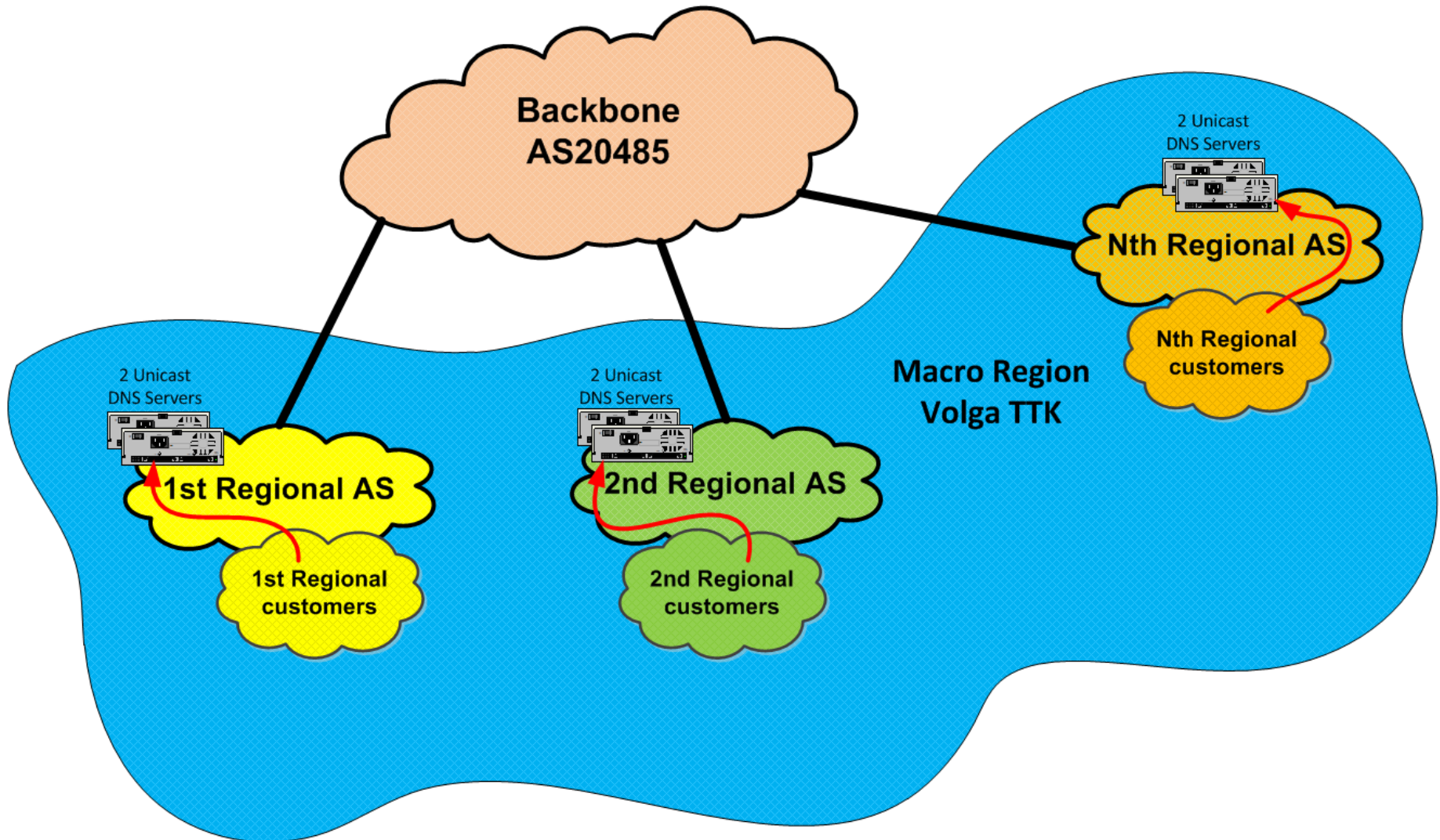




Anycast routing implementation for caching DNS servers in Volga MR

Denis Mikhlevich,
Chief IP-specialist of TTK-Volga,
Saratov city, Russia

How this was before Anycast DNS implemented



- I have collected information about current infrastructure
Volga TTK MR

- By our request TTK CC has assigned us 4 networks
for Anycast routing for retail AS15774:
IPv4: 188.168.15.0/24; 188.168.33.0/24
IPv6: 2a02:618:6::/48; 2a02:618:7::/48

