

Quality of Experience

DPI Statistics Module

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About VAS Experts

VAS Experts is a telecom software developer. Since 2013, we have completed **over 2000 installations** worldwide.

Our team has **over 25 years work experience** in telecommunication software development and wide knowledge in technologies.

20M+
users

More than
35 Tbps

Latest Installations:

- Middle East
- CIS
- South America
- Europe
- Africa
- Asia-Pacific



Our products

Stingray Service Gateway (SSG) — multifunctional platform for traffic management

For Internet service providers:



DPI

QoS-based traffic management,
filtering by black and white lists



BNG/BRAS

Scalable and Cost-Effective
Software Gateway



AntiDDoS

Protecting the operator's network
from cyberattacks



QoE analytics

Traffic Monitoring and Analysis
System



CG-NAT

Providing transparent network
address and protocol translation



VEOS

Operating system

Our products

Stingray Service Gateway (SSG) — multifunctional platform for traffic management

For mobile operators:



PGW

An intelligent gateway that provides traffic control within the EPC architecture



PCEF

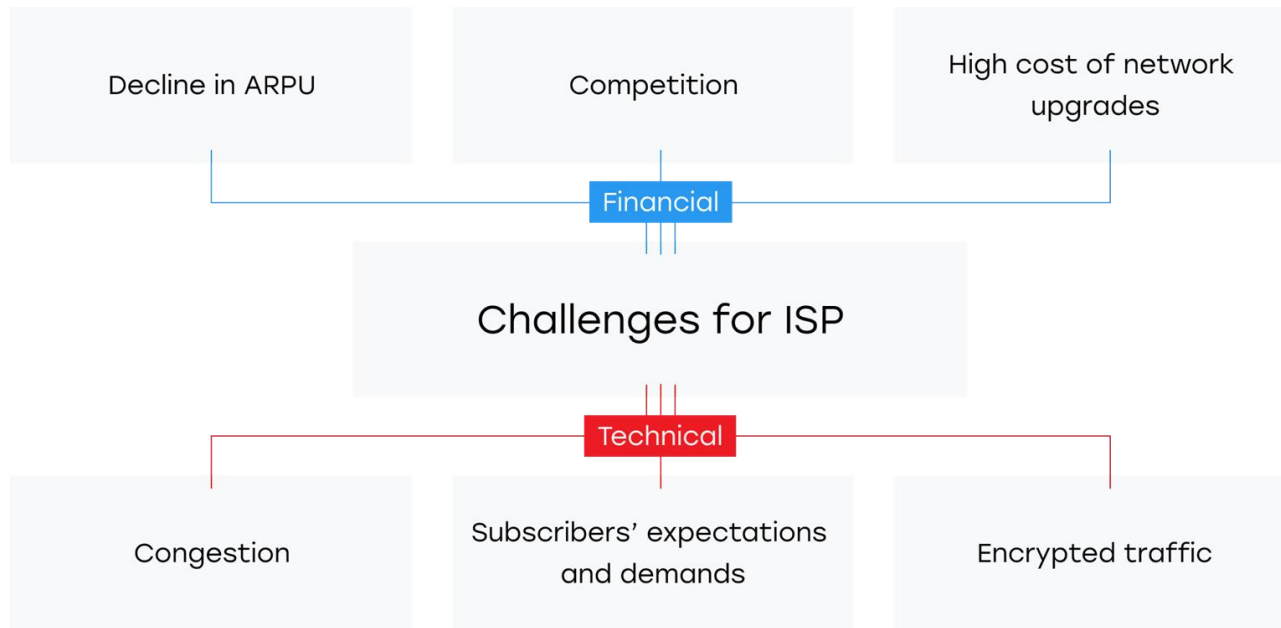
Flexible pricing based on various conditions in accordance with PCRF requirements



EPDGC

Solution for launching Wi-Fi Calling (VoWiFi)

Service Providers Challenges



Improving the Quality of Experience or Service Perception (QoE) makes it possible to reduce the risks faced by the operator's business.

