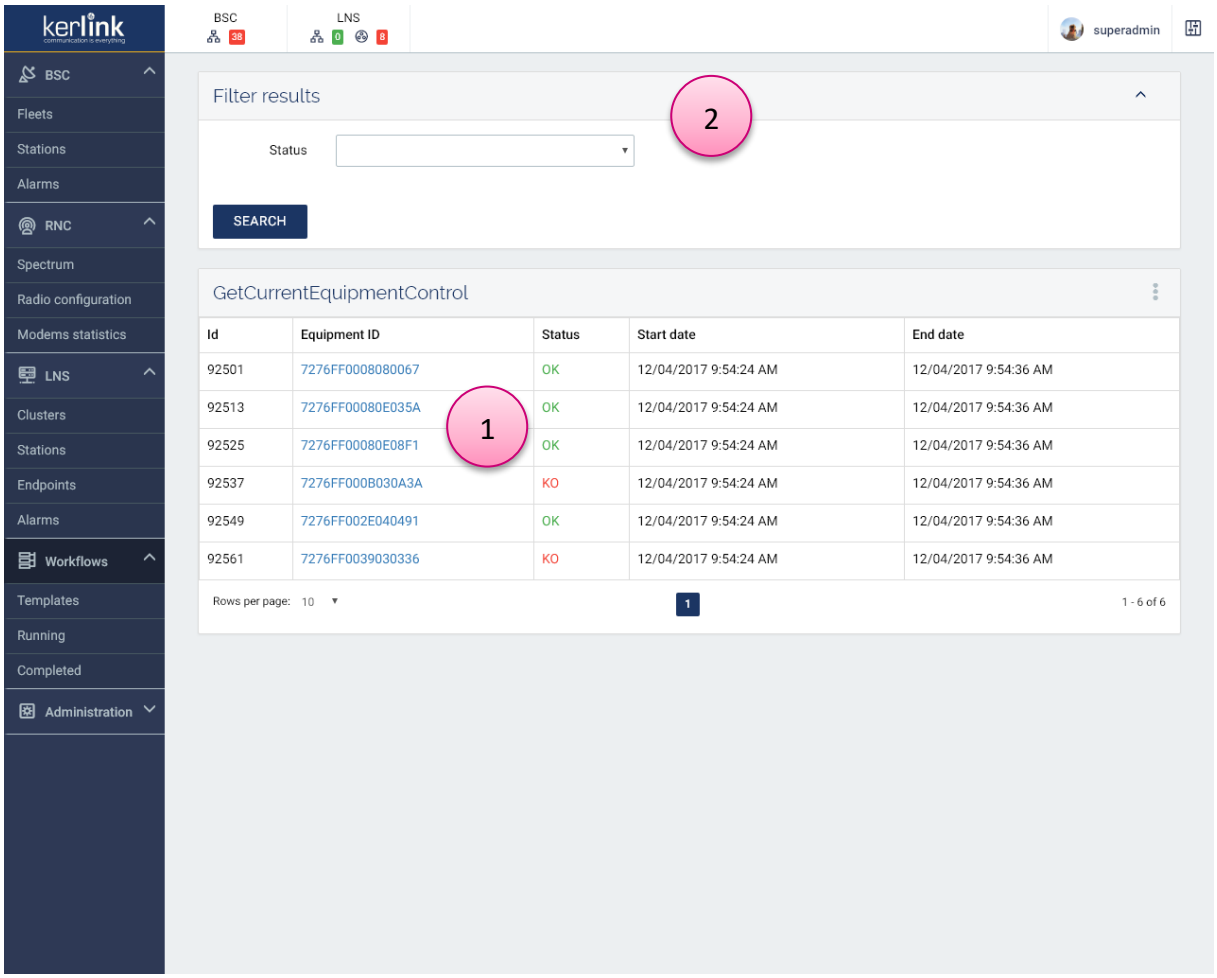

Figure 65 – Details of a running workflows

(1) The list shows all equipment on which the workflow has been executed and displays its status, start date and end date.

Clicking on an equipment ID will display the details of the execution for this equipment.

(2) Set the filters and click on search to filter the equipment list.

7.5.3 Details of a completed workflow execution for a specific equipment

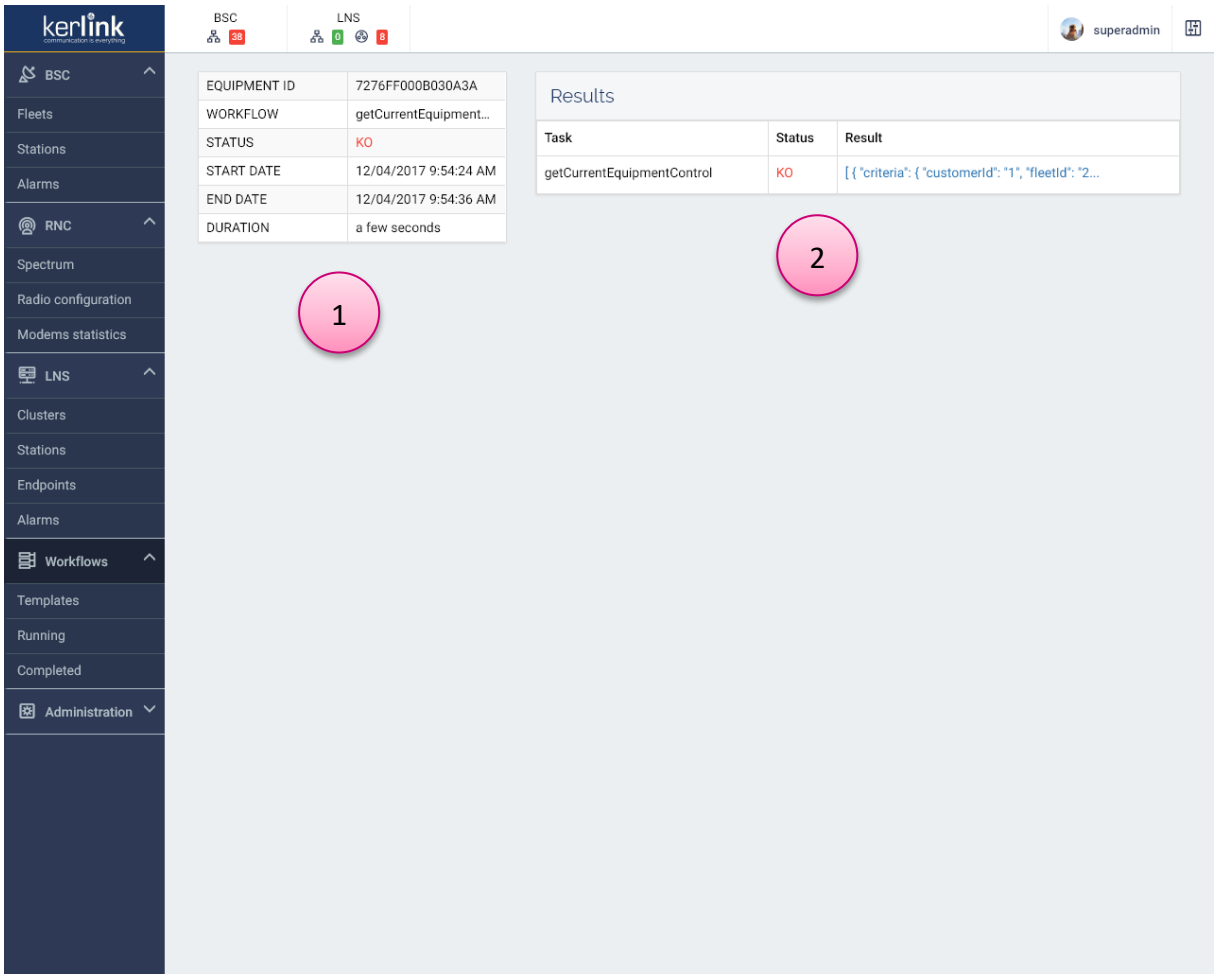

Figure 66 – Details of a completed workflows for an equipment

(1) When in completed, the details page shows all attributes of the execution.

(2) The “Results” table lists all webservices of the workflow:

- Its status of execution
- Its result. Clicking on a result will open a modal with the detailed result.

