

# HPE Customer Experience Assurance V5.3

Customer Care



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# Preface About this guide

This guide introduces the user to CEA V5.3 features related to troubleshooting of customer complaints with a review of the different available features

## Intended Audience

This guide is intended for anyone who is interested in using CEA V5.3 for troubleshooting of customer complaints

## **Disclaimers**

Customer Care and Troubleshooting modules require specific licensing

This document refers to data-sources and families that can require additional licensing

# Document history

Table 1: Document history

| Edition | Date           | Description    |
|---------|----------------|----------------|
| v1      | 11st July 2016 | Final version. |
|         |                |                |
|         |                |                |
|         |                |                |

## Document structure

The following table lists the chapters contained in this document:

Table 2: Document Structure

| Chapter                           | Description   |
|-----------------------------------|---|
| Chapter 1. Introduction           | Provides a description of the content of this document.   |
| Chapter 2. Customer Care Quippets | Describes the advanced Customer Care Quippets ( <b>Qu</b> estion Sn <b>ippet</b> ).             |
| Chapter 3. Customer Care Levels   | Describes the available dashboards at the different Customer Care levels supported in CEA R5.3. |

# **Notation Styles**

References to standard items are noted in Cursive

Section, Figures and Data table References are hyperlinks noted in Cursive



Information Statements are noted with an information icon



Warning Statements are noted with a warning icon

Sample notes look as follows. If you require a Danger or Warning alert, modify the caution alert label.



NOTE: Note alert.



NOTICE: Notice alert.



**CAUTION**: Caution alert.



TIP: Tip alert.

# Chapter 1 Introduction

# 1.1 Overview

This document is the Customer Care document for Customer Experience Assurance (CEA). The following subsections provide a full description of an advanced Customer Care Quippets. Moreover it provides an explanation about the available dashboards at the different Customer Care levels supported in CEA.



NOTICE: Customer Care and Troubleshooting Modules require additional licensing

# Chapter 2 Customer Care Quippets

CEA Release 5.3 provides new features related to Customer Care:

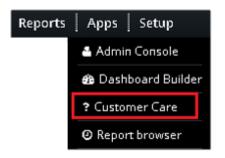


Figure 1.Customer Care Access

A "quippet" or Question Snippet is a definition for a question that the user of the system can ask very fast. In other words, quippets are dashboards that show KPI values for specific subscribers.

#### Some use cases could be:

- What is the speed of the connection for a subscriber?
- What are the OTT Apps used by a subscriber?
- What are the cells serving a subscriber?
- What are the sessions of a subscriber?
- What is the technology used by a subscriber?

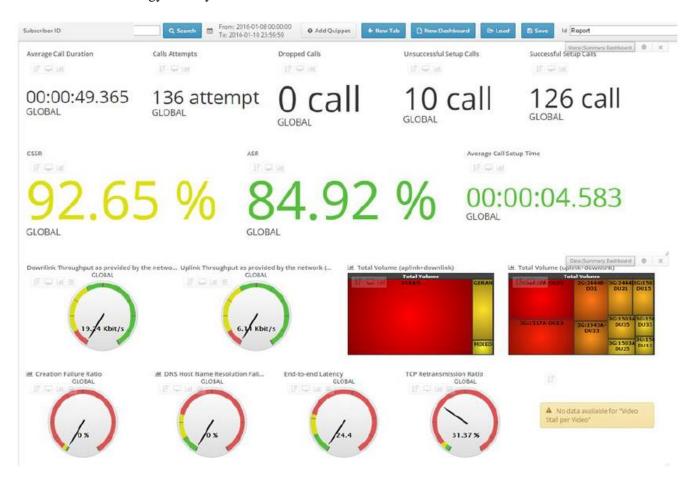


Figure 2.Quippets creation

After clicking on Apps and Customer Care, enter a subscriber ID in Subscriber ID search box before creating quippets. The steps to follow to create a new quippet are:

- STEP 1. Write the IMSI or the MSIDN of the subscriber you would like to analyze (note the autocompletion feature helping you writing it)
- STEP 2. Select the different quippets you would like to add based on your interest. You can combine any kind of quippets.
- STEP 3. It is possible to add different tabs to better organize the customer view.
- STEP 4. It is possible to change the quippet size and move the quippet situation.
- STEP 5. Once the dashboard is built, it can be saved by clicking on *Save* button.

After this, the title for the dashboard can be chosen in the *Title* field. The field *Menu entry* allows the user to choose what report this dashboard should appear under. Save your work as a customer dashboard if you want to use it later.

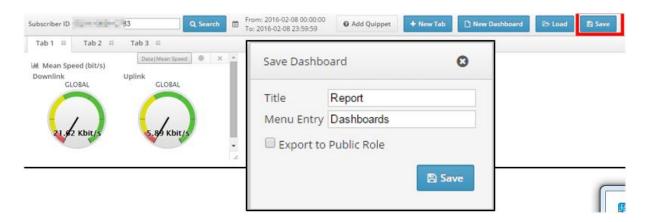


Figure 3. Saving a quippet Report

For example, if the report is named *test1* and it is saved within *Application* report:

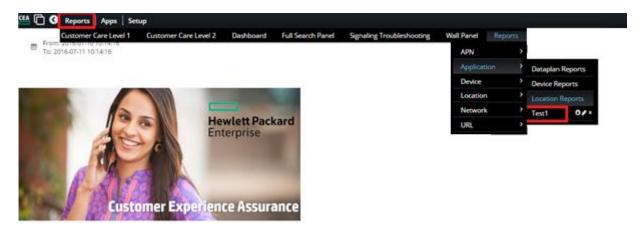
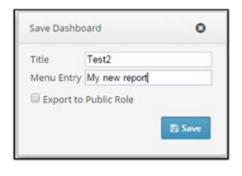