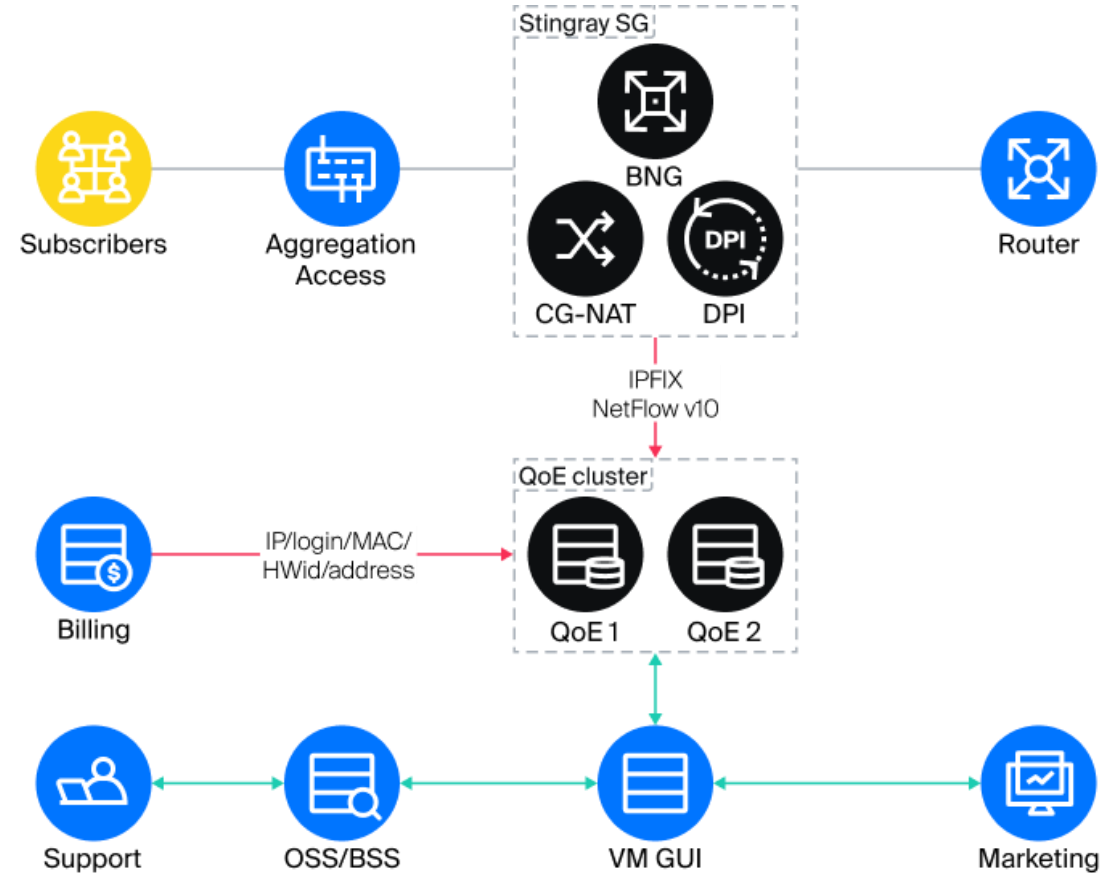
Analysis of network resources usage and user experience can reduce costs and helps to find the ways to get additional benefits.

Quality Of Experience Module

QoE is a software product responsible for statistic gathering and viewing subscribers' perception of services.

