DNS: Соглашение об уровне предоставления сервиса

DNS: authoritative servers: SLA examples

№ п/п	Сервис	Доступность (%)	Определение	<100	<99,99	<99,5	<95	DNSPef
1	Azure	100	"Downtime" is the total accumulated Maximum Available Minutes during which the DNS Zone is unavailable. A minute is considered unavailable for a given DNS Zone if a DNS response is not received within two seconds to a valid DNS Request, provided that the valid DNS Request is made to all name servers associated with the DNS Zone and retries are continually attempted for at least 60 consecutive seconds.	10	25	100		99,81
			Monthly Uptime % = (Maximum Available Minutes – Downtime) / Maximum Available Minutes X100					
2	Google	100	For Name Serving: Inability to serve responses from all of the Authoritative Name Servers to DNS queries for domains configured in Cloud DNS.	10	10	25	50	99,86
			"Downtime Period" means a period of 60 consecutive seconds of Downtime. Intermittent Downtime for a period of less than 60 consecutive seconds will not be counted towards any Downtime Periods.					
3	Alibaba	100 (n HA)	"Downtime Period" means a period of 60 consecutive seconds of Downtime. Intermittent Downtime for a period of less than 60 consecutive seconds will not be counted towards any Downtime Periods.	15	30	100		
4	Amazon 53	100	A Hosted Zone is “Unavailable” during a given minute if all four virtual name servers assigned to the Hosted Zone fail to respond to all DNS queries made to the Hosted Zone throughout the minute.	10	25	100		99,98
5	CloudFlare	100 (n HA)	For any and each Outage Period during a monthly billing period the Company will provide as a Service Credit an amount calculated as follows: Service Credit = (Outage Period minutes * Affected Customer Ratio) ÷ Scheduled Availability minutes					99,98
6	Dyn	100	Affected Client Ratio= (Unique visitors as measured by IP address affected by Unscheduled Service Outage)					99,95
			Total unique visitors as measured by IP address					
7	F5	99,9 (n HA)	Кредиты выписываются поминутно + реакция на инцидент	> 60 секунд	> 60 минут	> суток		
8	Godaddy	99,9						99,98
9	UltraDNS (neustar)	100	55 млрд запросов в сутки (30 узлов)					99,99

“ DNS:SLA”

Info		
Parameter	SLR (monthly basis)	
DNS	DNS service availability	0 min downtime = 100% availability
	DNS name server availability	< 432 min of downtime (» 99%)
	TCP DNS resolution RTT	< 1500 ms, for at least 95% of the queries
	UDP DNS resolution RTT	< 500 ms, for at least 95% of the queries
	DNS update time	< 60 min, for at least 95% of probes

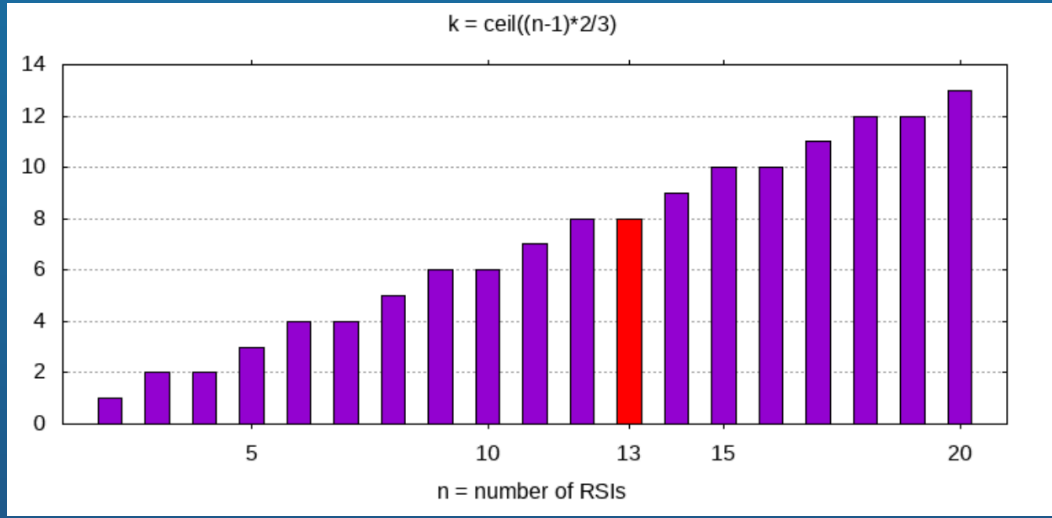
DNS: SLA: TLD

new gTLD		
	Parameter	SLR (monthly basis)
DNS	DNS service availability	0 min downtime = 100% availability
	DNS name server availability	< 432 min of downtime (» 99%)
	TCP DNS resolution RTT	< 1500 ms, for at least 95% of the queries
	UDP DNS resolution RTT	< 500 ms, for at least 95% of the queries
	DNS update time	< 60 min, for at least 95% of the probes

