

HP OSS Software



HP Customer Experience Assurance V5.2 BASE platform Datasource and functions

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Edition 1

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Chapter 1 Datasource

The data source is each of the different kind of data the CEA R5.2 is feed of. Data source selection is done by typing:

`sourcetype=<datastore_name>`

CEA release 5.2 includes an on-line help so that when you write the equal symbol the list of available datasources will be displayed making the selection easier by just clicking on the one you are interested in.

The list of available datasources depends on the acquired licence and the integrated datasources. Some *examples* are:

- datastore.nodes_records
- datastore.pdu_browsing_records
- datastore.pdu_dns_records
- datastore.pdu_file_sharing_records
- datastore.pdu_streaming_records
- datastore.pdu_tcp_records
- datastore.session_records
- datastore.voice
- datastore.volte_sip
- report.pdu_browsing-devices_rattype-300-timeline
- report.pdu_browsing-location_rattype-300-timeline
- report.pdu_browsing-location_rattype-86400-timeline
- report.pdu_browsing-servicepath_rattype-300-timeline
- report.pdu_dns-devices_rattype-300-timeline
- report.pdu_dns-location_rattype-300-timeline
- report.pdu_dns-servicepath_rattype-300-timeline
- report.pdu_file_sharing-devices_rattype-300-timeline
- report.pdu_file_sahring-location_rattype-300-timeline
- report.pedu_streaming-servcepath_codec_resolution-300-timeline
- report.pdu_tcp-devices_rattype-300-timeline
- report.pdu_tcp-location_rattype-300-timeline
- report.pdu_tcp-location_rattype-86400-timeline
- report.pdu_tcp-roaming-300-timeline
- report.pdu_tcp-servicepath_rattype-300-timeline
- report.session-apn-300-timeline
- report.session-devices-300-timeline
- report.session-location-300-timeline
- report.session-roaming-300-timeline
- report.session-sesrvicopath-300-timeline
- report.session-unique_subscribers-apn-86400-timeline
- report.session-unique_subscribers-devices-86400-timeline
- report.session-unique_subscribers-roamoing-86400-timeline
- report.signalling-apn-300 timeline

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- report.signalling-devices-300 timeline
- report.signalling-location-300 timeline
- report.signalling-servicepath-300 timeline



Next two sections depict the different datasources that are available in the system: aggregated info or raw XDRs.

Reader should consider that some fields in certain datasources required additional licenses to have values. Example: “application”.

1.1 Datasources for aggregated info

In these datasources the information has been aggregated throughout some metrics for specific dimensions. Therefore these datasources have been optimized to show specifically the preconfigured reports (they are accessible through the “reports” menu at the GUI).

The configuration files define which dimensions and metrics are available to process and query.

There is a nomenclature agreement to determine which data sources are preconfigured: its name must start with “report.” Reports with “-900-“ contains info aggregated every 15 minutes. Reports with “-86400-“ are related to info aggregated daily.

Current datasource list:

- report.pdu_browsing-devices_rattype-900-timeline
- report.pdu_browsing-location_rattype-86400-timeline
- report.pdu_browsing-location_rattype-900-timeline
- report.pdu_browsing-servicepath_rattype-900-timeline
- report.pdu_browsing-url_rattype-900-timeline
- report.pdu_dns-devices_rattype-900-timeline
- report.pdu_dns-location_rattype-900-timeline
- report.pdu_dns-servicepath_rattype-900-timeline
- report.pdu_file_sharing-devices_rattype-900-timeline
- report.pdu_file_sharing-location_rattype-900-timeline
- report.pdu_file_sharing-servicepath_rattype-900-timeline
- report.pdu_streaming-devices_codec_resolution-900-timeline
- report.pdu_streaming-servicepath_codec_resolution-900-timeline
- report.pdu_tcp-devices_rattype-900-timeline
- report.pdu_tcp-location_rattype-86400-timeline

- report.pdu_tcp-location_rattype-900-timeline
- report.pdu_tcp-roaming-900-timeline
- report.pdu_tcp-servicepath_rattype-900-timeline
- report.session-apn-900-timeline
- report.session-devices-900-timeline
- report.session-location-900-timeline
- report.session-roaming-900-timeline
- report.session-servicepath-900-timeline
- report.session_unique_subscribers-devices-86400-timeline
- report.session_unique_subscribers-roaming-86400-timeline
- report.signaling-apn-900-timeline
- report.signaling-devices-900-timeline
- report.signaling-location-900-timeline
- report.signaling-servicepath-900-timeline

The name of this data sources is composed using the following structure:

report.<family>-<dimension1>_<dimension2>...-<aggregation>-timeline

1.1.1 report.pdu_browsing-devices_rattype-900-timeline

It contains information related to browsing navigation such as http volume or session time for each device (brand, model and type) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
browsing_http_mean_data_rate.accumulate-bearer-volumedown-4
browsing_http_mean_data_rate.accumulate-bearer-volumeup-3
browsing_http_mean_data_rate.accumulate-net-activity-duration-down-2
browsing_http_mean_data_rate.accumulate-net-activity-duration-up-1
browsing_http_peak_data_rate.max-net-peak-throughputdown-1
browsing_http_peak_data_rate.max-net-peak-throughputup-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-1
browsing_http_session_failure_ratio.accumulate-http-num-rsp-4xx-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-5xx-3
browsing_http_session_failure_ratio.count-http-num-sessions-1
browsing_http_session_time.accumulate-bearer-summary-total-activity-1
browsing_http_session_time.accumulate-http-activity-groups-2
browsing_http_session_time.accumulate-http-session-time-duration-1
browsing_http_session_time.accumulate-http-session-time-samples-2
browsing_http_session_time.count-http-session-time-den-1

*common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
common.count-http-datarate-denominator-1
demographics.city
demographics.region
device.brand
device.model
device.type
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
timestamp
type-name*

1.1.2 report.pdu_browsing-location_rattype-86400-timeline

It contains information related to browsing navigation such as http volume or session time for each location at cell level per radio access technology (GERAN, UTRAN...). The information is aggregated every day.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
browsing_http_mean_data_rate.accumulate-bearer-volumedown-4
browsing_http_mean_data_rate.accumulate-bearer-volumeup-3
browsing_http_mean_data_rate.accumulate-net-activity-duration-down-2
browsing_http_mean_data_rate.accumulate-net-activity-duration-up-1
browsing_http_peak_data_rate.max-net-peak-throughputdown-1
browsing_http_peak_data_rate.max-net-peak-throughputup-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-1
browsing_http_session_failure_ratio.accumulate-http-num-rsp-4xx-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-5xx-3
browsing_http_session_failure_ratio.count-http-num-sessions-1
browsing_http_session_time.accumulate-bearer-summary-total-activity-1
browsing_http_session_time.accumulate-http-activity-groups-2
browsing_http_session_time.accumulate-http-session-time-duration-1
browsing_http_session_time.accumulate-http-session-time-samples-2
browsing_http_session_time.count-http-session-time-den-1
cell-name
city-name
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
common.count-http-datarate-denominator-1
demographics.city
demographics.region
device.brand*

*device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
region-name
timestamp*

1.1.3 report.pdu_browsing-location_rattype-900-timeline

It contains information related to browsing navigation such as http volume or session time for each location at cell level per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
browsing_http_mean_data_rate.accumulate-bearer-volumedown-4
browsing_http_mean_data_rate.accumulate-bearer-volumeup-3
browsing_http_mean_data_rate.accumulate-net-activity-duration-down-2
browsing_http_mean_data_rate.accumulate-net-activity-duration-up-1
browsing_http_peak_data_rate.max-net-peak-throughputdown-1
browsing_http_peak_data_rate.max-net-peak-throughputup-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-1
browsing_http_session_failure_ratio.accumulate-http-num-rsp-4xx-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-5xx-3
browsing_http_session_failure_ratio.count-http-num-sessions-1
browsing_http_session_time.accumulate-bearer-summary-total-activity-1
browsing_http_session_time.accumulate-http-activity-groups-2
browsing_http_session_time.accumulate-http-session-time-duration-1
browsing_http_session_time.accumulate-http-session-time-samples-2
browsing_http_session_time.count-http-session-time-den-1
cell-name
city-name
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
common.count-http-datarate-denominator-1
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name*

*region-name
timestamp*

1.1.4 report.pdu_browsing-servicepath_rattype-900-timeline

It contains information related to browsing navigation such as http volume or session time for each network element (GGSN, SGSN, RNC...) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
browsing_http_mean_data_rate.accumulate-bearer-volumedown-4
browsing_http_mean_data_rate.accumulate-bearer-volumeup-3
browsing_http_mean_data_rate.accumulate-net-activity-duration-down-2
browsing_http_mean_data_rate.accumulate-net-activity-duration-up-1
browsing_http_peak_data_rate.max-net-peak-throughputdown-1
browsing_http_peak_data_rate.max-net-peak-throughputup-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-1
browsing_http_session_failure_ratio.accumulate-http-num-rsp-4xx-2
browsing_http_session_failure_ratio.accumulate-http-num-rsp-5xx-3
browsing_http_session_failure_ratio.count-http-num-sessions-1
browsing_http_session_time.accumulate-bearer-summary-total-activity-1
browsing_http_session_time.accumulate-http-activity-groups-2
browsing_http_session_time.accumulate-http-session-time-duration-1
browsing_http_session_time.accumulate-http-session-time-samples-2
browsing_http_session_time.count-http-session-time-den-1
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
common.count-http-datarate-denominator-1
demographics.city
demographics.region
device.brand
device.model
device.type
enodeb-rnc-bsc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
rattype-name
sgw-sgsn-name
timestamp*

1.1.5 report.pdu_browsing-url_rattype-900-timeline

It contains information related to browsing navigation such as http volume or session time for the URLs with more traffic per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
browsing_http_session_time.accumulate-bearer-summary-total-activity-1
browsing_http_session_time.accumulate-http-activity-groups-2
browsing_http_session_time.count-http-session-time-den-1
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
common.count-http-datarate-denominator-1
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
timestamp
url-name*

1.1.6 report.pdu_dns-devices_rattype-900-timeline

It contains information related to dns operations such as number of failures or latency for the devices (brand, model and type) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
demographics.city
demographics.region
device.brand
device.model
device.type
dns_failure_ratio.count-dns-failure-count-1
dns_failure_ratio.count-dns-resolution-count-2
dns_resolution_time.average-net-latency-1
dns_resolution_time.average-net-latency-1-samples*

*model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
timestamp
type-name*

1.1.7 report.pdu_dns-location_rattype-900-timeline

It contains information related to dns operations such as number of failures or latency for each location at cell level per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
cell-name
city-name
demographics.city
demographics.region
device.brand
device.model
device.type
dns_failure_ratio.count-dns-failure-count-1
dns_failure_ratio.count-dns-resolution-count-2
dns_resolution_time.average-net-latency-1
dns_resolution_time.average-net-latency-1-samples
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
region-name*

1.1.8 report.pdu_dns-servicepath_rattype-900-timeline

It contains information related to dns operations such as number of failures or latency for each network element (GGSN, SGSN, RNC...) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
demographics.city*

demographics.region
device.brand
device.model
device.type
dns_failure_ratio.count-dns-failure-count-1
dns_failure_ratio.count-dns-resolution-count-2
dns_resolution_time.average-net-latency-1
dns_resolution_time.average-net-latency-1-samples
enodeb-rnc-bsc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
rattype-name
sgw-sgsn-name
timestamp

1.1.9 report.pdu_file_sharing-devices_rattype-900-timeline

It contains information related to file sharing such as volume or ip service setup time for the devices (brand, model and type) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
common.accumulate-bearer-volumedown-4
common.accumulate-bearer-volumeup-3
common.accumulate-net-activity-duration-down-2
common.accumulate-net-activity-duration-up-1
common.accumulate-net-interim-duration-5
common.average-http-setup-time-1
common.average-http-setup-time-1-samples
common.count-filesharing-failure-count-2
common.count-filesharing-failure-count-3
common.count-filesharing-failure-count-4
common.count-filesharing-failure-count-5
common.count-filesharing-session-count-1
demographics.city
demographics.region
device.brand
device.model
device.type
filesharing_ip_service_setup_time.average-net-latency-1
filesharing_ip_service_setup_time.average-net-latency-1-samples
filesharing_session_time.accumulate-bearer-summary-total-activity-down-1
filesharing_session_time.count-file_sharing-session-count-1

*filesharing_session_time_up.accumulate-bearer-summary-total-activity-up-1
filesharing_session_time_up.count-file_sharing-session-count-1
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
timestamp
type-name*

1.1.10report.pdu_file_sharing-location_rattype-900-timeline

It contains information related to file sharing such as volume or ip service setup time for each location at cell level per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
cell-name
city-name
common.accumulate-bearer-volumedown-4
common.accumulate-bearer-volumeup-3
common.accumulate-net-activity-duration-down-2
common.accumulate-net-activity-duration-up-1
common.accumulate-net-interim-duration-5
common.average-http-setup-time-1
common.average-http-setup-time-1-samples
common.count-filesharing-failure-count-2
common.count-filesharing-failure-count-3
common.count-filesharing-failure-count-4
common.count-filesharing-failure-count-5
common.count-filesharing-session-count-1
demographics.city
demographics.region
device.brand
device.model
device.type
filesharing_ip_service_setup_time.average-net-latency-1
filesharing_ip_service_setup_time.average-net-latency-1-samples
filesharing_session_time.accumulate-bearer-summary-total-activity-down-1
filesharing_session_time.count-file_sharing-session-count-1
filesharing_session_time_up.accumulate-bearer-summary-total-activity-up-1
filesharing_session_time_up.count-file_sharing-session-count-1
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension*

*rattypename
region-name
timestamp*

1.1.11 report.pdu_file_sharing-servicepath_rattypename-900-timeline

It contains information related to file sharing such as volume or ip service setup time for each network element (GGSN, SGSN, RNC...) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
common.accumulate-bearer-volumedown-4
common.accumulate-bearer-volumeup-3
common.accumulate-net-activity-duration-down-2
common.accumulate-net-activity-duration-up-1
common.accumulate-net-interim-duration-5
common.average-http-setup-time-1
common.average-http-setup-time-1-samples
common.count-filesharing-failure-count-2
common.count-filesharing-failure-count-3
common.count-filesharing-failure-count-4
common.count-filesharing-failure-count-5
common.count-filesharing-session-count-1
demographics.city
demographics.region
device.brand
device.model
device.type
enodeb-rnc-bsc-name
filesharing_ip_service_setup_time.average-net-latency-1
filesharing_ip_service_setup_time.average-net-latency-1-samples
filesharing_session_time.accumulate-bearer-summary-total-activity-down-1
filesharing_session_time.count-file_sharing-session-count-1
filesharing_session_time_up.accumulate-bearer-summary-total-activity-up-1
filesharing_session_time_up.count-file_sharing-session-count-1
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
rattypename
sgw-sgsn-name
timestamp*

1.1.12report.pdu_streaming-devices_codec_resolution-900-timeline

It contains information related to video streaming such as rebuffering or reproduction time for the devices (brand, model and type) per codec resolution (480x480, 1280x720...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
common.accumulate-tcp-rebuffering-time-1
common.average-stream-service-access-time-2
common.average-stream-service-access-time-2-samples
common.average-tcp-service-start-time-1
common.average-tcp-service-start-time-1-samples
common.count-streaming-session-count-1
demographics.city
demographics.region
device.brand
device.model
device.type
max-resolution-name
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
streaming_effective_reprod_time_per_video.average-stream-effective-reproduction-time-1
streaming_effective_reprod_time_per_video.average-stream-effective-reproduction-time-1-samples
streaming_rebuffering_time_percentage.accumulate-stream-effective-reproduction-time-1
streaming_reproduction_quality.average-stream-reproduction-quality-1
streaming_reproduction_quality.average-stream-reproduction-quality-1-samples
streaming_stalls_per_video.average-stream-rebuffering-groups-1
streaming_stalls_per_video.average-stream-rebuffering-groups-1-samples
timestamp
type-name
video-codec-name*