8. Administration

8.1 Manage customers

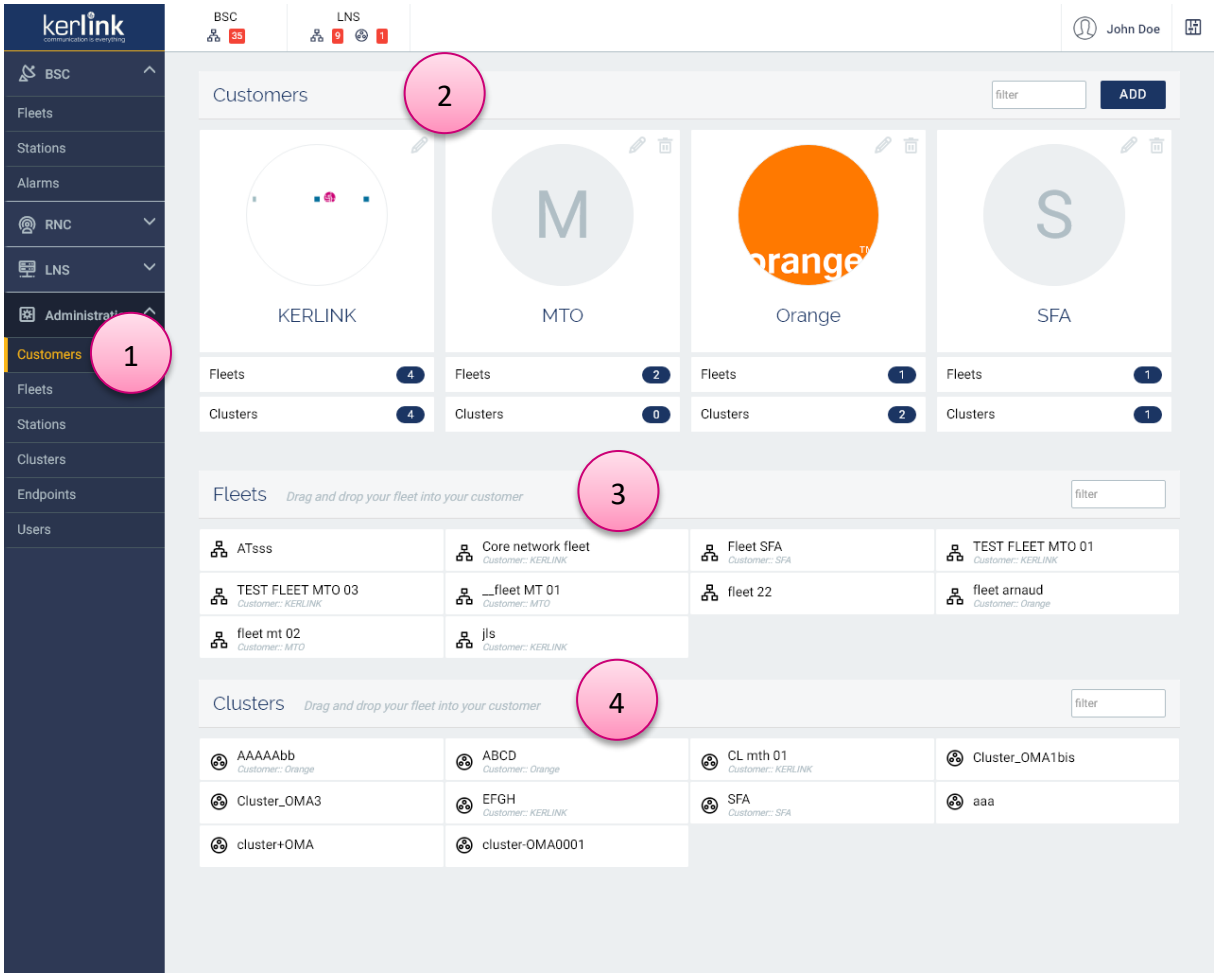

Figure 67 - Customers management

(1) Click on the “Customers” button to access to the customers management page.

(2) The “Customers” panel allows you to add, edit and remove a customer. It also lists the fleets and clusters attached to each customer. You can detach a fleet / cluster by clicking on the “trash” button next to it.

(3) The panel “Fleets” lists all the fleets of the application. You can drag and drop a fleet from this panel to the customer you want to attach it.

(4) The panel “Clusters” lists all the clusters of the application. You can drag and drop a cluster from this panel to the customer you want to attach it.

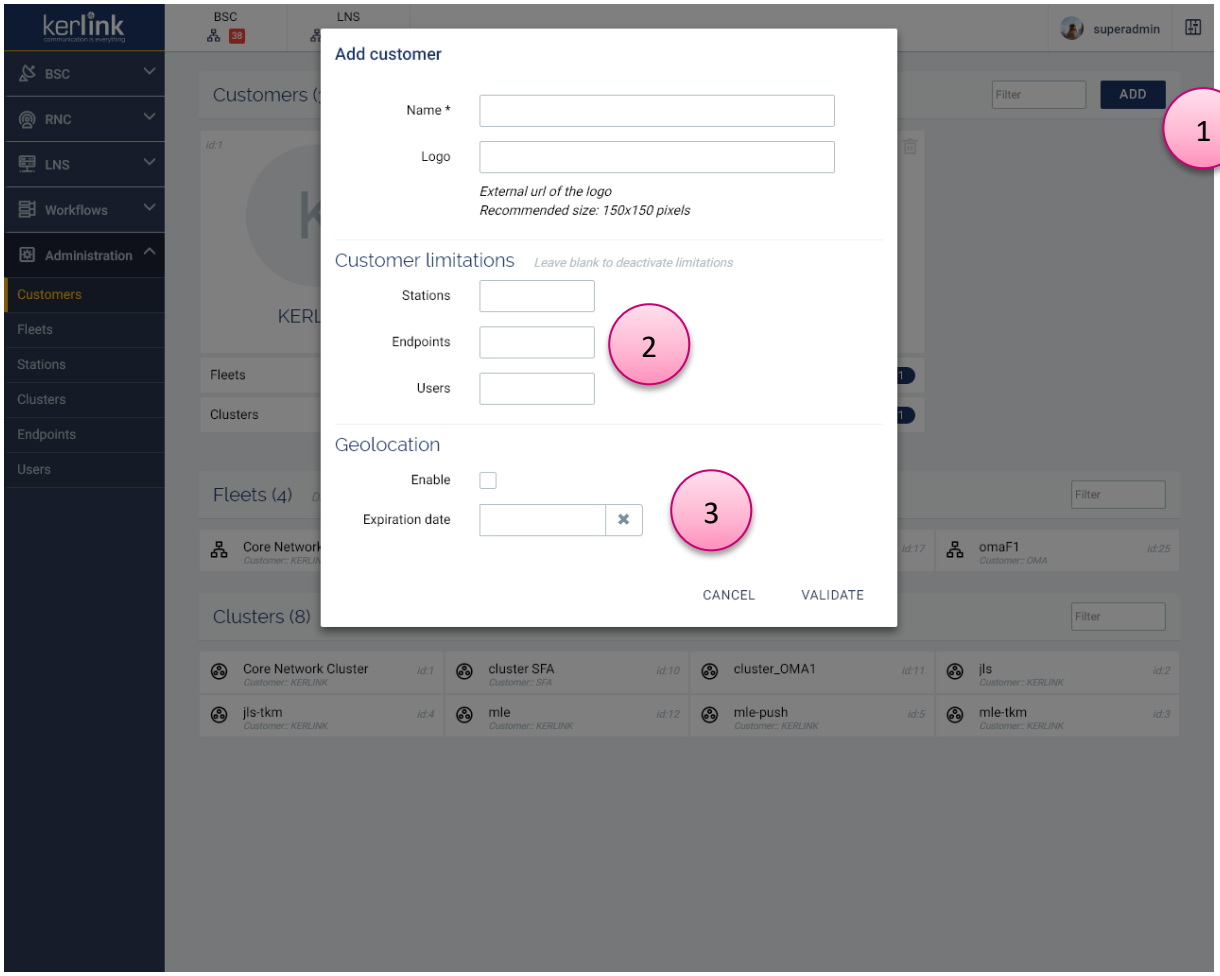

Figure 68 - Customer form

(1) Click on the “add” button or the “edit” button of a customer. The form appears as a popup.

(2) Customer limitations.

- Stations: Number of stations the customer can manage.
- Endpoints: Number of endpoints the customer can manage.
- Users: Number of users the customer can have.

(3) Activate or deactivate geolocation for a customer. An expiration date can also be set to deactivate geolocation at a specific date.