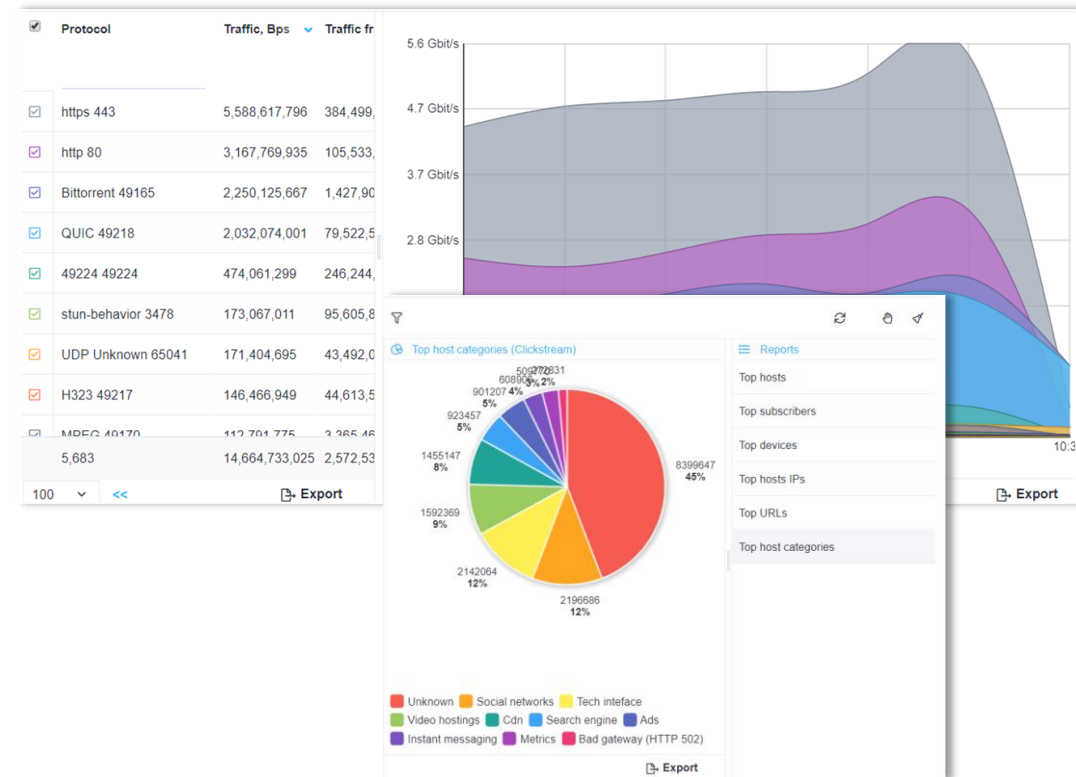
The statistics is transferred to special metrics which allow to define users' experience. It provides the operator with information about what kind of problems does he or she encounter.

The data obtained allows the operator to take action and to improve the services quality. The result is increasing customer loyalty.



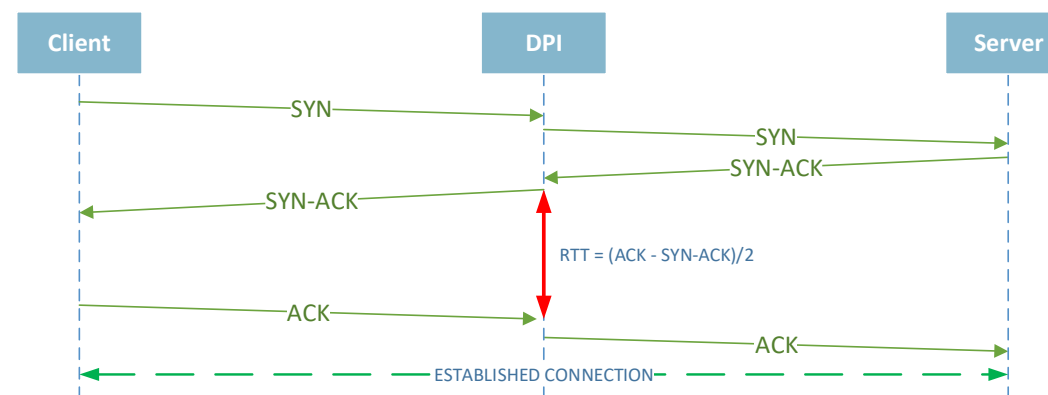
Graphical User Interface

1. Access restriction by role
2. Managing several DPI: monitoring and configuration
3. White and Black lists
4. Managing subscriber tariff plans
5. Creating of NAT-pools
6. HotSpot and Clickwrap option control
7. Work with statistics
8. API support for integration with external systems.



