Workspace Area

The workspace area in Scope hosts the result visualization views. In this area, measurement results can be configured, viewed, and analyzed.

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Measurement Control аx Dashboards Flows Numerical Map QoE Status Not connected \$ Name Measurement name Malformed packets, primary Malformed packets, primary, total Description Packets dropped by the interface, primary Packets dropped by the interface, prima SNR, primary Short packets, primary Single-point measurement Two-point measurement Hostname or address Packets dropped by pcap, primary SNR, primary Short packets, primary Duplicates, primary (sent)

The workspace area is on the right side of the window:

The workspace area is divided into six main tabs, which offer various methods to view and analyze measurement results. See the subsections below for more information on each tab.

1. Dashboards Tab

Visualizing average results in charts is the most common way to analyze measurement results in Qosium Scope. This can be done in the dashboards tab.

1.1. Overview

The dashboards tab contains, as the name implies, dashboards. Dashboards visualize *average results* with plots and charts. Each dashboard has its own tab, and you can freely create, remove, and switch between tabs, even during an ongoing measurement.

Dashboards tab has four main elements. These elements are further explained in the following sections.

- 1. Dashboard Tabs List of created dashboards
- 2. Charts Area Active plots and meters in the current dashboard
- 3. Settings Settings for the current dashboard
- 4. **Toolbar** Quick actions for the current dashboard



1.2. Dashboard Tabs

The dashboard tabs panel is used to organize and browse dashboards. In a typical, simple measurement, a single dashboard is sufficient. However, when viewing many various statistics, organizing the charts in multiple dashboards helps keep the interface neat and tidy.

Dashboards can be freely added and removed to allow better organization of measurement results. For example, you can add plots in one dashboard and meters in another. Also, arranging different statistics in their own dashboards is a good option.

- To add a new empty dashboard, click the *blue plus-sign* on the left side of the tab panel
- To remove an existing dashboard, click the *white x* next to the dashboard name in the tab panel



1.3. Chart Area

This region of the dashboard shows the opened charts. Each chart represents a single statistic in average results. Some plots have the combined *sent* and *received* directions of the same metric.

Plots have a few mouse controls available for viewing the results. Hover cursor over plots lines to inspect values. To zoom, draw a rectangle over the area of interest with the left mouse button. Use the right mouse

button to zoom back out.



1.4. Settings

Each dashboard has its own settings panel, where you can select the charts from two categories: plots and meters. You can also give the dashboard a name, shown in the dashboard tabs panel, for easy recognition.

Use the *blue triangles* to expand/collapse each statistics group in *Plots* and *Meters* lists. Left-click on any statistics to display them immediately in the charts area. To select multiple statistics, press and drag with the left mouse button over the preferred statistics. Statistics, which have results, are marked with *bold* text. Clicking an active statistic removes the corresponding chart from the chart area.

For more information on each statistic in average results, see Average Results.



1.5. Toolbar

The buttons on the right side of each dashboard can be used to control the settings group's visibility and the arrangement of charts.

- 1. Dashboard Settings Show/hide Dashboard settings
- 2. Arrange in Tabs Arrange charts in tabs, where only one chart can be visible at a time
- 3. Arrange in Tiles Arrange charts in tiles, where charts are stacked in a grid-like format (default)
- 4. Arrange Freely Move and resize charts manually



2. Flows Tab

The Flows tab of Scope contains the flow map, which lists currently active flows and their statistics in a table.

The flow monitor in Scope is very useful, showing the individual traffic flows composing the total captured traffic in the monitored interface with the given packet filter. It also has a security aspect, allowing you to easily detect if there are flows that should not be. In addition, you can use it to verify that the packet filter is functioning as expected, especially in complex measurement scenarios.