Figure 4. Quippet Report example

Moreover the user can create new report categories:



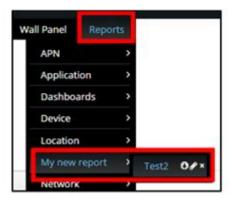


Figure 5. New report category

The saved dashboard quippets can be accessed from Full Search functionality, by clicking on any IMSI that appears within the results:

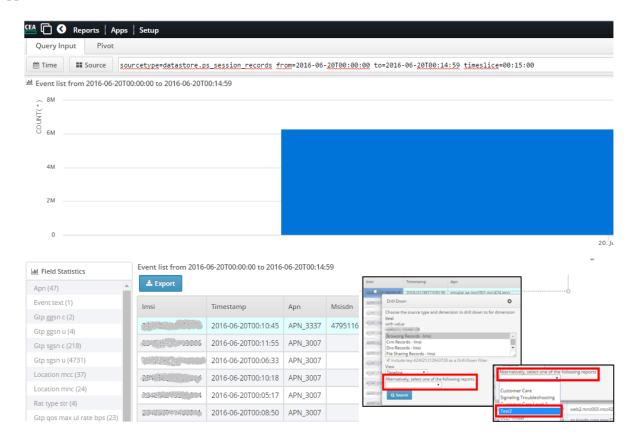


Figure 6. Quippet accessible via Full Search

# 2.1 Predefined quippets

There are several pre-defined quippets which you can select by clicking on "Add Quippet" button. After selecting this button the user would find the following elements: CRM, Credit, Data, Fault Management, KQI Reports, OTT, Policy, RAN Performance, Roaming, SMS, Trouble Ticket, USSD, and Voice.

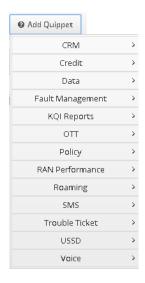


Figure 7.Predefined Quippets



NOTICE: The items of the list of predefined quippets depend on the available datasources and the acquired license. Some of them are optional such as Credit, Fault Management, OTT, Policy, RAN Performance, Roaming, SMS, Trouble Ticket, USSD and Voice.

# 2.1.1 CRM Quippet

Information about the subscriber in the CRM such as Activation Date, Subscriber status, Nationality, Segment, etc.



Figure 8.CRM Quippet example

## 2.1.2 Credit Quippet

It represents the Gy Interactions (CCA responses). Selecting this option, 'Out of cuota events' item appears.

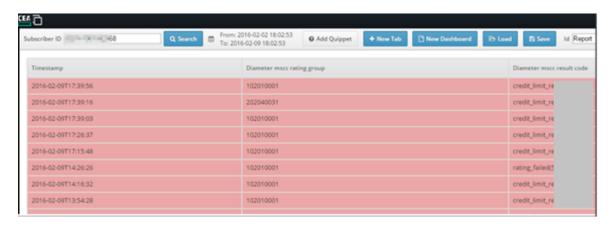


Figure 9.Credit Quippet example

# 2.1.3 Data Quippet

This quippet represents the usage of data services and quality. The predefined data quippets are:

