
HP Customer Care Dashboard

Version 1.0



MBBQoE Customization User Guide

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Preface

This guide describes how to use the Customer Care Dashboard web application, and more specifically the MBBQoE customization.

Product Name: HP Customer Care Dashboard (HP CCD)

Product Version: 1.0

Kit Version: 1.0

Intended Audience

Level 1 Customer Care personnel and Customer Care administrators.

Software Versions

The term UNIX is used as a generic reference to the operating system, unless otherwise specified.

The software versions referred to in this document are as follows:

Software	Version	OS	Databases
HP CCD	1.0	Suse SLES 11 SP1 for x86 machines	SQLite 3.7.2 for management of users
HP CEA	4.5	Suse SLES 11 SP1 for x86 machines	HP CEA Zstore

Table 1 - Software versions

Typographical Conventions

Courier Font:

- Source code and examples of file contents.
- Commands that you enter on the screen.
- Pathnames
- Keyboard key names

Italic Text:

- Filenames, programs and parameters.

- The names of other documents referenced in this manual.

Bold Text:

- To introduce new terms and to emphasize important words.

Associated Documents

The following documents contain useful reference information:

- *HP CCD V1.0 - MBBQoE Customization - Configuration Guide*
- *HP CCD V1.0 - Installation Configuration and Administration Guide*
- *HP CCD V1.0 – Release Notes*
- *HP CEA 4.5 Release Notes*
- *HP CEA V4.5 – MBBQoE User Guide*

Acronyms

2G	2nd Generation
3G	3rd Generation
APN	Access Point Name
CCD	Customer Care Dashboard
KPI	Key Performance Indicator
QoE	Quality of Experience
MBB	Mobile Broadband
MBBQoE	Mobile Broadband Quality of Experience
IMSI	International Mobile Subscriber Identity.
MSISDN	Mobile Subscriber ISDN Number
HPSA	High Speed Packet Access

Support

Please visit our HP Software Support Online Web site at www.hp.com/go/hpsupport for contact information, and details about HP Software products, services, and support.

The Software support area of the Software Web site includes the following:

- Downloadable documentation.
- Troubleshooting information.
- Patches and updates.
- Problem reporting.
- Training information.
- Support program information.

Introduction

This guide describes how to use the MBBQoE customization of the Customer Care Dashboard (HP CCD).

HP CCD allows to install multiple dashboard customizations, which present different view and data to separate audiences.

We will describe here the “Mobile Broad-band Quality of Experience” (MBBQoE) custom.

Please note that this guide describes the actual content of the custom, but the content is customizable (call your HP Sales representative to learn more about this Customization possibility).

This HP Customer Care Dashboard predefined customization works with HP CEA V4.5 and the associated Analysis & Correlation Package for MBB QoE, from Zhilabs PS core probes.

1.1 What is the MBBQoE Customization

The Customer Care Dashboard provides a synthetic dashboard representing the Quality of Experience Scores for the different services used by individual subscribers over a period of time. This helps the level 1 support staff to identify if issues affecting the subscriber have been detected by HP CEA application. It helps answering the initial concerns reported by these subscribers about their services and opening a Customer Ticket if additional investigation must be done by the level 2 & 3 support organization.

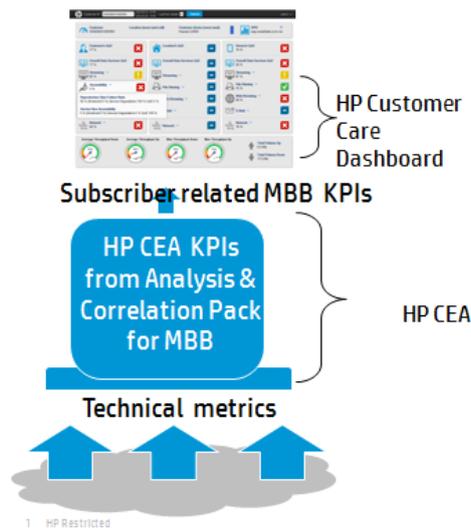
It provides by default QoE scores and thresholds for the different network and services indicators exposed by the HP CEA MBB value pack. QoE scores are calculated from lower level service indicators collected from the network and other sources, and aggregated by the HP CEA application.

1.1.1 Key Performance Indicators and Quality of Experience Scores

The following describes the overall approach to calculating Quality of Experience (QoE) Scores from lower level technical metrics and what thresholds are associated with these.

These are based on the ETSI and 3GPP industry standards which define Key Performance Indicator (KPI) categories and associate a category to each standard technical indicator collected in the network, and which QoE scores are calculated from.

HP Customer Care Dashboard QoE scores



HP Customer Care Dashboard QoE Scores are calculated using a weighted formula from lower level KPIs which characterize an issue

- 1st level gives the overall score, displayed as colored icons triggered by thresholds
- 2nd level is decomposed into standard categories
 - Accessibility, Retainability, Quality (Integrity) and usage volumes (throughput)
 - These are calculated from a selected set of KPIs supported by the HP CEA product

HP CCD integrates to the HP CEA, leveraging the Analysis & Correlation package for Mobile Broadband and its 75+ Out of the box supported KPIs for MBB



1.1.2 Key Performance Indicators Categories

KPI Category "**Accessibility**": this category groups indicator which indicate whether the subscriber is able to access the networks and the services subscribed to. Accessibility is usually formed of two subcategories

- Network Accessibility: Probability that the user performs a successful registration on the network which delivers the service. The network can only be accessed if it is available to the user.
- Service Accessibility: Probability that the user can access the service he wants to use. A given Network Accessibility is a precondition for this phase.

