



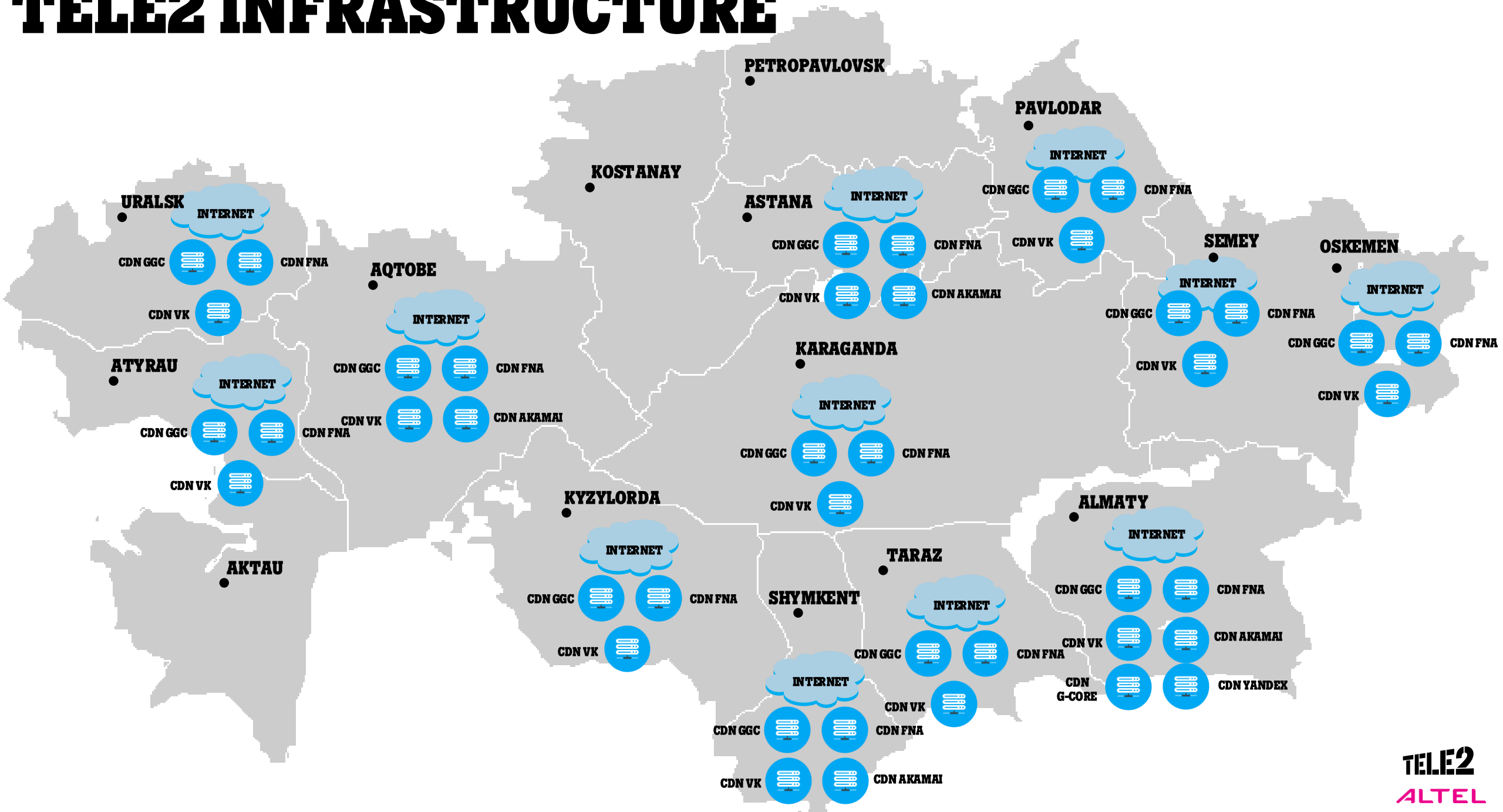
TELE2 KAZAKHSTAN

AGENDA

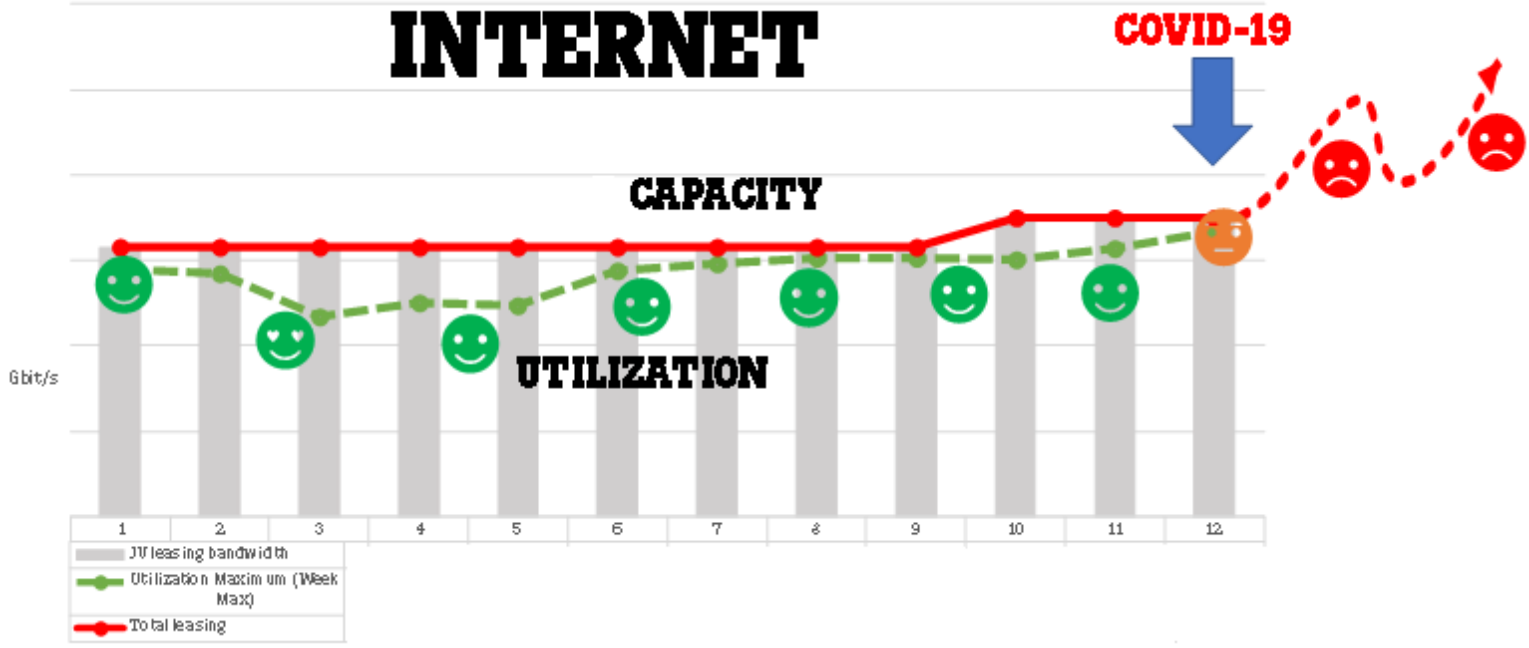