QoE Metrics

1. Round-trip-time (RTT);
2. Indicators of retries number;
3. The number of sessions, devices, agents, IP-addresses per subscriber;
4. Traffic distribution by application and transport protocols;
5. Traffic distribution by autonomous system (AS) numbers;
6. Clickstream for each subscriber.



How To Use QoE Metrics?



Improving Loyalty

- Conducting marketing campaigns concerning new tariffs, services and offers based on customer interests
- The service of user's personal account which provides information about the loan and quality of Internet connection
- Notifications about BotNet activity in subscriber's network (relevant for IoT)



Proactive Support

- Deep troubleshooting and monitoring with using Round Trip Time and TCP retransmitting
- Identification of problems with client terminal equipment, Wi-Fi router, access switch and aggregation
- Search for optimal peering points and connections to higher providers

How To Use QoE Metrics?



Upselling

- Determination and prompt response to quality degradation
- Management of possible customers outflow and analysis of its causes
- Automatic survey after subscriber's request to support



Customer Retention

- Selling equipment with better performance and coverage
- Restriction of services resale and transferring such subscribers to tariffs for legal entities
- Segmentation of subscribers: identification of clients' interests, hobbies and favorite online services, as well as their solvency

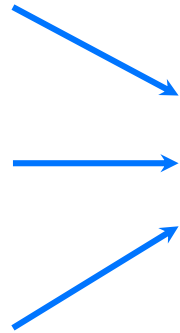
How to Improve QoE

ISPs Objectives

To increase the profitability
of business

To increase customer loyalty
with personalized offers

To reduce subscribers outflow



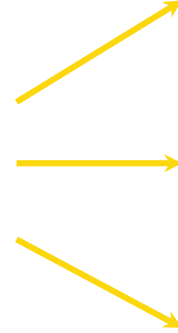
QoE

QoE Instruments

Interests-based subscriber list
segmentation

Marketing campaigns and
increasing ARPU

Statistics monetization

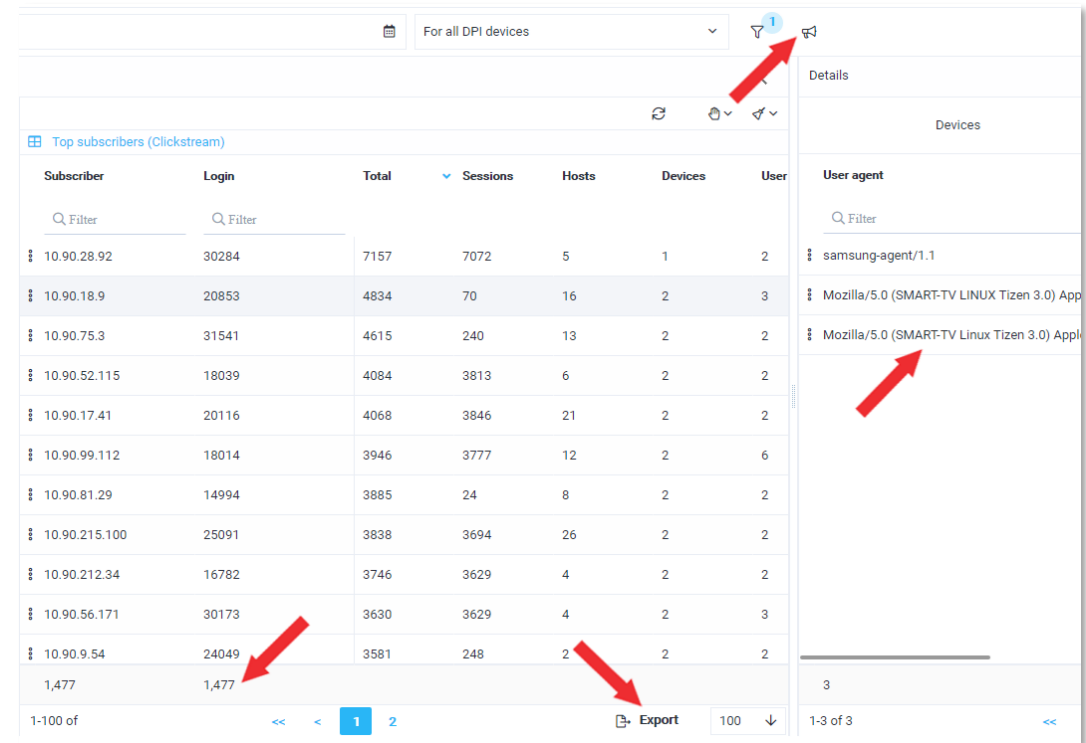


Use Case: Subscriber Profile

Category filters allow you to determine:

- Popular services (messaging, social networks, banking, telephony, dating sites)
- Volume of consumed traffic
- Level of income
- The presence of children, pets
- Hobbies
- Smart-TV devices

You can add these subscribers to a marketing campaign and show them special offers directly.



Subscriber	Login	Total	Sessions	Hosts	Devices	User
10.90.28.92	30284	7157	7072	5	1	2
10.90.18.9	20853	4834	70	16	2	3
10.90.75.3	31541	4615	240	13	2	2
10.90.52.115	18039	4084	3813	6	2	2
10.90.17.41	20116	4068	3846	21	2	2
10.90.99.112	18014	3946	3777	12	2	6
10.90.81.29	14994	3885	24	8	2	2
10.90.215.100	25091	3838	3694	26	2	2
10.90.212.34	16782	3746	3629	4	2	2
10.90.56.171	30173	3630	3629	4	2	3
10.90.9.54	24049	3581	248	2	2	2
1,477	1,477					

1-100 of << < 1 2 Export 100 ↓

Details

Devices

User agent

Filter

samsung-agent/1.1

Mozilla/5.0 (SMART-TV LINUX Tizen 3.0) App

Mozilla/5.0 (SMART-TV Linux Tizen 3.0) Appl

3

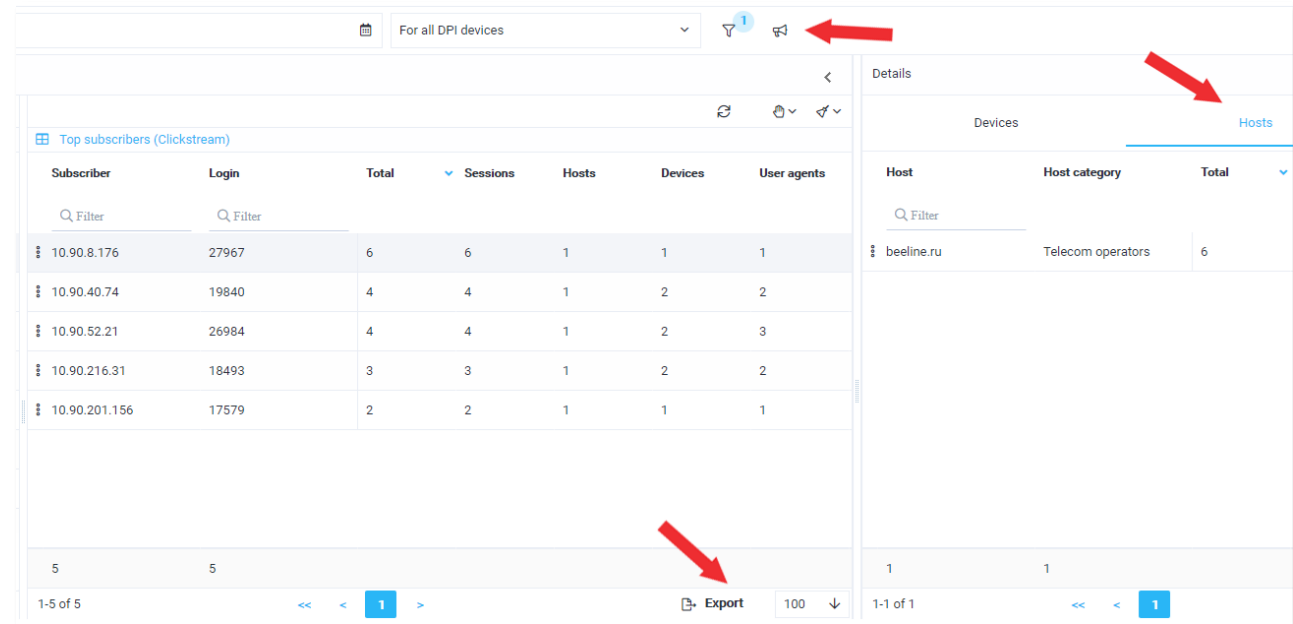
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Use Case: Prevent the Churn