- I have decided to try to set up caching DNS on zero addresses

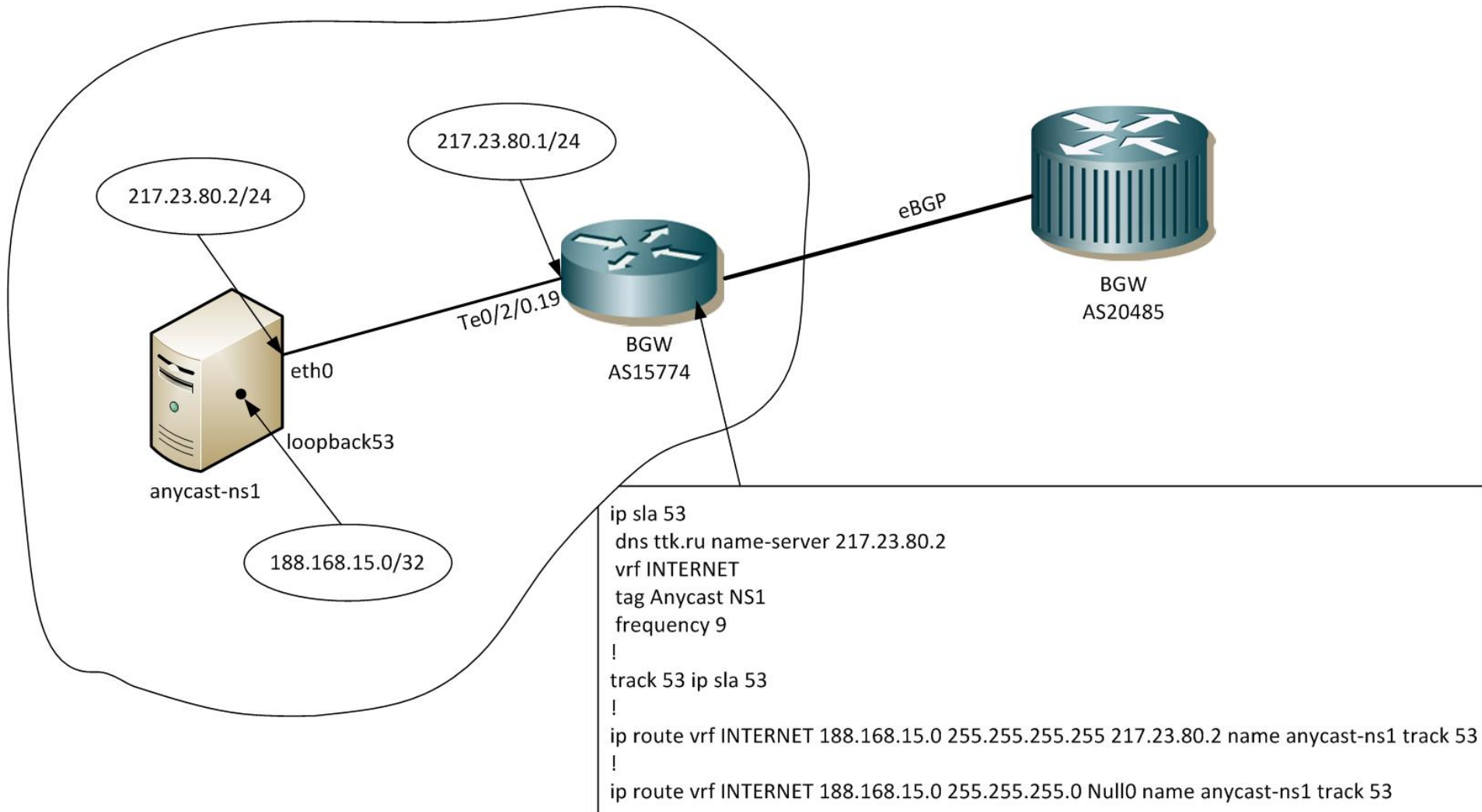
- anycast-ns1.ttk.ru. IN A 188.168.15.0 IN AAAA 2a02:618:6::