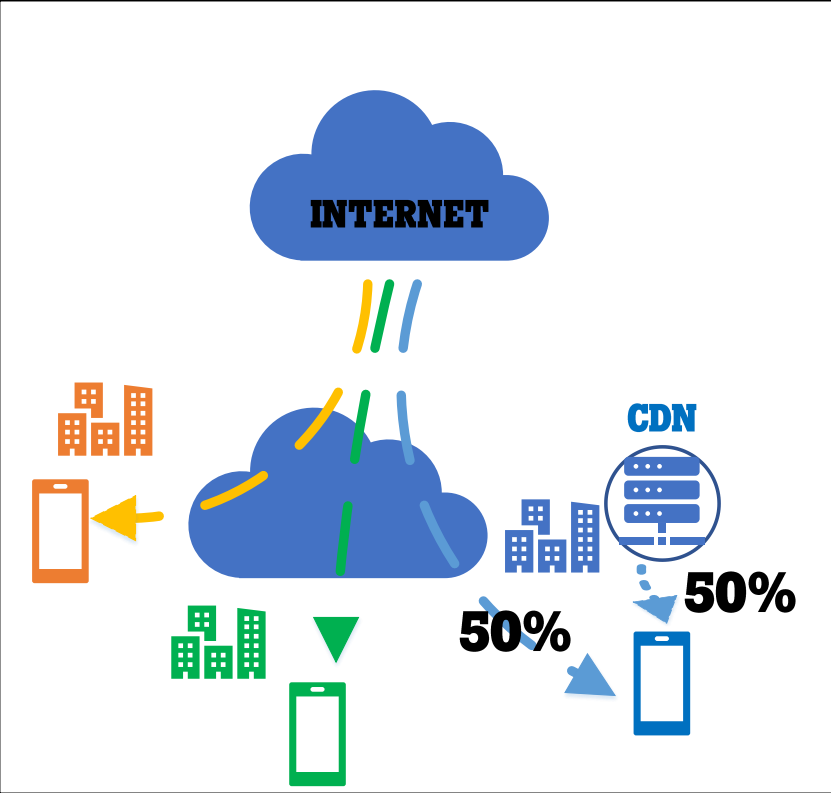
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