8.2 Manage fleets

Fleets are a logical way to group stations. You can choose to group them by position, type or whatever you want.
It will allow you to have an overview of a group of station in the fleet screen (see paragraph 3.1)

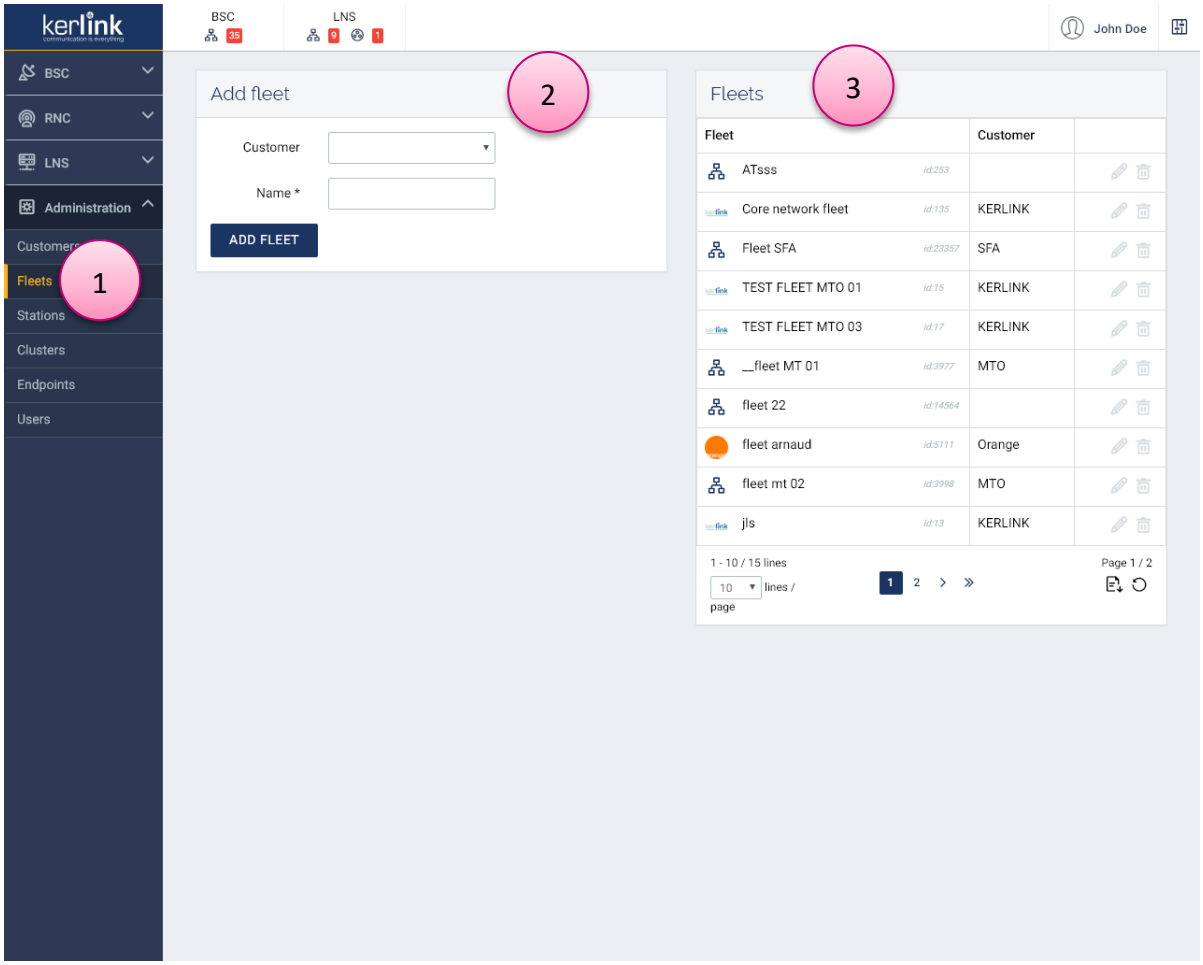

Figure 69 – Fleets management

(1) Click on the “Fleets” button to access to the fleets management page.

(2) The “Add fleet” panel allows you to add a new fleet.

(3) The “Fleets” panel lists all your fleets and allows you to rename or delete a fleet by using the respective buttons.

8.3 Manage stations

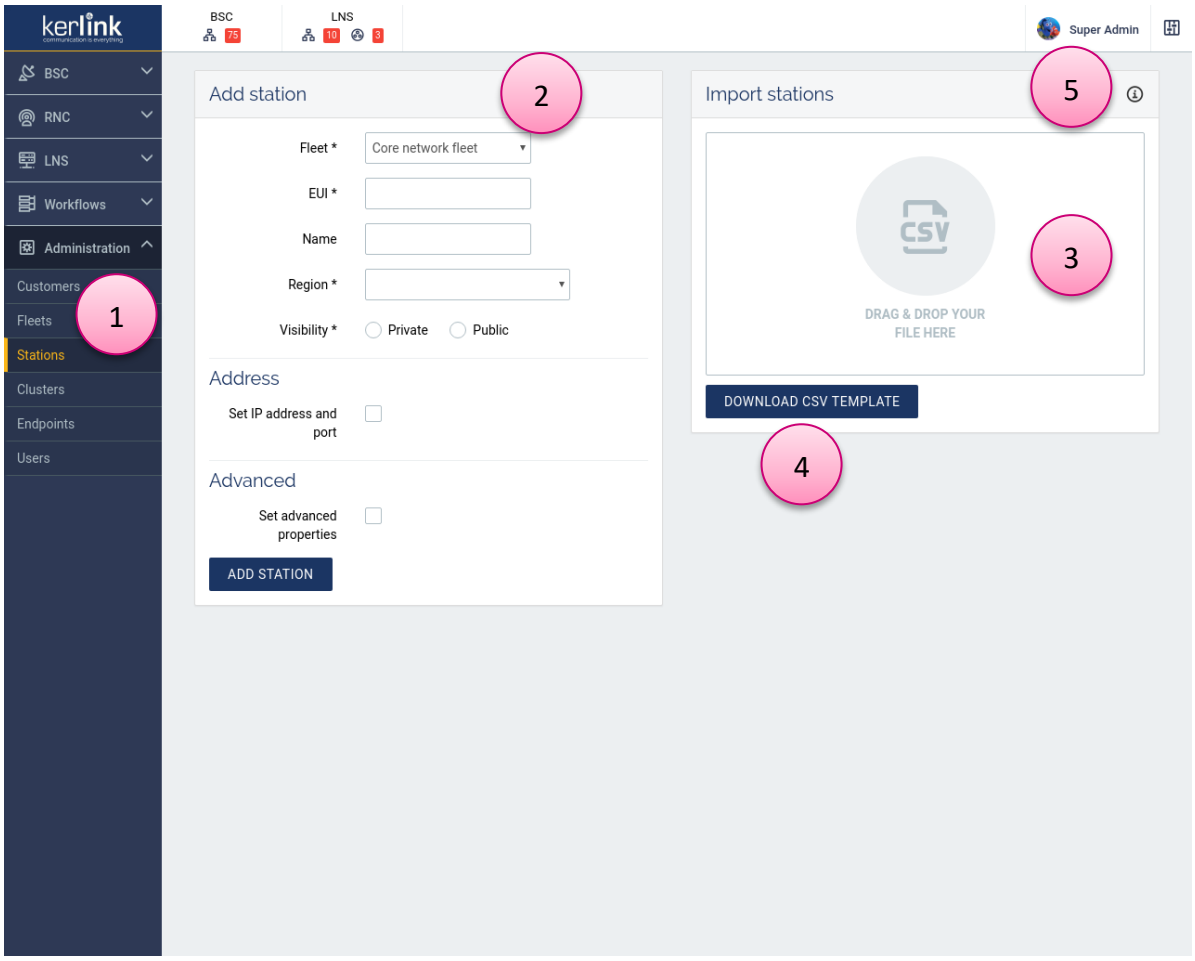

Figure 70 – Stations management

(1) Click on the “Stations” button to access to the stations management page.

(2) The “Add station” panel allows you to create a new station.

(3) The “Import stations” panel allows you to import a CSV file containing multiple station definitions.

(4) The “Download” button will download a CSV template with the correct columns to fill to import multiple stations.

(5) The “Info” button will display a modal with the details of all properties needed in the CSV file.

8.4 Manage clusters

Clusters are a logical way to group endpoints. You can choose to group them by position, type or whatever you want.