- anycast-ns2.ttk.ru. IN A 188.168.33.0 IN AAAA 2a02:618:7::

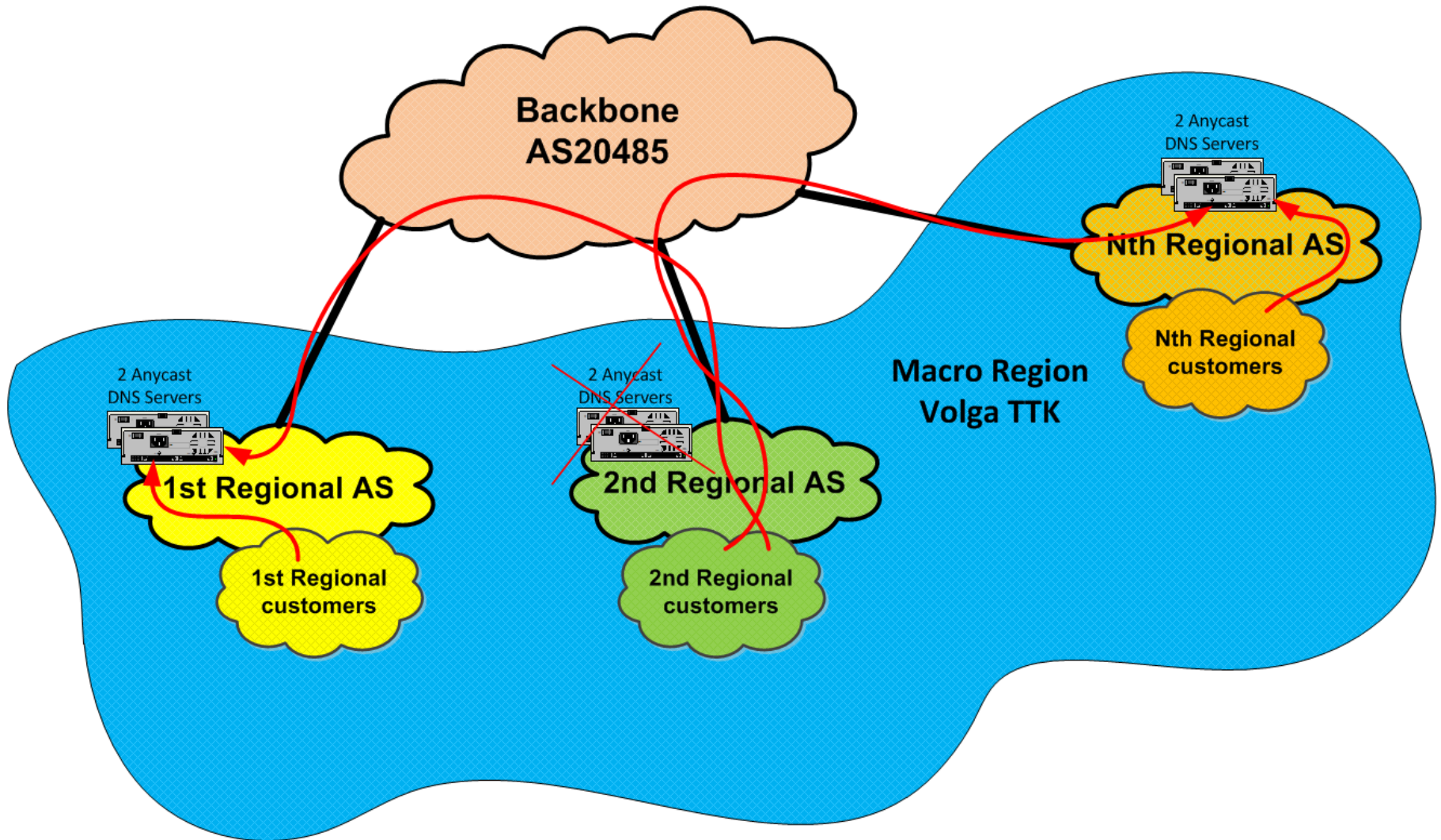
- I have chose servers which will have anycast-ns1 or -ns2
addresses (one server has one anycast address)