• Device Usage

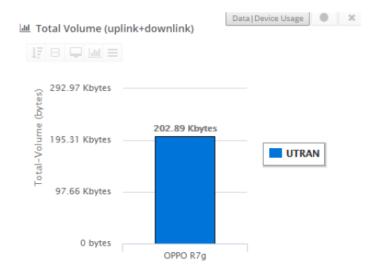


Figure 10.Device Usage Quippet example

• Mean Speed

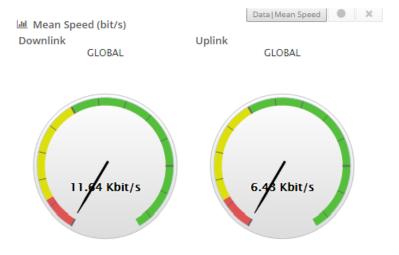


Figure 11.Mean Speed Quippet example

# 72.47 Kbit/s

Figure 12.Peak Speed Quippet example

• Servicing Cells-Map

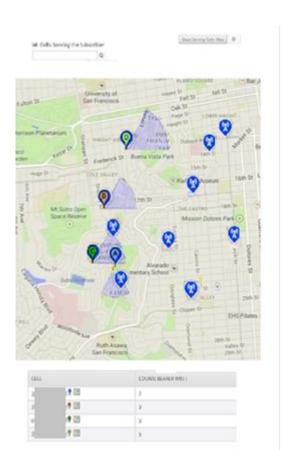


Figure 13. Servicing Cells Map example

### • Summary Dashboard

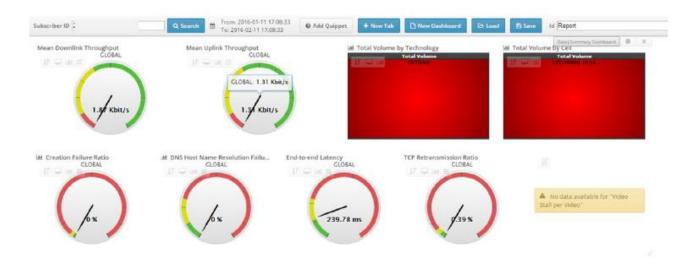


Figure 14.Summary quippet example

## • Technology Usage

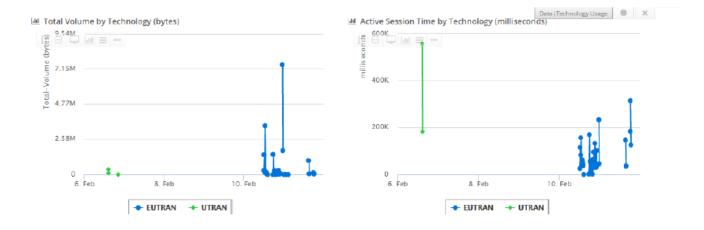


Figure 15. Technology usage quippet example

## • Top Cells – Time

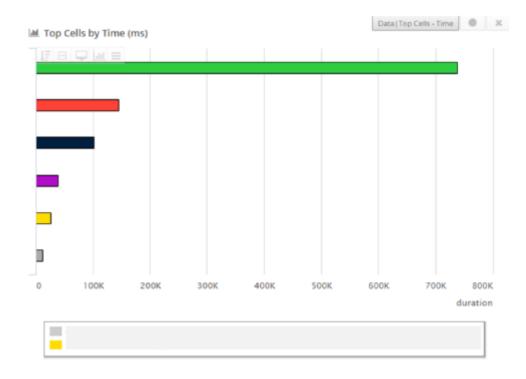


Figure 16. Top cells by time quippet example

• Top Cells - Volume.

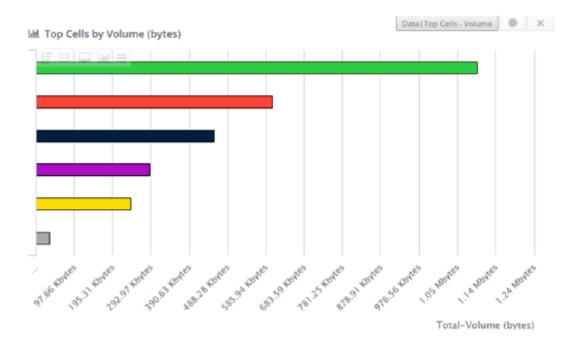


Figure 17.Top cells by time quippet example

# Chapter 3 Customer Care Levels

This section provides an explanation about the available dashboards at the different Customer Care levels supported in CEA. The aim of any Customer Care is to filter out as many complaints as possible at each level.

This feature requires an additional license and is optional.

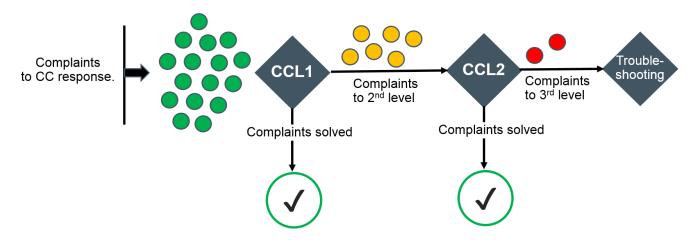


Figure 18. Customer Care levels

## 3.1 Customer Care Level 1

Level 1 support is the first attempt at solving customer complaint. Customer Care Level 1 reports are accessible via Reports menu:

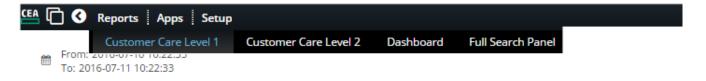


Figure 19. Customer Care Level 1

#### CCL1 provides data that:

- Is very high level.
- Requires low technical knowledge to interpret.
- Allows initial assessment after a quick glance.

If customer complaint is NOT solved by CCL1 agent, it moves on to CCL2 support, but the aim of any CC center is to solve as many complaints as possible at level 1 support. Only a small % of complaints should go on to level 2 support.

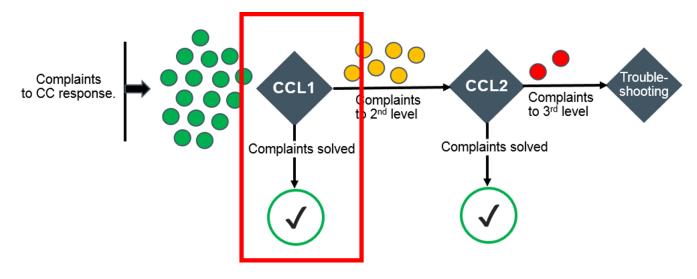


Figure 20. Customer Care Level 1

CCL1 is structured around four tabs that will be described in this section.

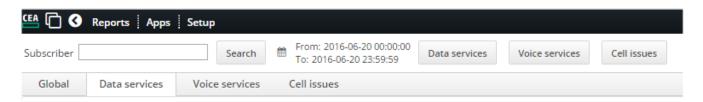


Figure 21. Customer Care Level 1 areas

The first thing to do for using CCL1 dashboard is enter an input data on the Subscriber text field. Then the user will select a time range to be queried and will click on Search button.

Data services, Voice services and Cell issues buttons are disabled by default. Just after entering the subscriber data these options will be loaded. After that the user could navigate to the available tabs in order to see the data.

Let's going to describe the different tab options:

## 3.1.1 Global tab

• Subscriber information: IMSI, MSISDN, dataplan, segment, sim type and status of the subscriber are provided on this table.



Figure 22. Subscriber information area

- Location and device: In these section two cells are provided:
  - The most used cell
  - The last used cells

As well as the most used device is shown.