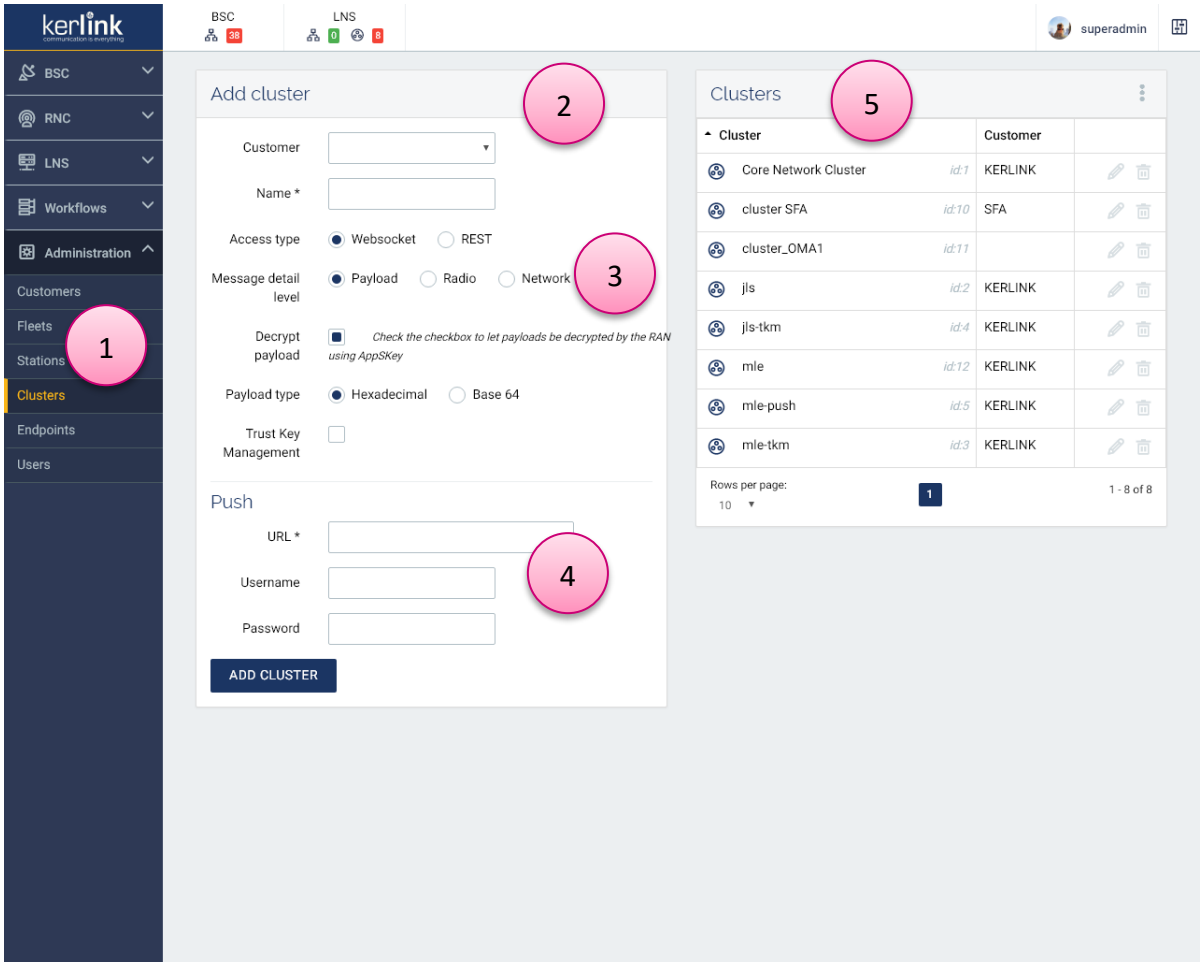

Figure 71 - Clusters management

(1) Click on the “Clusters” button to access to the clusters management page.

(2) The “Add cluster” panel allows you to add a new cluster.

(3) The “Message detail level” attribute defines which properties are returned by the endpoints of the cluster.

- Payload: “userData” property only.

Example of “userData”


```
{
	"fPort": 10,
	"payload": "d3d3LnNlbXRlY2guY29tAAAAABA",
	"maxRetry": 0,
	"ttl": 1.4071897396579e+14
}
```


- Radio: “userData” and “moteTx” properties.
  Example of “moteTx”


```
{
	"freq": 864.6,
	"modu": "LORA",
	"datr": "SF9BW125",
	"codr": "4\/5",
	"adr": true
}
```


- Network: “userData”, “moteTx” and “gwRx”.
  Example of “gwRx”


```
[
	{
		"eui": "124000",
		"ant": 0,
		"tmms": 1479455937000,
		"chan": 0,
		"rfch": 0,
		"rssic": -10,
		"lsnr": 10,
		"foff": 0,
		"rfbsb": 78,
		"rs2s1": 67
	}
]
```


(4) While editing an existing and attached cluster to a customer, the URL to get unsent RX messages is displayed here.

(5) The “Clusters” panel lists all your clusters and allows you to edit or delete a cluster by using the respective buttons.

8.5 Manage endpoints

8.5.1 Create or import endpoints

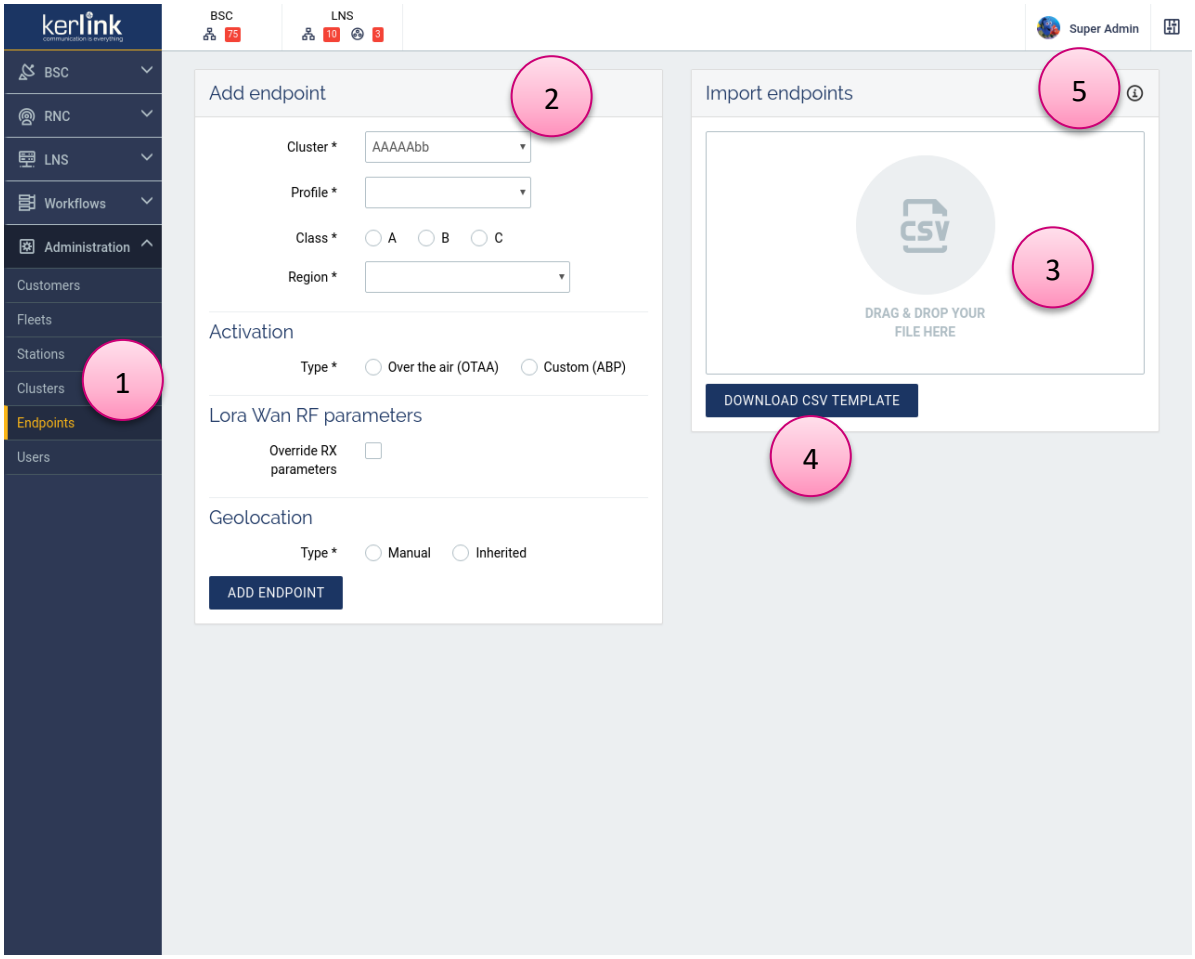

Figure 72 - Endpoints management

(1) Click on the “Endpoints” button to access to the endpoints management page.