1.1.13report.pdu_streaming-servicepath_codec_resolution-900-timeline

It contains information related to video streaming such as rebuffering or reproduction time for each network element (GGSN, SGSN, RNC...) per codec resolution (480x480, 1280x720...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell*

bearer.dataplan
bearer.group
bearer.subgroup
common.accumulate-tcp-rebuffering-time-1
common.average-stream-service-access-time-2
common.average-stream-service-access-time-2-samples
common.average-tcp-service-start-time-1
common.average-tcp-service-start-time-1-samples
common.count-streaming-session-count-1
demographics.city
demographics.region
device.brand
device.model
device.type
enodeb-rnc-bsc-name
max-resolution-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
sgw-sgsn-name
streaming_effective_reprod_time_per_video.average-stream-effective-reproduction-time-1
streaming_effective_reprod_time_per_video.average-stream-effective-reproduction-time-1-samples
streaming_rebuffering_time_percentage.accumulate-stream-effective-reproduction-time-1
streaming_reproduction_quality.average-stream-reproduction-quality-1
streaming_reproduction_quality.average-stream-reproduction-quality-1-samples
streaming_stalls_per_video.average-stream-rebuffering-groups-1
streaming_stalls_per_video.average-stream-rebuffering-groups-1-samples
timestamp
video-codec-name

1.1.14report.pdu_tcp-devices_rattype-900-timeline

It contains information related to tcp protocol such as rtt or bearer packets for the devices (brand, model and type) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
common.average-net-latency-1
common.average-net-latency-1-samples
common.average-tcp-rtt-client-2
common.average-tcp-rtt-client-2-samples
common.average-tcp-rtt-server-3
common.average-tcp-rtt-server-3-samples

*demographics.city
demographics.region
device.brand
device.model
device.type
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
tcp_retransmission_ratio.accumulate-bearer-packetsdown-3
tcp_retransmission_ratio.accumulate-bearer-packetsup-2
tcp_retransmission_ratio.accumulate-tcp-retransmissions-1
tcp_retransmission_ratio.count-event-interim-flows-1
timestamp
type-name*

1.1.15report.pdu_tcp-location_rattype-86400-timeline

It contains information related to tcp protocol such as rtt or bearer packets for each location at cell level per radio access technology (GERAN, UTRAN...). The information is aggregated every day.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
cell-name
city-name
common.average-net-latency-1
common.average-net-latency-1-samples
common.average-tcp-rtt-client-2
common.average-tcp-rtt-client-2-samples
common.average-tcp-rtt-server-3
common.average-tcp-rtt-server-3-samples
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
region-name
tcp_retransmission_ratio.accumulate-bearer-packetsdown-3
tcp_retransmission_ratio.accumulate-bearer-packetsup-2
tcp_retransmission_ratio.accumulate-tcp-retransmissions-1*

*tcp_retransmission_ratio.count-event-interim-flows-1
timestamp*

1.1.16report.pdu_tcp-location_rattype-900-timeline

It contains information related to tcp protocol such as rtt or bearer packets for each location at cell level per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
cell-name
city-name
common.average-net-latency-1
common.average-net-latency-1-samples
common.average-tcp-rtt-client-2
common.average-tcp-rtt-client-2-samples
common.average-tcp-rtt-server-3
common.average-tcp-rtt-server-3-samples
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
region-name
tcp_retransmission_ratio.accumulate-bearer-packetsdown-3
tcp_retransmission_ratio.accumulate-bearer-packetsup-2
tcp_retransmission_ratio.accumulate-tcp-retransmissions-1
tcp_retransmission_ratio.count-event-interim-flows-1
timestamp*

1.1.17report.pdu_tcp-roaming-900-timeline

It contains information related to tcp protocol such as rtt or bearer packets for roaming traffic. The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
common.average-net-latency-1*

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*common.average-net-latency-1-samples
common.average-tcp-rtt-client-2
common.average-tcp-rtt-client-2-samples
common.average-tcp-rtt-server-3
common.average-tcp-rtt-server-3-samples
demographics.city
demographics.region
device.brand
device.model
device.type
mcc-name
mnc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
timestamp*

1.1.18report.pdu_tcp-servicepath_rattype-900-timeline

It contains information related to tcp protocol such as rtt or bearer packets for each network element (GGSN, SGSN, RNC...) per radio access technology (GERAN, UTRAN...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
common.average-net-latency-1
common.average-net-latency-1-samples
common.average-tcp-rtt-client-2
common.average-tcp-rtt-client-2-samples
common.average-tcp-rtt-server-3
common.average-tcp-rtt-server-3-samples
demographics.city
demographics.region
device.brand
device.model
device.type
enodeb-rnc-bsc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
rattype-name
sgw-sgsn-name
tcp_retransmission_ratio.accumulate-bearer-packetsdown-3
tcp_retransmission_ratio.accumulate-bearer-packetsup-2*

*tcp_retransmission_ratio.accumulate-tcp-retransmissions-1
 tcp_retransmission_ratio.count-event-interim-flows-1
 timestamp*

1.1.19report.session-apn-900-timeline

It contains information related to sessions such as volume or throughput for each APN. The information is aggregated every fifteen minutes.

Fields:

*apn-name
 app.category
 bearer.cell
 bearer.dataplan
 bearer.group
 bearer.subgroup
 common.accumulate-bearer-volumedown-2
 common.accumulate-bearer-volumeup-1
 demographics.city
 demographics.region
 device.brand
 device.model
 device.type
 node.enodeb-name
 node.pgw-name
 node.sgw-name
 olap.dimension
 rattype-name
 session_mean_throughput.accumulate-bearer-volumedown-4
 session_mean_throughput.accumulate-bearer-volumeup-3
 session_mean_throughput.accumulate-net-activity-duration-down-2
 session_mean_throughput.accumulate-net-activity-duration-up-1
 session_peak_throughput.max-net-peak-throughputdown-2
 session_peak_throughput.max-net-peak-throughputup-1
 timestamp*

1.1.20report.session-devices-900-timeline

It contains information related to sessions such as volume or throughput for devices (brand, model and type). The information is aggregated every fifteen minutes.

Fields:

*app.category
 bearer.cell
 bearer.dataplan
 bearer.group
 bearer.subgroup
 brand-name
 common.accumulate-bearer-volumedown-2
 common.accumulate-bearer-volumeup-1
 demographics.city
 demographics.region*

*device.brand
device.model
device.type
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
session_mean_throughput.accumulate-bearer-volumedown-4
session_mean_throughput.accumulate-bearer-volumeup-3
session_mean_throughput.accumulate-net-activity-duration-down-2
session_mean_throughput.accumulate-net-activity-duration-up-1
session_peak_throughput.max-net-peak-throughputdown-2
session_peak_throughput.max-net-peak-throughputup-1
timestamp
type-name*

1.1.21 report.session-location-900-timeline

It contains information related to sessions such as volume or throughput for each location at cell level. The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
cell-name
city-name
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
region-name
session_mean_throughput.accumulate-bearer-volumedown-4
session_mean_throughput.accumulate-bearer-volumeup-3
session_mean_throughput.accumulate-net-activity-duration-down-2
session_mean_throughput.accumulate-net-activity-duration-up-1
session_peak_throughput.max-net-peak-throughputdown-2
session_peak_throughput.max-net-peak-throughputup-1
timestamp*

1.1.22 report.session-roaming-900-timeline

It contains information related to sessions such as volume or throughput for roaming traffic. The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
demographics.city
demographics.region
device.brand
device.model
device.type
mcc-name
mnc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattypename
timestamp*

1.1.23 report.session-servicepath-900-timeline

It contains information related to sessions such as volume or throughput for each network element (GGSN, SGSN, RNC...). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
common.accumulate-bearer-volumedown-2
common.accumulate-bearer-volumeup-1
demographics.city
demographics.region
device.brand
device.model
device.type
enodeb-rnc-bsc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
rattypename*

*session_mean_throughput.accumulate-bearer-volumedown-4
session_mean_throughput.accumulate-bearer-volumeup-3
session_mean_throughput.accumulate-net-activity-duration-down-2
session_mean_throughput.accumulate-net-activity-duration-up-1
session_peak_throughput.max-net-peak-throughputdown-2
session_peak_throughput.max-net-peak-throughputup-1
sgw-sgsn-name
timestamp*

1.1.24 report.session_unique_subscribers-devices-86400-timeline

It contains the total number of unique subscribers per device (brand, model and type). The information is aggregated every day.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
demographics.city
demographics.region
device.brand
device.model
device.type
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
session_unique.count-unique-subscribers-1
tac-name
timestamp
type-name*

1.1.25 report.session_unique_subscribers-roaming-86400-timeline

It contains the total number of unique subscribers with roaming traffic. The information is aggregated every day.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
demographics.city
demographics.region*

*device.brand
device.model
device.type
mcc-name
mnc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
session_unique.count-unique-subscribers-1
timestamp*

1.1.26report.signalng-apn-900-timeline

It contains information related to signalling records such as pdp creation time or failure ratio for each APN. The information is aggregated every fifteen minutes.

Fields:

*apn-name
app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-reject-1
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-response-2
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-reject-1
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-response-2
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-reject-1
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-response-2
signaling_pdp_creation_time.average-gtp-latency-1
signaling_pdp_creation_time.average-gtp-latency-1-samples
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-all-2
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-downlink-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-reject-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-response-2
signaling_session_creation_time.average-gtp-latency-1
signaling_session_creation_time.average-gtp-latency-1-samples
timestamp*

1.1.27report.signalng-devices-900-timeline

It contains information related to signalling records such as pdp creation time or failure ratio for devices (brand, model and type). The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
brand-name
demographics.city
demographics.region
device.brand
device.model
device.type
model-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-reject-1
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-response-2
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-reject-1
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-response-2
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-reject-1
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-response-2
signaling_pdp_creation_time.average-gtp-latency-1
signaling_pdp_creation_time.average-gtp-latency-1-samples
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-all-2
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-downlink-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-reject-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-response-2
signaling_session_creation_time.average-gtp-latency-1
signaling_session_creation_time.average-gtp-latency-1-samples
timestamp
type-name*

1.1.28report.signalng-location-900-timeline

It contains information related to signalling records such as pdp creation time or failure ratio for each location at cell level. The information is aggregated every fifteen minutes.

Fields:

*app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
cell-name*

city-name
demographics.city
demographics.region
device.brand
device.model
device.type
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
rattype-name
region-name
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-reject-1
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-response-2
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-reject-1
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-response-2
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-reject-1
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-response-2
signaling_pdp_creation_time.average-gtp-latency-1
signaling_pdp_creation_time.average-gtp-latency-1-samples
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-all-2
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-downlink-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-reject-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-response-2
signaling_session_creation_time.average-gtp-latency-1
signaling_session_creation_time.average-gtp-latency-1-samples
timestamp

1.1.29report.signalingservicepath-900-timeline

It contains information related to signalling records such as pdp creation time or failure ratio for each network element (GGSN, SGSN, RNC...). The information is aggregated every fifteen minutes.

Fields:

app.category
bearer.cell
bearer.dataplan
bearer.group
bearer.subgroup
demographics.city
demographics.region
device.brand
device.model
device.type
enodeb-rnc-bsc-name
node.enodeb-name
node.pgw-name
node.sgw-name
olap.dimension
pgw-ggsn-name
rattype-name

```
sgw-sgsn-name
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-reject-1
signaling_bearer_creation_failure_ratio.count-gtp-activate-bearer-response-2
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-reject-1
signaling_bearer_modification_failure_ratio.count-gtp-modify-bearer-response-2
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-reject-1
signaling_pdp_creation_failure_ratio.count-gtp-activate-pdp-response-2
signaling_pdp_creation_time.average-gtp-latency-1
signaling_pdp_creation_time.average-gtp-latency-1-samples
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-all-2
signaling_pdp_cutoff_ratio.count-gtp-deactivate-pdp-downlink-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-reject-1
signaling_session_creation_failure_ratio.count-gtp-activate-session-response-2
signaling_session_creation_time.average-gtp-latency-1
signaling_session_creation_time.average-gtp-latency-1-samples
timestamp
```

1.2 Datasources for raw XDRs

In these datasources the information has been inserted almost raw: some decoration rules and conditional filters could be applied if necessary but the information is available as you could see it at probe level. Therefore the drilldown to subscriber data is allowed in this kind of datasource.

There is a nomenclature agreement to determine which data sources are preconfigured: its name must start with “datastore.”

Current datasource list:

- datastore.pdu_browsing_records
- datastore.pdu_dns_records
- datastore.pdu_file_sharing_records
- datastore.pdu_streaming_records
- datastore.pdu_tcp_records
- datastore.session_records
- datastore.signaling_records

1.2.1 **datastore.pdu_browsing_records**

It contains information related to browsing navigation such as http volume or session time per subscriber. There is no aggregation and the information is stored in raw.

Fields:

app.category
bearer.apn
bearer.cell
bearer.charging-id

*bearer.dataplan
bearer.group
bearer.imeisv
bearer.imsi
bearer.msisdn
bearer.packetsdown
bearer.packetsup
bearer.rat-type-str
bearer.start-time
bearer.stop-time
bearer.subgroup
bearer.summary-average-throughput
bearer.summary-average-throughput-down
bearer.summary-average-throughput-up
bearer.summary-throughput
bearer.summary-throughput-down
bearer.summary-throughput-up
bearer.summary-total-activity
bearer.summary-total-activity-down
bearer.summary-total-activity-up
bearer.total-peak-throughput-down
bearer.total-peak-throughput-up
bearer.total-throughput-down
bearer.total-throughput-up
bearer.total-volume-down
bearer.total-volume-up
bearer.totalpackets
bearer.totalvolume
bearer.user-ip
bearer.volumedown
bearer.volumeup
demographics.city
demographics.region
device.brand
device.model
device.type
event.interim-id
event.start-time
event.stop-time
event.text
event.timestamp
gtp.ecgi-cellid
gtp.ecgi-enbid
gtp.ecgi-mcc
gtp.ecgi-mnc
gtp.ggsn-c
gtp.ggsn-teid-c
gtp.ggsn-teid-u
gtp.ggsn-u
gtp.qos-max-dl-rate-bps
gtp.qos-max-ul-rate-bps
gtp.rai-lac*

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*gtp.rai-mcc
gtp.rai-mnc
gtp.rai-rac
gtp.rat-type
gtp.session-id
gtp.sgsn-c
gtp.sgsn-teid-c
gtp.sgsn-teid-u
gtp.sgsn-u
http.activity-groups
http.host
http.num-rsp
http.num-rsp-4xx
http.num-rsp-5xx
http.session-time-activity
http.session-time-duration
http.session-time-samples
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
lte.enodeb
lte.enodeb-teid
lte.mme
lte.mme-teid
lte.pgw-c
lte.pgw-teid-c
lte.pgw-teid-u
lte.pgw-u
lte.sgw-c
lte.sgw-teid-c
lte.sgw-teid-u
lte.sgw-u
net.activity-duration
net.activity-duration-down
net.activity-duration-up
net.duration
net.effective-throughput
net.effective-throughputdown
net.effective-throughputup
net.peak-throughputdown
net.peak-throughputup
net.throughputdown
net.throughputup
net.uplink
node.enodeb-name
node.pgw-name
node.sgw-name
subscriber.duration-usage
timestamp*

1.2.2 **datastore.pdu_dns_records**

It contains information related to dns operations such as dns codes or latency per subscriber. There is no aggregation and the information is stored in raw.

Fields:

*app.category
bearer.apn
bearer.cell
bearer.dataplan
bearer.group
bearer.imeisv
bearer.imsi
bearer.msisdn
bearer.rat-type-str
bearer.start-time
bearer.stop-time
bearer.subgroup
demographics.city
demographics.region
device.brand
device.model
device.type
dns.code
event.interim-id
event.start-time
event.stop-time
event.text
event.timestamp
gtp.ecgi-cellid
gtp.ecgi-enbid
gtp.ecgi-mcc
gtp.ecgi-mnc
gtp.ggsn-c
gtp.ggsn-u
gtp.rat-type
gtp.sgsn-c
gtp.sgsn-u
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
lte.enodeb
lte.enodeb-teid
lte.mme
lte.mme-teid
lte.pgw-c
lte.pgw-teid-c
lte.pgw-teid-u*

*lte.pgw-u
lte.sgw-c
lte.sgw-teid-c
lte.sgw-teid-u
lte.sgw-u
net.cell-ip
net.cell-port
net.duration
net.latency
net.srv-ip
net.srv-port
node.enodeb-name
node.pgw-name
node.sgw-name
timestamp*

1.2.3 datastore.pdu_file_sharing_records

It contains information related to file sharing such as volume or http service setup time per subscriber. There is no aggregation and the information is stored in raw.