KPI Category "**Quality**": describes the Quality of Service during service use and contains elements like the quality of the transmitted content, e.g. speech quality, video quality or number of bit errors in a transmitted file. The Service Quality can only be determined if the service has been accessed successfully.

KPI Category "**Retainability**": Service retainability describes the termination of services (in accordance with or against the will of the user). Examples for this are all kinds of cut-off parameters, e.g. the call cut-off ratio or the data cut-off ratio. Again, a previously performed successful service access is a precondition for this phase.

1.1.3 Quality of Experience Scores

In the processing flow, technical indicators collected by HP CEA are further calculated and aggregated into KPIs, by category, and those KPIs are in turn calculated, using a weighted calculation formula, into a one single QoE score value reflecting the overall quality of experience. Customizable thresholds are then applied to the single score value to make the icon change color.

1.1.4 Methodology

There are several challenges to calculating score. First, while there are service agnostic indicators (e.g. pdp context activation applies to any data service), most of the indicators are service specific. Additionally, the indicators have different units such as time, number, percentage, and so forth. Finally, the calculation and associated thresholds must reflect the actual experience and signal degradations without under alerting or over alerting the Customer Care level 1 staff.

For these reasons, a single, simple methodology is being used:

KPI Category & QoE scores

- Use percentage as the only unit for the KPI Category Score and the QoE Score
- When multiple indicators are in the same category, take the worst score to calculate the KPI category score

Degradation factor proposed method

Consider the threshold:

- At 50% of the value of the threshold, there is a degradation factor already of 25% (QoE Score)
- At 100% of threshold, the degradation factor is of 50%
- Between 100% of the threshold and 200% of the threshold, the degradation evolves from 50% to 75%
- Between 200% of the threshold and 400% of the threshold, the degradation varies from 75% to 100%
- When the value goes beyond 400% of the threshold, the degradation is 100%

This gives the following table:

Threshold Value	Degradation factor	QoE score (efficiency)
50% of threshold	25%	75%
100% Threshold	50%	50%
101%-200%	51%-75%	51%-25%
200%-400%	76%-100%	24%-0%
>400 %	100%	0%

Table 2 - Degradation score

For values between 0% and 50% of the threshold, the degradation factor will vary from 0% to 25%. However, this degradation is not linear. Instead, we use a formula based on ArcTangent which will give a lower degradation factor for values closest to 0%, and higher degradation as values reach closer to 50% (lower and higher compared to what a linear formula would return)

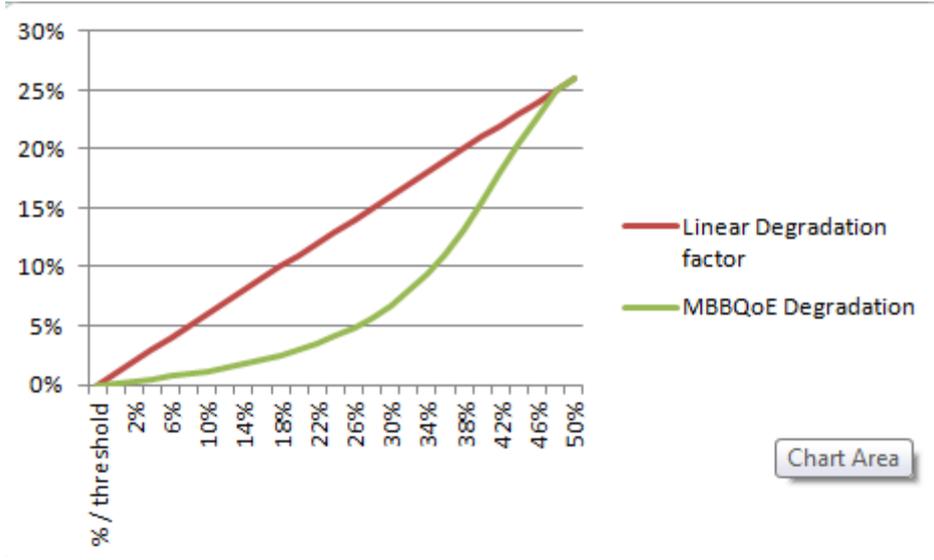
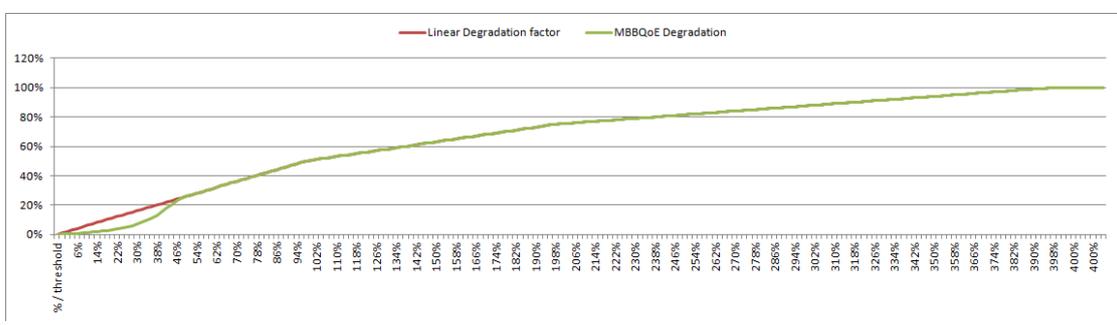


Chart Area



Using Customer Care Dashboard

2.1 Url

HP CCD is generally installed on the same Tomcat instance as the HP CEA application.