- I have chose servers which will be Anycast DNS class1 or
class2

Connection of one Anycast DNS servers

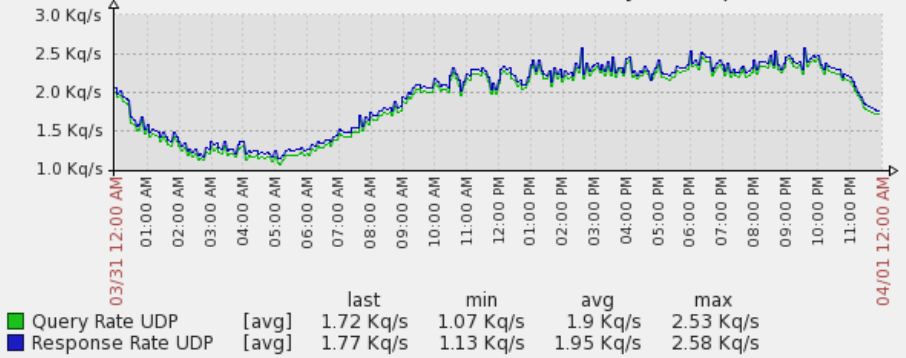


How this become after Anycast DNS has been implemented

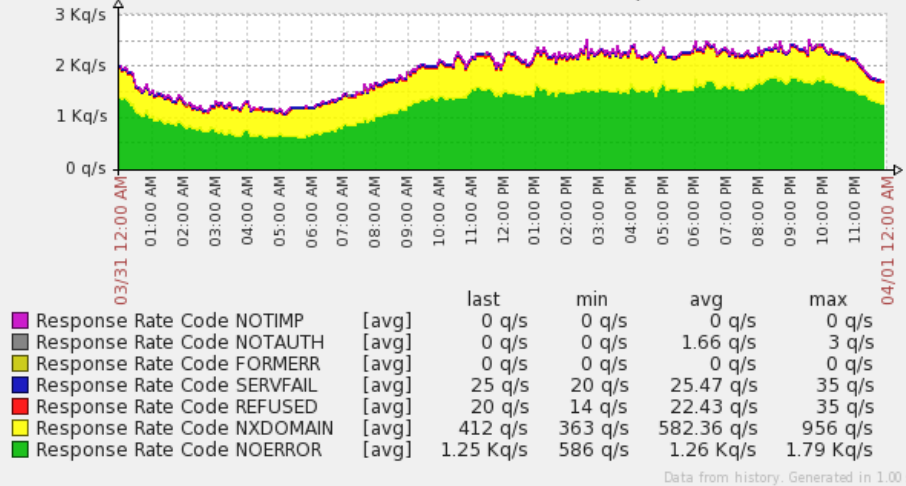