## Location and device Most used cell Last user cell Most used device Nokia C3-00 (35166405) Cell XX Cell YY

Figure 23. Location and device area

• Roaming and MVNO: Operator can see if the user is a roamer and the operator name or the MVNO throughout this table. If the subscriber has been in different countries this table will show multiple entries.

#### Roaming and MVNO

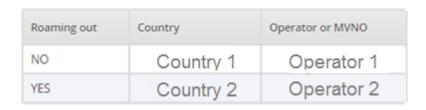


Figure 24. Roaming and MVNO area

• Data and Voice status: This heuristics combines different thresholds and KQIs provide two scores, one for Data and one for Voice. When a score is not OK, a brief explanation is provided (for example in the Data score in this example). General status of Data and Voice services are seen with a quick glance.

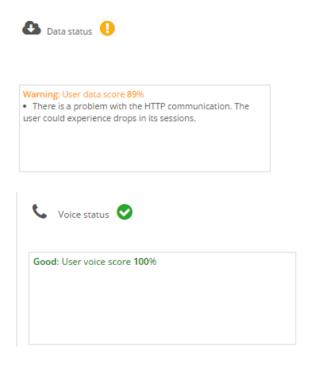


Figure 25. Data and Voice status

• Tot Vol by technology: This report shows what technology the customer is using.

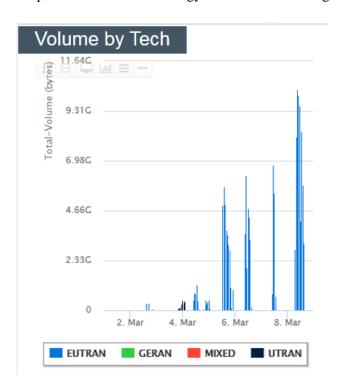


Figure 26. Tot Vol by technology area

• Charging events: This report identifies customers with quota-related issues.

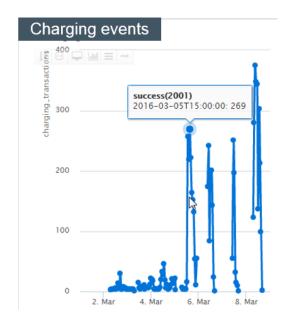


Figure 27. Charging events area

• Voice calls: This report displays the voice calls that the customer has done.

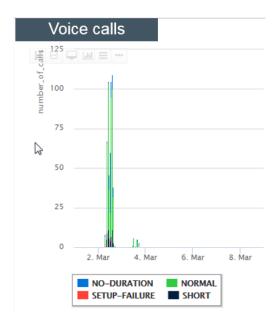


Figure 28. Voice calls area

## 3.1.2 Data services tab

In Data service tab section, the following reports are included:

• Top 20 apps by Volume: This report provides insight into the apps the subscriber is customer is using more.

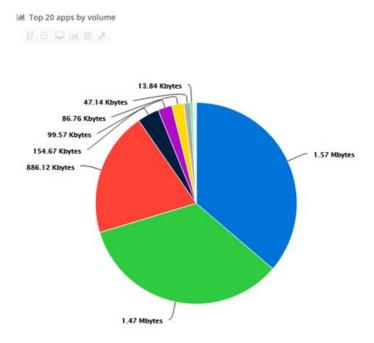


Figure 29. Top apps by Volume area

The following scores provide a high level few of customer experience for different services (application categories).

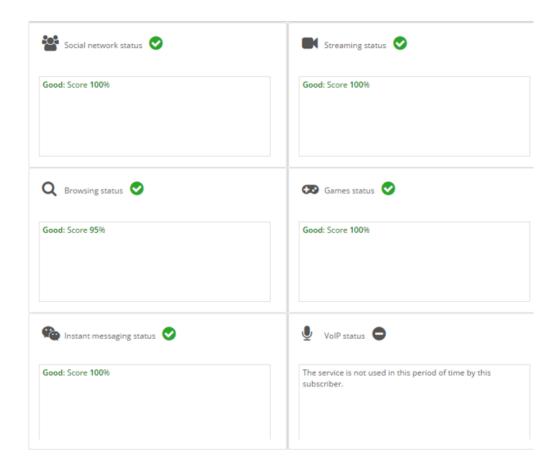


Figure 30. Data services area

The six scores for services include the following applications:

| Social Network   | Streaming   | VoIP   | Games   | Instant Messaging   | Browsing  |
|--|---|--|---|---|---|
| facebook instagram tumblr google+ twitter line waze msn pinterest beetalk badoo vine linkedin lovoo myspace picasa | youtube smule dailymotion spotify apple-player soundcloud mncplaymedia soundhound vimeo sky-go netflix shazam viewster last-fm pandora n-tv zdf napster | fb-voice<br>wa-stun<br>viber<br>skype<br>wa-voice<br>facetime<br>tango | unity clash-of-clans steam gameloft ea-mobile umeng king game-center candy-crush-saga plants-vs-zombies-2 twitch wooga angry-birds-friends everyplay ruzzle | whatsapp wechat snapchat hangouts apple-push jabber facebook-messenger yahoo-messenger fring telegram | http<br>https<br>opera<br>proxy<br>https-quic<br>http-quic<br>spiegel<br>bild |
| Enterprise   | prosieben   |  |   | Confidential © 2015 Hewlett Pack  | ard Enterprise, L.P. All rights reserved.                                     |

Figure 31. Service score area



Note that specific app names will vary depending on the traffic being monitored.

## 3.1.3 Voice services tab

In Voice Services tab section, the following reports are included:

• Dropped Call Rate: This report shows Dropped Call Rate for incoming (MT) and outgoing (MO) calls. The subscriber in the following example shows a 100% Dropped Call Rate for MT calls at a specific point in time. Other than that, Dropped Call Rate is 0%.