DNS: SLA: Methodology: RSS

”While developing the metrics and thresholds for availability, the RSSAC found it helpful to apply a “k-out-of-n system model” to the RSS.”

The k-out-of-n model as applied here requires some simplifying assumptions. One such assumption is that all components (e.g., RSIs) are identical. Another is that IPv4 service is identical to IPv6 service. Another assumption is that all components are independent and that the failure of one does not increase the load for any other



But how is the availability parameter calculated?

DNS: SLA: Methodology: RSI Availability

Measurements. Measurements shall be made by sending DNS queries of type SOA with QNAME=“.” at five-minute intervals over each of the transports and address types to the root server addresses. Measurements shall use a timeout value of four seconds.

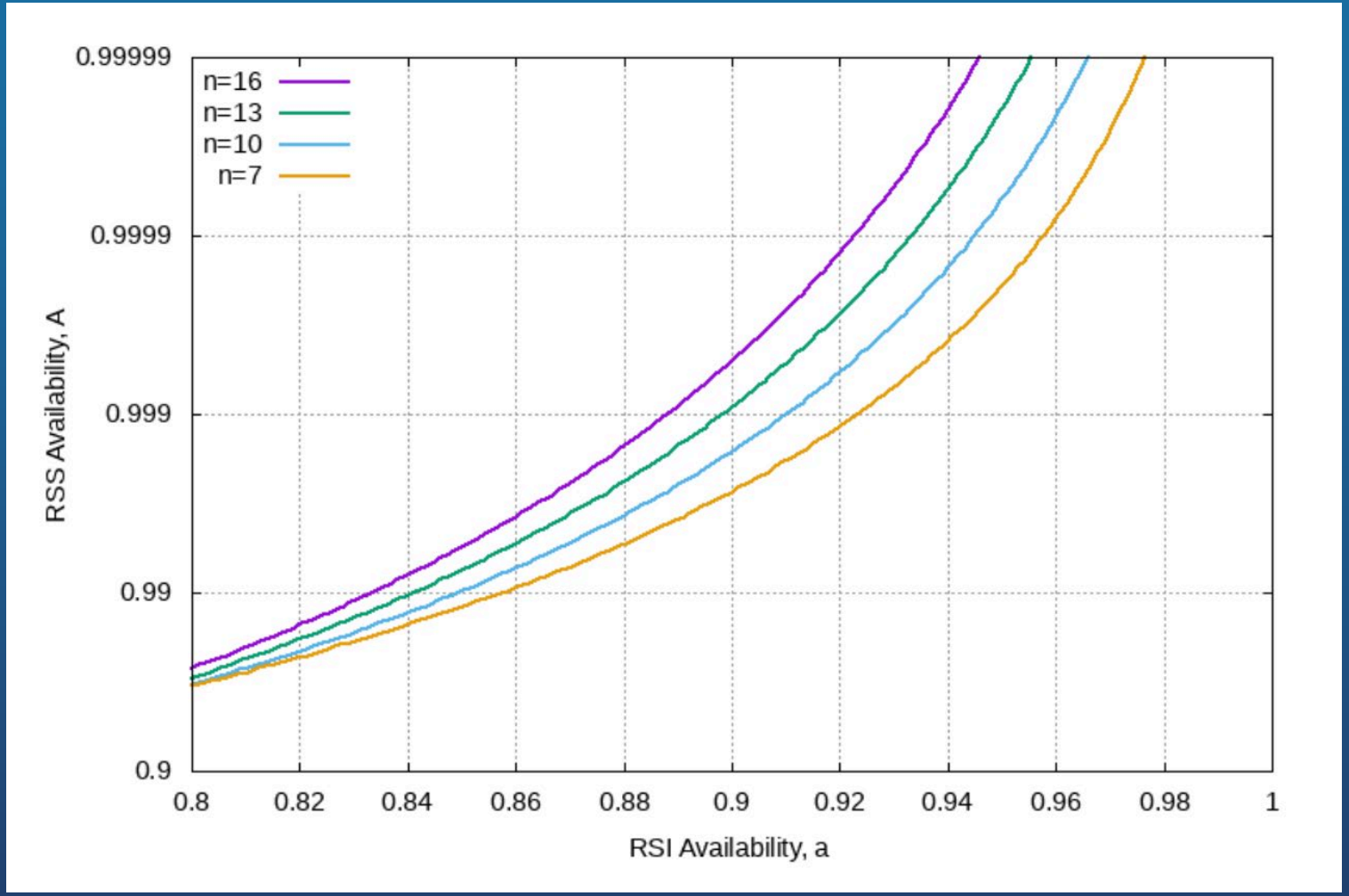
Aggregation. All of the measurements for each transport and address type, from all vantage points, covering a period of one month are aggregated with the other measurements from the same transport and address type. Availability is calculated as the number of non-timed-out and non-error responses received divided by the number of queries sent, expressed as a percentage.