Monitoring DNS. Software: Zabbix+DSC*

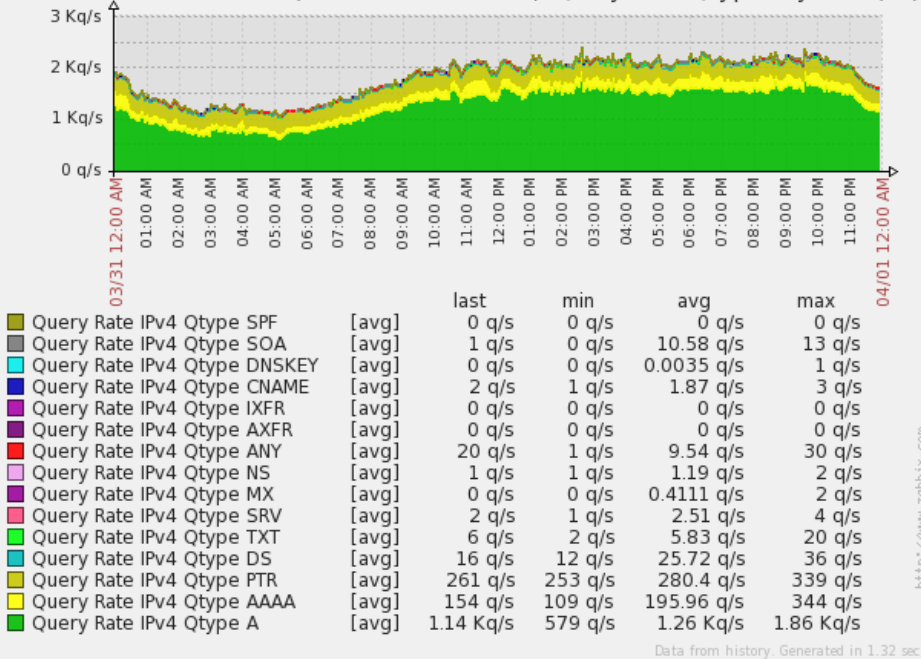
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Query vs Response Rate (1d)



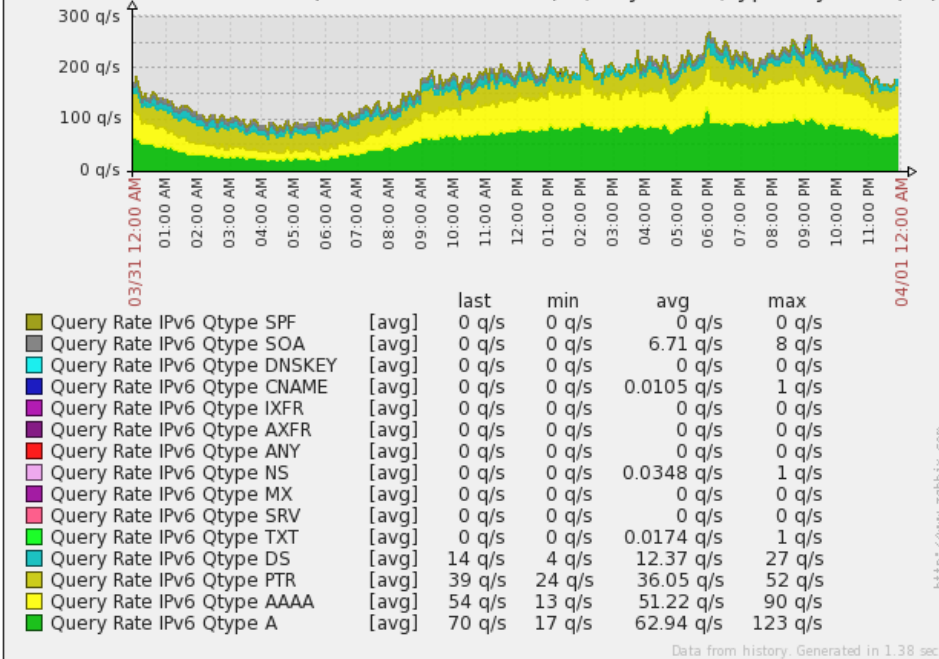
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Response Rate Codes (1d)



DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Query Rate Qtypes by IPv4 (1d)

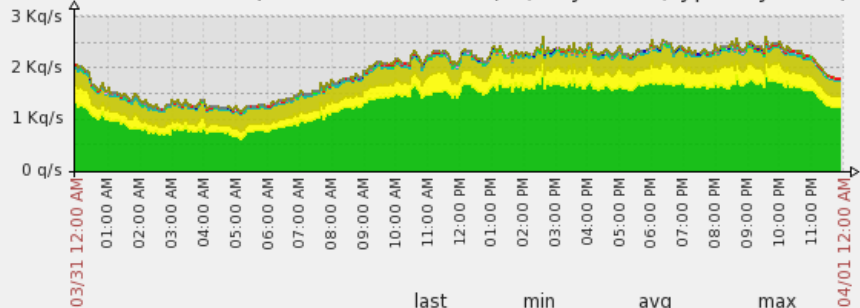


DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Query Rate Qtypes by IPv6 (1d)



*Collector DNS <https://www.dns-oarc.net/>

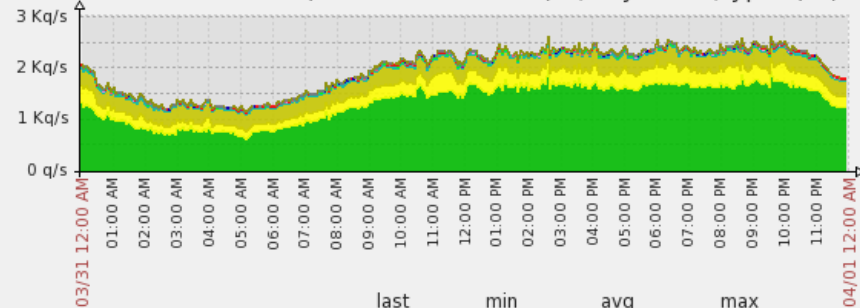
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Query Rate Qtypes by UDP (1d)



	last	min	avg	max
Query Rate UDP Qtype SPF	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate UDP Qtype SOA	[avg] 1 q/s	0 q/s	17.32 q/s	21 q/s
Query Rate UDP Qtype DNSKEY	[avg] 0 q/s	0 q/s	0.0035 q/s	1 q/s
Query Rate UDP Qtype CNAME	[avg] 2 q/s	1 q/s	2.24 q/s	4 q/s
Query Rate UDP Qtype IXFR	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate UDP Qtype AXFR	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate UDP Qtype ANY	[avg] 19 q/s	1 q/s	9.08 q/s	29 q/s
Query Rate UDP Qtype NS	[avg] 1 q/s	1 q/s	1.64 q/s	3 q/s
Query Rate UDP Qtype MX	[avg] 0 q/s	0 q/s	0.4425 q/s	3 q/s
Query Rate UDP Qtype SRV	[avg] 2 q/s	1 q/s	2.63 q/s	5 q/s
Query Rate UDP Qtype TXT	[avg] 6 q/s	2 q/s	6.02 q/s	20 q/s
Query Rate UDP Qtype DS	[avg] 30 q/s	25 q/s	37.83 q/s	50 q/s
Query Rate UDP Qtype PTR	[avg] 299 q/s	289 q/s	316.24 q/s	378 q/s
Query Rate UDP Qtype AAAA	[avg] 208 q/s	122 q/s	246.7 q/s	433 q/s
Query Rate UDP Qtype A	[avg] 1.21 Kq/s	599 q/s	1.32 Kq/s	1.94 Kq/s

Data from history. Generated in 1.55 sec.