The url to access HP CCD is

```
http://<server>:<port>/ccd/
```

by default, port is 8080

If more than one custom is installed, then the url is

```
http://<server>:<port>/ccd/CustomerCareDashboard.html?custom=mbbqoe
```

If the tomcat server has been configured to support https, then HP CCD can be access securely with this url:

```
https://<server>:<port>/ccd/
```

by default, https port is 8443

2.1.1 Localisation

If the custom supports multiple languages, then it is possible to specify a locale in the url:

```
http://<server>:<port>/ccd/CustomerCareDashboard.html?custom=mbbqoe&locale=<locale>
```

where `<locale>` can take the form of language (e.g. "fr") or language_Country (e.g. "fr_FR")

If the requested locale is not deployed as part of the custom, then it defaults to English.

2.1.2 Passing parameters in the url

HP CCD supports passing the following parameters in the url:

Parameter	Description	Example
dateinf	Initialises the date/time interval (format: yyyy-MM-dd HH:mm) for the beginning of	2014-03-20 19:10

	the time period. Must be used with the datesup parameter	
datesup	Initialises the date/time interval (format: yyyy-MM-dd HH:mm) for the end of the time period. Must be used with the datesup parameter	2014-03-20 23:59
custom	Name of the customization to execute	mbbqoe
locale	Language/country to display	fr_FR
customerid	MSISDN and IMSI of the customer	722071000000001

Table 3 - URL parameters

Example:

`http://<server>:<port>/ccd/CustomerCareDashboard.html?custom=mbbqoe&locale=fr&dateinf=2014-03-20 19:10&datesup=2014-03-20 23:59&customerid=722071000000001`

2.1.3 Browser

HP CCD is only compatible with HTML 5 compatible browsers.

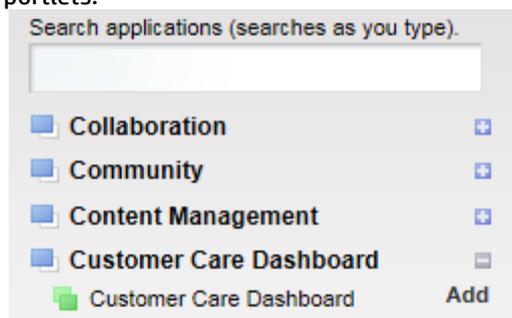
This includes:

- Internet Explorer 9 and above
- Google Chrome
- Mozilla Firefox

2.1.4 Using HP CCD from within a portal

HP CCD can run as a portlet and can be incorporated inside a portal like LifeRay.

To add the portlet to a page, select “Customer Care Dashboard” from the list of available portlets.



Then click on the “Preferences” menu to configure the url.

The hostname, port and path parameters must be configured to match the HP CCD url: `http://<server>:<port>/ccd/`

All other preferences are optional.

Parameter	Description	example
hostname	Server name where HP CCD is installed	
Port	Server port to access HP CCD	8080
Path	Url path for the HP CCD web application	/ccd/
Customerid	Default customer Id to pass to the HP CCD	722071000000001
Time Interval	A predefined time interval to use as default	Today, Last Hour
user	Username to login into HP CCD	User1
password	Password to login into HP CCD Must be used with the user parameter	****
Customization	Name of the custom to execute when running HP CCD	mhbqoe