Fields:

*app.category
app.name
bearer.apn
bearer.cell
bearer.dataplan
bearer.group
bearer.imsi
bearer.msisdn
bearer.packetsdown
bearer.packetsup
bearer.rat-type-str
bearer.start-time
bearer.stop-time
bearer.subgroup
bearer.summary-total-activity-down
bearer.summary-total-activity-up
bearer.total-volume-down
bearer.total-volume-up
bearer.volumedown
bearer.volumeup
demographics.city
demographics.region
device.brand
device.model
device.type
event.interim-id
event.start-time
event.stop-time
event.text
event.timestamp*

gtp.ecgi-cellid
gtp.ecgi-enbid
gtp.ecgi-mcc
gtp.ecgi-mnc
gtp.ggsn-u
gtp.qos-max-dl-rate-bps
gtp.qos-max-ul-rate-bps
gtp.sgsn-c
gtp.sgsn-u
http.code
http.content-type
http.host
http.session-time
http.setup-time
http.user-agent
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
lte.pgw-u
lte.sgw-u
net.activity-duration
net.activity-duration-down
net.activity-duration-up
net.duration
net.latency
net.peak-throughputdown
net.peak-throughputup
net.tag
net.termination-code
net.throughputdown
net.throughputup
node.enodeb-name
node.pgw-name
node.sgw-name
tcp.retransmissions
tcp.rtt-client
tcp.rtt-server
timestamp

1.2.4 datastore.pdu_streaming_records

It contains information related to video streaming such as rebuffering or video resolution per subscriber. There is no aggregation and the information is stored in raw.

Fields:

app.category
app.name
bearer.apn
bearer.cell

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*bearer.dataplan
bearer.group
bearer.imsi
bearer.msisdn
bearer.packetsdown
bearer.packetsup
bearer.rat-type-str
bearer.start-time
bearer.stop-time
bearer.subgroup
bearer.volumedown
bearer.volumeup
demographics.city
demographics.region
device.brand
device.model
device.type
event.interim-id
event.start-time
event.stop-time
event.text
event.timestamp
gtp.ecgi-cellid
gtp.ecgi-enbid
gtp.ecgi-mcc
gtp.ecgi-mnc
gtp.ggsn-u
gtp.qos-max-dl-rate-bps
gtp.qos-max-ul-rate-bps
gtp.sgsn-c
gtp.sgsn-u
http.code
http.content-type
http.host
http.session-time
http.setup-time
http.user-agent
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
lte.pgw-u
lte.sgw-u
net.activity-duration
net.activity-duration-down
net.activity-duration-up
net.duration
net.latency
net.peak-throughputdown
net.peak-throughputup*

*net.tag
net.termination-code
net.throughputdown
net.throughputup
node.enodeb-name
node.pgw-name
node.sgw-name
stream.audio-codec
stream.duration
stream.effective-reproduction-time
stream.max-resolution
stream.rebuffering-groups
stream.reproduction-quality
stream.service-access-time
stream.video-codec
stream.video-resolutions
stream.video-resolutions-time
tcp.rebuffering-time
tcp.retransmissions
tcp.service-start-time
timestamp*

1.2.5 **datastore.pdu_tcp_records**

It contains information related to tcp protocol such as rtt or retransmissions per subscriber. There is no aggregation and the information is stored in raw.

Fields:

*app.category
app.name
bearer.apn
bearer.cell
bearer.dataplan
bearer.group
bearer.imsi
bearer.msisdn
bearer.packetsdown
bearer.packetsup
bearer.rat-type-str
bearer.start-time
bearer.stop-time
bearer.subgroup
bearer.volumedown
bearer.volumeup
demographics.city
demographics.region
device.brand
device.model
device.type
event.interim-id
event.start-time
event.stop-time*

*event.text
event.timestamp
gtp.ecgi-cellid
gtp.ecgi-enbid
gtp.ecgi-mcc
gtp.ecgi-mnc
gtp.ggsn-u
gtp.qos-max-dl-rate-bps
gtp.qos-max-ul-rate-bps
gtp.sgsn-c
gtp.sgsn-u
http.code
http.content-type
http.host
http.session-time
http.setup-time
http.user-agent
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
lte.pgw-u
lte.sgw-u
net.activity-duration
net.activity-duration-down
net.activity-duration-up
net.duration
net.latency
net.peak-throughputdown
net.peak-throughputup
net.tag
net.termination-code
net.throughputdown
net.throughputup
node.enodeb-name
node.pgw-name
node.sgw-name
tcp.retransmissions
tcp.rtt-client
tcp.rtt-server
timestamp*

1.2.6 datastore.session_records

It contains information related to sessions such as session volume or throughput per subscriber. There is no aggregation and the information is stored in raw.

Fields:

*app.category
bearer.apn*

*bearer.cell
bearer.charging-id
bearer.dataplan
bearer.group
bearer.imeisv
bearer.imsi
bearer.msisdn
bearer.packetsdown
bearer.packetsup
bearer.rat-type-str
bearer.start-time
bearer.stop-time
bearer.subgroup
bearer.summary-average-throughput
bearer.summary-average-throughput-down
bearer.summary-average-throughput-up
bearer.summary-throughput
bearer.summary-throughput-down
bearer.summary-throughput-up
bearer.summary-total-activity
bearer.summary-total-activity-down
bearer.summary-total-activity-up
bearer.total-peak-throughput-down
bearer.total-peak-throughput-up
bearer.total-throughput-down
bearer.total-throughput-up
bearer.total-volume-down
bearer.total-volume-up
bearer.totalpackets
bearer.totalvolume
bearer.user-ip
bearer.volumedown
bearer.volumeup
demographics.city
demographics.region
device.brand
device.model
device.type
event.interim-id
event.start-time
event.stop-time
event.text
event.timestamp
gtp.ecgi-cellid
gtp.ecgi-enbid
gtp.ecgi-mcc
gtp.ecgi-mnc
gtp.ggsn-c
gtp.ggsn-teid-c
gtp.ggsn-teid-u
gtp.ggsn-u
gtp.qos-max-dl-rate-bps*

*gtp.qos-max-ul-rate-bps
gtp.rai-lac
gtp.rai-mcc
gtp.rai-mnc
gtp.rai-rac
gtp.rat-type
gtp.session-id
gtp.sgsn-c
gtp.sgsn-teid-c
gtp.sgsn-teid-u
gtp.sgsn-u
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
lte.enodeb
lte.enodeb-teid
lte.mme
lte.mme-teid
lte.pgw-c
lte.pgw-teid-c
lte.pgw-teid-u
lte.pgw-u
lte.sgw-c
lte.sgw-teid-c
lte.sgw-teid-u
lte.sgw-u
net.activity-duration
net.activity-duration-down
net.activity-duration-up
net.duration
net.effective-throughput
net.effective-throughputdown
net.effective-throughputup
net.flowid
net.peak-throughputdown
net.peak-throughputup
net.throughputdown
net.throughputup
net.uplink
node.enodeb-name
node.pgw-name
node.sgw-name
subscriber.duration-usage
timestamp*

1.2.7 **datastore.signaling_records**

It contains information related to signalling records such as the signalling events per subscriber. There is no aggregation and the information is stored in raw.

Fields:

*app.category
bearer.apn
bearer.cell
bearer.charging-id
bearer.dataplan
bearer.group
bearer.imeisv
bearer.imsi
bearer.msisdn
bearer.rat-type-str
bearer.subgroup
bearer.user-ip
demographics.city
demographics.region
device.brand
device.model
device.type
event.interim-id
event.start-time
event.stop-time
event.text
event.timestamp
gtp.cause
gtp.dst
gtp.duration
gtp.ggsn-c
gtp.ggsn-teid-c
gtp.ggsn-teid-u
gtp.ggsn-u
gtp.latency
gtp.match-by
gtp.proposed-gsn-c
gtp.proposed-gsn-u
gtp.proposed-teid-c
gtp.proposed-teid-u
gtp.qos-max-dl-rate-bps
gtp.qos-max-ul-rate-bps
gtp.rai-lac
gtp.rai-mcc
gtp.rai-mnc
gtp.rai-rac
gtp.rat-type
gtp.seqno
gtp.session-id
gtp.sgsn-c
gtp.sgsn-teid-c
gtp.sgsn-teid-u
gtp.sgsn-u
gtp.src
gtp.teid*

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*gtp.version
imei.tac
location.ci
location.lac
location.mcc
location.mnc
location.sac
net.cell-ip
net.cell-port
net.duration
net.flowid
net.ip-proto
net.srv-ip
net.srv-port
net.tag
net.uplink
node.enodeb-name
node.ggsn
node.pgw-name
node.sgsn
node.sgw-name
timestamp*

Chapter 2

Functions

In this section, we will learn to write queries that can be executed in the Query Console. The section starts with the simplest queries and finishes with the most complex ones. You need to practise a little bit, but the bases are quite simple and advancing in complexity becomes easy once you understand the rules.

In addition, you are not alone, as the CEA R5.2 provides you an on-line help with auto completion function related to the section of the query you are writing.

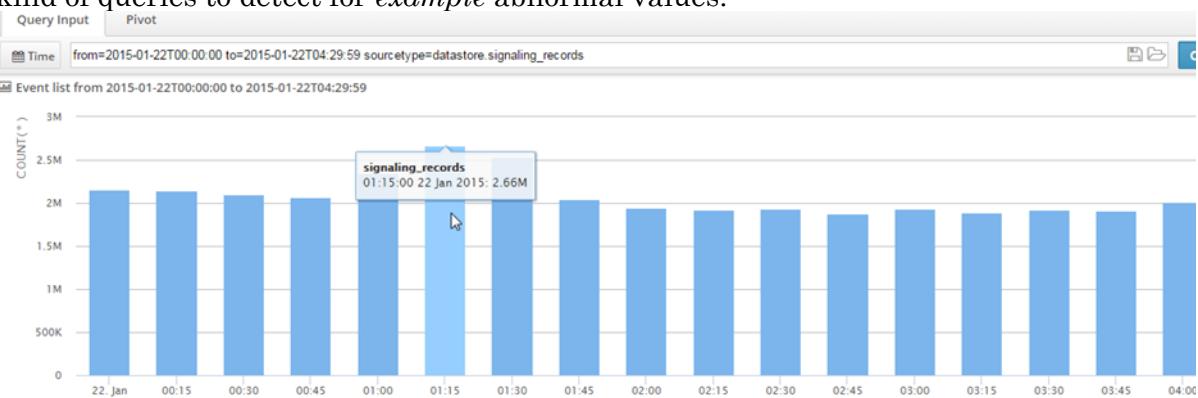
Let's start with the base. In a summarized way a query is always composed of these elements:

- (M) Data Range
- (M) Data Source (Source Type)
- (O) Aggregation Period
- (O) Summarization Function
- (O) Filters
- (O) Functions

Where (M) are mandatory and (O) are optional. This means that the simplest query is that one composed by a Data Range and a Data Source.

2.1 Data Range and Data Source

The simplest CEA Query requires at least a Data Range and a Data Source. A query containing these two elements provides as a result the temporal evolution of the count of all the events contained in the datasource for the selected time range which is an Event Time Line chart. It is very usual to start the high level inspection with this kind of queries to detect for *example* abnormal values.

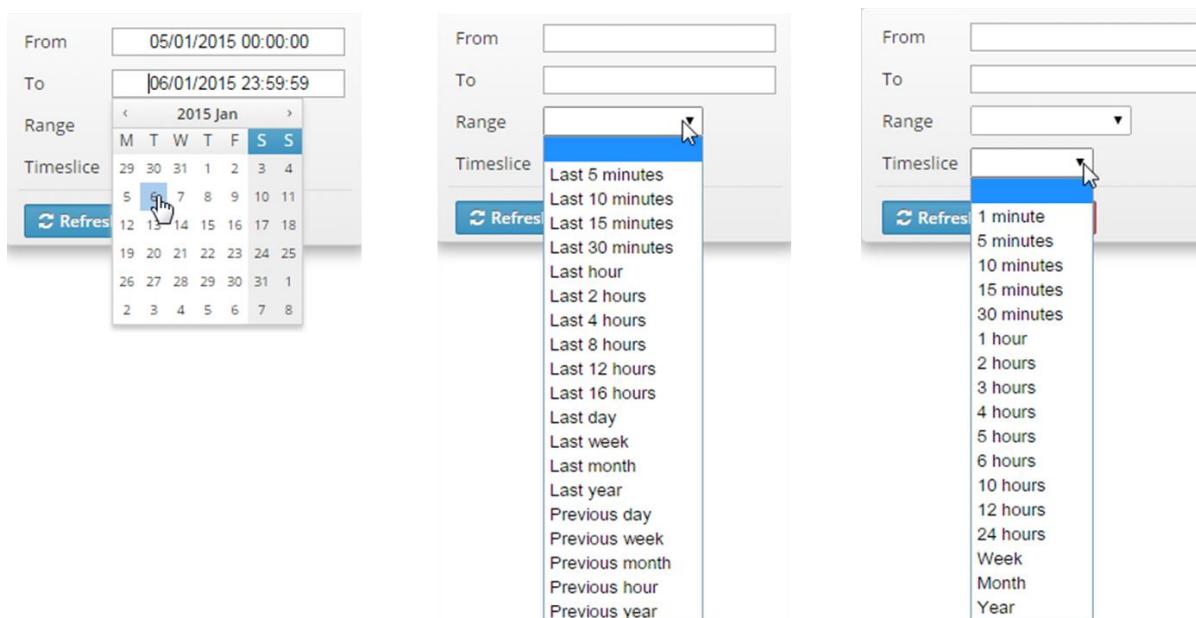


2.1.1 Configuring Data Range and Temporal Aggregation

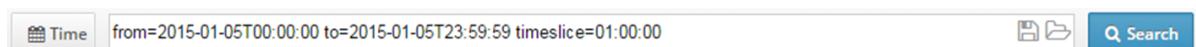
Data Range is selected by means of the Data Range Selector or, alternatively, it can be written directly in the Query Command Line in the format `YYYY-mm-ddTHH:MM:SS`.

The *Data Range* can be a fixed from – to date in the format `YYYY-mm-ddTHH:MM:SS` that you can directly pick and edit in the Data Range Selector, but it can also be a relative range as for *example* last day or last week.

Additionally, the Data Range Selector allow the selection of a *Timeslice* which is an optional parameter indicating the temporal aggregation of data for the query calculation.



By clicking the Refresh Button, the selected Data Range and timeslice will be automatically written in the Command Line.

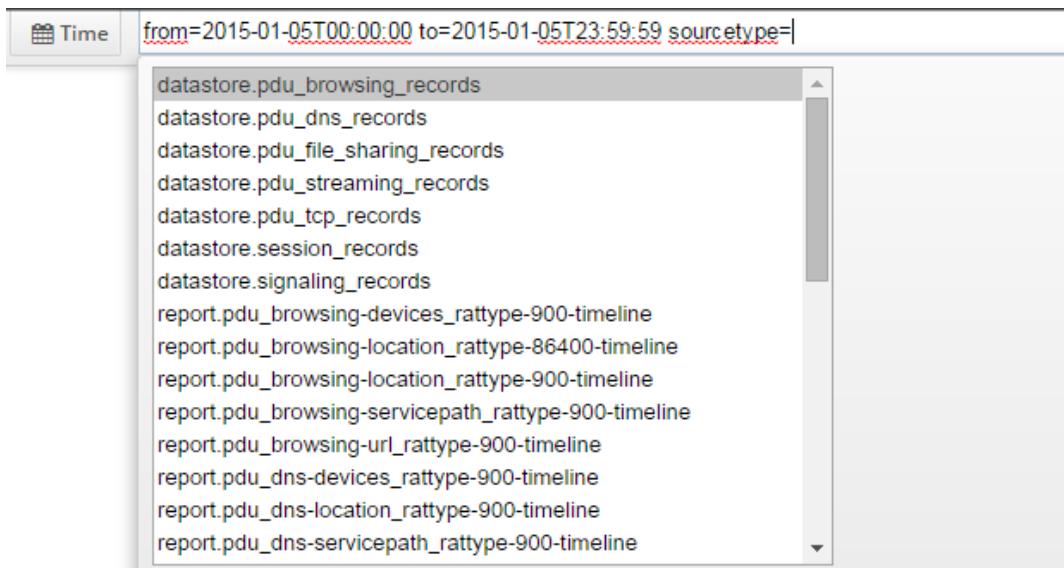


2.2 Selecting a data source

The data source is each of the different kind of data the CEA R5.2 is feed of. Data source selection is done by typing:

`sourcetype=<datastore_name>`

CEA release 5.2 includes an on-line help so that when you write the equal symbol the list of available datasources will be displayed making the selection easier by just clicking on the one you are interested in.



Please, note that the list of available datasources depends on the acquired licence and the integrated datasources. For further information about datasources, review *Datasource* section

2.3 Sampling

There are some KPIs which computation is not much penalized by sampling. For this reason, CEA release 5.2 supports sampling. This is an optional feature applying a sampling rate in the computation of the query providing a faster response for the user to get a quick view on the result.