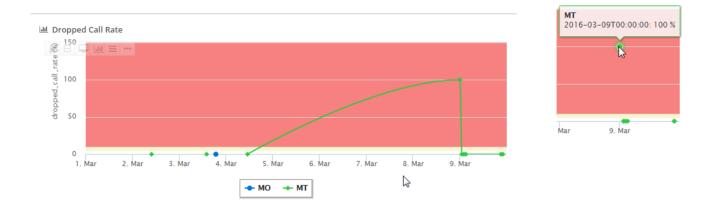


Figure 32. Dropped Call Rate report

• Call Setup Success Rate: This report shows Call Setup Success Rate for incoming (MT) and outgoing (MO) calls. The subscriber in the following example shows a 100% Success Rate for the time period queried.

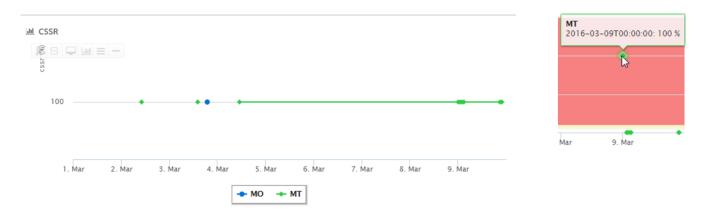


Figure 33. Call Setup Success Rate report

- Incoming SMS Success Rate: This report shows SMS Success Rate for incoming SMS.
- Outgoing SMS Success Rate: This report shows SMS Success Rate for outgoing SMS.

The subscriber in this example shows a 0% Success Rate for outgoing SMS, and no data for incoming SMS (no SMS received in this period of time).



Figure 34. Incoming / Outgoing SMS Success Rate report

• Total USSD Messages: This dashboard shows a count of Unstructured Supplementary Service Data (USSD) messages. This service is used by GSM phones to communicated with the service provider's computers.

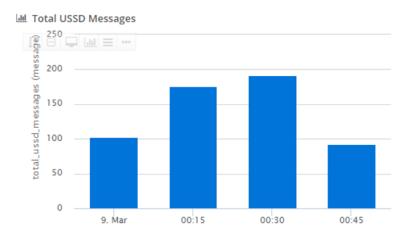


Figure 35. Total USSD Messages report

## 3.1.4 Cell issues tab

Information is provided for last cell and for most used cell:

• Cell drop rate for most used cell: This report provides information regarding the cell drop rate for last cell and most used cell.

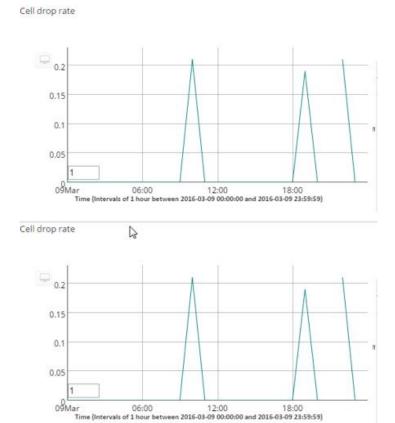


Figure 36. Cell drop rate report

• Cell alarms: Alarms for most and last used cells from PM system.

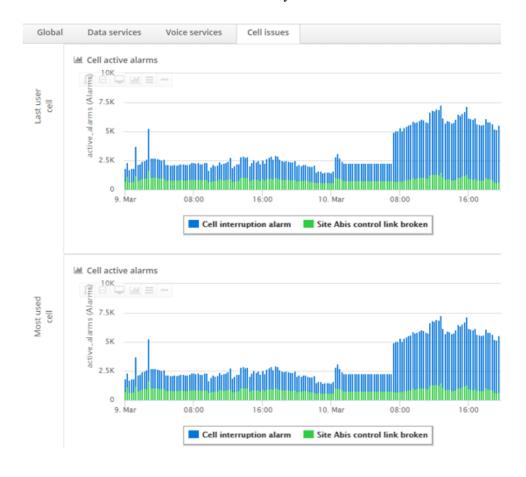


Figure 37. Cell alarms report

## 3.2 Customer Care Level 2

As it was indicated in the previous section, if Level 1 does not solve the issue, a report is created and Level 2 support attempts to solve the problem. If customer complaint is NOT solved by CCL2 agent, it moves on to deeper troubleshooting. Most complaints will not require Level 2 support. The aim is to filter out as many as possible at Level 1.Of the complaints that reach L2, most will be solved at this level without requiring L3 support. For further information about troubleshooting, please go to 3.3 section.

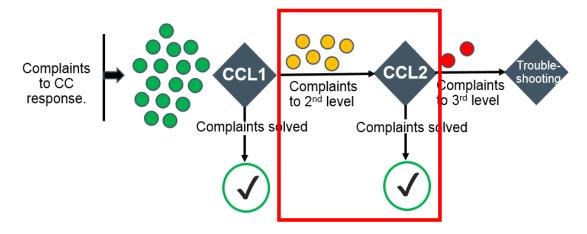


Figure 38. Customer Care Level 2

#### CCL2 provides data that:

- Is high level, although more detailed than CCL1 data.
- Requires higher (than in Level 1) technical knowledge to interpret.
- Allows initial assessment of status with key indicators.

#### This feature is accessible via:

Dashboards:



Figure 39. CCL2 dashboards



Note that Voice CCL2 option is available only from the dashboard options

Main Menu>Report> Customer Care Level 2.