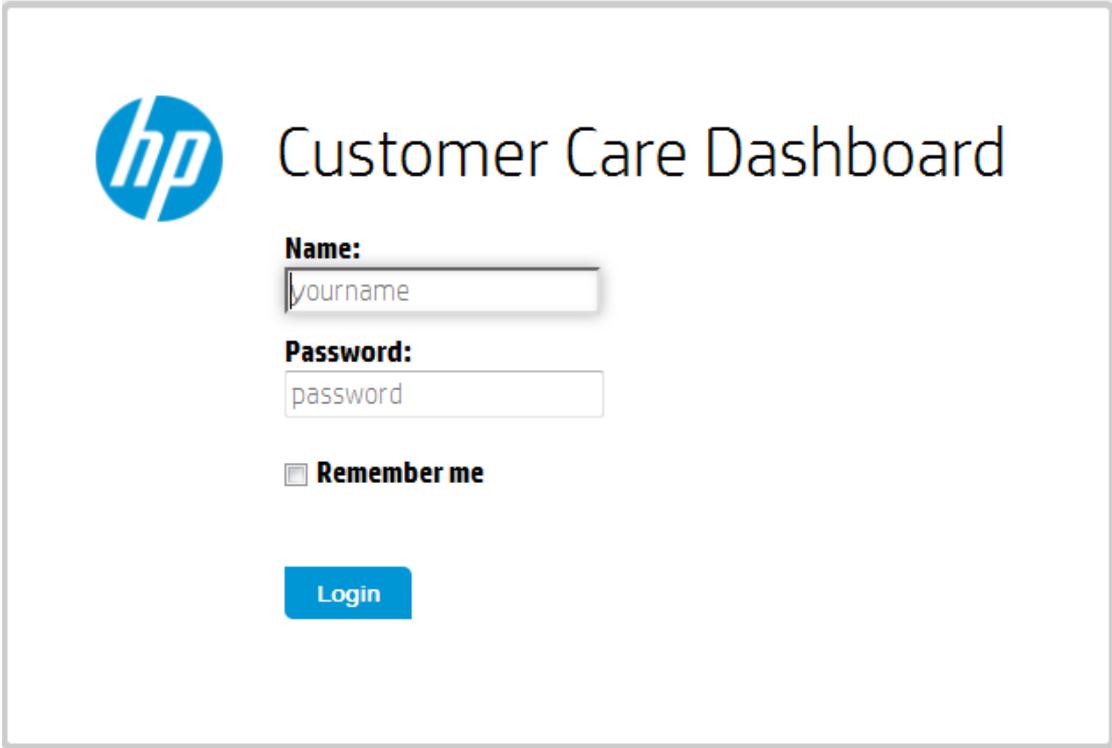
Table 4 - Portal preferences

The screenshot shows the 'Customer Care Dashboard' interface. It contains several input fields for configuration:

- Hostname:** atchoumv3.gre.hp.com
- Port:** 8080
- Path:** /ccd/
- Customer Id:** (empty field)
- Time Interval:** Today (dropdown menu)
- User:** admin
- Password:** (masked with dots)
- Customization:** mhbqoe

 A 'Save' button with a checkmark icon is located at the bottom right of the form.

2.2 Login screen



The screenshot shows the HP Customer Care Dashboard login interface. It includes the HP logo, the title 'Customer Care Dashboard', and a login form with the following elements:

- Name:** A text input field containing the placeholder text 'yourname'.
- Password:** A text input field containing the placeholder text 'password'.
- Remember me**
- Login** button

To access the HP CCD dashboard, the user must login using credentials provided by his administrator.

Each credential is associated to roles, which can give access to different customizations, or different visualisations.

To login, enter your username and password, and click on the Login button.

If the “Remember me” checkbox is checked, then the username you have entered will be remembered and pre-populated the next time you access HP CCD.

A cookie named CCDLastUserName is used to remember the user name.

2.3 Dashboard view

The HP CCD view is composed of two sections. The “Topbar”, displayed on top of the screen, and the dashboard itself, which is specific to each customization.

2.3.1 Topbar

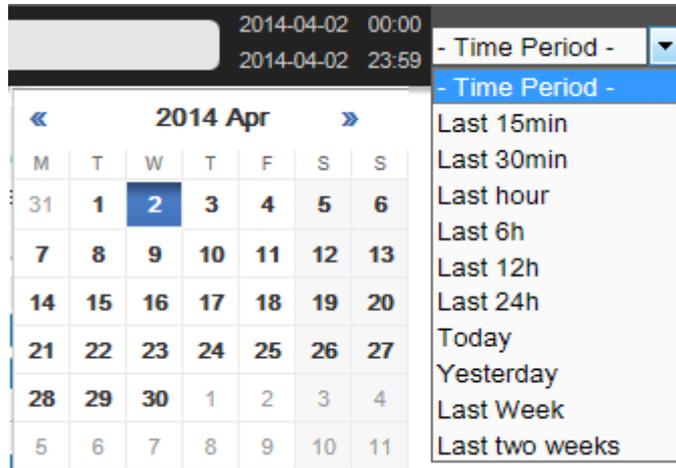


2.3.1.1 Customer number

This is where you enter the customer identifier, which can be either an MSISDN, or an IMSI.

2.3.1.2 Time period selection

You need to select the time interval for which you want to get the KPIs. This can be done either by selecting a predefined Time Period in the drop down, or by clicking on one of the two time fields and selecting the date/time in the associated calendar.



The time period cannot exceed two weeks, so if you set either the start or end date beyond this interval, the other date is automatically adjusted so the interval is two weeks.

2.3.1.3 Search button



Click on the **Search** button to query the database for the Quality of Experience indicators for the specified customer, and time period.

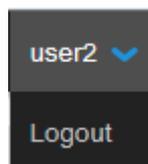


2.3.1.4 Custom launch menu

This drop down menu can be configured (as a customization) to launch new browser window to other urls, taking as parameters data coming from the HP CCD (customer id, cell, kpi details).