Dashboards Flows Numerical Map QoE Status								
	Source	Destination	Protocol	State	Load [b/s] (downlink)	Load [b/s] (uplink)	Age [s]	Inactivity
	192.168.0.112 : 58492	89.166.9.145 : 443	тср	Persistent	1180	3502	118.4	
	192.168.0.100 : 55301	239.255.255.250 : 1900	UDP	New		3259		
	192.168.0.100 : 55300	239.255.255.250 : 1900	UDP	New		3017		
	192.168.0.106 : 54915	192.168.0.255 : 54915	UDP	Persistent		2439	119.4	
	192.168.0.112 : 54915	192.168.0.255 : 54915	UDP	Persistent		2439	119.5	
	192.168.0.112 : 58694	37.16.105.72 : 22	тср	New	7968	2326	2.5	
	00:d8:61:7a:ba:94 : 62654	ff:ff:ff:ff:ff:ff : 5355	ARP	Persistent		335	7.8	
	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 63771	2001:14b8:1000::0002 : 53	UDP	New	315	195	4.1	
	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 61255	2001:14b8:1000::0002 : 53	UDP	New	311		4.1	
	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 49169	2001:14b8:1000::0002 : 53	UDP	Persistent			24.1	
11	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 60534	2001:14b8:1000::0002 : 53	UDP	Persistent			12.9	12
12	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 60933	2001:14b8:1000::0002 : 53	UDP	Old			32.9	32
13	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 61121	2001:14b8:1000::0002 : 53	UDP	Persistent			11.1	11
14	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 62755	2001:14b8:1000::0002 : 53	UDP	Old			32.8	32
15	2001:14ba:16fd:8300:24d4:ba2f:5f70:7dab : 63309	2001:14b8:1000::0002 : 53	UDP	Persistent			18.3	
16	fe80::bad9:4dff:fe61:8564	ff02::0001	ICMPV6	Persistent			110.8	15
17	192.168.0.112 : 57671	37.16.105.72 : 8888	тср	Persistent			118	
18	192.168.0.112 : 123	62.241.198.252 : 123	UDP	Persistent			108.7	12
19	192.168.0.112 : 56210	139.99.46.91 : 443	тср	Persistent			119.6	
20	192.168.0.112 : 58490	139.99.46.91 : 443	ТСР	Persistent			11.1	
21	192.168.0.112 : 58447	172.67.72.165 : 443	тср	Old			32.9	32

The view has a set of fixed columns. For more information on the columns and flow results in general, see <u>Flow Results</u>.

Column Header	Description
Source	The source address and port (if port number is available)
Destination	The source address and port, (if port number is available)
Protocol	The protocol above the address layer
State	New => Persistent => Old

Column Header	Description
Load [b/s] (downlink)	The current throughput in the downlink (received direction)
Load [b/s] (uplink)	The current throughput in the uplink (sent direction)
Age [s]	The age of the flow in seconds
Inactivity	The time passed in seconds since the last packet detected in this flow

Each flow has a state, which can have one of three values:

- New The flow is new and reported for the first time
- Persistent The flow has traffic or has been inactive less than the set limit
- Old The flow has been inactive longer than the set limit and will be removed the next time flow results arrive

The *inactivity* counts duration from the last observed packet in the flow. If the flow is active, this number remains at or near zero. When inactivity begins to increase, the flow has stopped, i.e., no more packets are observed related to that. Once it reaches the set limit, i.e., <u>Flow timeout</u>, the flow is deemed ended and will be removed from the visualization.

🚹 No flows

If flows do not appear in the flow monitor during measurement:

- Check that flow results are selected in the <u>Results Tab</u>
- Check that the capture interface is pointing to the correct interface
- If using manual packet filter, make sure that the packet filter is not too strict
 - Test by switching to automatic filtering and see if flows begin to appear in the flow map

3. Numerical Tab

The numerical tab in Scope has two sub-tabs: Average results and Packet results. As the names imply, these two tabs show the corresponding result types in numerical table format.

3.1. Average Results Tab

This tab displays the average results in a table format. The table has a set of columns that can be selected for view. For more information on the columns and average results in general, see <u>Average Results in</u> <u>Qosium</u>.