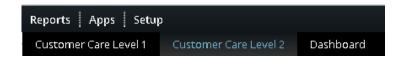


Figure 40. CCL2 via Reports menu

### Free exploration

In order to access you have to select the Customer Care Level 2 option on the drill-down emerging menu that it is displayed when you click over a MSISDN/IMSI.

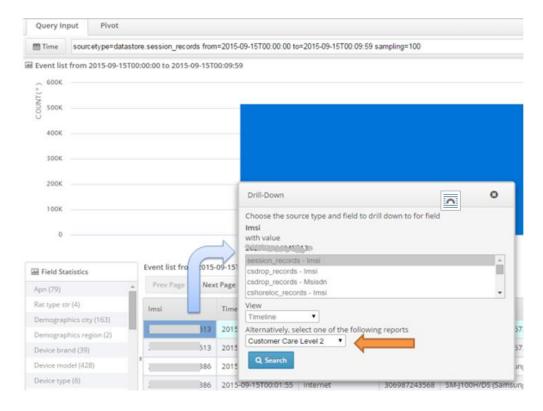


Figure 41. Customer care via free exploration

Operators could use all available Quippets for Level 2 Troubleshooting.

## 3.2.1 Data Customer Care Level 2

Data CCL2 panel includes the following main elements:



Figure 42. Data CCL2 panel

- Input elements: They are at the top of the panel. Some of them are used for the introduction of data and others are shortcut buttons to other CEA views.
  - **A. MSISDN Box:** Use this box to introduce the MSISDN/IMSI of the user you want to query.
  - **B.** Query Button: Click this button to launch the query and get the user sessions summary result.
  - C. Data Range Selector: Use this selector to select the from-to dates.
  - **D.** Details Button: By clicking this button, you will be redirected to the Full Search Panel and the following automatic query will be executed there:

sourcetype=datastore.session\_records <msisnd> from=<from\_date> to=<to\_date> nt list from 2015-03-29T09:24:25 to 2015-03-30T09:24:25

Figure 43. List of events accessed from CCL2

**E.** Traces Button: By clicking this button, you will be redirected to the Signaling Troubleshooting Panel. (For further information go to Troubleshooting. Customer Care Level 3 section)



Figure 44. Signaling Troubleshooting Panel

#### • Result elements

- F. User Sessions Summary: This table lists all the session the user has performed in the selected data range. It includes the following info:
  - · Session start time
  - Session stop time
  - Msisdn
  - Imsi
  - Imeisv
  - Apn
  - RAT Type
  - Volume Down
  - Volume Up
  - Duration
  - User IP
  - Nodes used in the session (SGSN/GGSN/PGW/SGW)
  - Session start time jitter
  - Session stop time jitter

By clicking on each session, the detailed session information at Customer Experience Level and Location will be shown in the widgets bellow the summary table.

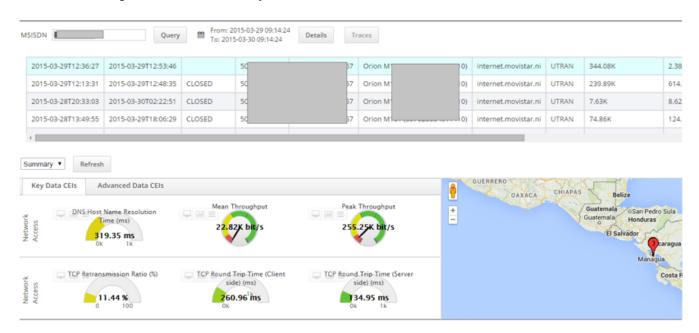


Figure 45. User Session Summary

**Detailed Session information:** For each session, the following summarized CEIs available are:

Table 3: Key and Advanced CEIs

|                | Key Data CEIs                          | Advanced Data CEIs                     |
|----------------|--|--|
| Network Access | DNS Host Name Resolution Time (ms)     | DNS Host Name Resolution Failure Ratio |
|                | Mean Throughput                        | (%)                                    |
|                | Peak Throughput                        | End to End Latency (ms)                |
| Network Access | TCP Retransmission Ratio (%)           |  |
|                | TCP Round Trip Time (Client side) (ms) |  |
|                | TCP Round Trip Time (Server side) (ms) |  |

|           | Key Data CEIs  | Advanced Data CEIs  |
|-----------|--|---|
| Browsing  | HTTP Session Time (ms) HTTP Mean Data Rate (bit/s) HTTP Peak Data Rate (bit/s) | HTTP Session Failure Ratio (%)  |
| Streaming | Time to Stream Start (ms) Video Stall per Video (#stalls)                      | Total Reproduction Time per Video (secs) Streaming Rebuffering Time (ms) Streaming Rebuffering Time Percentage (percentage)  Streaming Reproduction Quality (%) |

Note that No Data message indicated that session has no traffic of a certain type.