2.3.1.5 User information

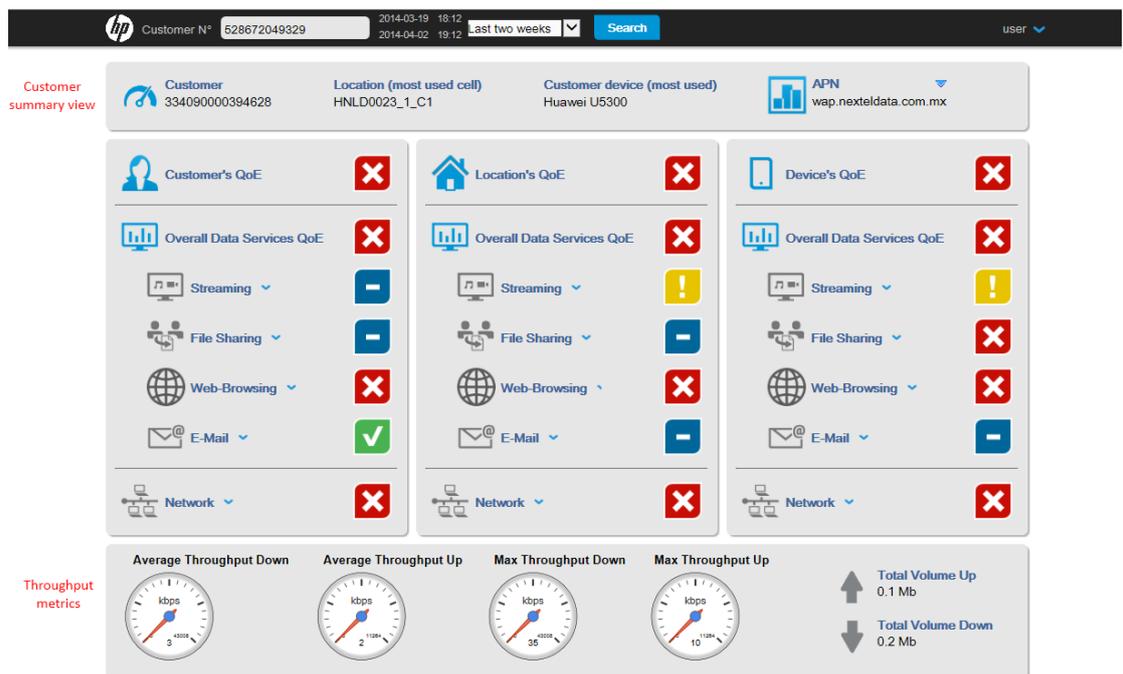
The user drop down is displayed on the right side of the topbar. It shows the username, and gives access to the Logout function.



Using MBBQoE Customization

3.1 MBBQoE dashboard view

This view is dedicated to the Front Desk Users (or Level One Customer Care staff) who need a simple view (by opposition to the admin role which we describe later on).



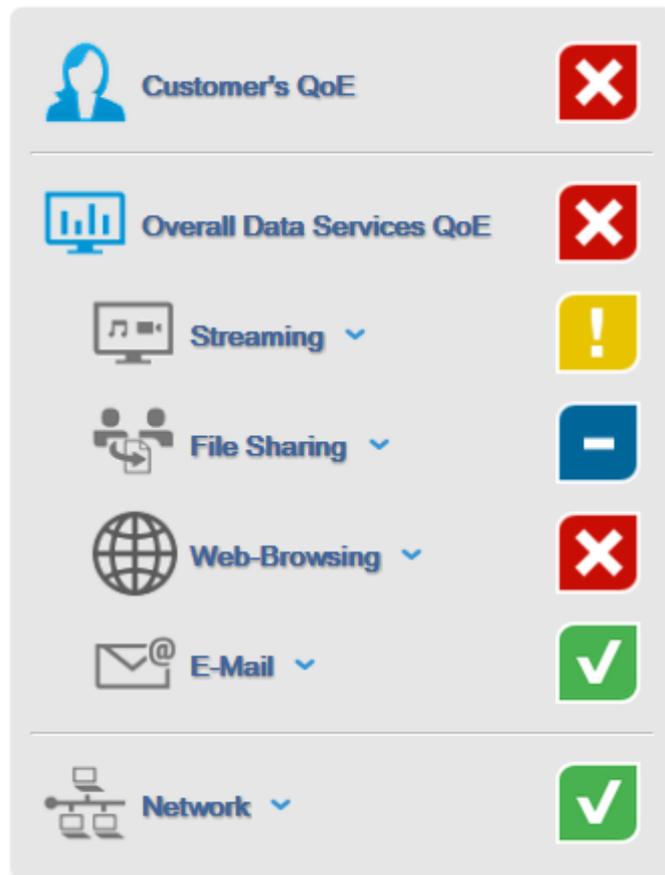
3.1.1 Customer summary view



From left to right:

- **Customer:** the IMSI of the customer, either coming from the topbar input field, or retrieved based on the MSISDN
- **Location:** the cell identifier of the “most used cell” by the customer, during the time period considered. By most used, we mean the cell for which we have the highest number of sessions during the time period.
- **Customer device:** shows the device model, most used by the customer during the time period considered.
- **APN:** List of all APNs (Access Point Names) used by the customer (click on the arrow to view all the values)

3.1.2 Customer's Quality of Experience



This panel shows a synthetic view of the Customer Quality of experience, represented through color icons.



indicates that the service or experience is satisfactory (score is greater than 70%)



indicates that the service or experience is not optimal (score is between 50% and 70%)

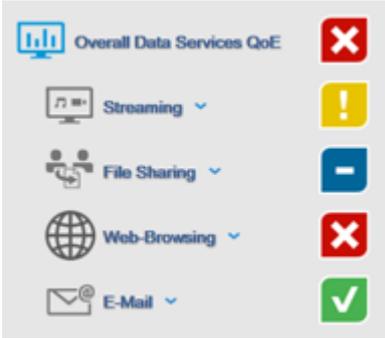
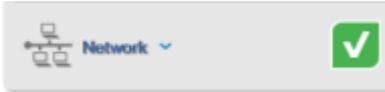
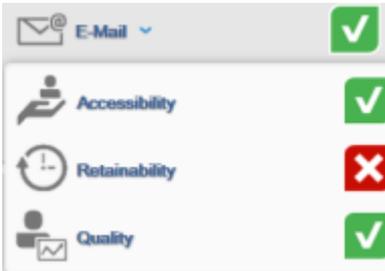


indicates an issue (score is lower than 50%)



indicates that there is no data for this category or indicator.