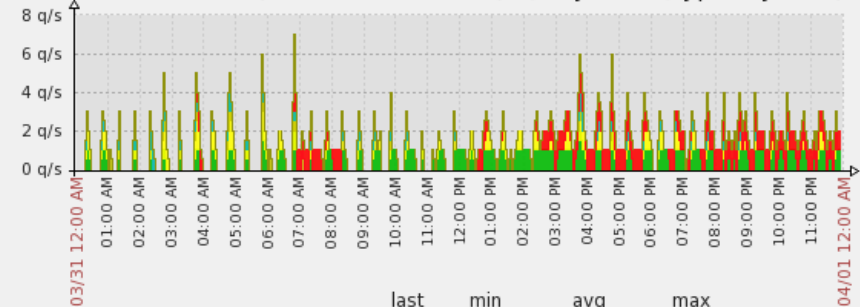
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Query Rate Qtypes (1d)



	last	min	avg	max
Query Rate Qtype SPF	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate Qtype SOA	[avg] 1 q/s	0 q/s	17.32 q/s	21 q/s
Query Rate Qtype DNSKEY	[avg] 0 q/s	0 q/s	0.0383 q/s	1 q/s
Query Rate Qtype CNAME	[avg] 2 q/s	1 q/s	2.24 q/s	4 q/s
Query Rate Qtype IXFR	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate Qtype AXFR	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate Qtype ANY	[avg] 20 q/s	1 q/s	9.54 q/s	30 q/s
Query Rate Qtype NS	[avg] 1 q/s	1 q/s	1.64 q/s	3 q/s
Query Rate Qtype MX	[avg] 0 q/s	0 q/s	0.4495 q/s	3 q/s
Query Rate Qtype SRV	[avg] 2 q/s	1 q/s	2.63 q/s	5 q/s
Query Rate Qtype TXT	[avg] 6 q/s	2 q/s	6.06 q/s	20 q/s
Query Rate Qtype DS	[avg] 30 q/s	25 q/s	38.06 q/s	50 q/s
Query Rate Qtype PTR	[avg] 299 q/s	290 q/s	316.42 q/s	379 q/s
Query Rate Qtype AAAA	[avg] 208 q/s	122 q/s	247.17 q/s	434 q/s
Query Rate Qtype A	[avg] 1.21 Kq/s	599 q/s	1.32 Kq/s	1.94 Kq/s

Data from history. Generated in 1.47 sec.

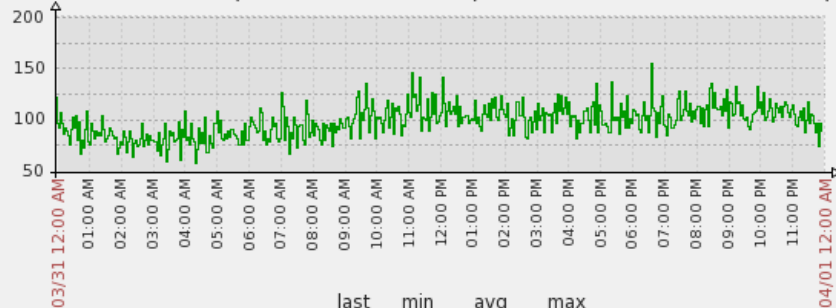
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Query Rate Qtypes by TCP (1d)



	last	min	avg	max
Query Rate TCP Qtype SPF	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype SOA	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype DNSKEY	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype CNAME	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype IXFR	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype AXFR	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype ANY	[avg] 1 q/s	0 q/s	0.4111 q/s	1 q/s
Query Rate TCP Qtype NS	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype MX	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype SRV	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype TXT	[avg] 0 q/s	0 q/s	0 q/s	0 q/s
Query Rate TCP Qtype DS	[avg] 0 q/s	0 q/s	0.1254 q/s	1 q/s
Query Rate TCP Qtype PTR	[avg] 0 q/s	0 q/s	0.0418 q/s	1 q/s
Query Rate TCP Qtype AAAA	[avg] 0 q/s	0 q/s	0.2787 q/s	2 q/s
Query Rate TCP Qtype A	[avg] 1 q/s	0 q/s	0.5052 q/s	2 q/s

Data from history. Generated in 1.42 sec.