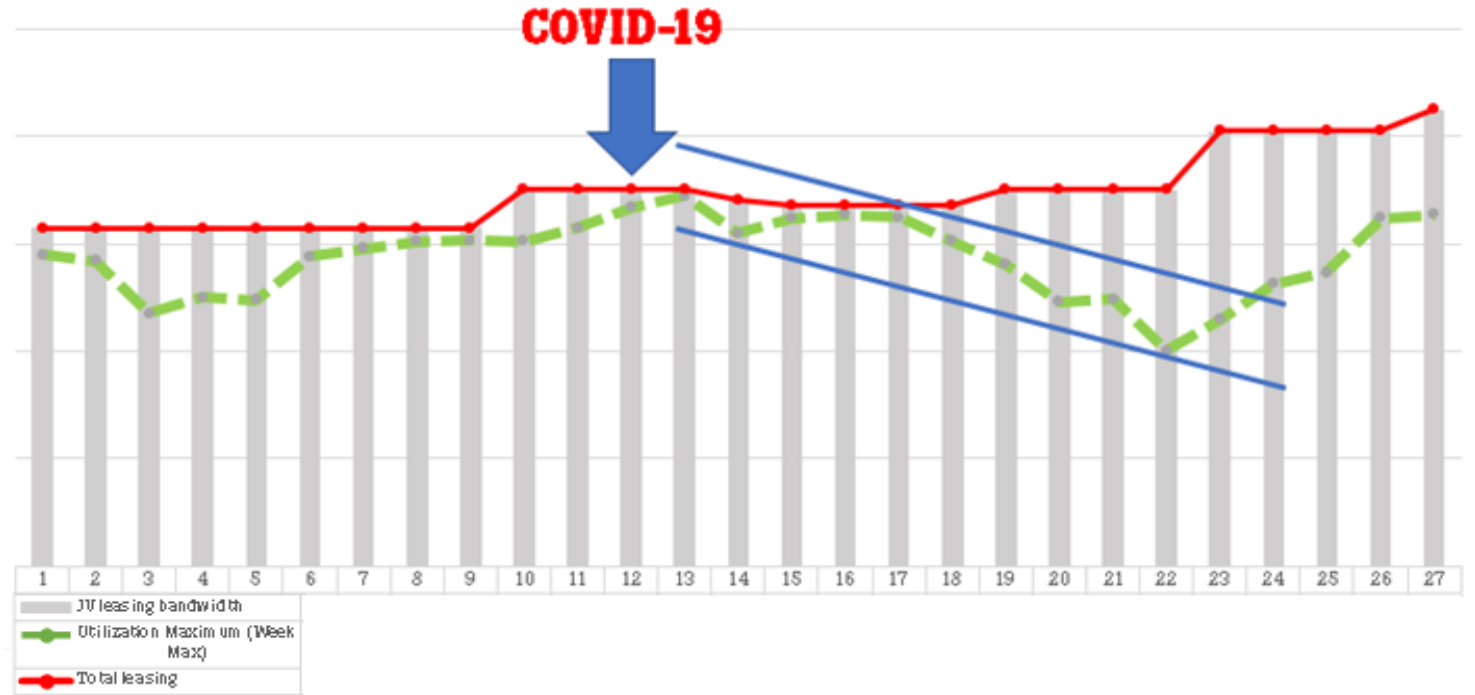
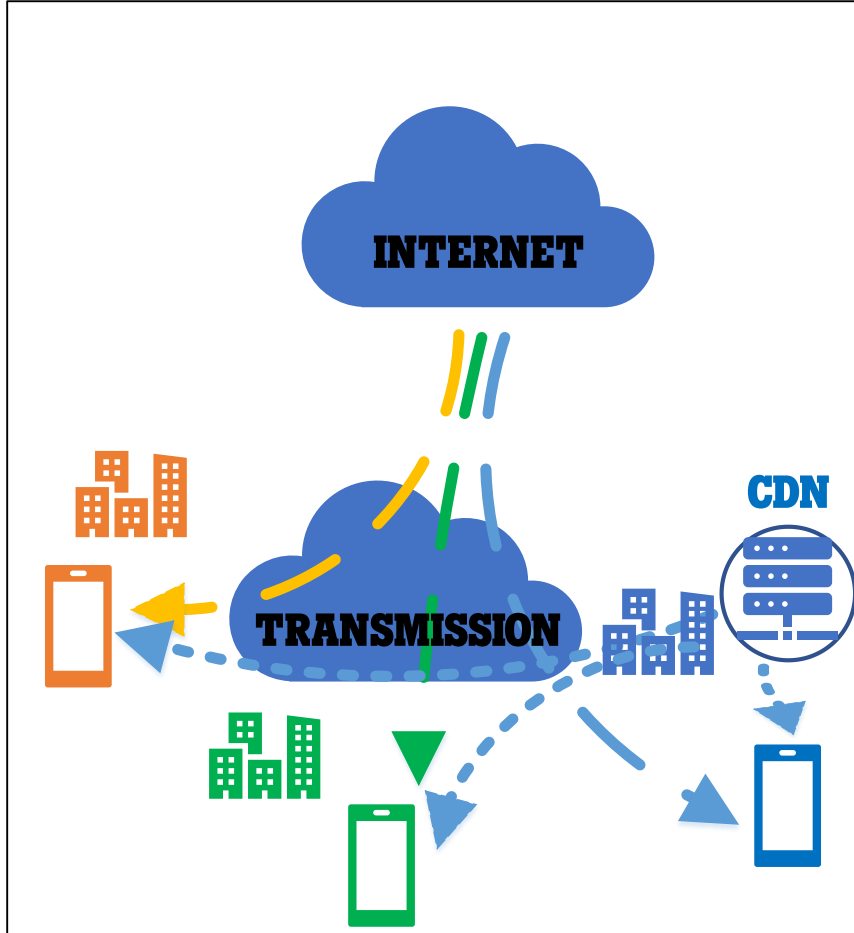
TELE2 INFRASTRUCTURE