Average Results Packet Res	sults				
	Jitter (received)	Jitter (sent)	Traffic, primary, bytes (received)	Traffic, secondary, bytes (received)	Table Settings
10.6.2020 15:08:01.812			1.11 kbytes	1.11 kbytes	Table columns
10.6.2020 15:08:02.813		1.362 ms	1.11 kbytes	1.11 kbytes	Jitter threshold crossings, total (received)
10.6.2020 15:08:03.813			888 bytes	1.11 kbytes	Jitter threshold crossings, total (sent)
10.6 2020 15:08:04 812	379s	738.05	1 11 khytes	1 11 khytes	Jitter, max (received)
10.0.2020 13.00.04.012	575 03	150 us			Jitter, moving average (received)
10.6.2020 15:08:05.811	1.889 ms	1.439 ms	1.11 kbytes	1.11 kbytes	Jitter, moving average (sent)
10.6.2020 15:08:06.813			1.11 kbytes	1.11 kbytes	Lost packets (sent)
10.6.2020 15:08:07.812			1.11 kbytes	888 bytes	Lost packets, total (received)
10.6 2020 15:00:00 012	615 us	810 uc	1 11 kbytes	1 11 kbytes	Lost packets, total (sent)
10.0.2020 13.06.06.612	015 05	015 03	1.11 KDytes	1.11 KBytes	Packet loss (received)
10.6.2020 15:08:09.812	668 us	1.115 ms	1.11 kbytes	1.11 kbytes	Packet loss, total average (received)
10.6.2020 15:08:10.811		1.096 ms	888 bytes	1.11 kbytes	Packet loss, total average (sent)
10 6 2020 15:08:11 813	684 us	1.366 ms	1.11 kbytes	1.11 kbytes	QoE-evaluation: GQOSM (received) QoE-evaluation: GQoSM (sent)
					QoE-evaluation: PSQA (received)
10.6.2020 15:08:12.813	152 us	1.148 ms	1.11 kbytes	1.11 kbytes	QoE-evaluation: PSQA (sent)
10.6.2020 15:08:13.811		1.752 ms	1.11 kbytes	888 bytes	QoS samples (received) QoS samples (sent)
10.6.2020 15:08:14.813	1.338 ms	3.219 ms	1.11 kbytes	1.11 kbytes	Sent info is not found (received)
10.6.2020 15:08:15.813	1.519 ms	896 us	1.11 kbytes	1.11 kbytes	Sent info is not found (sent)
10 6 2020 15:00:16 012	1.456 mc	1 152 mc	999 bytes	1.11 khutor	Sent info is not found, total (received)
10.0.2020 15:08:10.812	1.450 115	1.105 1115		I.TT KUYICS	Freeze table
10.6.2020 15:08:17.813	2.555 ms	902 us	1.11 kbytes	1.11 kbytes	
10.6.2020 15:08:18.812	1.042 ms		1.11 kbytes	1.11 kbytes	Auto Column Width (include headers)
10.6.2020 15:08:19.811			1.11 kbytes	888 bytes	Auto Column Width (exclude headers)
10.6 2020 15:08:20 811					

Table columns lists all available average results. Use the *blue triangles* to expand/collapse each statistics group. Left-click on any statistics to display it immediately in the table as a column. Left-clicking an active statistic again will remove the column. To select multiple statistics, press and drag with the left mouse button. Statistics, which have results, are shown with bold text.

Freeze table stops automatic update of the table. This is especially helpful if there's a need to study the results in more detail during the measurement.

Auto Column Width (Include Headers) resizes columns according to the widest row. If you want to resize columns without taking the header row's width into account, use Auto Column Width (Exclude Headers).

(i) Tip

Double-click a result row to see the corresponding packet results in Packet Results Tab.

3.2. Packet Results Tab

This tab displays the packet results in a table format. The table has a set of fixed columns. For more information on the columns and packet results in general, see <u>Packet Results in Qosium</u>.