Threshold. The recommended threshold for this metric is 96%. The recommended threshold value was determined by using the formula for simple k-out-of-n parallel availability:

$$A = \sum_{i=k}^{n} \binom{n}{i} a^i (1-a)^{(n-i)}$$

Given a desired overall system availability of $A = 99.999\%$ (“five nines”), $n = 13$, and $k = 8$, this formula tells us that an individual RSI availability of $a = 96$ is necessary to meet the desired system availability.

DNS: SLA: Methodology: RSI Availability



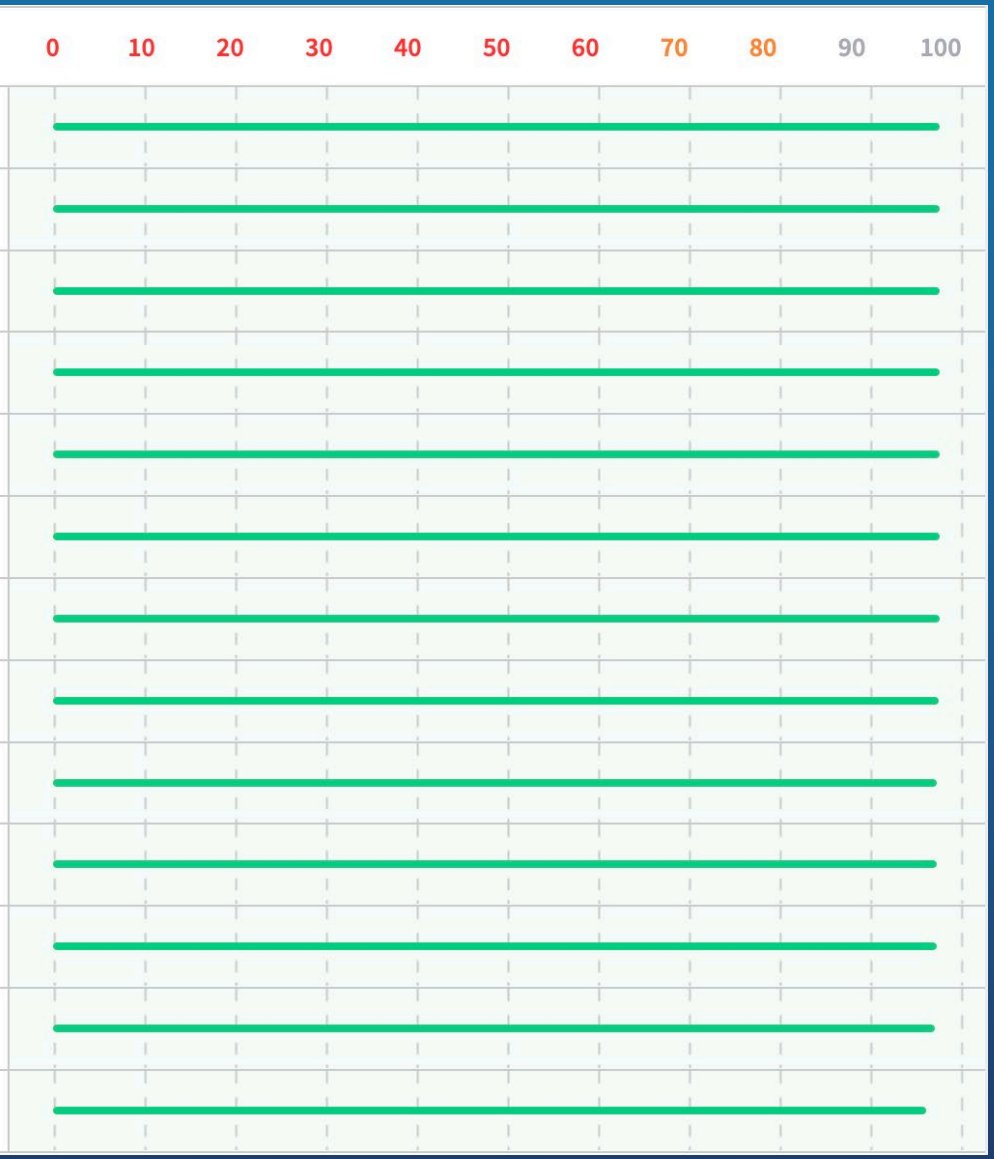
Metrics	Name(s)	Threshold(s)
5.1 RSI Availability	IPv4 UDP Availability IPv4 TCP Availability IPv6 UDP Availability IPv6 TCP Availability	96% 96% 96% 96%
5.2 RSI Response Latency	IPv4 UDP Response Latency IPv4 TCP Response Latency	250 milliseconds 500 milliseconds