DATA TRAFFIC RE-ROUTING



DATA TRAFFIC RE-ROUTING



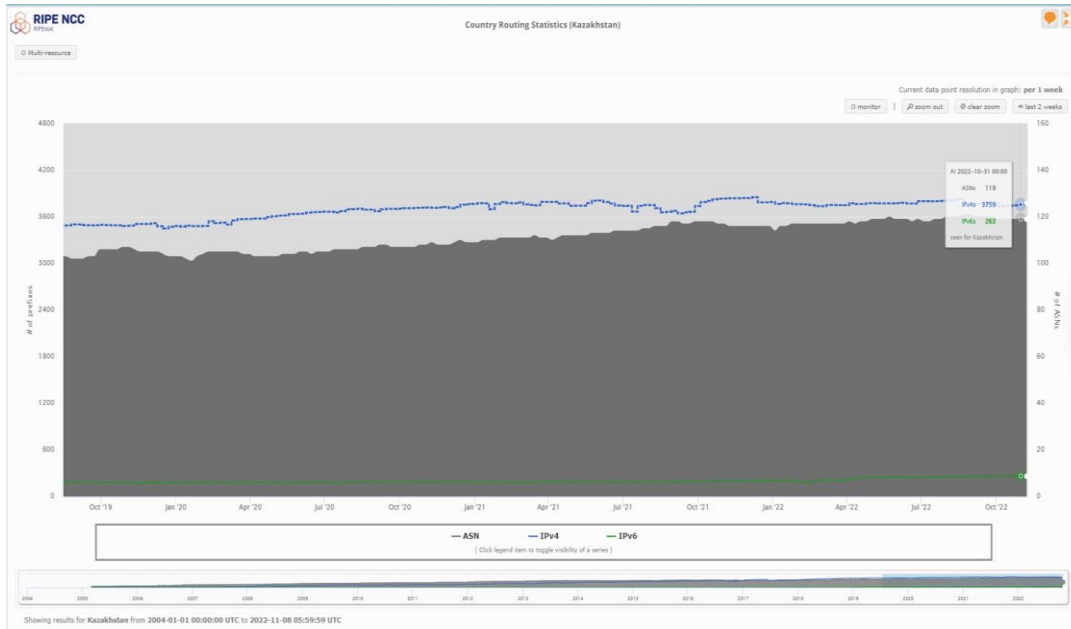
IPV6 HOW IT WAS

Implementation of IPv6 technology on the Tele2 network:

- IPv6 activation for LTE/5G subscribers Tele2 Kazakhstan
- Launching traffic towards Internet providers
- Passing traffic at the junctions with Internet Exchange
- Passing traffic at the junctions of CDN and Cache servers

Основные преимущества интеграции пакета «IPV6» на смену «IPV4», являются то, что бизнес или простой абонент сети может получить качественное подключение к серверам, отличающееся высоким уровнем безопасности и удобством поиска.

IPV6



According to RIPE NCC statistics, as of October 31, 2022, announcements of 119 autonomous networks (AS), 3759 IPv4 address prefixes and 263 IPV6 address prefixes related to Kazakhstan were recorded.
(<https://stat.ripe.net/widget/country-routing-stats#w.resource=kz>)

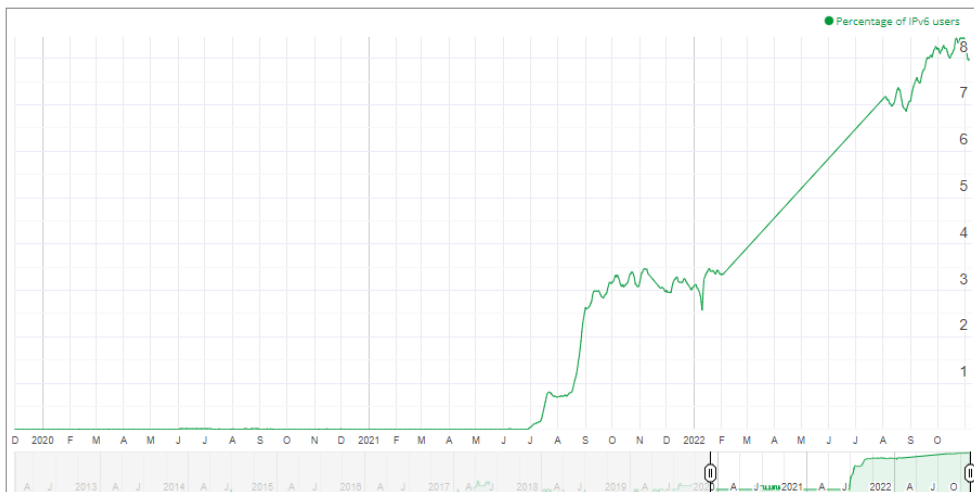
List of participants (incomplete) AS
IPv6 in Kazakhstan
(<https://stats.labs.apnic.net/ipv6/KZ>)

ASN	AS Name	IPv6 Capable	IPv6 Preferred	Samples
AS9198	KAZTELECOM-AS	0.03%	0.03%	310,934
AS48503	TELE2-KZ Tele2 Kazakhstan	21.55%	21.29%	163,531
AS206026	IPNET_KAR-TEL	23.17%	22.87%	122,474
AS21299	KAR-TEL-AS Almaty, Republic of Kazakhstan	0.02%	0.02%	94,754
AS29355	KCELL-AS	0.01%	0.01%	93,047
AS29555	Tele2 Kazakhstan	24.98%	24.65%	33,602
AS41798	TTC-AS JSC Transtelecom	0.03%	0.03%	20,593
AS39824	ALMANET-AS	0.02%	0.02%	16,583
AS35104	KTC-AS	0.00%	0.00%	7,135