Dashboards Flows Numerical Map QoE Status										
Average Results	Packet Re									
Showing result		/ 292 📕 Always sho	w most recent results							
Timestamp	Direction	Source Address	Destination Address	Protocol	Packet Size [B]	Delay [us]	Jitter, average [us]	Jitter, absolute [us]	Packet ID	Fragment Number
18:36:39.126		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						2 880 328 801	
18:36:39.219		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201							
18:36:39.329	Sent	fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						1 996 812 314	
18:36:39.384	Received	192.168.0.104 : 8177	192.168.0.103 : 49801	тср					1 604 892 196	
18:36:39.422		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						1 919 550 222	
		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						1 422 555 879	
	Sent	fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						1 543 584 274	
18:36:39.592		fe80::c1ba:0470:1617:a73c	fe80::9553:ee0e:63d4:af83	ICMPv6					1 856 191 011	
18:36:39.599	Received	fe80::9553:ee0e:63d4:af83	fe80::c1ba:0470:1617:a73c	ICMPv6					1 673 280 681	
18:36:39.623		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						3 967 444 118	
18:36:39.717		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						3 709 558 840	
		fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						3 562 893 671	
	Received	192.168.0.104 : 8177	192.168.0.103 : 49801	тср					3 634 862 732	
	Sent	fe80::c1ba:0470:1617:a73c : 56761	fe80::9553:ee0e:63d4:af83 : 5201						2 111 925 241	
18:36:39.940	Received	192.168.0.104 : 8177	192.168.0.103 : 49801	тср					3 812 242 168	
		192.168.0.104	192.168.0.103	ICMP					4 037 182 691	
		192.168.0.103	192.168.0.104	ICMP					2 902 645 265	
18:36:40.001	Received	192.168.0.104 : 22	192.168.0.103 : 49828	тср		3 844			1 942 516 962	

When **Always show most recent results** is checked, Scope will automatically switch to the newest complete result. Unchecking it allows you to select any result index.

4. Map Tab

The map tab in the Scope workspace area is used to draw heatmaps on a geographical map. This type of visualization is beneficial when measuring Quality of Service or Quality of Experience in a real location.

4.1. Overview

The map tab consists of two main elements: *Map Window* and *Settings*. See the following subsections for more information on these elements. For a practical example of using this tab, see resources/documentation/how-to-guides/qos-heatmaps-with-scope.

Dashboards Flows Numerical Map QoE Status					
			Update Heatmap		
	Map style Kaitotek		Auto-update		
🖉 Qosium Scope Map — 🗆 🗙	Alow downloading map tiles		Source		
0.414 km	Show/H	lide Map	Malformed packets, prima Packets dropped by pcap, p	y (pkts) primary (pkts)	
June Hand	Auto	Zoom	Packets dropped by the int SNR, primary (dB)	erface, primary (pkts)	
The second secon	Clear C	Cache	Short packets, primary (pk Signal strength, primary (dBr	ts) n)	
			 General statistics, secondary Traffic statistics, primary Dunlicates, primary (received) 	1) (nkte)	
PARKANI CHERNATU	Show probe on map		Duplicates, primary (received Duplicates, primary (sent) (p Packet size, primary (received	kts) red) (bytes)	
	Location source		Packet size, primary (sent) Traffic, primary, bits/s (rec	(bytes) eived) (kbits/s)	
	Manual Probe Position (rig		Traffic, primary, bits/s (sent) (kbits/s) Traffic, primary, bytes (received) (kbytes)		
Kauper Jacobian State			Traffic, primary, bytes (sent) (kbytes) Traffic, primary, packets (received) (pkts)		
			Traffic, primary, packets (s Traffic, primary, packets/s	ent) (pkts) (received) (pkts/s)	
			 Traffic statistics, secondary 	(sent) (pkts/s)	
	Image source		15,7000	109,3000	•
			Swaj	• <>	
SAARBSTON	Opacity		Auto Scale		
109.3	Rotation		Filter values outside scale		
	Latitude (top)		Draw distance		
	Latitude (bottom)		Resolution		
	Longitude (left)		Opacity		
	Longitude (right)		Value compositing mode		

4.2. Map Window

To open the map window, press Show/Hide Map in the Map Control settings group.