(2) The “Add endpoint” panel allows you to create a new endpoint.

(3) The “Import endpoints” panel allows you to import a CSV file containing multiple endpoint definitions.

(4) The “Download” button will download a CSV template with the correct columns to fill to import multiple endpoints.

(5) The “Info” button will display a modal with the details of all properties needed in the CSV file.

8.5.2 Overriding RX parameters

When creating a new endpoint, you can choose to override RX parameters:

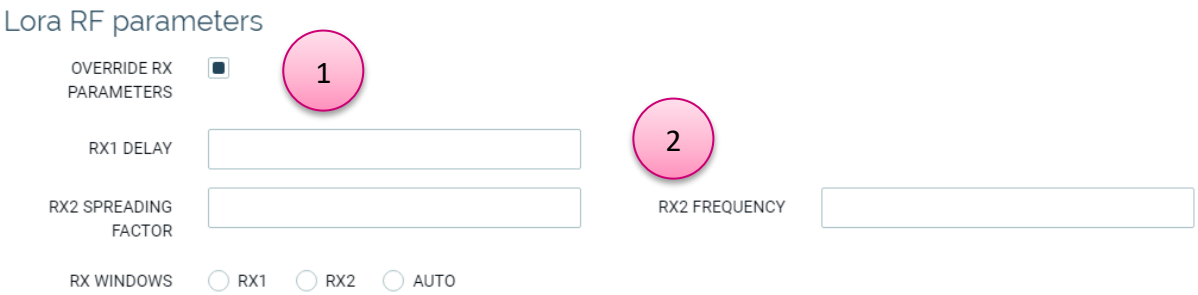

Figure 73 - Overriding RX parameters

(1) Check the "Override RX parameters" checkbox. It will allow you to set specific parameters for an endpoint instead of using the default ones described in the LoRaWAN Specification.

(2) Parameters are:

- RX1 delay: the delay in seconds before the opening of the RX1 receive window.
- RX2 spreading factor: the spreading factor of the RX2 receive window.
- RX2 frequency: the frequency in Hertz of the RX2 receive window.
- RX WINDOWS: the receive window to use (default = auto). Auto allows to use RX1 or RX2 receive windows.

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8.6 Manage users

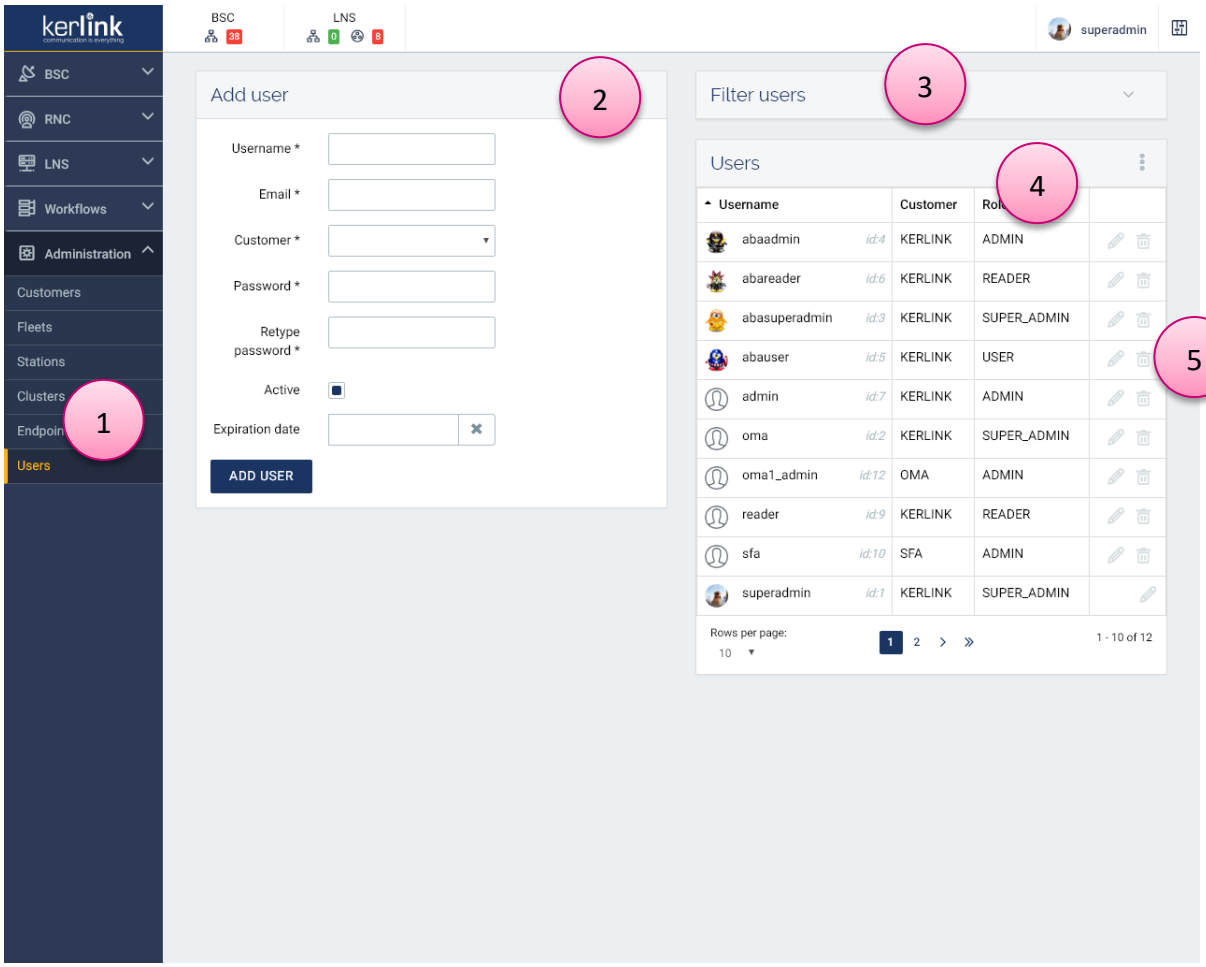

Figure 74 – Users management

(1) Click on the “Users” button to access to the users management page.

(2) The “Add user” allows you to create a new user.

(3) Use the “Filter” panel to search for users with specific filters.

(4) The “Users” panel lists all the existing users.

(5) For each user, you can access to his profile page (see paragraph 9.1), to edit his information clicking on the “edit” button and to delete the user by clicking on the “trash” button.