It is possible to get this information in two formats by clicking on Refresh button:

timeline format:

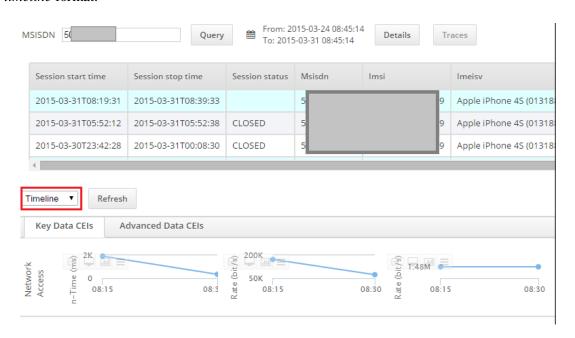


Figure 46. Timeline representation of CEIs

Summary format:

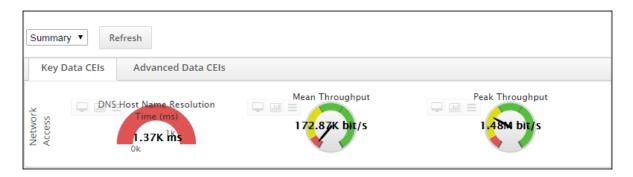


Figure 47. Summary representation of CEIs

### G. Map

After clicking on any session, it will appear a Google map displaying the location where the session took place

CCL2 Dashboard provides location data. This display shows the different cells appearing in the session. The cells are shown in a map:

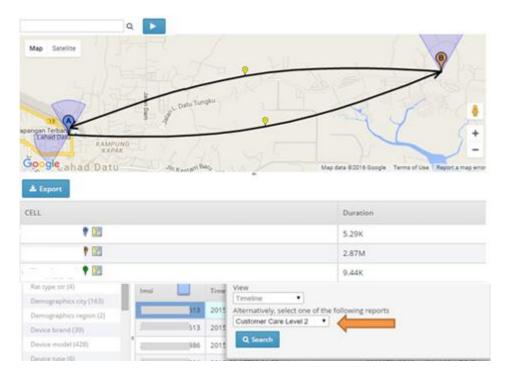


Figure 48 CCL2 Cells map

#### H. Location table

Location table provides information about all the cells associated to the selected session along the time the session lasts with the following details:

- The cells where the session took place. By clicking on any map icon of the *Uli cell* column, it leads the user to Google map application where information about the latitude and longitude of the cell is also displayed.
- The duration of the session on the different cells where was carried out

## 3.2.2 Voice CCL2

Voice CCL2 dashboard is structured around three tabs as the following picture depicts:



Figure 49. Voice CCL2 dashboard

The first thing to do for using Voice CCL2 dashboard is enter an input data on the Subscriber text field. Then the user will select a time range to be queried and will click on Search button. Search button is disabled by default. Just after entering the subscriber number will be loaded. After that the user could navigate to the available tabs in order to see the corresponding information.

Every tab provides information of the subscriber throughout different Voice KQIs:

- Calls CCL2 tab contains the following KQIs:
  - Dropped call rate
  - Dropped calls by cell 0
  - Average call setup time by call type 0
  - Call Setup Success Rate 0
  - Calls map 0
  - Total seized minutes by technology 0
  - Answer seizure ratio by technology

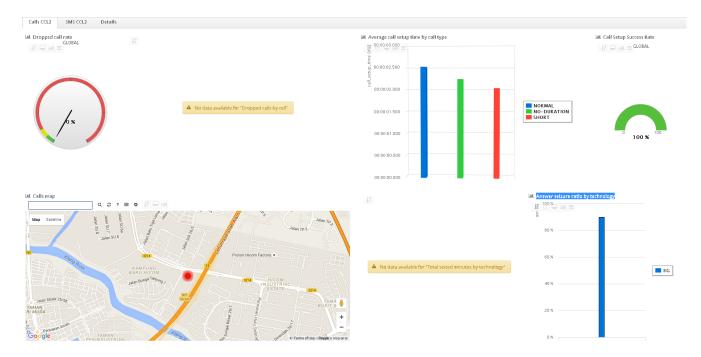


Figure 50. Calls CCL2 example

- SMS CCL2 tab contains the following KQIs:
  - **Total SMS Success Rate**
  - 0 SMS Incoming Success Rate
  - SMS Outgoing Success Rate 0
  - USSD SMS by direction 0
  - Failed outgoing SMS by cell 0
  - Failed incoming SMS by cell



Figure 51. SMS CCL2 example

- Details tab contains the voice and SMS details in table format:
  - Voice details table
  - SMS details table

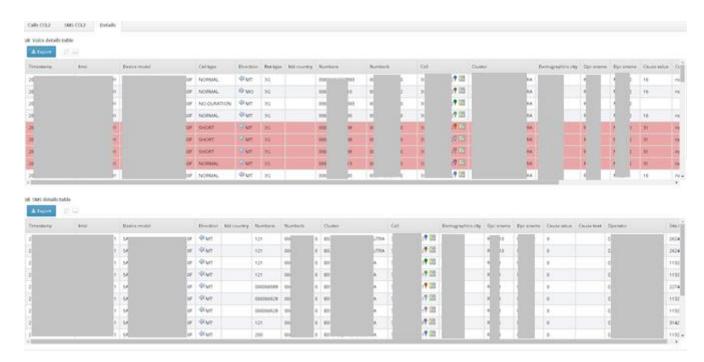


Figure 52. Details CCL2 example

# 3.3 Troubleshooting. Customer Care Level 3

When support levels 1 and 2 do not provide a satisfactory result, deeper troubleshooting is required. This provides very detailed data that requires deep technical understanding. Only a small % of complaints should reach this level.