Dashboards Flows Numerical Map QoE Status		
	Title	
	Map style Basic	
	Allow downloading map tiles	
AND	Show/Hide Map	
0.718 kr	Auto Zoom	
march and a second a		
ru de la companya de la compa		
Heidin	Show probe on map	
ii.	Location source Primary Probe	

The window can be moved, scaled, maximized, and minimized normally as any other window. The map can be navigated with a few mouse/keyboard controls:

- Zoom in/out Mouse wheel up/down
- Pan map Press and hold the left mouse button and drag
- **Pitch/rotate map** Press and hold either left or right *Ctrl* button on the keyboard, then simultaneously press and hold the left mouse button and drag

4.3. Settings

The map is configured via settings displayed on the right side of the tab. See the following subsections for more information on each settings group.

4.3.1. Map Control

The map control group has controls for showing/hiding the map window, selecting map theme, and controlling map data download and caching.

Map Contro	I	
Title		
Map style	Basic	•
Allow d	lownloading map tiles	
	Show/Hide Map	
	Auto Zoom	
	Clear Cache	

When **Allow downloading map tiles** is checked, Scope can download map data from the map cloud service. It is recommended to keep this option checked when preparing a measurement but unchecked during measurement if there's a risk that the traffic between Scope and map cloud service will disrupt measurement results.

Show/Hide Map toggles the visibility of the map window.

Use **Auto Zoom** to reset pitch and rotation. Auto-zoom also sets location and zoom according to the following priority:

- Focus on the heatmap, if available
- Focus on overlay image, if available
- If neither heatmap nor overlay image is visible, focus on the map cursor

Clear Cache... removes the map cache file from the computer. Use it to release disk space (typically ~10-60MB). Removing the cache file can be helpful when resolving issues related to map data download & rendering. Removing the map cache does not affect heatmap or measurement results.

4.3.2. Location

The location group considers the geographical location of the Probes.



Show Probe on map toggles the visibility of the selected source Probe icon on the map. The icon appears on the map as follows:



If the Probe icon is not visible on the map even when this option is checked, it may be due to the Probe having no location info yet, or the map hasn't been updated.

Manual Probe Position allows placing the location of the source Probe manually. This is useful functionality when you are performing, e.g., indoor measurements, where it is not possible to enable GNSS or other automatic positioning systems to Probe. During measurement, enable this option, then right-click anywhere on the map. The map cursor appears in this location. Manual positioning is available only when the measurement is running.

\triangleright

4.3.3. Overlay Image

The overlay image can be used to add an image on top of the map. Typically, this feature is used to add a floor plan for an interior measurement or another layout image of a known location whenever the map itself is visually inadequate.

Overlay Image		
Image source		x
Opacity		 -
Rotation		—
Latitude (top)	60,000000°	÷
Latitude (bottom)	-60,000000°	÷
Longitude (left)	-60,000000°	÷
Longitude (right)	60,000000°	÷

Image source indicates the filename of the current overlay image. Use ... to select the image file or **x** to remove the current overlay image.

Opacity controls the transparency of the image. By default, the overlay image is fully opaque. Adjust the opacity to allow map visuals to pass through the overlay image partially.

Rotation allows adjusting the overlay image orientation if the source image is not aligning with the map projection.

Latitude (top), Latitude (bottom), Longitude (left), and Longitude (right) are used to align the overlay image on top of the map.

4.3.4. Heatmap

The heatmap group contains controls for drawing and displaying the QoS heatmap on the geographical map.



Update Heatmap, as the name implies, updates the heatmap immediately. The time the update takes

depends on the amount of data and the visualization settings.