DPI uploads ClickStream – all HTTP/HTTPS requests to your competitors web-sites. The QoE module aggregates information for each IP (login, if used). The statistics fix the URL for HTTP and the domain name for HTTPS.

Filtering is handled according to your own list of competitors in your location or according to the category "Telecom operators".

This example displays 5 clients who probably have interest for competitors' offers.



Subscriber	Login	Total	Sessions	Hosts	Devices	User agents
10.90.8.176	27967	6	6	1	1	1
10.90.40.74	19840	4	4	1	2	2
10.90.52.21	26984	4	4	1	2	3
10.90.216.31	18493	3	3	1	2	2
10.90.201.156	17579	2	2	1	1	1

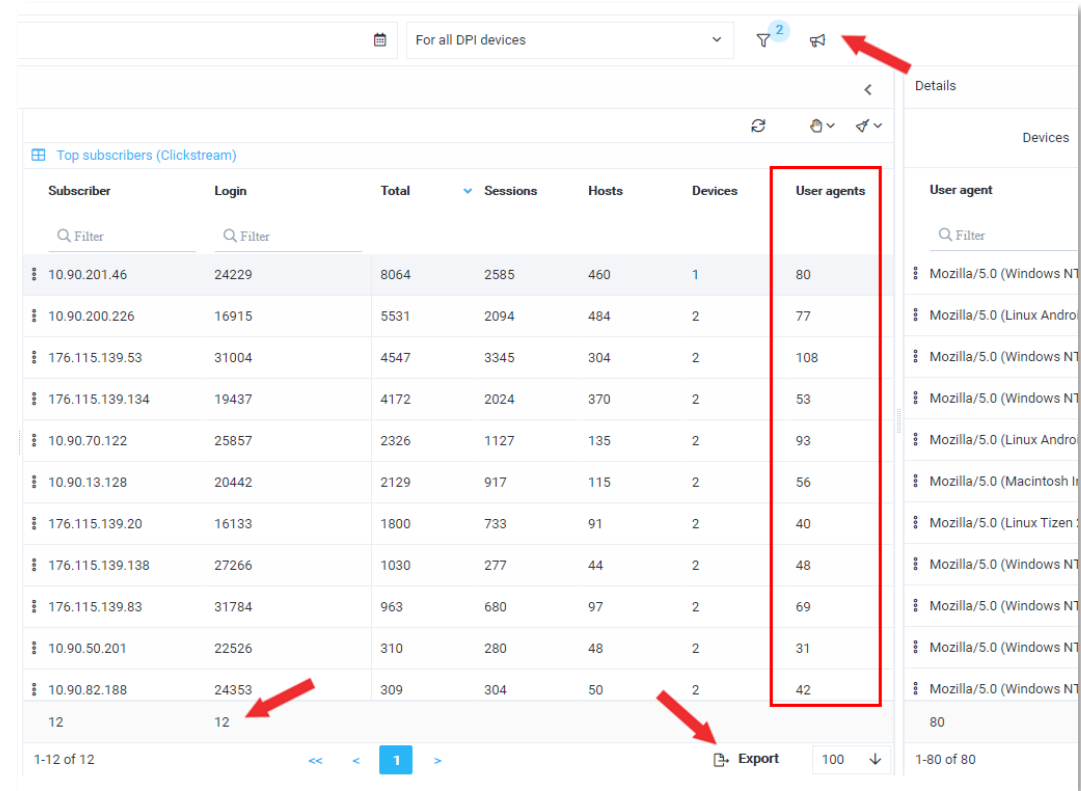
Host	Host category	Total
beeline.ru	Telecom operators	6

Use Case: Search for Service Resellers

DPI uploads the unique UserAgent from the HTTP request. The QoE module aggregates information for each IP (login, if used). In statistics, each phone and PC is fixed for subscriber NAT.