9. User profile

9.1 Update your profile

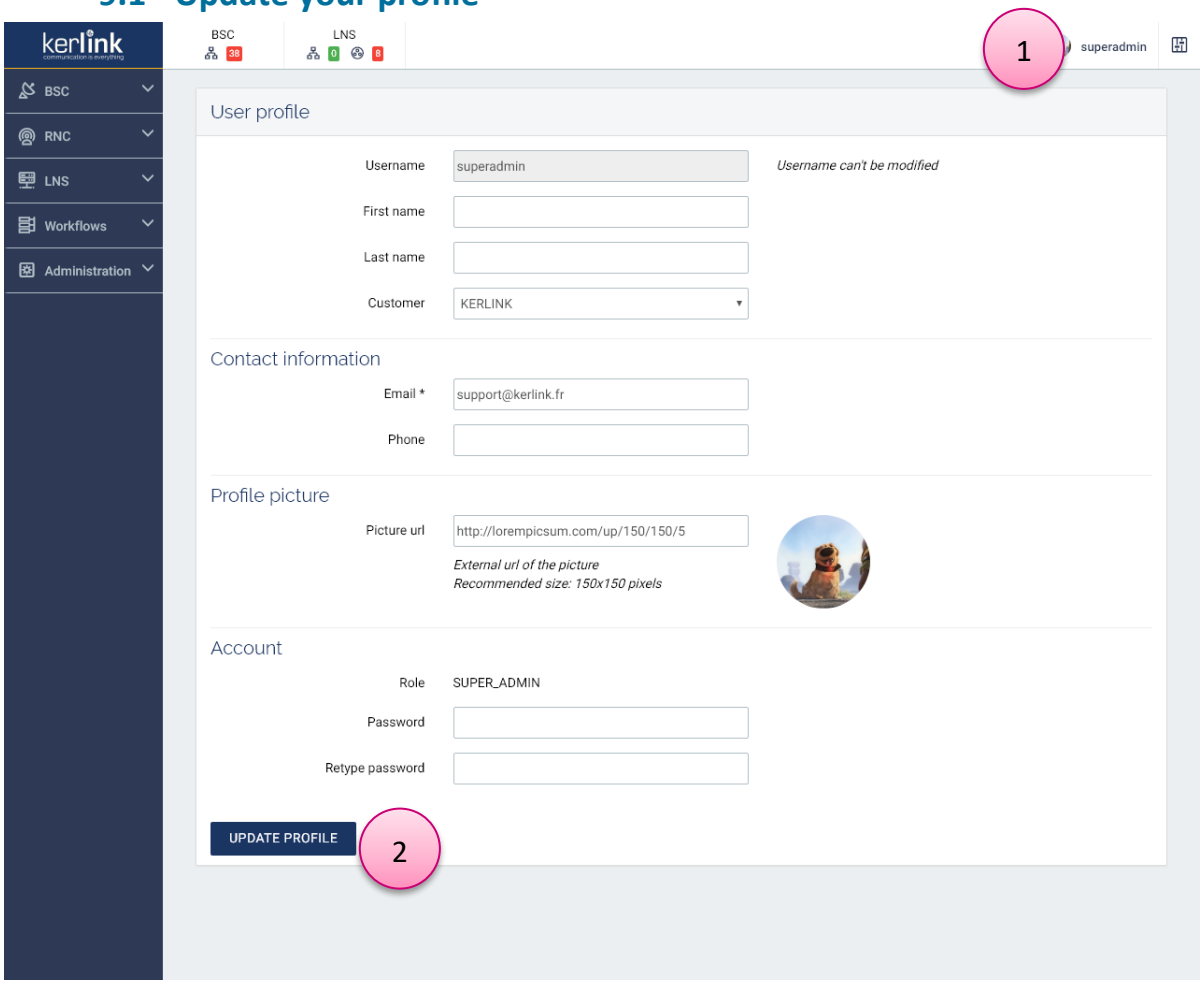

Figure 75 - Profile update

(1) The profile button allows you to access to your profile.

(2) You can change your information and click the “Update profile” button to save the modifications.

10. Settings

10.1 Dashboard

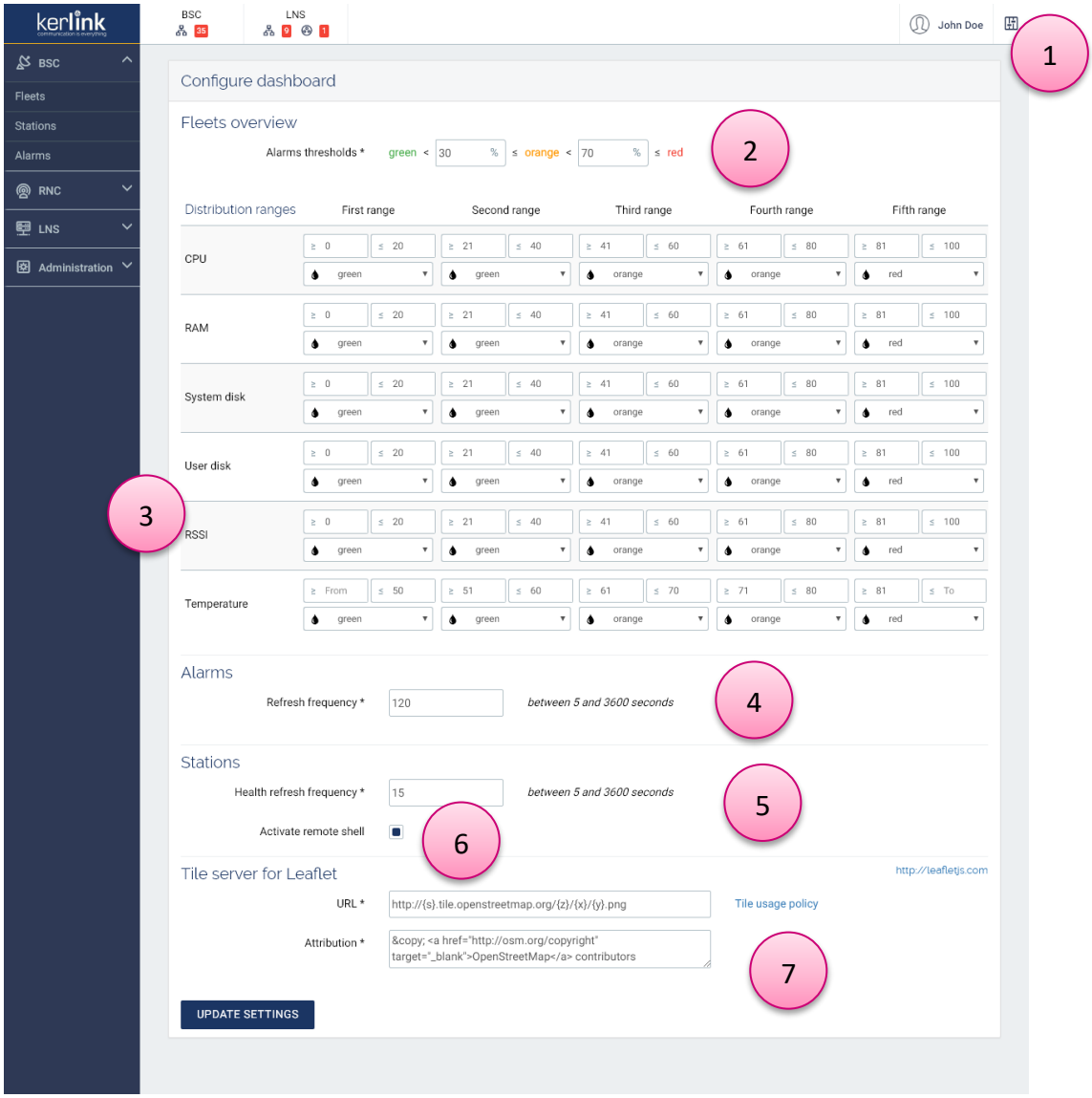

Figure 76 - Settings dashboard

(1) Click on the “Application settings” menu to access to the settings page.

(2) Alarms thresholds: Green, orange and red colors applied on fleet percentage ranges.

(3) Distribution ranges: Ranges and colors applied on the fleet statistics overview.

(4) Refresh frequency: Interval in seconds the count of alarms is updated.

(5) Health refresh frequency: Interval in seconds the station “health” is updated.

(6) Activate remote shell: Activate or deactivate the remote shell functionality.

(7) Tile server for Leaflet: Map Tile Server to display map layer with the Leaflet library.
Logs