Auto-update can be used to update the heatmap in every *n*th second. Use the spin box to adjust the interval.

Source determines the QoS statistic that the heatmap visualizes. Use the *blue triangles* to expand/collapse each statistics group.

The Scale group controls how the sample values are scaled linearly into the displayed gradient. Give the scale limits manually, or use Auto Scale to automatically use the current minimum and maximum samples as scale limits. Use Swap <> to swap the given scale limits, effectively inverting the heatmap colors. When Filter values outside scale are checked, values outside scale limits are not included in the heatmap.

Draw distance indicates the radius of influence of each data point. There's no right or wrong value for draw distance; instead, choose a value that serves the best visual appearance. For an outdoor measurement, values starting from 10 m are usually sensible. For small indoor spaces, values between 1 and 10 meters make more sense.

Resolution determines the draw precision of the heatmap image. Low-resolution values yield more accurate images than higher values. Keep in mind that the heatmap's actual precision depends on the amount and distribution of the measurement samples.

Opacity controls the transparency of the heatmap. By default, the heatmap is fully opaque. Adjust the opacity to allow map visuals to pass through the heatmap partially.

Value compositing mode determines the method of resolving the value of overlapping samples. Overlapping samples occur when two or more measurement samples are taken from the same location. The options are:

- Average Calculate the average of the samples
- Worst value Take the worst value and visualize it
- Best value Take the best value and visualize it

5. QoE Tab

The QoE tab can be used to configure and show a Quality of Experience indicator window. This window visualizes QoE statistics from average results and can be placed, for example, next to an external application window for quality reference.

The *QoE* tab contains one group for configuring and displaying a QoE indicator window. This window can be placed anywhere on the screen visualizing QoE results.

Dashboard	s Flows Numerical Ma	ap Status			
QoE In	dicator				
Title:					
Video	o Quality Monitor				
Туре					
\bigcirc	GQoSM	O PSQA	🍲 Video Quality Monitor	×	
Orier	ntation				
0	Horizontal	O Vertical			
Opa	city		Received	Sent	
_					
Value	e(s)				I
	Received Sent				
\bigcirc	Both				
	Show/Hide	QoE Indicator			

The QoE indicator has the following options:

- Title Type the title of the QoE Indicator Window
- **Type** Use either *GQoSM* or *PSQA* as the source model
- Orientation Display quality bars either with horizontal or vertical orientation
- **Opacity** Change the opacity of the indicator window
- Value(s) Show either the received, sent, or both directions
- Show/Hide QoE Indicator Toggle visibility of the QoE indicator window

No Quality Results

If the quality bars remain colorless during measurement:

- Verify from <u>numerical average results</u> that quality results are received properly
- If quality results are not received (all values are -):
 - See <u>No QoS Results</u> in <u>Troubleshooting</u>. If QoS results are missing, then the QoE indicator won't work either
- If quality results are received (values are or 1):
 - If using GQoSM, try relaxing the model settings in <u>QoE Tab</u> by disabling QoS parameters used for calculating the results
- If quality results are received properly (values range from 5 to 1):
 - Check that the correct source model is selected in **Type** (GQoSM or PSQA)

i Scopemon

Scope is intended for targeted manual measurements. For continuous QoE monitoring needs, see <u>Qosium Scopemon</u>. Scopemon has, in fact, a QoE visualization similar to Scope's, but it has some advanced features, such as automated alerts.

6. Status Tab

The status tab displays information about the current measurement and the operation of Scope.