	<p>On top of the panel is the “Customer’s QoE”. This represents the overall customer’s experience, and is equal to the worst between the “Overall Data Services QoE”, and the “Network QoE”.</p> <p>If one of these two aggregated indicators is good, and the other bad, then the overall experience will be shown as bad.</p>
--	---

	<p>The next section represents the Data Services QoE.</p> <p>The panel shows the performance of 4 different data services, streaming, file sharing, web browsing and e-mail.</p> <p>Each of these services shows up with an icon indicating the level of quality.</p> <p>Then, we have the “Overall Data Services QoE”, which is the worst of all 4 services QoE. So even if 3 services out of 4 are performing well, if the other one is behaving badly, then the Overall indicator will show up as bad.</p>
	<p>The last section shows the Network quality of service, which measures network performance.</p>
	<p>For each of the four data services, plus the network indicator, it is possible to get more details on the experience, by clicking on the panel (or the arrow).</p> <p>A popup panel is then displayed, showing QoE scores for the three separate categories: Accessibility, Retainability and Quality)</p> <p>The overall service score is a weighted average of all three categories: 40% for accessibility, 30% for retainability and 30% for quality.</p>

3.1.3 Key Performance Indicators (KPIs)

The following table lists all the KPIs that are integrated in the computation of the QoE score for each service and category.

The score of a category is equal to the worst KPI that is included in the category.

Streaming	
Accessibility	Streaming Service Non-Accessibility (compared to a threshold of 5%) Streaming Reproduction Start Failure Ratio (threshold 5%)
Retainability	Streaming Rebuffering Failure Ratio (threshold 5%) Streaming Reproduction Cut-off Ratio (threshold 5%)
Quality	Time to Stream Start (threshold 5 seconds) Streaming Rebuffering Time Percentage (threshold 25%)
File-Sharing	
Accessibility	File Download and Upload Service Non-Accessibility (threshold 5%) File Download and Upload IP Service Access Failure Ratio (threshold 5%)
Retainability	File Download and Upload Data Transfer Cut-Off Ratio (threshold 5%)

	File Download and Upload Session Failure Ratio (threshold 5%)
Quality	File Download and Upload IP Service Setup Time (threshold 5 seconds)
Web-Browsing	
Accessibility	HTTP IP Service Access Failure Ratio (threshold 5%)
Retainability	HTTP Data Transfer Cut-off Ratio (threshold 5%) HTTP Session Failure Ratio (threshold 5%)
Quality	HTTP IP Service Setup Time (threshold 0.5 seconds)
E-Mail	
Accessibility	E-Mail Login Non-Accessibility (threshold 5%)
Retainability	E-Mail DownLoad Data Transfer Cut-Off Ratio (threshold 5%) E-Mail UpLoad Transfer Cut-Off Ratio (threshold 5%) E-Mail End-to-End Failure Ratio (threshold 5%)
Quality	E-Mail Login Access Time (threshold 5 seconds)
Network	
Accessibility	PDP Context Creation (Activation) Failure Ratio (Gn) (threshold 2%) Data Call Access Failure Ratio (threshold 5%) DNS Host Name Resolution Failure Ratio (threshold 5%)
Retainability	PDP Context Cut-off Ratio (threshold 2%)
Quality	TCP Round Trip Time (threshold 500 ms) DNS Host Name Resolution Time (threshold 400 ms) PDP Context Creation Time (Gn) (threshold 2 seconds) TCP Retransmission Ratio (threshold 5%) Data Call Access Time (threshold 5 seconds)

3.1.4 Location's Quality of Experience

This column shows the QoE scores for all customers using the same cell as the one used by the customer.

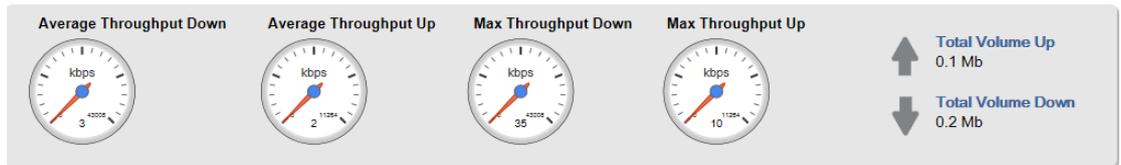
QoE is computed and aggregated from the same KPIs, categories and services as what is being displayed for Customer in the left column.

3.1.5 Device's Quality of Experience

This column shows the QoE scores for all customers using the same device as the one used by the customer. By "Device", we mean the same combination of Brand, Model and OS.

QoE is computed and aggregated from the same KPIs, categories and services as what is being displayed for Customer in the left column.