The syntax of sampling is as simple as including in *sampling=<sampling rate>*. A sampling rate equal to 10 means that the system will take 1 of every 10 samples to compute the query.

Example:

From XXX to XXXX datasource=sourcetype... sampling=10

2.4 Filtering by a subscriber or subscribers

It is possible to filter the registers to a specific subscriber or a list of them. To do so it is necessary to add the MSISDN(s) of the subscriber(s) after the sourcetype and the query will be restrained to that particular subscriber(s) separated by space.

Syntax:

From=<from_date> to=<to_date> sourcetype=<sourcetype_name><SUBSCRIBER_MSISDN1> <SUBSCRIBER_MSISDN2> ... <SUBSCRIBER_MSISDNN>

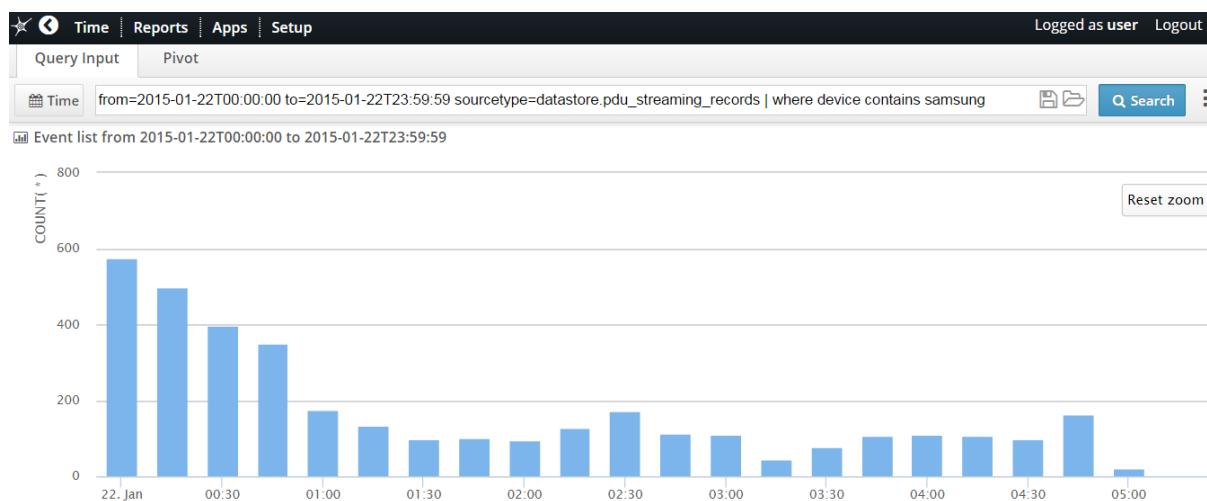
Example:

From=<from_date> to=<to_date> datasource= datastore.volte_sip

999111999

2.5 Filters

Filters introduce a condition that the data displayed on the result of the query will always obey. They are optional and it is possible to add from 0 to N filters on a specific query. The addition of more than one filter behaves as an AND operation on the data. This means that if, for example, there are two conditions filtered, it is necessary that both of them are matched on a register in order to consider it on the query result. Filters are separated from the first part of the query by a “|”



Syntax:

```
From=<from_date> to=<to_date>
sourcetype=<sourcetype_name> | where <field> <operator> <value>
```

<field> It is the name of a field belonging to the selected data source or one of the reserved words: carrier, country, device, uli-cell. A full description of the reserved words can be found in section **Error! Reference source not found..**

<operator> It can be one of the following:

Table 1. Operators

Operator	Meaning
<	Less than
>	Greater than
<=	Less than or equal
>=	Greater than or equal
=	Equal
!=	Not equal
starts-with	Starts with for strings
!starts with	Does not starts with for strings
ends-with	Ends with for strings

!ends-with	Does not end with for strings
contains	Contains for strings
!contains	Does not contain for string

<value> It can be a number or a string. It depends on the field to filter

Example 1:

```
from=2014-10-06T00:00:00 to=2014-10-12T23:59:59
sourcetype=datastore.nodes_records | where CPU > 20
```

Example 2:

```
sourcetype=datastore.pdu_streaming_records from=2015-01-
22T00:00:00 to=2015-01-22T23:59:59 | where http.session-time >
2790 | where device.type !contains "Mobile Handset"
```

Example 3:

```
from=2015-01-22T00:00:00 to=2015-01-22T23:59:59
sourcetype=datastore.pdu_streaming_records | where device contains
samsung
```

2.6 Functions

The use of functions provides an extremely flexibility and power to the CEA Query Language. This section describes them with different *examples* for a better understanding of them.

2.6.1 chart

Synopsis

The chart function refers to the graphical representation of the data. There is a wide range of available charts each of one better suit the representation of a query result.

Syntax

```
chart type field [fieldN] by field_By [field_ByN] [-height=num] [-width=num] [-legend=no] [-ylabel=no] [-layout=tab | horizontal | vertical | gridWxH] [-override-title=yes] [-table=no]
```

[] means they are optional parameters, otherwise they are obligatory.

So, the simplest chart query is:

```
chart type field by field_By
```

Parameters

type can be one of the following elements:

Table 2. <Type> parameter description

<Type>	Meaning
pie	Displays the diagram as a pie chart
pie3d	Displays the diagram as a 3D pie chart
stackedpie	Displays the diagram as a stacked donut chart

donut	Displays the diagram as a donut chart
donut3d	Displays the diagram as a 3D donut chart
column or col	Displays the diagram as a column chart
column3d or col3d	Displays the diagram as a 3D column chart
bar	Displays the diagram as a bar chart
bar3d	Displays the diagram as a 3D bar chart
stackedbar	Displays the diagram as a stacked bar chart
stackedcol	Displays the diagram as a stacked col chart
treemap	Displays the diagram as a treemap chart
bubble	Displays the diagram as a bubble chart
timeline	Displays the diagram as a timeline with the values in chronological order. Supersedes dygraph
dygraph	Displays the diagram as timeline with the values in chronological order
stackedtimeline	Displays the diagram as a timeline with the values in chronological order with stacked values
filledareatimeline	Displays the diagram as a timeline with the values in chronological order with filled area
stackedareatimeline	Displays the diagram as a timeline with the values in chronological order with stacked values and filled area
stackedtimebar, timebar	Displays the diagram as stacked bars in chronological order
groupedtimebar	Displays the diagram as grouped bars with the values in chronological order
map	Displays the diagram as a geographical representation of the location information in the records
table	Displays the diagram as an exportable table
summary-table	Displays the diagram as an exportable summarized table
speedometer	<p>Displays the diagram as a speedometer. It needs to define max limit value("-max-limit="), and high("-medium-high=") and low("-medium-low=") values for the medium range.</p> <ul style="list-style-type: none"> • For indicators which high values are ok and low values are not ok configure the speedometer using: max limit value > medium-high value > medium-low. In this case: <ul style="list-style-type: none"> – the range from 0 to medium-low is painted in red. – the range from medium-low to medium-high is painted in yellow. – the range from medium-high to max limit value is painted in green. • For indicators which high values are nok and low values are ok configure the speedometer using: max limit value > medium-low >medium-high value: <ul style="list-style-type: none"> – the range from 0 to medium-high is painted in green.

- the range from medium-high to medium-low is painted in yellow
- the range from medium-low to max limit value is painted in green.

At the end of the section there are some *examples* with speedometer chart.

You can find an *example* of each chart type representation in the section **Error! Reference source not found.** from **Error! Reference source not found..**

field [fieldN] can be one of the following elements:

- One of the fields contained in the query sourcetype.
- A function included in Table 3.

Table 3. <Function> Parameter Description

<function>	Meaning
avg(fieldA)	This function calculates the average value of the field specified in fieldA. Where fieldA is one of fields contained in the sourcetype.
median(fieldA)	This function calculates the median value of the field specified in fieldA
max(fieldA)	This function calculates the maximun value of the field specified in fieldA
min(fieldA)	This function calculates the minimun value of the field specified in fieldA
sum(fieldA)	This function sum the values of the field specified in fieldA
count(fieldA)	This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified
unique(fieldA)	This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified
avg_if(fieldA, expression)	This function calculates the average value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
median_if(field A, expression)	This function calculates the median value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
max_if(fieldA, expression).	This function calculates the maximun value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
max_if(fieldA, expression).	This function calculates the maximun value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in

	where function
min_if(fieldA, expression).	This function calculates the minimum value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
sum_if(fieldA, expression)	This function sum the values of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
count_if(fieldA, expression)	This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified when the expression defined is true. Available expressions are the same as the ones used in where function
unique_if(field A, expression)	This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified when the expression defined is true. Available expressions are the same as the ones used in where function

- *[fieldA operator fieldB] [as expressionName]* which is an expression or group of expressions in brackets, where:
 - fieldA, fieldB can be:
 - one of the fields included in sourcetype.
 - numerical values
 - a function as described in Table 3.
 - operator can be any of the following arithmetic operators included in Table 4.
 - as expressionName it is an optional parameter to specify an alias for the expression

Table 4. <Operator> Parameter Description

<operator>	Meaning
+	Addition
-	Subtraction
*	Multiplication
/	Division

Examples:

... | chart pie [acct-output-octets + acct-input-octets] as volume by rat-type

... | chart pie [acct-output-octets + acct-input-octets] by rat-type

... | chart pie [(acct-output-octets + acct-input-octets) * 5] by rat-type

```
... | chart pie [acct-output-octets + acct-input-octets] /[(acct-output-octets + acct-input-octets)/unique] by rat-type
```

field_By..field_ByN Represents the aggregation dimension. It can be:

- one of the fields contained in sourcetype.
- one of the reserved words specified below:
 - *carrier*. This reserved word is used to aggregate by carrier and country.
 - *country*. This reserved word is used to aggregate by country.
 - *device*. This reserved word is used to aggregate by device type.
 - *uli-cell*. This reserved word is used to aggregate by user location.

-height=num is used to set a fixed height for the chart, where num is the number of pixels. If this parameter is not specified, default value will be used.

-width=num is used to set a fixed width for the chart, where num is the number of pixels. If this parameter is not specified, default value will be used.

-legend=no is used to hide the chart legend. This will apply only to the following charts: pie, col, bar, stackedbar, stackedcol and donut.

-ylabel=no is used to hide the y axis label.

-layout=tab | horizontal | vertical | gridWxH is used to decide how to represent the widgets when there are multiple metrics (in tabs or horizontally).

-override-title=yes is used to override the title of the panel with the information coming from the KPI definition (if defined).

-table=no is used to hide table containing chart's data.

Example:

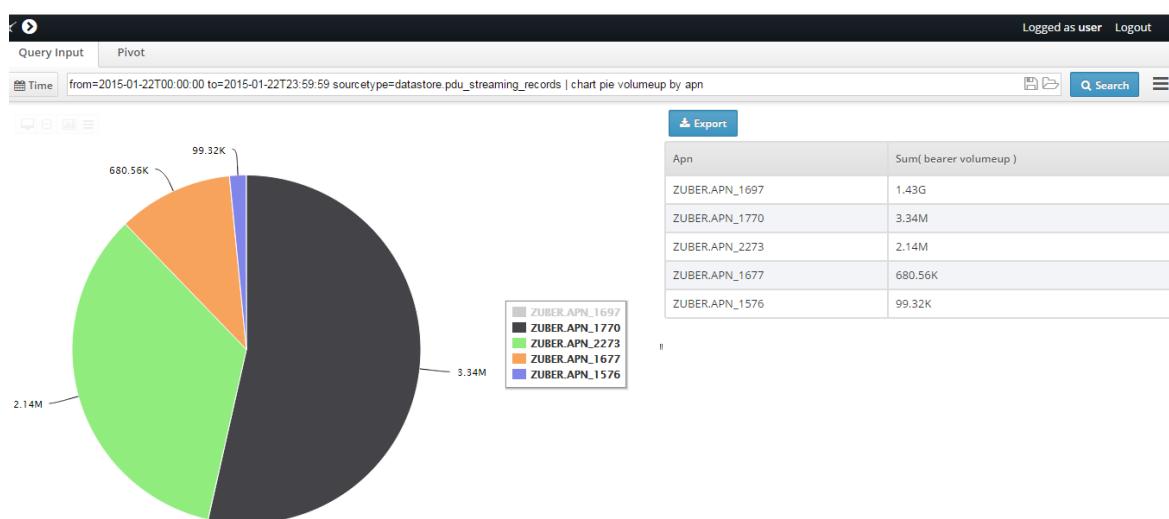
```
chart stackedbar3d volumedown volumeup by dpi-service -height=400 -width=400 -legend=no
```

Examples

Example1. Pie chart showing volumeup of the streaming records aggregated by apn for a complete day.

from=2015-01-22T00:00:00 to=2015-01-22T23:59:59

sourcetype=datastore.pdu_streaming_records | chart pie volumeup by apn



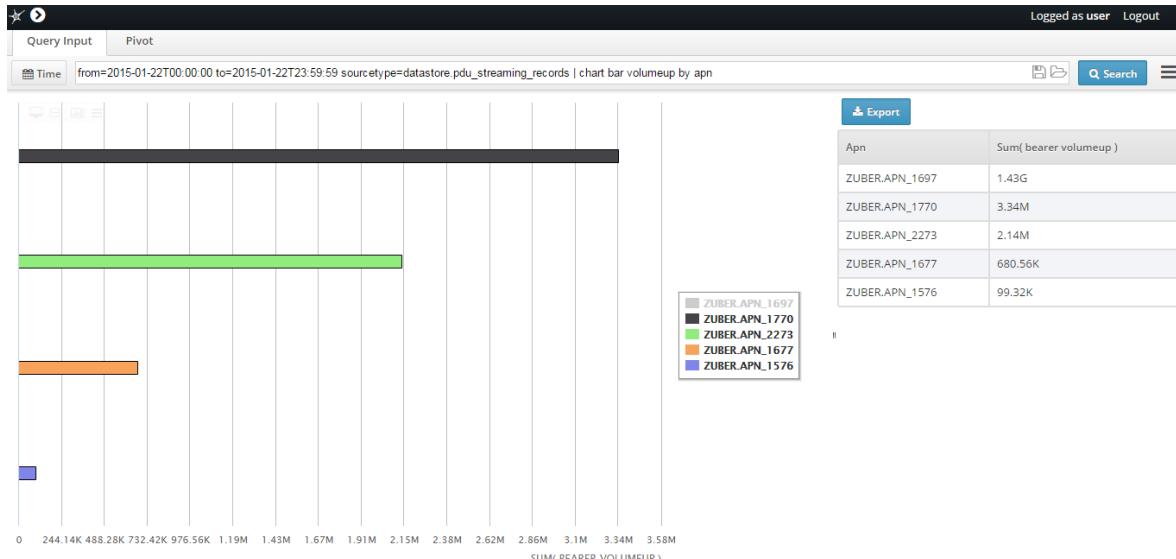
Example 2. Bar chart showing volume up of the streaming records aggregated by

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apn for a complete day.

from=2015-01-22T00:00:00 to=2015-01-22T23:59:59

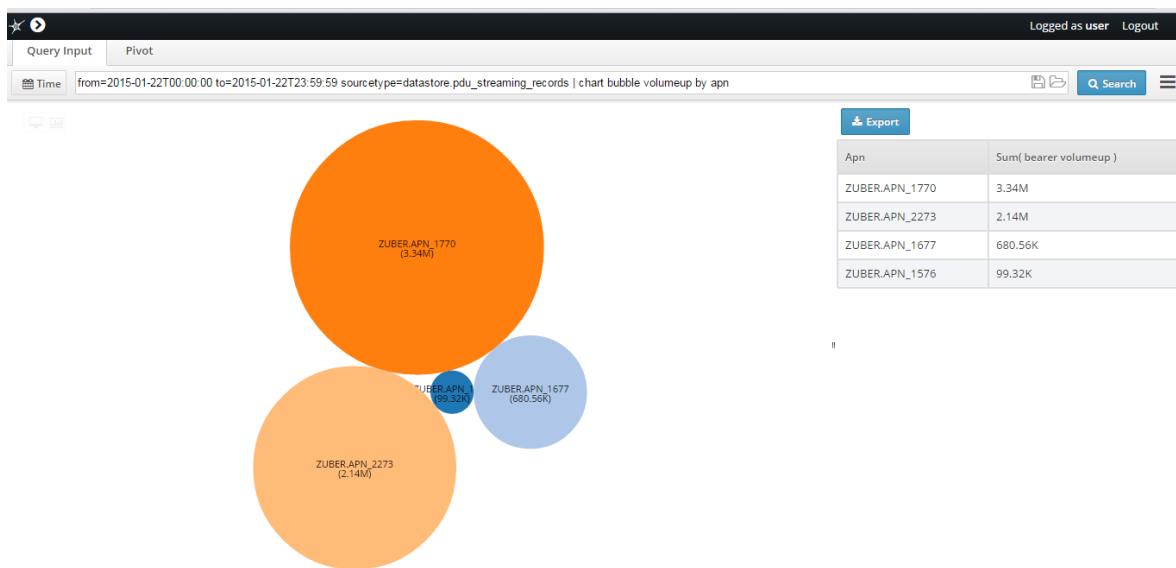
sourcetype=datastore.pdu_streaming_records | chart bar volumeup by apn