6.1. Overview

The status tab contains three groups:

- Computed Parameters
- Results in Memory
- Log

Dashboards Flows Numerical Map QoE Statu	IS	
	—	
Computed Parameters Re	esults in Memory	
is and hart A	warages 671 (6 %)	
Packet filter 192 168 0 112		
P.	ackets 0	
Control packet interval 500 ms	eriod 11.11.2024 17:29:05 - 12.11.2024	
Averaging interval 1000 ms	20:01:01	
Loa		
[20:00:49] [detailed] [controller] P	SOA packetization interval: 0	Logging settings
[20:00:49] [detailed] [controller]: P	SOA resolution: 0	
[20:00:49] [detailed] [controller]: PS	SQA calculated movement quantity: 8.71041e-312	
[20:00:49] [detailed] [controller]: Pr	rimary Probe hostname: localhost	Print detailed messages
[20:00:49] [detailed] [controller]: Pr	rimary Probe custom port: 8177	
[20:00:49] [detailed] [controller]: Pr	rimary Probe senders mode (IPv4): 0	d
[20:00:49] [detailed] [controller]:	169.254.104.222	Clear
[20:00:49] [detailed] [controller]:	169.254.107.78	
[20:00:49] [detailed] [controller]:	192.168.0.103	
[20:00:49] [detailed] [controller]:	192.100.1.100	
[20:00:49] [detailed] [controller]:	192.168.90.127	
[20:00:49] [detailed] [controller]: Pr	rimary Probe senders mode (IPv6): 0	
[20:00:49] [detailed] [controller]:	fdl2:3456:789a:0001:0000:0000:0000:0010	
[20:00:49] [detailed] [controller]:	fe80:0000:0000:0000:2f9a:6ec0:fe65:9ff4	
[20:00:49] [detailed] [controller]:	fe80:0000:0000:0000:538c:169f:5d9b:2ae3	
[20:00:49] [detailed] [controller]:	fe80:0000:0000:0000:clba:0470:1617:a73c	
[20:00:49] [detailed] [controller]:	fe80:0000:0000:0000:d69c:0ead:a3ab:f520	
[20:00:49] [detailed] [controller]:	fe80:0000:0000:0000:e678:a3ef:d90d:c61a	
[20:00:49] [detailed] [controller]:	fe90:0000:0000:0000:0000:0000:0000:9000	
[20:00:49] [detailed] [controller]:	rimary Probe senders mode (Ethernet): 0	
[20:00:49] [detailed] [controller]: Fi	00:d8:61:7a:ba:94	
[20:00:49] [detailed] [controller]:	02:00:4c:4f:4f:50	
[20:00:49] [detailed] [controller]:	0a:00:27:00:00:15	
[20:00:49] [detailed] [controller]:	5c:f3:70:8b:93:b8	
[20:00:49] [detailed] [controller]:	84:af:ec:38:07:3d	
[20:00:49] [detailed] [controller]: Us	se secondary Probe: 0	
[20:00:49] [detailed] [controller]: Fe	etching packet filter	
[20:00:49] [detailed] [controller]: Pa	acket filter fetched: ip and host 192.168.0.112	
[20:01:02] [info] [controller]: St	topping measurement	
[20:01:02] [info] [controller]: Me	easurement stopped	
[20:01:02] [decalled] [ui]: Me	easurement duration: 12000 ms	

6.2. Computed Parameters

The computed parameters group displays the values, which are automatically calculated by Qosium when a measurement is started. Depending on the measurement settings, these may be the given manual values, but they may also differ if Qosium can determine values better suited for the measurement scenario.

Computed Parameters		
Packet filter	ip and (host 169.254.61.171 or host 169.254.155.140 or host 192.168.1.4 or host 192.168.1.243 or host 192.168.17.1 or host 192.168.157.1)	í)
Control packet interval	500 ms	
Averaging interval	1000 ms	

i Tip

Use the button next to the computed packet filter to copy it to the clipboard. You can then paste it as a template for <u>a manual packet filter</u>.

6.3. Results in Memory

This group shows how many results there are currently in Qosium Scope's memory.

- Averages
 - The number of average results in memory
 - The percentage in parenthesis tells the fraction of the reserved average results sample memory.
 - The sample memory size can be set under the Results tab.
 - When the sample memory is about to get full, some of the earliest samples will be erased.
- Packets
 - Indicates the number of packet-based results in memory
 - When average samples are erased from memory, the corresponding packet results are also removed.
- Period
 - Describes the period of time from the earlier result to the latest in memory.