3.1.6 Throughput and download metrics



This section shows several throughput indicators, showing the customer's throughput (upload and download, and both the average throughput and the maximum throughput)

The gauges display the customer's throughput, as compared to the theoretical maximum of a 3G HSPA+ network: 42 Mb for download, and 11 Mb for upload.

On the right side of the panel, we display the total volume of data downloaded and uploaded by the customer during the time period considered.

Troubleshooting

When errors occur, a message is displayed on top of the screen, just below the top navigation bar.

Click on the message to get more details, or click on [close] to remove the message

[close]

You must provide in the URL the identifier of the customization you want to load: custom=customizationName

4.1 Client error messages

You must provide in the URL the identifier of the customization you want to load:
custom=customizationName

This message indicates that more than one custom is installed on this instance of HP CCD. To access the mbbqoe custom, you need to specify this parameter in the url: “?custom=mbbqoe”.

You are not authorized to display customization: mbbqoe, please contact your administrator

This message indicates that you do not have the right privileges to access this custom. HP CCD allows customs to be restricted based on roles. If you do not have the right role, you might not be able to access the custom.

The customization is currently not deployed

ERROR CCD-03-013 The following customization cannot be displayed because it is not currently deployed: test. Customizations currently deployed are: example,mbbqoe

This message indicates that the custom requested is not installed. By clicking on the error message, you can view additional information, including the list of all the customs installed

Can't parse datesup [04/02/2014] expected format is yyyy-MM-dd HH:mm

When using url parameters to specify either “datesup” or “dateinf”, the date must respect the specified format: yyyy-MM-dd HH:mm

Where

yyyy is the year (e.g. 2014)

MM is the month, from 01 to 12

dd is the day, from 01 to 31

HH is the hour, from 00 to 23

mm is the minute, from 00 to 59

The selected time range is too large. Please select a time range lower than 2 weeks. Calendars have been automatically modified to fit a correct time range: from **2014-03-17 23:00** to **2014-04-01 00:00**

The time period cannot exceed 2 weeks. If by changing one of the two dates by using the calendars, the interval becomes greater than 2 weeks, then the other date is automatically adjusted, and this warning is displayed.

Treatments were stopped because they took too long. This may be due to a too large selected time range. Please try again with a smaller time range

This message indicates that the request to display the dashboard took too long, and was stopped. This can indicate an issue with the database, or that too many users are accessing the server at the same time.

Reducing the time period might help reducing the time taken by the queries.

A server-side error occurred - see server logs for details.

This message indicates a problem with the HP CCD server, which can include the server being down, or the database being unaccessible.

Administrators should look at the ccd.log file to get more details about the issue. The most common causes of errors are detailed in the following section, "application errors".

4.2 Application errors

This section describes some of the errors that can be found in the ccd.log file.

Please refer to "*HP CCD V1.0 - Installation Configuration and Administration Guide*" to get details on the logging mechanism and where to find the ccd.log file on the server.

```
Connection to Zstore database
[jdbc:zstore://16.17.99.62:1974//m0/zen5/zstore-frontend] failed
Due to ERROR: java.sql.SQLException Error connecting database server Stack
trace: com.hp.ccd.server.dslapi.CDDSLAPIException: Connection to Zstore
database [jdbc:zstore://<zstore address>:1974//m0/zen5/zstore-frontend]
failed
```

This error indicates that the Zstore configured is Config.groovy is not accessible (or the configuration is wrong).

```
Connection to Zstore (JNDI Datasource) database [jdbc/Zstore] failed: JNDI
problem: Failed to get initial context:
```

This error shows that the Config.groovy file is expecting to find a datasource named "jdbc/Zstore" configured in tomcat, but this datasource is not properly configured.

```
Query to Zstore (JNDI Datasource) database [jdbc/Zstore] failed: SELECT
FIELD:BEARER.IMSI FROM index.msisdn-imsi-index WHERE BEARER.MSISDN =
'722071000000335'
```

```
Communication error(java.net.SocketException: Connection reset)
```

Due to: Connection reset

This error indicates a connection issue to the Zstore. Since the query to table "index.msisdn-imsi-index" is the first query executed by the MbbQoE custom, this error indicates that the HP CCD cannot access the Zstore.

This typically indicates an issue with the datasource configured in Tomcat. Restarting Tomcat, or reloading HP CCD might help restarting the datasource.

If the problem persists, check the definition of the datasource in /var/opt/CCD/conf/ccd.xml and /var/opt/CCD/conf/web.xml