11. Logs

11.1 Application logs

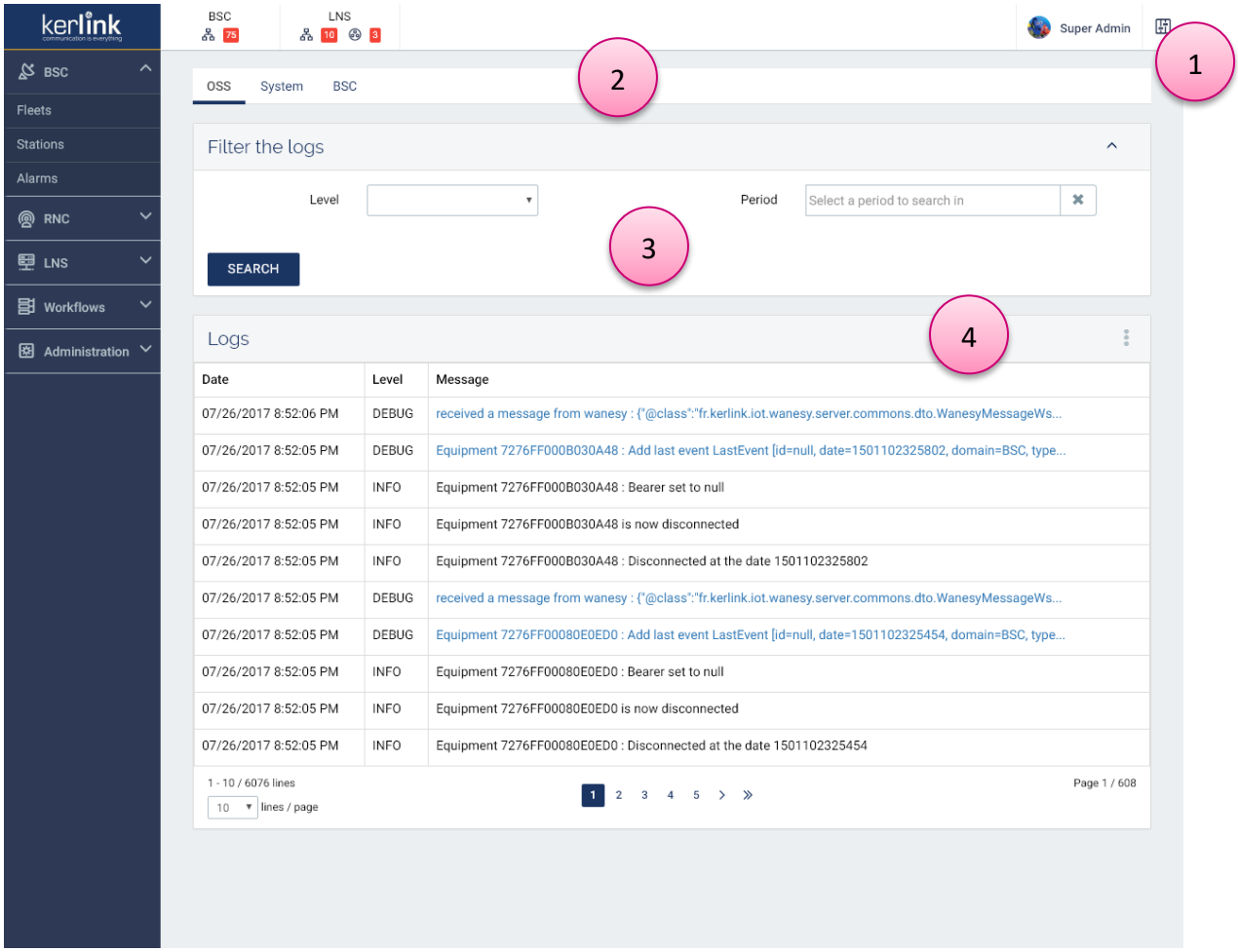

Figure 77 - Application logs

(1) Click on the “Application logs” menu to access to the page.

(2) The tabs list the applications which logs are available.

(3) Filters on logs properties.

(4) The selected application logs. A click on some message cell will show a modal with log details.

11.2 Activity logs

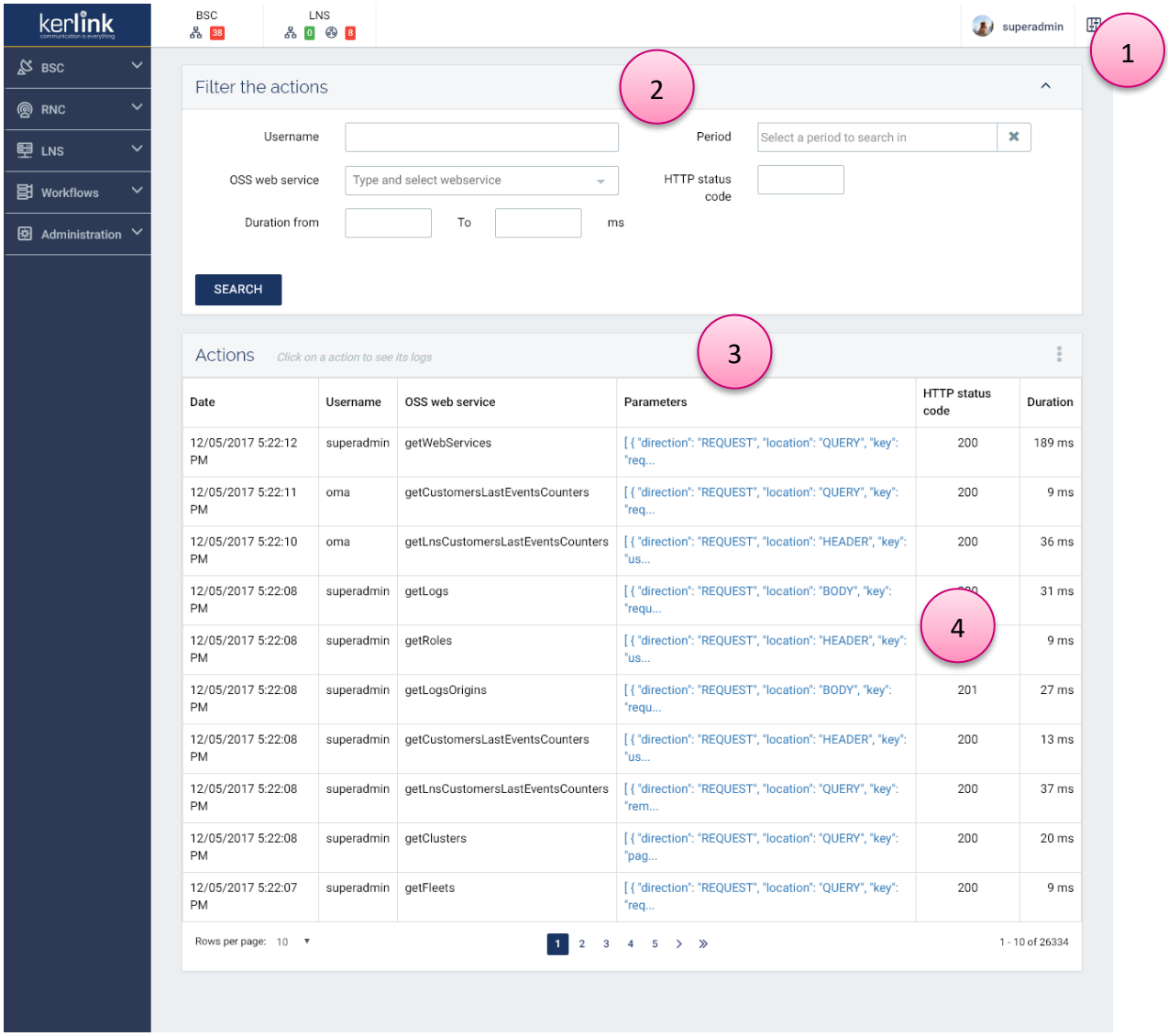

Figure 78 - Users actions logs

(1) Click on the “Activity logs” menu to access to the actions page.

(2) Filters on actions properties.

(3) The list of the web service called by the dashboard. A click on parameters cell will show a modal with parameters details.

(4) The column “HTTP status code” is the status code of the HTTP request. Most common codes are:

- 200: OK
- 301 and 302: Redirection
- 401: User not authenticated
- 403: Not allowed
- 404: Not found
- 500 and 503: Server error

A full list of HTTP status code can be found in Wikipedia.