6.4. Log

The log window contains information on the operation and events of Scope. Error and warning messages are also printed in the log for later review.

This group contains a few settings:

- Print detailed messages When checked, low level measurement functional messages are also included in the log
- Clear Clear the log window

Log	
<pre>[19:48:50] [detailed] [controller]: fe90:0000:0000:0000:0000:0000:0000:9000 [19:48:50] [detailed] [controller]: fe99:0000:0000:0000:0000:0000:9999 [19:48:50] [detailed] [controller]: Primary Probe senders mode (Ethernet): 0 [19:48:50] [detailed] [controller]: 00:d8:61:7a:ba:94 [19:48:50] [detailed] [controller]: 02:00:42:4f:4f:50 [19:48:50] [detailed] [controller]: 02:00:42:4f:4f:50</pre>	Logging settings
[19:10:00] [detailed] [controller]: 5c:f3:70:8b:93:b8	Clear
<pre>[19:48:50] [detailed] [controller]: 5c:f3:70:8b:93:b8 [19:48:50] [detailed] [controller]: 84:af:ec:38:07:3d [19:48:50] [detailed] [controller]: Use secondary Probe: 0 [19:48:50] [detailed] [controller]: Fetching packet filter [19:48:52] [info] [controller]: Packet filter fetched: icmp [19:48:52] [info] [controller]: Stopping measurement [19:48:53] [info] [controller]: Measurement stopped [19:48:53] [detailed] [ui]: Measurement duration: 2000 ms [19:48:56] [detailed] [controller]: Sending measurement parameters to primary Probe</pre>	
[19:48:56] [detailed] [controller]: Parameters sent successfully	
[19:48:56] [detailed] [controller]: Setting interface for primary Probe: Realtek PCIe GbE Family Controller	
[19:48:56] [detailed] [controller]: Primary Probe interface set successfully	
<pre>[19:48:56] [detailed] [controller]: Setting capture filter: [19:48:56] [detailed] [controller]: Setting capture filter: [19:48:56] [detailed] [controller]: Requesting average results [19:48:56] [detailed] [controller]: Requesting average results from primary Probe only [19:48:56] [detailed] [controller]: Requesting flow results [19:48:56] [detailed] [controller]: Requesting flow results</pre>	
[19:48:56] [info] [controller]: Measurement started	
[19:48:56] [detailed] [controller]: Fetching Probe parameters [19:48:56] [detailed] [controller]: Parameters fetched successfully [19:48:56] [detailed] [controller]: Printing out Probe parameters:	

(i) Accessing the log file

Scope also saves the log to a file. The location of the log file depends on the operating system.

In Windows, the filename is C:\Users\[username]\AppData\Local\Kaitotek\QosiumScope\debug.log.

In Linux, the filename is ~/.config/QosiumScope/debug.log or /etc/xdg/QosiumScope/debug.log.

7. Glossary

Uplink / Sent Direction

Refers to a network path direction where traffic is flowing away from the observer towards a remote point.

Downlink / Received Direction

Refers to a network path direction where traffic is flowing from a remote point towards the observer.

Quality of Experience

Indicates the overall performance of a network application, and how user's experience is affected by the network conditions.

For more information, see our article on <u>Quality of Experience</u>.

Generic QoS Measure Algorithm

A parameter based QoS mapping algorithm allowing to map a single quality indicator from several parameters. When tuned with real user tests, GQoSM allows also QoE estimations.

GQoSM, however, is meant for evaluating the influence of the network to the quality – not for estimating the absolute quality (e.g., including the defects of codecs, etc.). For more information, see our article on <u>Quality</u> of <u>Experience</u>.

Pseudo-Subjective Quality Assessment

A neural network based model for estimating QoE.

For more information, see our article on Quality of Experience.