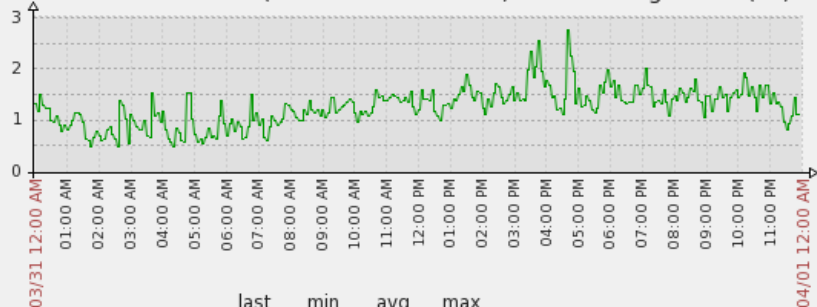
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Number of recursive clients (1d)



	last	min	avg	max
Number of recursive clients	[avg] 89	55	98.34	155

Data from history. Generated in 1.05 sec.

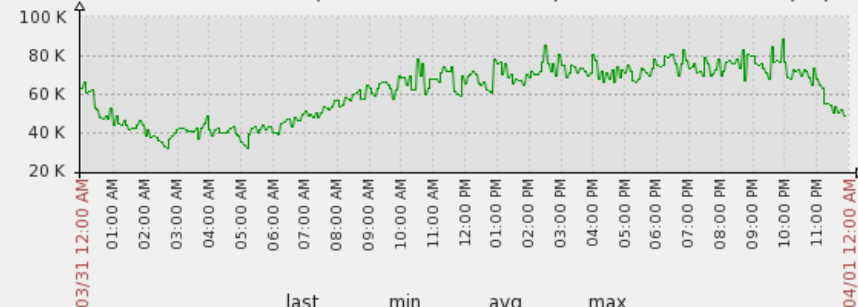
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Load Average 5min (1d)



	last	min	avg	max
Load Average 5min [avg]	1.1	0.49	1.26	2.76

Data from history. Generated in 1.24 sec.

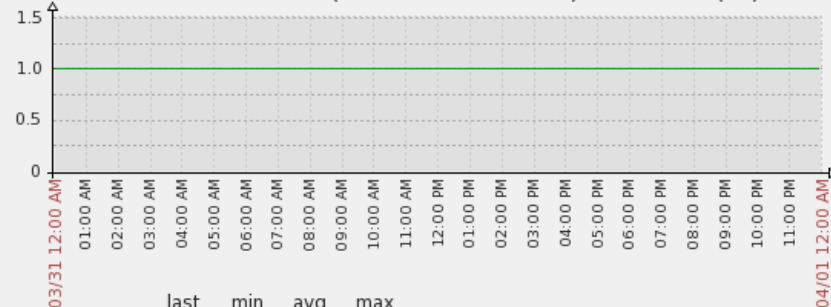
DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Total Connections (1d)



	last	min	avg	max
Total Connections [avg]	48.82 K	32.16 K	61.34 K	88.48 K

Data from history. Generated in 0.34 sec.

DNS Saratov 217.23.80.2 (188.168.15.0 class 1): Alive DNS (1d)



	last	min	avg	max
Alive DNS [avg]	1	1	1	1

Data from history. Generated in 0.40 sec.

Telegram Bot

VTT

PROBLEM. Original event ID: 100000003443057

DNS Ulyanovsk 79.132.98.153 (188.168.15.0 class 2) перестал отвечать на запросы

18:28

OK. Original event ID: 100000003443057

DNS Ulyanovsk 79.132.98.153 (188.168.15.0 class 2) возобновил отвечать на запросы

18:30





Thank you! Questions?

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@mikhlevich
nic-hdl: IPv6-RU