This example displays 12 clients that might be reselling services.

In the "Details" you can find more information about the devices indicated in the report.



Subscriber	Login	Total	Sessions	Hosts	Devices	User agents
10.90.201.46	24229	8064	2585	460	1	80
10.90.200.226	16915	5531	2094	484	2	77
176.115.139.53	31004	4547	3345	304	2	108
176.115.139.134	19437	4172	2024	370	2	53
10.90.70.122	25857	2326	1127	135	2	93
10.90.13.128	20442	2129	917	115	2	56
176.115.139.20	16133	1800	733	91	2	40
176.115.139.138	27266	1030	277	44	2	48
176.115.139.83	31784	963	680	97	2	69
10.90.50.201	22526	310	280	48	2	31
10.90.82.188	24353	309	304	50	2	42
12	12					

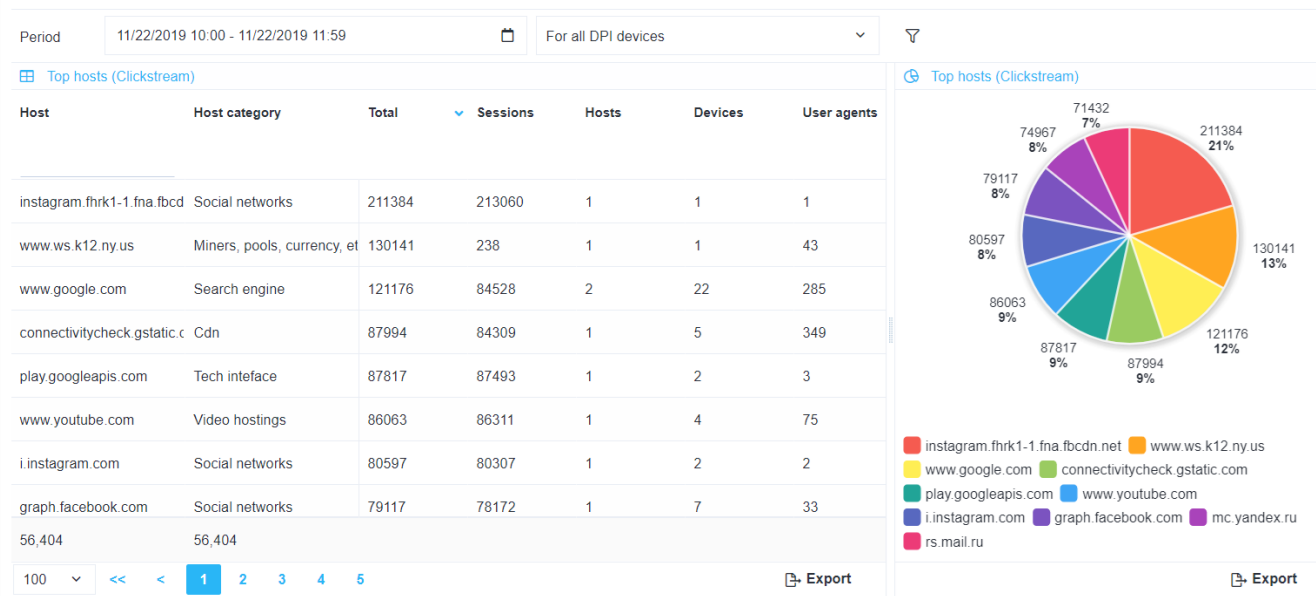
1-12 of 12

Export 100

Use Case: Improve The ARPU

Create personalized offers, services and tariffs for your subscribers and offer conditions for legal entities by segmenting your database.

QOE ANALYTICS / CLICKSTREAM



- Learn about subscribers interests (sport, movies, videogames, news, nature, children content)
- Select subscribers by certain criteria in order to conduct a marketing campaign
- Find the users who resell services and transfer them to corporate tariff plans.