IPv6

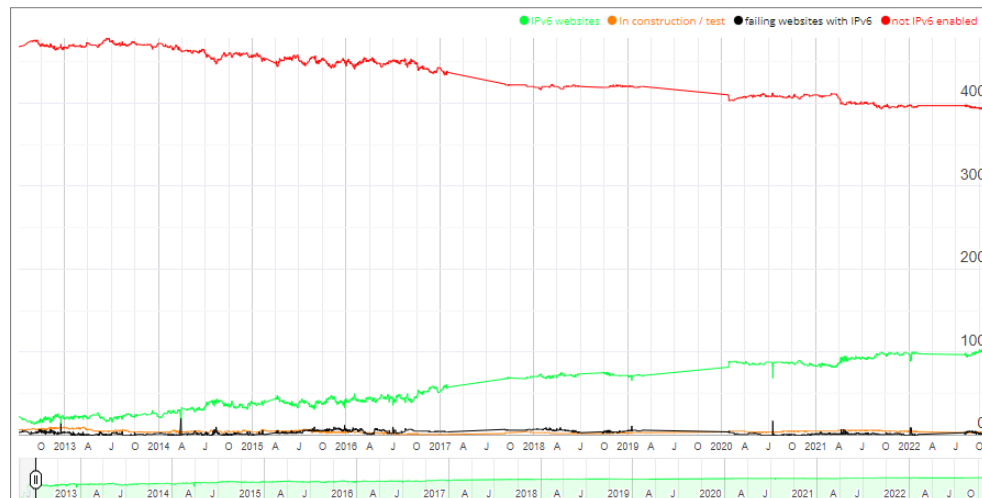
Kazakhstan

Display Users Data ⓘ



Kazakhstan

Display Content Data ⓘ



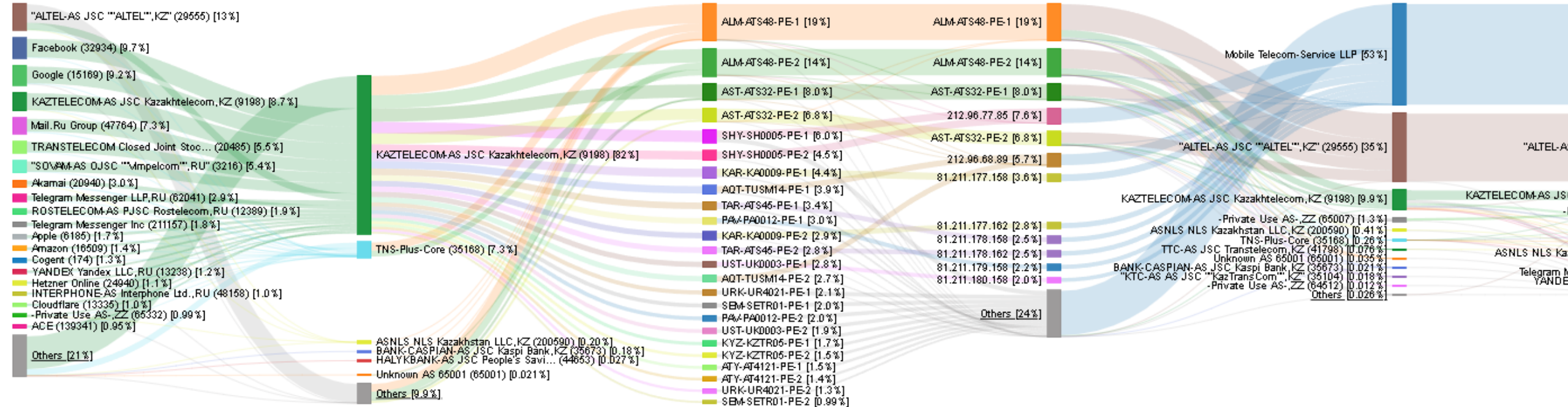
According to Cisco's IPv6 Lab statistics, the number of subscribers and web resources using IPv6 technology is increasing and today they are 8.42% and 102, respectively.

(<https://6lab.cisco.com/stats/cible.php?country=KZ&option=all>)