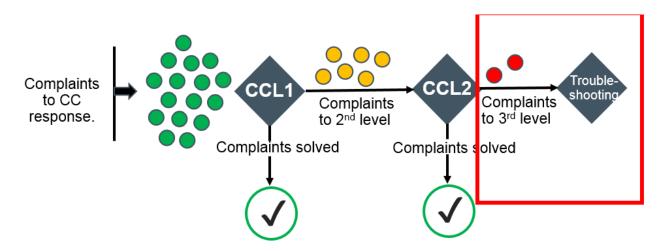


Figure 53. Customer Care Level 3

Troubleshooting dashboard is accesible via:

Customer dashboard:









Figure 54. Troubleshooting dashboard

Link from CCL2 throughout Traces button. Signalling data can be accessed from CCL2 dashboard for a first step in troubleshooting:

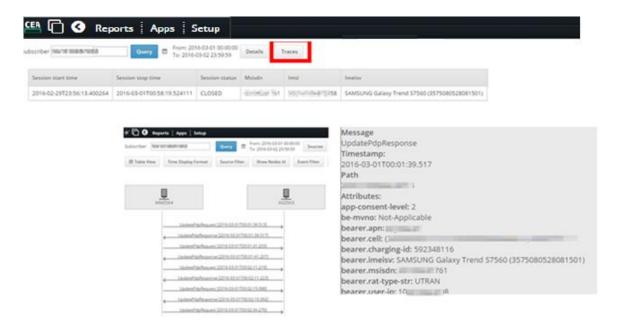


Figure 55. Accessing Signaling Troubleshooting by means of Customer Care Level2

Troubleshooting panel includes the following main elements:

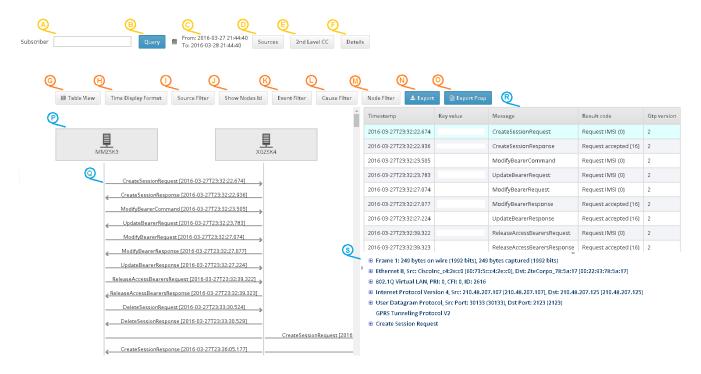


Figure 56. Troubleshooting panel

- Input elements: They are at the top of the panel. Some of them are used for the introduction of data and others are shortcut buttons to other CEA views.
  - A. MSISDN Box: Use this box to introduce the MSISDN/IMSI of the user you want to Troubleshoot.
  - **B.** Query Button: Click this button to launch the query and get the user sessions summary result.
  - **C. Data Range Selector**: Use this selector to select the from-to dates.
  - **D.** Sources Button: By clicking this button, you will be able to select the source desired to show:



Figure 57. Sources panel

- E. 2<sup>nd</sup> Level CC button: By clicking this button, you will be redirected to the Customer Care Level 2
- **F. Details button:** By clicking this button, you will be redirected to the Full Search screen.
- Ladder Interaction menu: They are under the *Input Elements* menu. And there are used for managing the data shown below.

- G. Toggle Table/Ladder Visualization: This button changes between two view options: showing the table or ladder+table.
- H. Time Display Format: Absolute Time or Delta Time between messages

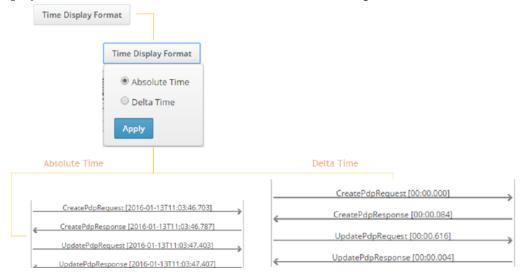


Figure 58. Time display panel

I. Source Filtering: This button shows the tables where the info is coming from, allowing to select/unselect these tables.

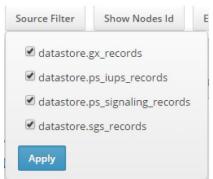


Figure 59. Source filter panel

- J. Show/Hide Node ID: shows/hide nodes IPs.
- K. Event Filtering: this button allows to select/unselect network events from every source table.

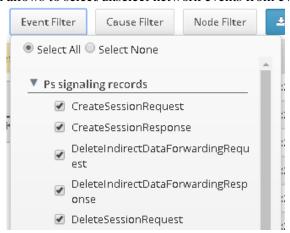


Figure 60. Source filter panel

**L. Cause Filter:** this button allows to select/unselect causes from every source table.

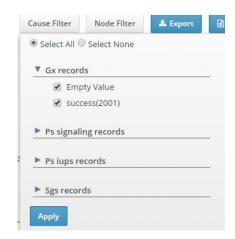


Figure 61. Cause filter panel

M. Node Filter: this button shows the nodes involved and allows the option to show/hide them.



Figure 62. Node filter panel

- **N.** Export: Export the information in .csv format
- O. Export Pcap: Export the information in .cap format

#### • Result elements

- **P.** Nodes: These are the nodes between the connection is established decorated with the names.
- Q. Legs: Every message between Nodes is represented by an arrow showing the message way.
- **R.** Table: Shows all the events related to the session selected and ordered by timeline.
- S. Wireshark-like tree: This screen shows a detailed view of a selected event as wireshark view.

For using signaling troubleshooting solution, follow the following steps:

1. Introduce the MSISDN or IMSI of the subscriber you want to troubleshoot

- 2. Select the Time Range
- 3. Select the sources
- 4. Depict the tree clicking in any of the transactions
- 5. Change the display format if needed
- 6. Filter out events or nodes as per your convenience
- 7. Optionally export the pcap or move to other reports such as Customer Care Level 2 or Full Search panel.