Use Case: Communicate With Your Clients

Notify your subscribers about special offers and new services via the browser.

The formats are:

- desktop and mobile
- native advertising
- interactive
- video
- fullscreen
- menu and filling out the form
- heading

Mobile formats



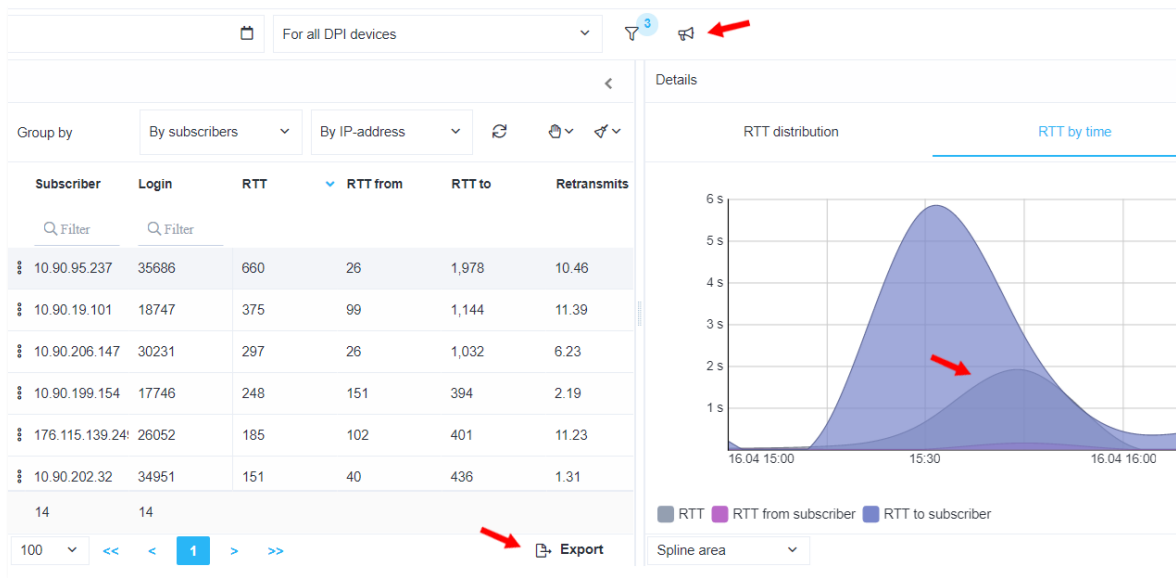
Desktop formats



Use Case: Proactive Support & Upselling

The QoE Module allows you to analyze the Round Trip Time during the TCP connection establishment and find the subscribers who may have Internet access problems.

- detect low-quality CPE (Wi-Fi routers), access and aggregation switch and other equipment
- search for optimal peering points and connections to the upstream providers
- track DDoS and virus attacks, develop a system of countermeasures



Base	Standard	Options
✓	✓	DPI-based Full NetFlow and ClickStream statistics visualization
✓	✓	Built-in TOP reports on Full NetFlow: high RTT and retries, by speed and traffic volume, by application protocols, by AS, by subscriber AS, by traffic classes and DSCP, by access and aggregation switches
✓	✓	Built-in ClickStream-based reports: URLs, hosts, subscribers, devices, IP resources
✓	✓	Custom filters by categories of web resources, protocols, protocol groups, subscribers, AS, IP
✓	✓	Reports export in *.xlsx, *.csv, *.pdf and *.png
✓	✓	API support for integration with external systems
✓	✓	Uplinks quality monitoring and cyberthreats detection
✓	✓	Online reports by specific IP, Login, Host IP
	✓	NAT Flow statistics collection, compression, custom filters
	✓	DNS Flow statistics collection, compression, custom filters
	✓	GTP Flow statistics collection, compression, custom filters, map view
	✓	Setting triggers and actions for events, notification by email and telegram with a set frequency
	✓	DDoS and BotNet attacks detection and mitigation (blackhole and flowspec). SSG BASE version is required for mitigation

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sales@vas.expert

vasexperts.com