Example 3. Bar chart showing volume up of the streaming records aggregated by apn for a complete day.

from=2015-01-22T00:00:00 to=2015-01-22T23:59:59

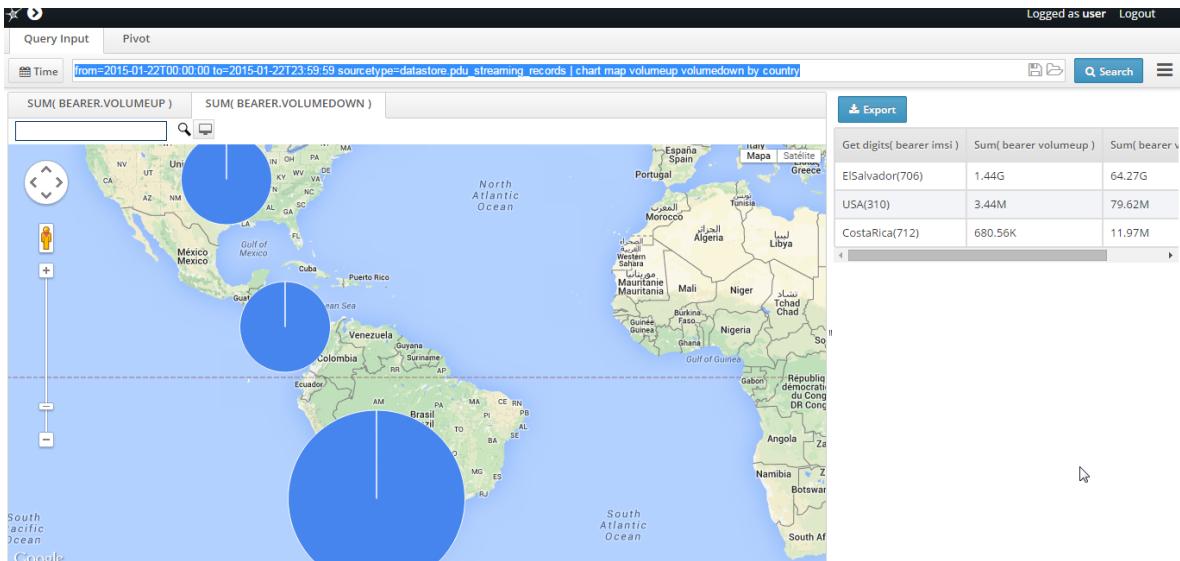
sourcetype=datastore.pdu_streaming_records | chart bubble volumeup by apn



Example 4. Map chart showing volume up of the streaming records aggregated by country for a complete day.

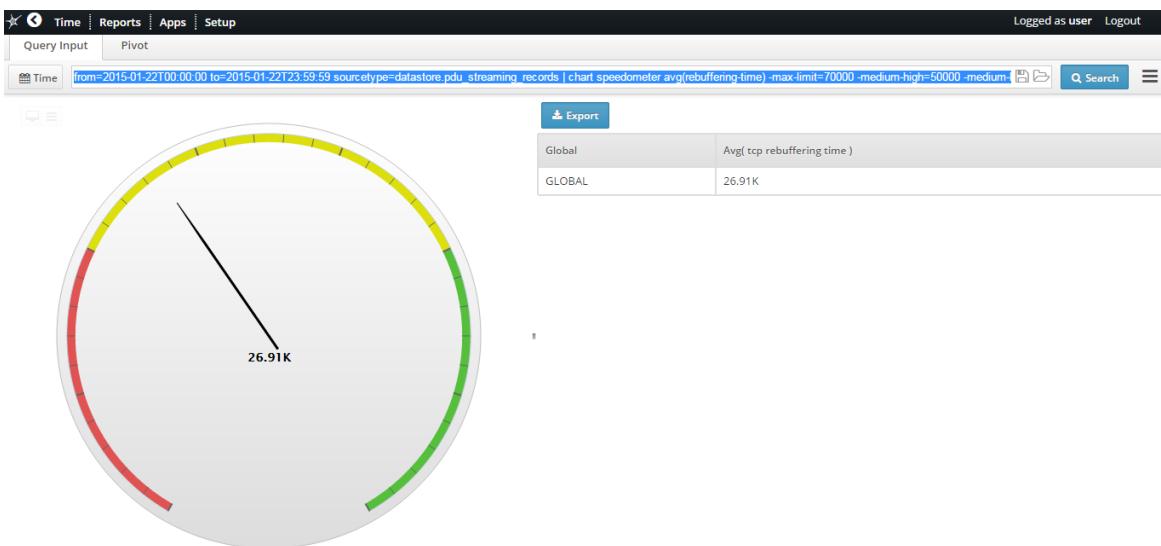
from=2015-01-22T00:00:00 to=2015-01-22T23:59:59

sourcetype=datastore.pdu_streaming_records | chart map volumeup volumedown by country



Example 5. Speedometer showing average rebuffering time for the complete network in a day.

```
from=2015-01-22T00:00:00 to=2015-01-22T23:59:59
sourcetype=datastore.pdu_streaming_records | chart speedometer
avg(rebuffering-time) -max-limit=70000 -medium-high=50000 -medium-low=20000
```



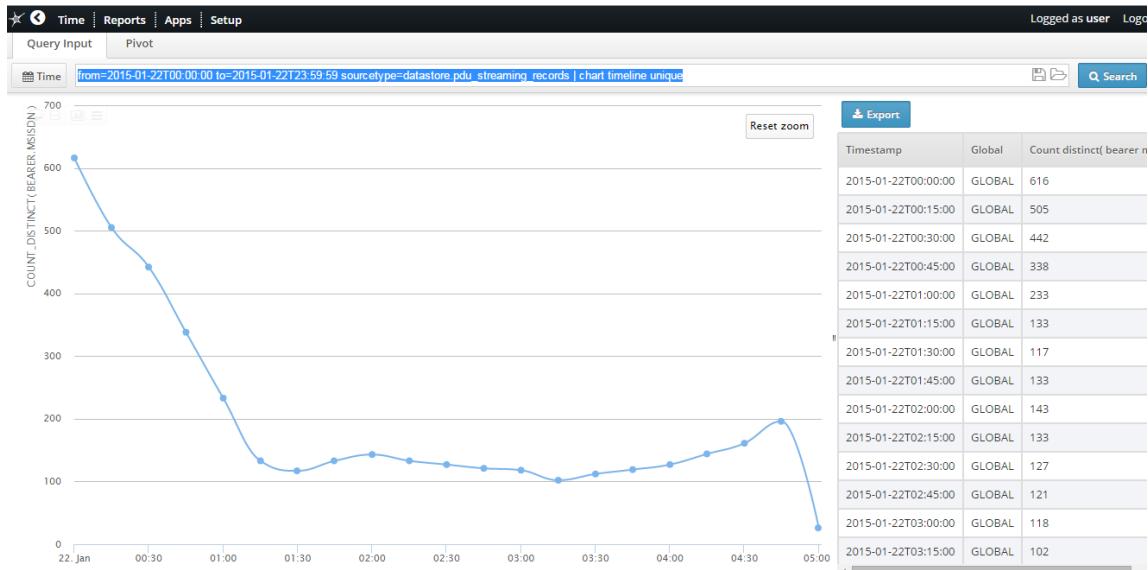
Example 6. Speedometer showing average session time. (Inverse definition of range)

```
from=<date> to=<date> sourcetype=datastore.radius | speedometer
[avg(acct-ssession-time)] as sessiontime -medium-low=5000 -medium-high=2000 -max-limit=10000
```

Example 7. Temporal evolution of unique subscribers with streaming records.

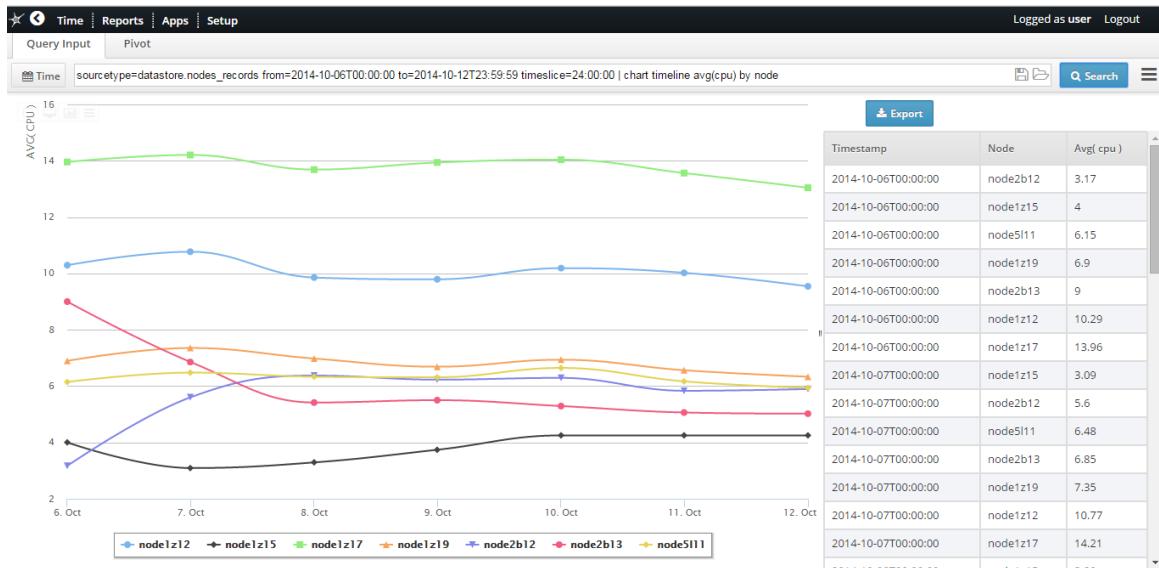
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*from=2015-01-22T00:00:00 to=2015-01-22T23:59:59
 sourcetype=datastore.pdu_streaming_records | chart timeline unique*



Example 8. Temporal evolution of average CPU per day by node.

sourcetype=datastore.nodes_records from=2014-10-06T00:00:00 to=2014-10-12T23:59:59 timeslice=24:00:00 | chart timeline avg(cpu) by node



2.6.2 cdf

Synopsis

The Cumulative Distribution Function (CDF) shows the probability that a given field `fieldName` takes on a value less than or equal to "x".

Syntax

cdf fieldName [by aggrField1 ...[aggrFieldN]] {params num-buckets min-value max-value} | {list val1 ...[valN]} [-unique=yes | no] [-max-results=num]

Parameters

fieldName: The field on which the cdf will be calculated

Example:

```
... | cdf acct-output-octets ...
```

by aggrField1 ...[aggrFieldN]: Aggregates the results by aggrField1...aggrFieldN

Example:

```
... | cdf acct-output-octets by APN ...
```

params num-buckets min-value max-value: Sets the minimum and maximum values and the number of buckets to calculate the probability distribution function.. Being:

- *num-buckets.* The number of buckets to be used .
- *min-value.* The minimum value.
- *max-value.* The maximum value.

Example:

```
... | cdf acct-output-octets params 3 0 9000
```

list val1...[valN]]: This parameter allows the buckets definition without the restriction of a uniform step value. Being:

val1...[valN] The buckets that are to be used.

Example:

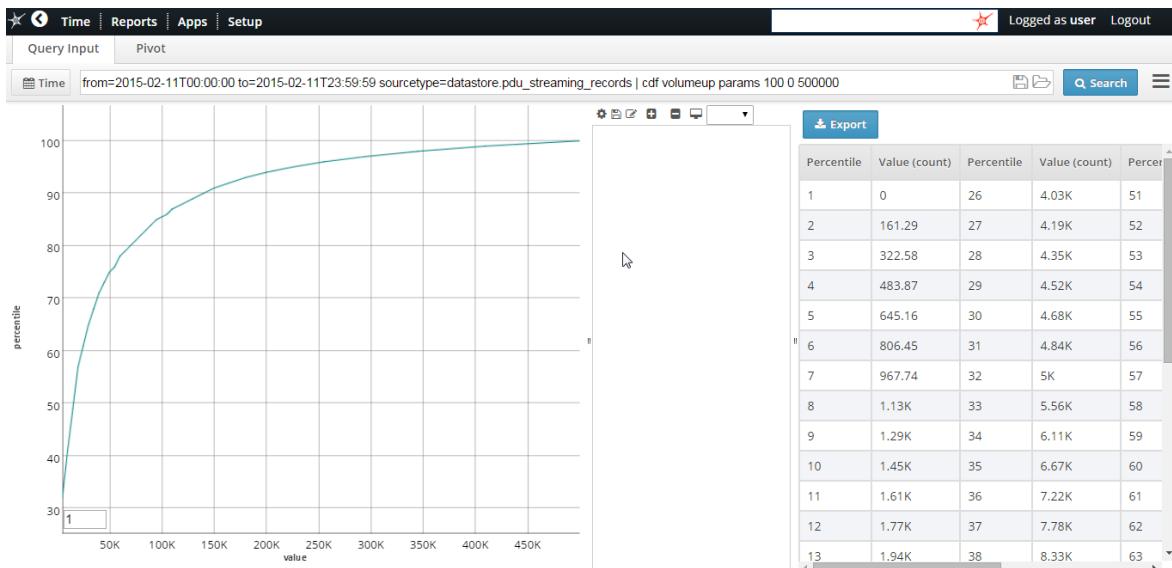
```
... | cdf acct-output-octets list 10 100 400 5000 8000 9000
```

-unique=yes | no: When set to 'yes', instead of take into account all the selected field's events, will take into account only the uniques selected fields's events. If this option is not present, it defaults to -unique=no

Example 1. Cumulative Distribution Function for the streaming volumeup

```
from=2015-02-11T00:00:00 to=2015-02-11T23:59:59
sourcetype= datastore.pdu_streaming_records | cdf volumeup params 100 0
500000
```

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2.6.3 pdf

Synopsis

The Probability Distribution Function (PDF) shows how the samples(%) are distributed among the different possible values for a given field `fieldName`.

Syntax

```
pdf fieldName [by aggrField1 ...[aggrFieldN]] {params num-buckets min-value max-value} | {list val1 ...[valN]} [-unique=yes | no] [-max-results=num]
```

Parameters

fieldName: The table's field on which the PDF will be calculated

Example:

```
... | pdf acct-output-octets ...
```

by aggrField1 ...[aggrFieldN]: Aggregates the results by *aggrField1...aggrFieldN*

Example:

```
... | pdf acct-output-octets by aggf1 aggf2 ...
```

params num-buckets min-value max-value: Sets the minimum and maximum values and the number of buckets to calculate the probability distribution function.. Being:

- *num-buckets*. The number of buckets to be used .
- *min-value*. The minimum value.
- *max-value*. The maximum value.

Example:

```
... | pdf acct-output-octets params 3 0 9000
```

list val1...[valN]: This parameter allows the buckets definition without the restriction of a uniform step value. Being:

- *val1...[valN]*. The buckets that are to be used.

Example:

```
... | pdf acct-output-octets list 10 100 400 5000 8000 9000
```

-unique=yes | no: When set to 'yes', instead of take into account all the selected field's events, will take into account only the uniques selected fields's events. If this option is not present, it defaults to -unique=no

Example:

```
... | pdf acct-output-octets params 3 0 9000 -unique=yes
```

-max-results=num: The max number of results (rows) that will be shown. By default num will be 200 events. Maximum value for num can be 100.000 events.