TELE2 IX AS48503



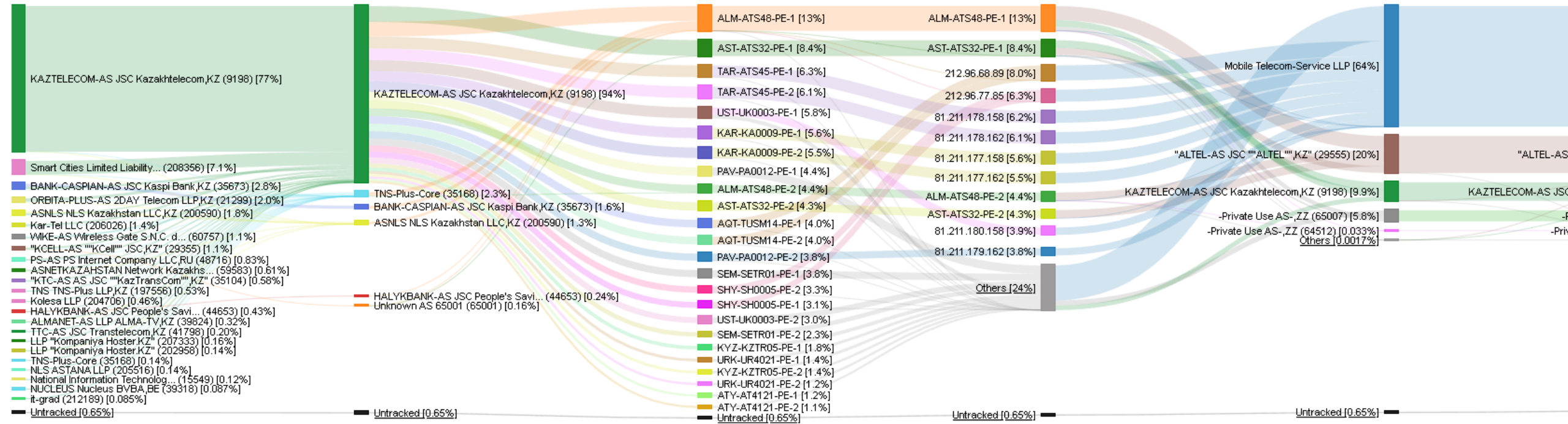
NETFLOW ANALYTICS



NETFLOW ANALYTICS

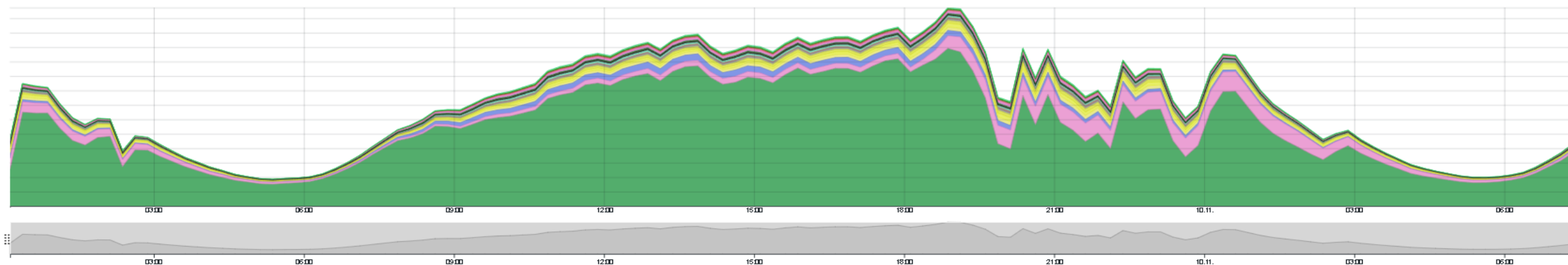
Source AS 23
Handover AS 6
Ingress Router 24
Egress Router 12
Nexthop AS 5
Destination AS 5
Begin 09.11.2022
End 10.11.2022

177 filters
0 filters
0 filters
0 filters
0 filters
0 filters



NETFLOW ANALYTICS

Relative
 Show SNMP Total Traffic
 Cannot display SNMP for filter(s): Source AS. Please clear this filter to view SNMP