12. About

12.1 Check services statuses

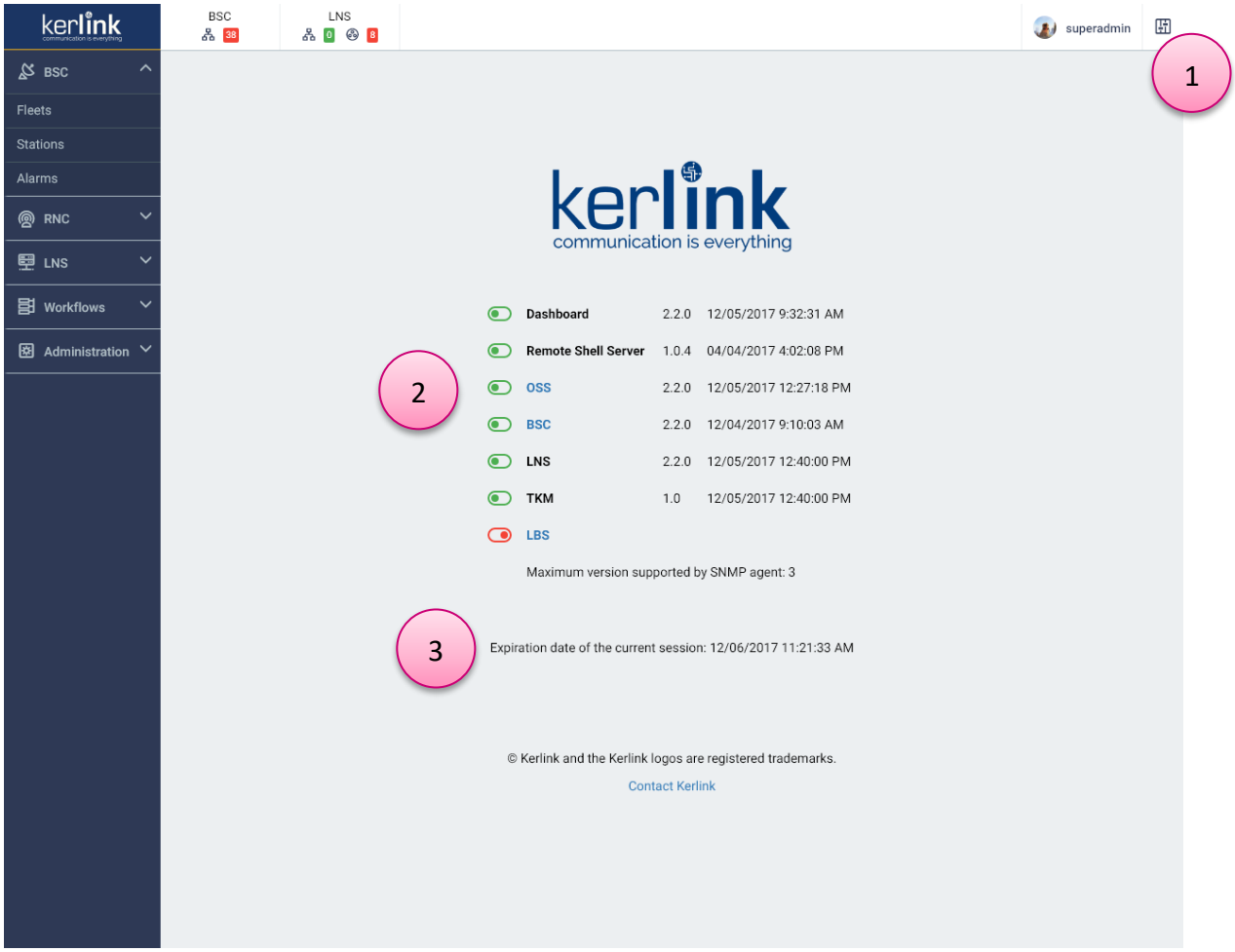

Figure 79 - About page

(1) Click on the “About” menu to access to the about page.

(2) The page list the status of all services with their version number and, if available, their build date.

A super admin can access to some services metrics by clicking on the service name.

(3) The expiration date of the current session.

13. Documentations

13.1 Access the documentation in the dashboard

Figure 80 - Documentations page

(1) Click on the “Documentations” menu to access to the documentations page.

(2) The tabs list the available documentations. Click on a tab to display the PDF file.

(3) The PDF will be displayed in an iframe.

Pre-requisite for IE11: Microsoft Internet Explorer 11 does not have an internal PDF reader unlike Chrome, Firefox and Microsoft Edge. To be able to display a PDF file, the user must have an external PDF reader with an Internet Explorer plugin.

14. Annex 1: Supported browsers

Due to technical limitations, only recent browsers are officially supported. Older browsers may run the application but experiences random issues.

Browser	Minimum version
Microsoft Internet Explorer	11
Microsoft Edge	12
Mozilla Firefox	49
Google Chrome	49

Figure 81 - Supported browsers

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15. Annex 2: Roles tables

15.1 BSC

	Reader	User	Admin	Super admin
Fleet				
Consult fleets overview	✓	✓	✓	✓
Stations				
Search and list stations	✓	✓	✓	✓
Station				
Consult station overview	✓	✓	✓	✓
Delete station	•	•	✓	✓
Rename station	•	✓	✓	✓
Move station	•	✓	✓	✓
Set station geolocation	•	✓	✓	✓
Mark station events as read	✓	✓	✓	✓
Consult station statistics	✓	✓	✓	✓
Access station file explorer	•	•	✓	✓
Access station through SSH	•	•	✓	✓
Access station through remote commands	•	•	✓	✓
Configure station	•	•	✓	✓
Consult station versions	•	•	✓	✓
List station tasks	•	•	✓	✓
List station SNMP logs	•	•	✓	✓
List station events	•	•	✓	✓
Cart				
Manage station cart	✓	✓	✓	✓
Alarms				
Consult fleet alarms	✓	✓	✓	✓

Figure 82 – BSC roles table

15.2 RNC

	Reader	User	Admin	Super admin
Spectrum				
Analyze radio frequency	•	✓	✓	✓
Radio configuration				
Configure radiopath	•	✓	✓	✓

Modem configuration				
Analyze modem statistics	✓	✓	✓	✓

Figure 83 - RNC roles table

15.3 LNS

	Reader	User	Admin	Super admin
Clusters				
List your clusters	✓	✓	✓	✓
Stations				
List stations	✓	✓	✓	✓
Station				
Consult station overview	✓	✓	✓	✓
Consult network properties	✓	✓	✓	✓
Set network properties	•	•	✓	✓
Consult station AES keys	•	•	✓	✓
Add station AES key	•	•	✓	✓
Remove station AES key	•	•	✓	✓
Consult positioning properties	✓	✓	✓	✓
Set positioning properties	•	•	✓	✓
List RX and TX messages	✓	✓	✓	✓
List events	✓	✓	✓	✓
Endpoints				
List endpoints	✓	✓	✓	✓
Endpoint				
Consult endpoint overview	✓	✓	✓	✓
Reset frame counter down	•	✓	✓	✓
Move endpoint	•	✓	✓	✓
Set endpoint geolocation	•	✓	✓	✓
List messages	✓	✓	✓	✓
List events	✓	✓	✓	✓
Send TX messages	✓	✓	✓	✓
Delete endpoint	•	•	✓	✓
Cart				
Manage endpoint cart	✓	✓	✓	✓
Alarms				
Consult station alarms	✓	✓	✓	✓

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Consult cluster alarms	✓	✓	✓	✓

Figure 84 - LNS roles table

15.1 Workflows

	Reader	User	Admin	Super admin
Create a new workflow	•	•	✓	✓
Execute a workflow on a cart	•	✓	✓	✓
Consult running workflows	•	✓	✓	✓
Consult completed workflows	•	✓	✓	✓
Consult workflows results	•	✓	✓	✓

Figure 85 - Administration roles table

15.1 Administration

	Reader	User	Admin	Super admin
Manage customers	•	•	•	✓
Manage fleets	•	•	✓	✓
Manage stations	•	•	✓	✓
Manage clusters	•	•	✓	✓
Manage endpoints	•	•	✓	✓
Manage users	•	•	✓	✓

Figure 86 - Administration roles table

15.2 Settings

	Reader	User	Admin	Super admin
Update alarm settings	•	•	•	✓
Update fleet settings	•	•	•	✓
Update station settings	•	•	•	✓

Figure 87 - Settings roles table

15.3 Logs

	Reader	User	Admin	Super admin
Consult application logs	•	•	•	✓
Consult activity logs	•	•	•	✓

Figure 88 - Logs roles table

15.4 Profile

	Reader	User	Admin	Super admin

Update your profile	✓	✓	✓	✓
Update another profile	•	•	✓	✓

Figure 89 - Profile roles table

15.5 About and documentation

	Reader	User	Admin	Super admin
Check services statuses	✓	✓	✓	✓
Consult documentations	✓	✓	✓	✓

Figure 90 - About roles table

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16. Annex 3: FAQ

16.1 How do I move a station from a fleet to another fleet?

You can move a station from a fleet to another fleet from:

(1) **The BSC cart**: add one or more stations to the cart, click on the cart icon and then use the move action to move your stations (see paragraph 3.3)

(2) **The station overview page**: go on the main page of the station you want to move and click on the floating button to edit the station. Select another fleet to move the station (see paragraph 3.4.1)

16.2 How can I put a station in two fleets?

You cannot. Stations can only be in one fleet.

16.3 How can I put an endpoint in two clusters?

You cannot. Endpoint can only be in one cluster.

16.4 How can I deactivate a user or set an expiration date to a user's account?

You must have at least the role Admin to access to the user profile page you want to manage. But you can only deactivate or set an expiration date to a user who has a lowest role than yours. Of course, you cannot update the limitations of your own account.

END OF DOCUMENT