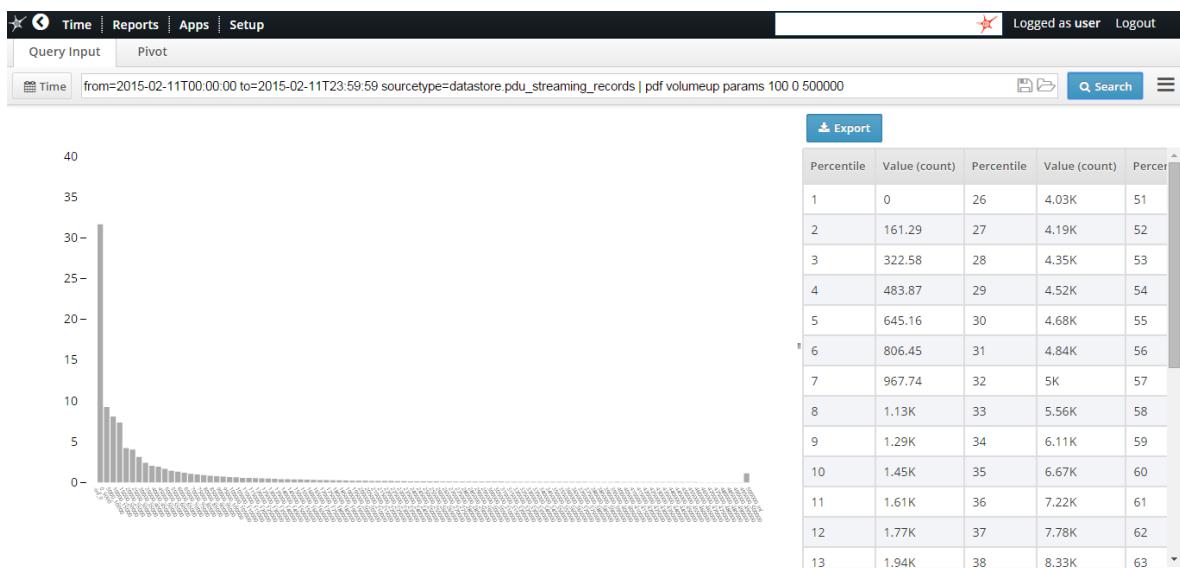
Example:

```
... | pdf acct-output-octets params 3 0 9000 -unique=yes -max-results=500
```

Example:

PDF for the streaming volumeup

```
from=2015-02-11T00:00:00 to=2015-02-11T23:59:59
sourcetype=datastore.pdu_streaming_records | pdf volumeup params 100 0
500000
```



2.6.4 download

Synopsis

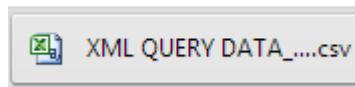
The download function executes the direct download of the query to an external file.

Syntax

download

Example 1. Exportation of the clustering of users as per their streaming service characterization based on the following indicators: tcp retransmissions, reproduction quality, rebuffering time and service access time.

```
from=2015-02-11T00:00:00 to=2015-02-11T23:59:59  
sourcetype=datastore.pdu_streaming_records | pdf volumeup params 100 0  
500000 | download
```



2.6.5 filter

Synopsis

The filter function displays a table with the chosen fields. This function cannot be used with others function types.

Syntax

filter field1 ... [fieldN]

field1...fieldN are table fields of the specified sourcetype.

Examples:

```
... | filter acct-input-octets rat-type ras-client
```

```
from=2015-02-11T00:00:00 to=2015-02-11T00:59:59  
sourcetype=datastore.pdu_streaming_records | filter timestamp msisdn  
volumeup volumedown
```

The screenshot shows a web-based dashboard with a navigation bar at the top containing links for Time, Reports, Apps, and Setup. On the right side of the header, there are icons for a star, user status (Logged as user), and Logout. Below the header is a search bar with a 'Time' dropdown set to 'from=2015-02-11T00:00:00 to=2015-02-11T00:59:59 sourcetype=datastore.pdu_streaming_records | filter timestamp'. To the right of the search bar are 'Search' and 'Export' buttons. The main content area displays a table with four columns: Timestamp, Msisdn, Volumeup, and Volumedown. The table contains 11 rows of data, each representing a session event with its timestamp, subscriber ID (Msisdn), volume up (Volumeup), and volume down (Volumedown) values.

Timestamp	Msisdn	Volumeup	Volumedown
2015-02-11T00:08:40	12063317061		1.92 M
2015-02-11T00:08:39	50234157927		2.52 M
2015-02-11T00:08:39	50234157927		38.19 K
2015-02-11T00:08:38	50234341227		138.8 K
2015-02-11T00:08:38	50234341227		132.25 K
2015-02-11T00:08:37	50578490430		1.96 M
2015-02-11T00:08:37	50578644849		2.16 M
2015-02-11T00:08:37	50589721047		2.34 M
2015-02-11T00:08:36	50234050212		2.74 M
2015-02-11T00:08:36	50234017741		918.81 K
2015-02-11T00:08:35	50234157927		21.25 K

2.6.6 get-sessions

Synopsis

The get sessions function allows obtaining a session summary from a signaling based source. It lookup the newest reference for a session, which is denoted by the subscriber and session identifiers.

Syntax

```
get-sessions -subscriber-field=subscriberField -session-
field=sessionField [-jitter=jitter -offset-seek=offsetSeek -default-start-
time-field=timestampField -default-end-time-field=timestampField]
```

Parameters

-subscriber-field: Name of the subscriber id field.

Example:

```
-subscriber-field=bearer.msisdn
```

-session-field: Name of the session id field. It can also be specified as a list of fields

Example:

```
-session-field=gtp.session-id
```

Example:

```
-session-field=gtp.field1,gtp.field2
```

-default-start-time-field: Field to consider for start session time. Set this if differs the event timestamp

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Example:

`-default-start-time-field=event.start-time`

`-default-end-time-field`: Field to consider for end session time. Set this if differs the event timestamp

Example:

`-default-end-time-field=event.stop-time`

`-jitter`: Session jitter in seconds. Will be included in session start and end timestamps

Example:

`-jitter=3600`

`-offset-seek`: offset in seconds to considerer sessions messages which are not within the query from and to

Example

`-offset-seek=7200`

`-promoted-fields`: fields to show in the result. If any provided field doesn't exist, it will be discarded

Example

`-promoted-fields=msisdn,imsi,apn`

Example

`from=2015-01-22T00:00:00 to=2015-01-22T23:59:59`

`sourcetype=datastore.session_records <msisdn> | get-sessions -subscriber-field=bearer.msisdn -session-field=gtp.session.id`

Session start time	Session end time	Msisdn	Timestamp	IMSI	Net flowid	APN	IMEI/SV	Packetsup	Packet
2015-01-22T03:08:36	2015-01-22T09:58:52	1:	2015-01-22T09:58:52	310	GTP/0x7fb681ab6910	ZUBER.APN_1576	Oneplus One (864587021039480)	1	2
2015-01-22T03:08:21	2015-01-22T09:59:29	1:	2015-01-22T09:59:29	310	GTP/0x7fe80af3560	ZUBER.APN_1576	Samsung T999 Galaxy S3 (353025050101330)	65	55
2015-01-22T00:05:23	2015-01-22T03:03:09	1:	2015-01-22T03:03:09	310	GTP/0x7fb695724350	ZUBER.APN_1576	Oneplus One (864587021039480)	57	54
2015-01-22T00:02:56	2015-01-22T03:04:10	1:	2015-01-22T03:04:10	310	GTP/0x7fceeb9d230	ZUBER.APN_1576	Samsung T999 Galaxy S3 (353025050101330)	0	0

2.6.7 head

Synopsis

The head function limits the number of returned values in the performed query.

Syntax

`head rows_number`

`rows_number` is a number. This is the number of rows to be returned.

Examples:

`... | head 2`

`... | filter msisdn rat-type | head 2`

Query Example 1: top 15 devices per average latency

sourcetype=datastore.pdu_dns_records from=2015-02-02T00:00:00 to=2015-02-02T00:59:59 | chart bar avg(net.latency) by bearer.imeisv | head 15



2.6.8 heatmap

Synopsis

The heatmap function displays a heat map based on the type chosen through the different available fields in the records.

Heat maps provide a graphical representation of the metrics in a map. The metric values are clustered by colors in different layers.

Syntax

```
heatmap [field [fieldN]] [order-by orderField [orderFieldN] [asc | desc]] [by groupbyField [groupbyFieldN]] [-table=yes] [-results=num] [-gradient-type=num] [-single-layer=yes] [-format-results=yes]
```

Parameters

field..fieldN can be one of the following elements:

- One of the table fields specified in sourcetype.
- A function:
 - `avg(fieldA)`. This function calculates the average value of the field specified in `fieldA`.
 - `median(fieldA)`. This function calculates the median value of the field specified in `fieldA`.
 - `max(fieldA)`. This function calculates the maximum value of the field specified in `fieldA`.
 - `min(fieldA)`. This function calculates the minimum value of the field specified in `fieldA`.
 - `sum(fieldA)`. This function sum the values of the field specified in `fieldA`.
 - `count(fieldA)`. This function count the number of events of the field specified in `fieldA` or the primary key if no `fieldA` is specified.
 - `unique(fieldA)`. This function counts the unique occurrences number of the field specified in `fieldA` or the primary key if no `fieldA` is specified

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[fieldA operator fieldB] [as expressionName]: an expression or group of expressions in brackets. Where:

fieldA, fieldB can be:

- one of the table fields specified in sourcetype.
- numerical values.
- a function:
 - avg(fieldA). This function calculates the average value of the field specified in fieldA.
 - median(fieldA). This function calculates the median value of the field specified in fieldA.
 - max(fieldA). This function calculates the maximum value of the field specified in fieldA.
 - min(fieldA). This function calculates the minimum value of the field specified in fieldA.
 - sum(fieldA). This function sums the values of the field specified in fieldA.
 - count(fieldA). This function counts the number of events of the field specified in fieldA or the primary key if no fieldA is specified.
 - unique(fieldA). This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified
- *operator* can be any of the arithmetic operators: +, -, *, /
- *as expressionName* to specify an alias for the expression. This parameter is optional.

order-by orderField..orderFieldN [asc | desc]:

to order results by a specific criteria. Being:

- *orderField..orderFieldN* must be one of the fields specified in the heatmap fields mentioned above.
- *asc | desc*: to specify if you want ascendant or descendant order. Optional. By default, order is ascendant.

by groupByField..groupByFieldN: to create a multilayer heatmap by group-by fields.

-table=yes is used to show the result table. By default, the legend is hidden.

-results=num is the max number of results shown in the map. By default num will be 10.000 events. Maximum value for num can be 100.000 events. It can be used with "max" value.

-gradient-type=num is the type of colors used to represent the heatmap. By default num will be green to red. Color values are:

0 = red

1 = green

2 = blue

3 = yellow

4 = magenta

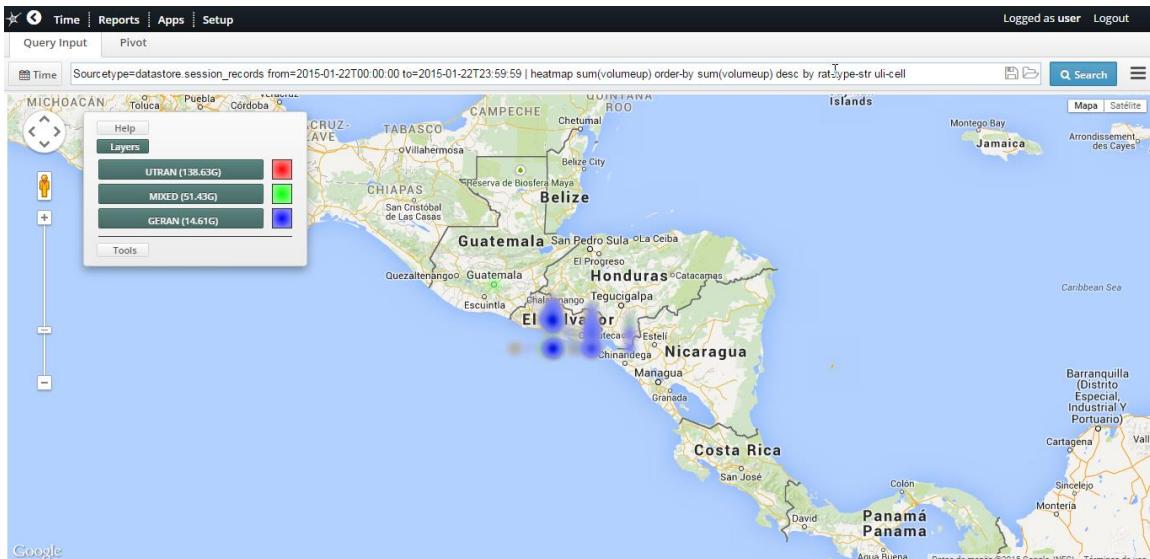
5 = cyan

-single-layer=yes this forces single-layer although groupByField(s) are present. By default, single-layer is only active if no groupByField(s) are present.

-format-results=yes this forces the result table results to be formatted (ie: Volume in K, M, G or T). Disabled by default.

Examples:

```
... | heatmap [AVG(acct-input-octets)] as avgVolume order-by avgVolume -format-
results=yes
... | heatmap unique -table=yes order-by unique desc -results=max
Sourcetype=datastore.session_records from=2015-01-22T00:00:00 to=2015-01-
22T23:59:59 | heatmap sum(volumeup) order-by sum(volumeup) desc by rat-type-str
uli-cell
```



2.6.9 kqi-chart

Synopsis

The kqi-chart is the function that allows the use of the precomputed reports in the Full Search Panel as part of a query.

Syntax

```
kqi-chart type "path_to_the_kqi_report" ["path_to_other_kqi_report"]* by
field_By [field_ByN] [-height=num] [-width=num] [-legend=no] [-table=no] [-
ylabel=no] [-layout=tab | horizontal | vertical | gridWxH] [-include-units=no] [-
override-title=no] [-include-thresholds=no] [-table-
position=north | south | east | west]
```

Parameters

type can be one of the elements contained in Table 2

"path_to_the_kqi_report" is the path where the kqi report is stored. The available kqi report paths are automatically visible and selectable in the online help once you have selected the datasource and the kqi-chart operator.

- *field_By..field_ByN* can be:
 - one of the table fields specified in sourcetype.
 - one of the reserved words specified below:
 - carrier. This reserved word is used to aggregate by carrier and country.
 - country. This reserved word is used to aggregate by country.
 - device. This reserved word is used to aggregate by device type.
 - uli-cell. This reserved word is used to aggregate by user location.
- *-height=num* is used to set a fixed height for the chart, where num is the

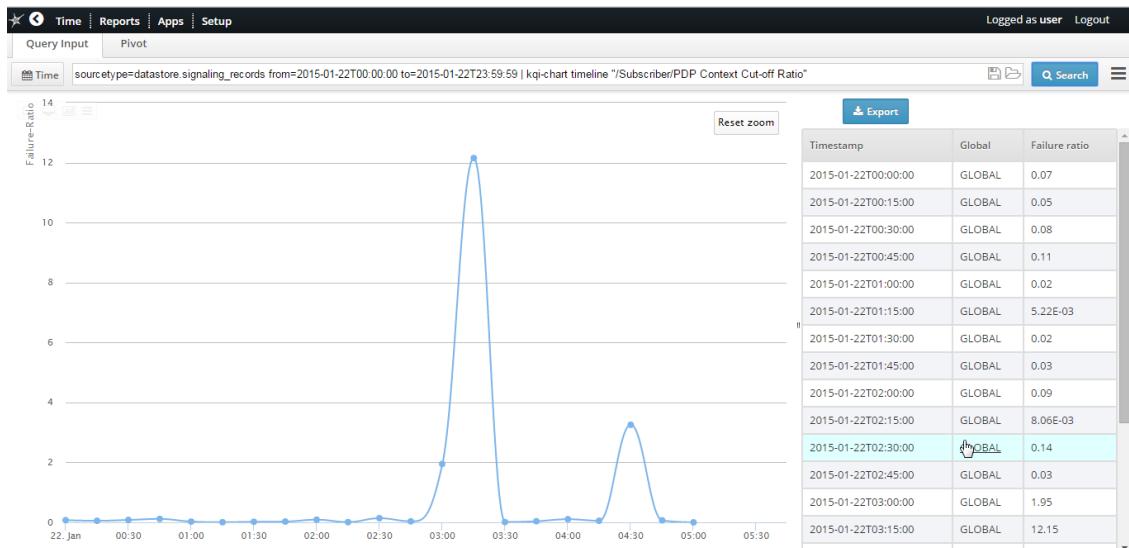
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number of pixels. If this parameter is not specified, default value will be used.