<input checked="" type="checkbox"/>	AS	AS Name	Flow Average	Flow Max	Flow 95th	Flow
<input checked="" type="checkbox"/>	9198	KAZTELECOM-AS JSC Kazakhtelecom,KZ	27.5 Gbps	55.1 Gbps	49.2 Gbps	
<input checked="" type="checkbox"/>	208356	Smart Cities Limited Liability Partnership	2.53 Gbps	7.03 Gbps	6.42 Gbps	
<input checked="" type="checkbox"/>	35673	BANK-CASPIAN-AS JSC Kaspi Bank,KZ	999 Mbps	2.3 Gbps	2.15 Gbps	
<input checked="" type="checkbox"/>	21299	ORBITA-PLUS-AS 2DAY Telecom LLP,KZ	709 Mbps	1.48 Gbps	1.34 Gbps	
<input checked="" type="checkbox"/>	200590	ASNLS NLS Kazakhstan LLC,KZ	633 Mbps	1.5 Gbps	1.33 Gbps	
<input checked="" type="checkbox"/>	206026	Kar-TeI LLC	485 Mbps	1.13 Gbps	1.03 Gbps	
<input checked="" type="checkbox"/>	60757	WIKE-AS Wireless Gate S.N.C. di Gasparri & Ciofi,IT	400 Mbps	692 Mbps	612 Mbps	
<input checked="" type="checkbox"/>	29355	"KCELL-AS ""KCell"" JSC,KZ"	387 Mbps	816 Mbps	757 Mbps	
<input checked="" type="checkbox"/>	48716	PS-AS PS Internet Company LLC,RU	297 Mbps	561 Mbps	517 Mbps	
<input checked="" type="checkbox"/>	59583	ASNETKAZAHSTAN Network Kazakhstan LLC,KZ	218 Mbps	448 Mbps	366 Mbps	
<input checked="" type="checkbox"/>	35104	"KTC-AS AS JSC ""KazTransCom"" ,KZ"	205 Mbps	461 Mbps	413 Mbps	
<input checked="" type="checkbox"/>	197556	TNS TNS-Plus LLP,KZ	189 Mbps	376 Mbps	327 Mbps	
<input checked="" type="checkbox"/>	204706	Kolesa LLP	164 Mbps	329 Mbps	307 Mbps	
<input checked="" type="checkbox"/>	44653	HALYKBANK-AS JSC People's Savings Bank Kazakhstan,KZ	152 Mbps	363 Mbps	345 Mbps	
<input checked="" type="checkbox"/>	39824	ALMANET-AS LLP ALMA-TV,KZ	115 Mbps	258 Mbps	224 Mbps	
<input checked="" type="checkbox"/>	41798	TTC-AS JSC Transtelecom,KZ	71.6 Mbps	147 Mbps	130 Mbps	
<input checked="" type="checkbox"/>	207333	LLP "Kompaniya Hoster.KZ"	56 Mbps	131 Mbps	102 Mbps	
<input checked="" type="checkbox"/>	202958	LLP "Kompaniya Hoster.KZ"	51.2 Mbps	172 Mbps	117 Mbps	
<input checked="" type="checkbox"/>	35168	TNS-Plus-Core	50.6 Mbps	135 Mbps	110 Mbps	
<input checked="" type="checkbox"/>	205516	NLS ASTANA LLP	48.4 Mbps	199 Mbps	131 Mbps	
<input checked="" type="checkbox"/>	15549	National Information Technologies Joint-Stock Company,KZ	43.1 Mbps	126 Mbps	102 Mbps	
<input checked="" type="checkbox"/>	39318	NUCLEUS Nucleus BVBA,BE	30.8 Mbps	78.9 Mbps	63.2 Mbps	
<input checked="" type="checkbox"/>	212189	it-grad	30.4 Mbps	66.1 Mbps	61.6 Mbps	
<input checked="" type="checkbox"/>	Untracked	Untracked	230 Mbps	448 Mbps	427 Mbps	
	Total		35.6 Gbps		66.6 Gbps	

INTERNET SERVICE RELIABILITY

GEO IP



LOOKING GLASS

[HTTPS://LG.TELE2.KZ/](https://lg.tele2.kz/)

RPKI

RPKI Dashboard 34 CERTIFIED RESOURCES ALERTS ARE SENT TO 1 ADDRESS


107 BGP Announcements 108 ROAs

107 Valid 0 Invalid 0 Unknown 108 OK 0 Causing problems

BLOCKING BOGONS NETS



AS48503 Looking Glass

Type of Query	Additional parameters	Node
<input checked="" type="radio"/> bgp		
<input type="radio"/> bgp graph		
<input type="radio"/> traceroute	<input type="text"/>	Almaty <input type="button" value="v"/>
<input type="radio"/> ping		
	IPv4 <input type="button" value="v"/>	
<input type="checkbox"/> Я не робот 		
Капитализация - Условия использования		
<input type="button" value="Submit"/>		

WEB MONITORING



ZABBIX

- Measuring the availability of popular Internet resources
 - HTTP/HTTPS Service availability
 - Download speed and Response time
 - ICMP Packet Loss and Delay
- MTR
- Alerts (Traffic Lost, Traffic Spikes, High Utilization) by E-Mail and Telegram
- Visualization by Grafana



RIPE ATLAS

- Measuring the availability of popular Internet resources
 - Traceroute/ping Response time
 - ICMP Packet Loss and Delay



ThousandEyes

- Ability to run synthetic tests from a large number of locations around the world - 58 countries and 194 cities
- Monitoring of key Internet services (DNS, CDN, etc.)
- Checking the availability and loading of web resources (ICMP, Latency, Loss, jitter)
- Monitoring the status of network protocols in Data Centers (in particular, the BGP protocol)
- The ability to provide a vision of global issues on the Internet
- Monitoring of VoIP traffic