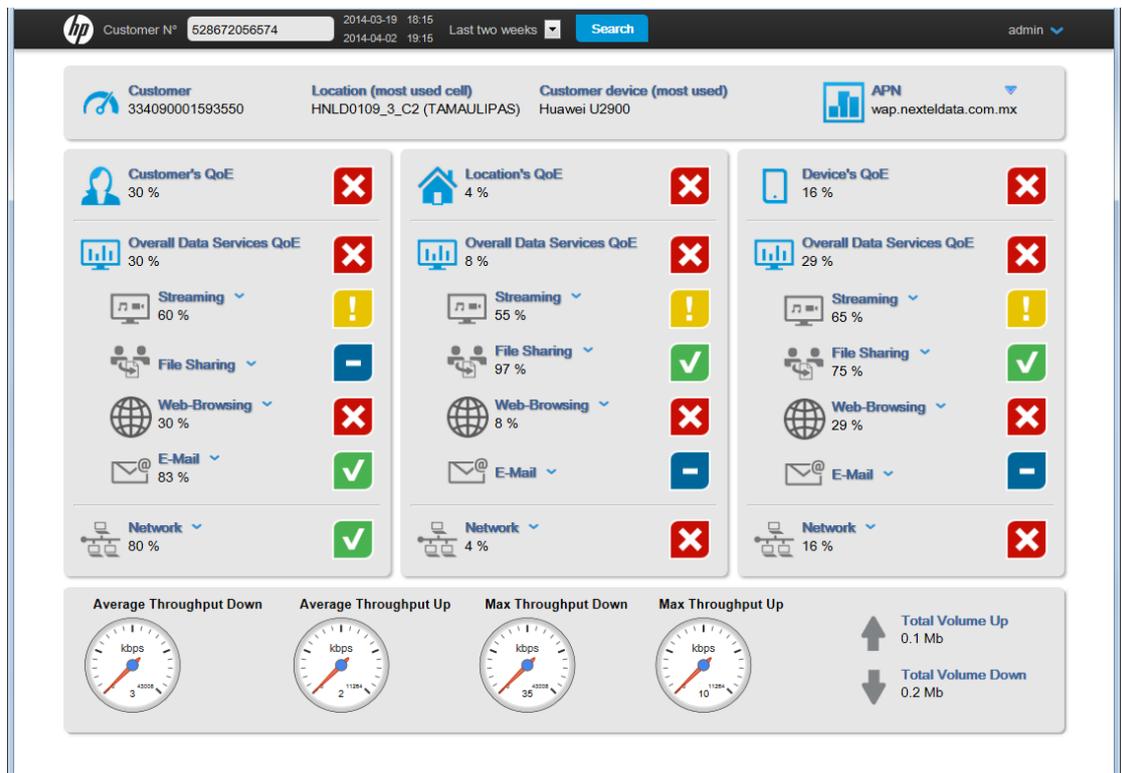
```
An error occurred while reading a ResultSet to get a column as a list
Due to ERROR: java.lang.RuntimeException Query to Zstore database
[jdbc:zstore://16.17.99.150:1974//m0/zen5/zstore-frontend] failed: SELECT ...
java.lang.RuntimeException: An error occurred while reading a ResultSet to
get a column as a list
...
Caused by: java.sql.SQLException: Cannot find field(Invalid column name) in
ontology
```

There is error in the custom configuration. It is trying to access a field that does not exist in the Zstore.

This can be due either to a typo in the custom, or the Zstore might have been updated and the field removed or renamed.

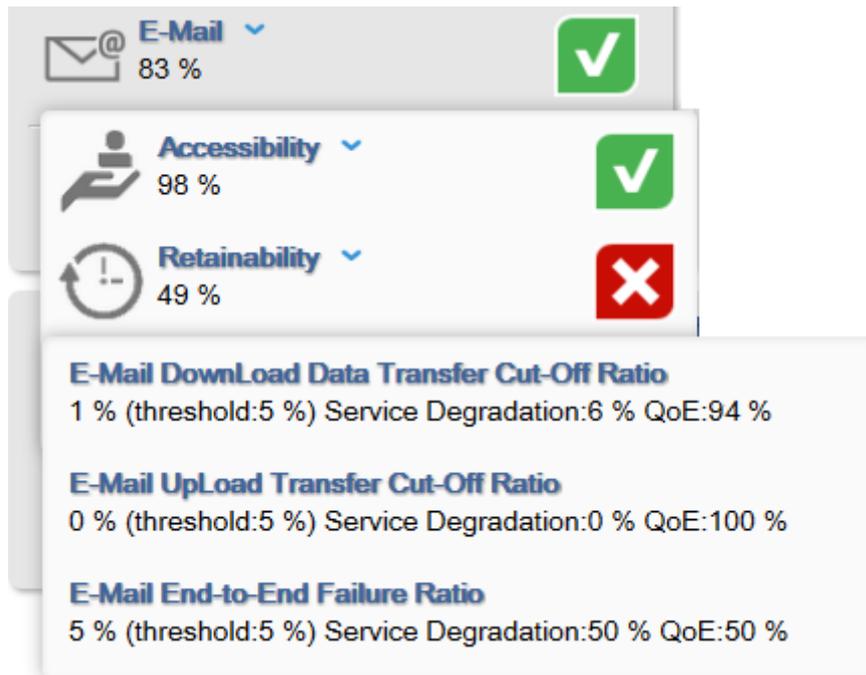
Administrative view

When accessing the MBBQoE custom with an admin role, the view presents additional information:



The view shows the QoE of each indicator, expressed as a percentage.

And when you click on one of the service QoE category, you have access to an additional level of details showing all the KPIs that contributed to the global score.



For more details on the measure of degradation and QoE scores, refer to Table 2 - Degradation score

In the first example, the KPI score is 1%, which is 20% of the threshold (5%). This corresponds to a service degradation of 6%, which means a quality of experience of 94%.

In the third example, the KPI is 5% which represents exactly 100% of the threshold. This corresponds to a degradation of 50%, hence the QoE is 50%.