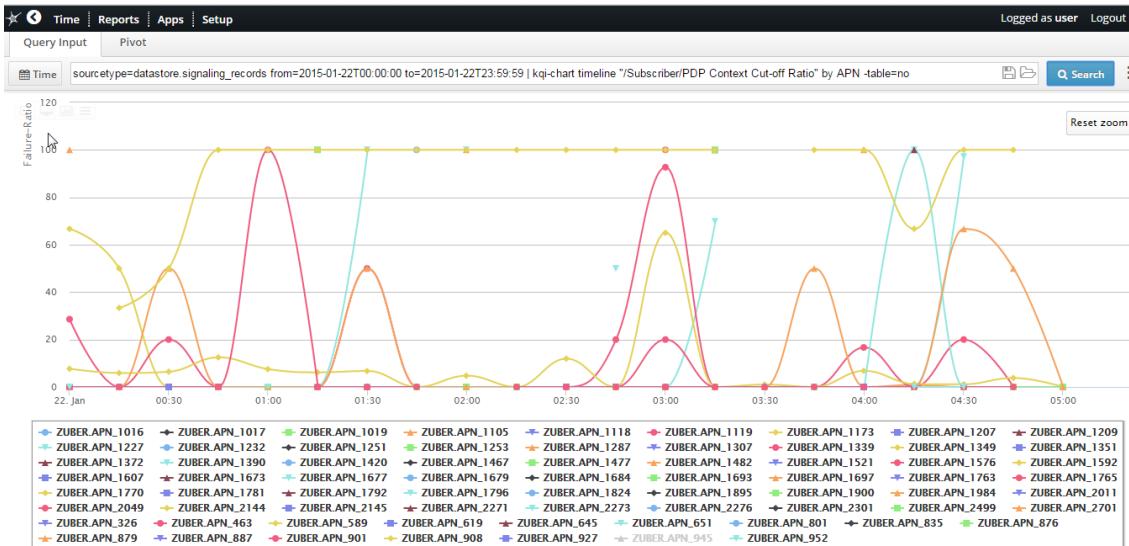
- *-width=num* is used to set a fixed width for the chart, where num is the number of pixels. If this parameter is not specified, default value will be used.
- *-legend=no* is used to hide the chart legend. This will apply only to the following charts: pie, col, bar, stackedbar, stackedcol and donut.
- *-table=no* is used to hide table containing kqi-chart's data.
- *-ylabel=no* is used to hide the y axis label.
- *-layout=tab | horizontal | vertical | gridWxH* is used to decide how to represent the widgets when there are multiple metrics (in tabs or horizontally).
- *-override-title=yes* is used to override the title of the panel with the information coming from the KPI definition (if defined).
- *-include-units=yes* is used include units in all tooltips.
- *-include-thresholds=yes* is used include thresholds in the widgets. Defaults to true.
- *-table-position=north | south | east | west* is used to include the table in one of the given positions when it is displayed. Defaults to east.

Example:

```
kqi-chart pie "/Axis-Network/GGSN/Total throughput" by ggsn -height=400 -  
width=400 -legend=no  
sourcetype=datastore.signalizing_records from=2015-01-22T00:00:00 to=2015-01-  
22T23:59:59 | kqi-chart timeline "/Subscriber/PDP Context Cut-off Ratio"
```



```
sourcetype=datastore.signalizing_records from=2015-01-22T00:00:00 to=2015-01-  
22T23:59:59 | kqi-chart timeline "/Subscriber/PDP Context Cut-off Ratio" by APN -  
table=no
```



Per subscribers available indicators

- /Subscriber/Bearer Creation Failure Ratio
- /Subscriber/Bearer Creation Failure Ratio (Global)
- /Subscriber/Bearer Modification Failure Ratio
- /Subscriber/DNS Host Name Resolution Failure Ratio
- /Subscriber/DNS Host Name Resolution Time
- /Subscriber/End-to-end Latency
- /Subscriber/File Download and Upload Data Transfer Cut-off
- /Subscriber/File Download and Upload Failure Ratio
- /Subscriber/File Download and Upload IP Service Access Failure Ratio
- /Subscriber/File Download and Upload IP Service Setup Time
- /Subscriber/File Download and Upload Service Non-Accessibility
- /Subscriber/File Download and Upload Setup Time
- /Subscriber/File Download Effective Data Rate
- /Subscriber/File Download Mean Data Rate
- /Subscriber/File Download Session Time
- /Subscriber/File Upload Effective Data Rate
- /Subscriber/File Upload Mean Data Rate
- /Subscriber/File Upload Session Time
- /Subscriber/HTTP Mean Data Rate
- /Subscriber/HTTP Peak Data Rate
- /Subscriber/HTTP Session Failure Ratio
- /Subscriber/HTTP Session Time
- /Subscriber/Number of Videos
- /Subscriber/PDP Context Creation Failure Ratio (Gn)
- /Subscriber/PDP Context Creation Time (Gn)
- /Subscriber/PDP Context Cut-off Ratio
- /Subscriber/Session Creation Failure Ratio
- /Subscriber/Session Creation Time
- /Subscriber/Streaming Rebuffering Time
- /Subscriber/Streaming Rebuffering Time Percentage
- /Subscriber/Streaming Reproduction Quality
- /Subscriber/TCP Retransmission Ratio
- /Subscriber/TCP Round Trip Time (Client side)
- /Subscriber/TCP Round Trip Time (Server side)

/Subscriber/Throughput as provided by the network (Mean Throughput)
/Subscriber/Throughput as provided by the network (Peak Throughput)
/Subscriber/Time to Stream Start
/Subscriber/Total Reproduction Time per Video
/Subscriber/Total Throughput
/Subscriber/Total Volume
/Subscriber/Total Volume (uplink+downlink)
/Subscriber/Video Stall per Video

2.6.10 kqi-heatmap

Synopsis

The kqi-heatmap is the function that allows the use of the precomputed reports as part of a heat map.

Syntax

```
kqi-heatmap ["path_to_the_kqi_report" ["path_to_other_kqi_report"]*]  
[order-by orderField [orderFieldN] [asc | desc]] [by groupbyField  
[groupbyFieldN]] [-table=yes] [-results=num] [-gradient-type=num] [-  
single-layer=yes] [-format-results=yes]
```

Parameters

order-by orderField..orderFieldN [asc | desc]: to order results by an specific criteria.
Being:

- *orderField..orderFieldN* must be one of the fields specified in the heatmap fields mentioned above.
- *asc | desc*: to specify if you want ascendant or descendant order. Optional. By default, order is ascendant.

by groupByField..groupByFieldN: to create a multilayer heatmap by group-by fields.

-table=yes is used to show the result table. By default, the legend is hidden.

-results=num is the max number of results shown in the map. By default num will be 10.000 events. Maximum value for num can be 100.000 events. It can be used with "max" value.

-gradient-type=num is the type of colors used to represent the heatmap. By default num will be green to red. Color values are:

- 0 = red
- 1 = green
- 2 = blue
- 3 = yellow
- 4 = magenta
- 5 = cyan

-single-layer=yes this forces single-layer although groupByField(s) are present. By default, single-layer is only active if no groupByField(s) are present.

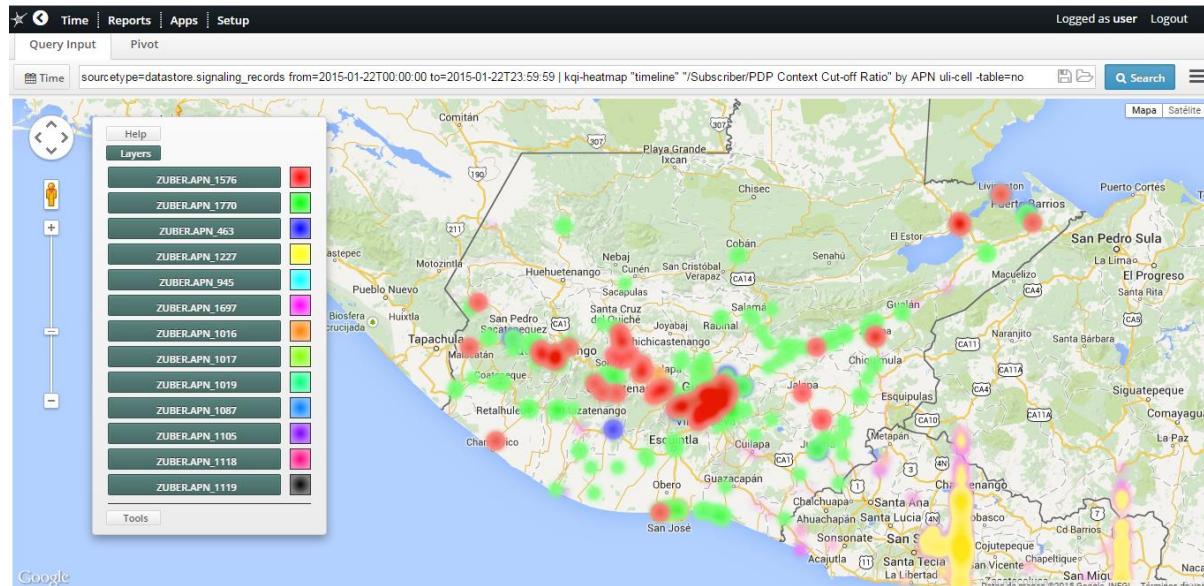
-format-results=yes this forces the result table results to be formatted (ie: Volume in K, M, G or T). Disabled by default.

Example

```
... | kqi-heatmap "/Axis-Location/City/Total throughput" -format-results=yes
```

Example

```
sourcetype=datastore.signalizing_records from=2015-01-22T00:00:00 to=2015-01-22T23:59:59 | kqi-heatmap "timeline" "/Subscriber/PDP Context Cut-off Ratio" by APN uli-cell -table=no
```



2.6.11 ladder

Synopsis

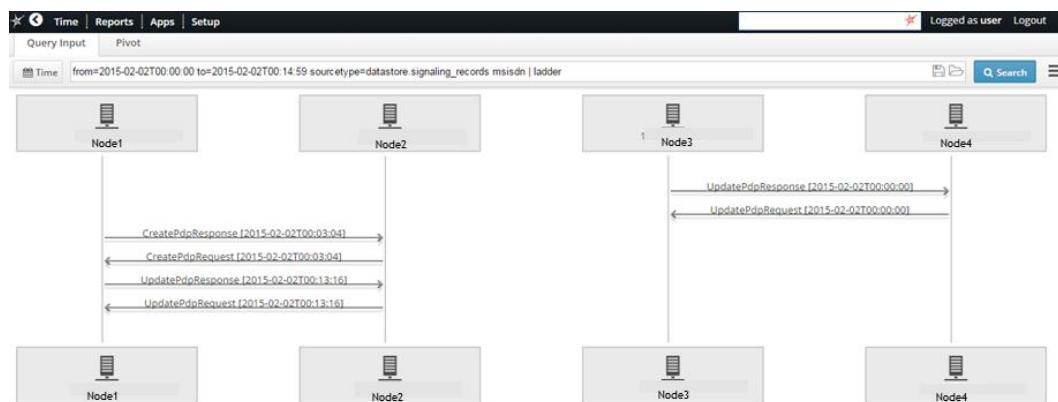
The ladder function provides a graphical representation of a ladder diagram by using the messages present in the records. It is aimed to troubleshooting representation of the signaling messages

Syntax

Ladder

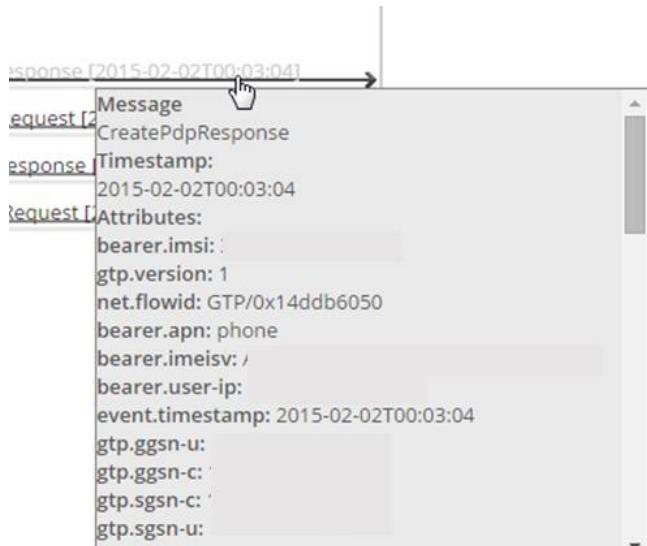
Examples

```
from=2015-02-02T00:00:00 to=2015-02-02T00:14:59
sourcetype=datastore.signalizing_records <msisdn> | ladder
```



Note that ladder may be interesting for a specific user. Each arrow represents a signaling message from one node to another node. By over hovering each arrow the details of the message will pop up as shown in the next figure:

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2.6.12 ladder-table

Synopsis

The ladder-table function will provide a graphical representation of a ladder diagram by using the messages present in the records with a summarized table

Syntax

ladder-table

Example

from=2015-02-02T00:00:00 to=2015-02-02T00:14:59

sourcetype=datastore.signalining_records <msisdn> | ladder-table

Msisdn	Timestamp	Imsi	Gtp version	Net flowid	Apn	Imeisv	User ip	Event text	Event timestamp	Gtp sr
1	2015-02-02T00:13:40	310	3	1	GTP/0x779fa640	Tfast.t-mobile.com	Apple iPhone 4S (013207005707110)	CreatePdpRequest	2015-02-02T00:13:40	GUA C
1	2015-02-02T00:13:40	310	3	1	GTP/0x779fa640	Tfast.t-mobile.com	Apple iPhone 4S (013207005707110)	CreatePdpResponse	2015-02-02T00:13:40	216.1
1	2015-02-02T00:14:11	310	3	1	GTP/0xd0cc6570	Tfast.t-mobile.com	Apple iPhone 4S (013207005707110)	CreatePdpRequest	2015-02-02T00:14:11	GUA C
1	2015-02-02T00:14:12	310	3	1	GTP/0xd0cc6570	Tfast.t-mobile.com	Apple iPhone 4S (013207005707110)	CreatePdpResponse	2015-02-02T00:14:12	216.1

2.6.13 ladder-tree

Synopsis

The ladder-tree function will provide a graphical representation of a ladder diagram and a summarize table by using the messages present in the records. By each table entry, after click, a tree with transaction details will be shown

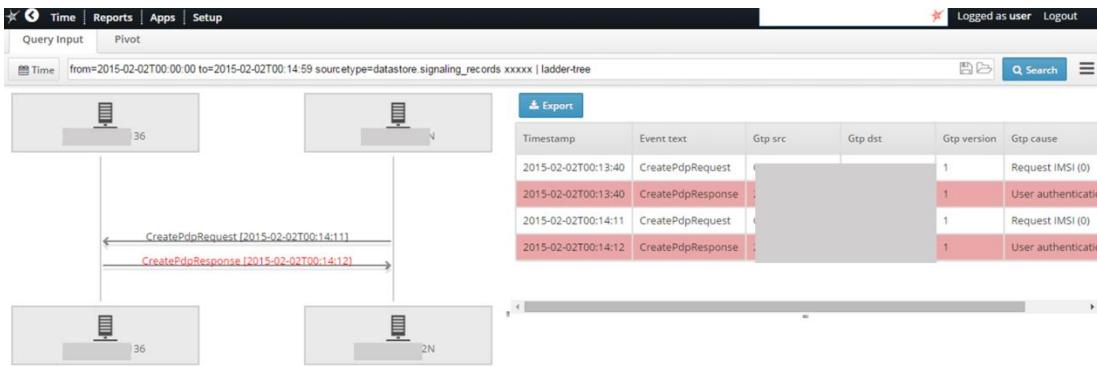
Syntax

ladder-tree

Example

from=2015-02-02T00:00:00 to=2015-02-02T00:14:59

sourcetype=datastore.signalining_records xxxxxx | ladder-tree



2.6.14 map

Synopsis

The map function provides a geographical representation of the location information in the records.

Syntax

```
map [by uli-cell] [-table-position=north | south | east | west]
```

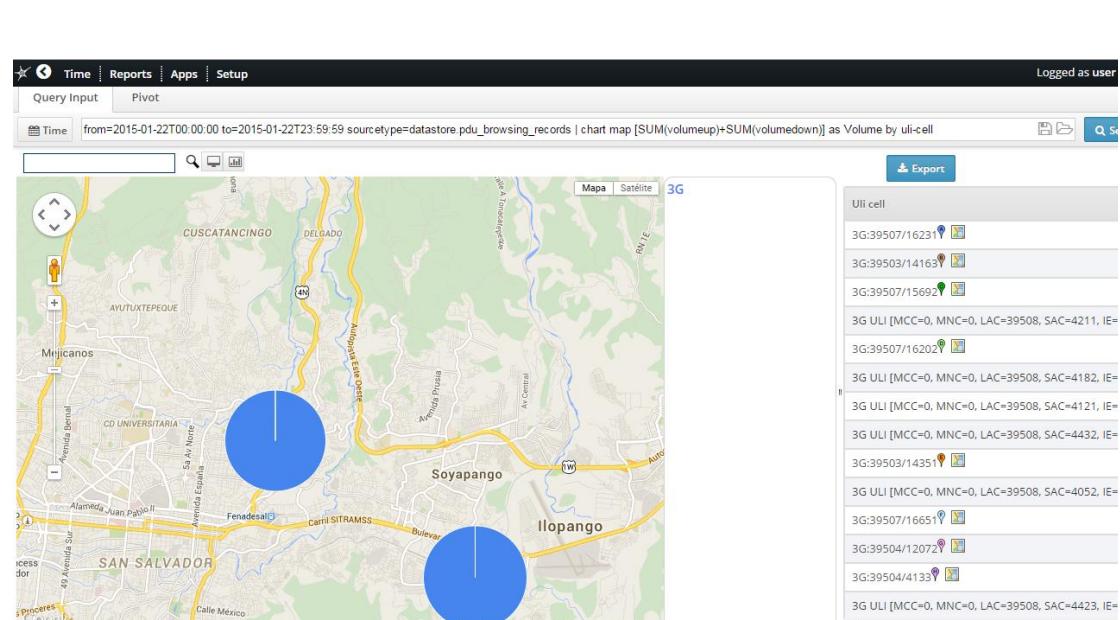
Parameters

by uli-cell: to use cell info in order to geolocate the event.

-table-position=north | south | east | west is used to include the table in one of the given positions when it is displayed. Defaults to east.

Example:

```
from=2015-01-22T00:00:00 to=2015-01-22T23:59:59
sourcetype=datastore.pdu_browsing_records | chart map
[SUM(volumeup)+SUM(volumedown)] as Volume by uli-cell
```



2.6.15 multi-source

Synopsis

The Multi Source function allows to show information from different datasources

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when they have a common field with a specific value.

This function can be used for *example* to see all the information for a specific MSISDN in different datasources.

Syntax

```
multi-source table2 ...[tableN] -fieldname=fieldTable1,...,fieldTableN -  
fieldvalue=value [-columnfield=column1,...,columnN] [-  
charttype=table | ladder]
```

Parameters

table2 ...[tableN]: The tables where the query will be performed sourcetype table in addition to the one specified in the sourcetype option. Clarification: table1 would be the table defined in the sourcetype option.

Example:

```
... sourcetype = datastore.radius | multi-source datastore.mme ...
```

-fieldname=fieldTable1,...,fieldTableN: The name of the field to be filtered For each corresponding table. They can have different names but must represent the same field. fieldTable1 is the field associated to the table defined in sourcetype option, fieldTable2 is the field associated to table2 and so on...

Example:

```
... sourcetype = datastore.radius | multi-source datastore.mme -fieldname=calling-  
station-id,msisdn ...
```

-fieldvalue=value: The value to be filtered for the defined tables

Example:

```
sourcetype=datastore.radius | multi-source datastore.mme -fieldname=calling-station-  
id,msisdn -fieldvalue=34651xxxxxx
```

-columnfield=column1,...,columnN: Optional. A comma separated list of additional columns(of any of the selected tables) to be shown in the multi-source table when charttype=table. Note that configuring this field any other configuration will be discarded

Example:

```
sourcetype=datastore.radius | multi-source datastore.pcrf -fieldname=calling-station-  
id,msisdn -fieldvalue=34651xxxxxx -columnfield=acct-output-octets,framed-ip-  
address,full-name,acct-session-time,id
```

-charttype=table | ladder: Optional. When set to table it will show a table with the results of the query. When set to ladder it will show a ladder + table with the results of the query. Ladder will only work when gui hint config files are properly configured. When this option is not present it defaults to -charttype=table

Example:

```
from=2015-01-22T00:00:00 to=2015-01-22T23:59:59  
sourcetype=datastore.session_records | multi-source datastore.pdu_dns_records -  
fieldname=msisdn,msisdn -fieldvalue=<msisdn>-charttype=table
```

Timestamp	Key value	Source type	Imeisv	Packetsup	Apn	Imsi	Packetsdown	Net flowid
2015-01-22T00:01:32.850	1	3 datastore.ottapp_records	HTC One S (359902042082920)	1	ZUBER.APN_1576	311	2007	1
2015-01-22T00:01:34.457	1	3 datastore.ottapp_records	HTC One S (359902042082920)	16	ZUBER.APN_1576	311	2007	13
2015-01-22T00:01:34.973	1	3 datastore.ottapp_records	HTC One S (359902042082920)	1	ZUBER.APN_1576	311	2007	1
2015-01-22T00:01:37.830	1	3 datastore.ottapp_records	HTC One S (359902042082920)	13	ZUBER.APN_1576	311	2007	10
2015-01-22T00:01:37.849	1	3 datastore.ottapp_records	HTC One S (359902042082920)	10	ZUBER.APN_1576	311	2007	7
2015-01-22T00:01:39.599	1	3 datastore.ottapp_records	HTC One S (359902042082920)	14	ZUBER.APN_1576	311	2007	9
2015-01-22T00:01:39.990	1	3 datastore.ottapp_records	HTC One S (359902042082920)	15	ZUBER.APN_1576	311	2007	13
2015-01-22T00:02:00.573	1	3 datastore.ottapp_records	HTC One S (359902042082920)	10	ZUBER.APN_1576	311	2007	11
2015-01-22T00:03:37.360	1	3 datastore.ottapp_records	HTC One S (359902042082920)	11	ZUBER.APN_1576	311	2007	11
2015-01-22T00:03:41.600	1	3 datastore.ottapp_records	HTC One S (359902042082920)	14	ZUBER.APN_1576	311	2007	10
2015-01-22T00:03:41.777	1	3 datastore.session_records	HTC One S (359902042082920)	183	ZUBER.APN_1576	311	2007	153
2015-01-22T00:03:41.777	1	3 datastore.ottapp_records	HTC One S (359902042082920)	11	ZUBER.APN_1576	311	2007	7
2015-01-22T00:03:42.910	1	3 datastore.ottapp_records	HTC One S (359902042082920)	15	ZUBER.APN_1576	311	2007	11
2015-01-22T00:04:03.185	1	3 datastore.ottapp_records	HTC One S (359902042082920)	20	ZUBER.APN_1576	311	2007	19
2015-01-22T00:04:05.312	1	3 datastore.ottapp_records	HTC One S (359902042082920)	16	ZUBER.APN_1576	311	2007	15
2015-01-22T00:05:59.925	1	3 datastore.ottapp_records	HTC One S (359902042082920)	1	ZUBER.APN_1576	311	2007	1

2.6.16 network

Synopsis

The network function will display the network by auto-discovering it through the different available fields in the records.

Syntax

```
network type [-path=path] field [fieldN] [order-by orderField
[orderFieldN] [asc | desc]]
```

Parameters

type can be one of the following elements:

- *rgraph*. Displays the network as an RGraph. This is the default representation if no type is specified in the command line.
- *hypertree*. Displays the network as a hypertree.
- *treemap*. Displays the network as a treemap.
- *spacetree*. Displays the network as a tree.

Example:

```
... | network treemap
```

-path=pathFields can be used to show the nodes and connections in network representation.

- *pathFields* can be one of the table fields specified in sourcetype separated by ">" with no blank spaces.

Example: Representation of the volume transferred between sgsn and ggsn nodes.

```
... | network -path=3gpp-sgsn-address>ras-client SUM(acct-input-octets)
```

field..fieldN can be one of the following elements:

- one of the table fields specified in sourcetype.
- a function:
 - avg(fieldA). This function calculates the average value of the field specified in fieldA.
 - median(fieldA). This function calculates the median value of the field specified in fieldA.

- max(fieldA). This function calculates the maximum value of the field specified in fieldA.
- min(fieldA). This function calculates the minimum value of the field specified in fieldA.
- sum(fieldA). This function sum the values of the field specified in fieldA.
- count(fieldA). This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified.
- unique(fieldA). This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified.
- avg_if(fieldA, expression). This function calculates the average value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- median_if(fieldA, expression). This function calculates the median value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- max_if(fieldA, expression). This function calculates the maximum value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- min_if(fieldA, expression). This function calculates the minimum value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- sum_if(fieldA, expression). This function sum the values of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- count_if(fieldA, expression). This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified when the expression defined is true. Available expressions are the same as the ones used in where function
- unique_if(fieldA, expression). This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified when the expression defined is true. Available expressions are the same as the ones used in where function
- *[fieldA operator fieldB] [as expressionName]* : an expression or group of expressions in brackets.
 - fieldA, fieldB can be one of the following elements:
 - one of the table fields specified in sourcetype.
 - numerical values.
 - a function:
 - avg(fieldA). This function calculates the average value of the field specified in fieldA.
 - median(fieldA). This function calculates the median value of the field specified in fieldA.
 - max(fieldA). This function calculates the maximum value of the field specified in fieldA.
 - min(fieldA). This function calculates the minimum value of the field specified in fieldA.
 - sum(fieldA). This function sum the values of the field specified in fieldA.

- `count(fieldA)`. This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified.
- `unique(fieldA)`. This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified.
- `avg_if(fieldA, expression)`. This function calculates the average value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- `median_if(fieldA, expression)`. This function calculates the median value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- `max_if(fieldA, expression)`. This function calculates the maximum value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- `min_if(fieldA, expression)`. This function calculates the minimum value of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- `sum_if(fieldA, expression)`. This function sum the values of the field specified in fieldA when the expression defined is true. Available expressions are the same as the ones used in where function
- `count_if(fieldA, expression)`. This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified when the expression defined is true. Available expressions are the same as the ones used in where function
- `unique_if(fieldA, expression)`. This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified when the expression defined is true. Available expressions are the same as the ones used in where function

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- *operator* can be any of the arithmetic operators: +, -, *, /
- *as expressionName*: to specify an alias for the expression. This parameter is optional.

Examples:

... | network [avg(acct-output-octets) + avg(acct-input-octets)] as avgVol order-by avgVol desc
... | network [avg(acct-output-octets) / 3] as avgVolThird order-by avgVolThird desc

order-by orderField..orderFieldN [asc|desc]: to order results by an specific criteria. Being:

- *orderField..orderFieldN* must be one of the fields specified in the network fields mentioned above.
- *asc|desc*: to specify if you want ascendant or descendant order. Optional. By default, order is ascendant.

Example:

... | network [AVG(acct-input-octets) * 4] as avg4Times order-by avg4Times

2.6.17 pivot-table

Synopsis

The pivot-table function will display a pivot table with the rows and columns passed as group by **parameters**.

Syntax

pivot-table field [fieldN] by field_Row_By [field_Row_ByN] and field_Column_By [field_Column_ByN]

Parameters

field [fieldN] can be one of the following elements:

- One of the fields contained in the query sourcetype.
- A function included in Table 3.

Table 5. <Function> Parameter Description

<function>	Meaning
avg(fieldA)	This function calculates the average value of the field specified in fieldA. Where fieldA is one of fields contained in the sourcetype.
median(fieldA)	This function calculates the median value of the field specified in fieldA
max(fieldA)	This function calculates the maximum value of the field specified in fieldA
min(fieldA)	This function calculates the minimum value of

	the field specified in fieldA
sum(fieldA)	This function sum the values of the field specified in fieldA
count(fieldA)	This function count the number of events of the field specified in fieldA or the primary key if no fieldA is specified
unique(fieldA)	This function counts the unique occurrences number of the field specified in fieldA or the primary key if no fieldA is specified

- $[fieldA \ operator \ fieldB] [as \ expressionName]$ which is an expression or group of expressions in brackets, where:
 - $fieldA, fieldB$ can be:
 - one of the fields included in sourcetype.
 - numerical values
 - a function as described in Table 3.
 - $operator$ can be any of the following arithmetic operators included in Table 4
 - $as \ expressionName$ it is an optional parameter to specify an alias for the expression

Table 6. $<\text{operator}>$ Parameter Description

$<\text{operator}>$	Meaning
+	Addition
-	Subtraction
*	Multiplication
/	Division

Examples

```
... | pivot-table [acct-output-octets + acct-input-octets] as volume by country and rat-type
... | pivot-table [acct-output-octets + acct-input-octets] by rat-type
... | pivot-table [(acct-output-octets + acct-input-octets) * 5] by rat-type
... | pivot-table [acct-output-octets + acct-input-octets] [(acct-output-octets + acct-input-octets)/unique] by rat-type
```

from=2015-01-22T00:00:00 to=2015-01-22T23:59:59

sourcetype=datastore.signalizing_records | pivot-table avg(duration) by bearer.apn and bearer.rat-type

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The screenshot shows a query results page with a header bar for 'Logged as user' and 'Logout'. Below the header is a search bar with the query: 'from=2015-01-22T00:00:00 to=2015-01-22T23:59:59 sourcetype=datastore.signalizing_records | where rat-type != "" | pivot-table avg(duration) by bearer.apn and bearer.rat-type'. The main area displays a table with two columns: 'Apn' and 'Avg(GTP.DURATION)'. The table has 14 rows, each corresponding to a different APN with its average duration.

Apn	Avg(GTP.DURATION)
ZUBER.APN_1105	04:26:23.367
ZUBER.APN_1160	
ZUBER.APN_1227	00:01:33.872
ZUBER.APN_1232	00:02:40.340
ZUBER.APN_1521	00:55:03.068
ZUBER.APN_1576	
ZUBER.APN_1697	01:33:44.742
ZUBER.APN_1765	00:01:47.242
ZUBER.APN_1770	00:00:01.919
ZUBER.APN_2273	00:24:28.561
GERAN (2)	UTRAN (1)
	Avg(GTP.DURATION)
	05:00:50.985
	16:26:15.544
	00:05:35.260
	00:17:58.194
	02:59:24.703
	13:55:17.521
	04:18:40.120
	01:08:05.816
	15:27:27.069
	00:20:11.768

2.6.18 unique

Synopsis

The unique function will return the number of unique keys for the given time range after all filters have been applied.

Syntax

unique [field]

field is one of the table field specified in sourcetype. This field is used for aggregation.

Example: Number unique users per APN.

```
from=2015-01-22T00:00:00 to=2015-01-22T23:59:59
sourcetype=datastore.signalizing_records | unique apn
```

The screenshot shows a query results page with a header bar for 'Logged as user' and 'Logout'. Below the header is a search bar with the query: 'from=2015-01-22T00:00:00 to=2015-01-22T23:59:59 sourcetype=datastore.signalizing_records | unique apn'. The main area displays a table with one column labeled 'Apn'. The table has 18 rows, each listing a unique APN and its count of distinct bearers.

Apn	Count distinct(bearer.msisdn)
ZUBER.APN_952	3
ZUBER.APN_945	1
ZUBER.APN_927	1
ZUBER.APN_913	2
ZUBER.APN_908	3
ZUBER.APN_901	2
ZUBER.APN_887	1
ZUBER.APN_882	1
ZUBER.APN_879	1
ZUBER.APN_876	2
ZUBER.APN_835	1
ZUBER.APN_801	2
ZUBER.APN_651	2
ZUBER.APN_645	2

2.6.19 where

Synopsis

The where command allows to specify the conditions to perform the search.

Syntax

where condition

Parameters

condition can be one of the following elements:

1. fieldA operator conditionA

- fieldA is one of the table field specified in sourcetype.
- operator can be any of the following operators:
 - < (less than)
 - (greater than)
 - <= (less than or equal)
 - >= (greater than or equal)
 - = (equal)
 - != (not equal)
 - starts-with (starts with for strings)
 - !starts-with (not starts with for strings)
 - ends-with (ends with for strings)
 - !ends-with (not ends with for strings)
 - contains (contains for strings)
 - !contains (not contains for strings)
- conditionA can be:
 - an alphanumeric value. For *example*:

... | where rat-type = 6

- a decorated or translated value. For *example*:

... | where rat-type = UTRAN

- a substring of the value in quotes (can contain blank spaces). For *example*:

... | where device = "Apple iPhone 5"

... | where imsi != ""

2. fieldA in conditionA conditionN

- fieldA can be:
 - one of the table field specified in sourcetype.
 - one of the following reserved words.
 - carrier. to filter by carrier.
 - country. to filter by country.
 - device. to filter by device type.
 - uli-cell. to filter by user location.
- conditionA..conditionN are alphanumeric values. For *example*:

... | where rat-type in 6 4



Note that Forecast, Anomaly, Clustering and Reduce funtions are not supported in version 5.2.0