DNS: SLA: Methodology: Thresholds

Metrics	Name(s)	Threshold(s)
6.1 RSS Availability	IPv4 UDP Availability IPv4 TCP Availability IPv6 UDP Availability IPv6 TCP Availability	99.999% 99.999% 99.999% 99.999%
6.2 RSS Response Latency	IPv4 UDP Response Latency IPv4 TCP Response Latency IPv6 UDP Response Latency IPv6 TCP Response Latency	150 milliseconds 300 milliseconds 150 milliseconds 300 milliseconds

DNS: SLA: Facts

	DNS name	Uptime
1	d.root-servers.net	99.98 %
2	f.root-servers.net	99.98 %
3	g.root-servers.net	99.98 %
4	l.root-servers.net	99.98 %
5	c.root-servers.net	99.97 %
6	h.root-servers.net	99.96 %
7	b.root-servers.net	99.91 %
8	k.root-servers.net	99.82 %
9	a.root-servers.net	99.61 %
10	e.root-servers.net	99.59 %
11	i.root-servers.net	99.58 %
12	m.root-servers.net	99.37 %
13	j.root-servers.net	98.38 %



DNS: SLA: Facts

№ п/п	Сервис	Доступность (%)	Определение	<100	<99,99	<99,5	<95	DNSPef
1	Azure	100	"Downtime" is the total accumulated Maximum Available Minutes during which the DNS Zone is unavailable. A minute is considered unavailable for a given DNS Zone if a DNS response is not received within two seconds to a valid DNS Request, provided that the valid DNS Request is made to all name servers associated with the DNS Zone and retries are continually attempted for at least 60 consecutive seconds.	10	25	100		99,81
			Monthly Uptime % = (Maximum Available Minutes – Downtime) / Maximum Available Minutes X100					
2	Google	100	For Name Serving: Inability to serve responses from all of the Authoritative Name Servers to DNS queries for domains configured in Cloud DNS.	10	10	25	50	99,86
			"Downtime Period" means a period of 60 consecutive seconds of Downtime. Intermittent Downtime for a period of less than 60 consecutive seconds will not be counted towards any Downtime Periods.					
3	Alibaba	100 (n HA)	"Downtime Period" means a period of 60 consecutive seconds of Downtime. Intermittent Downtime for a period of less than 60 consecutive seconds will not be counted towards any Downtime Periods.	15	30	100		
4	Amazon 53	100	A Hosted Zone is “Unavailable” during a given minute if all four virtual name servers assigned to the Hosted Zone fail to respond to all DNS queries made to the Hosted Zone throughout the minute.	10	25	100		99,98
5	CloudFlare	100 (n HA)	For any and each Outage Period during a monthly billing period the Company will provide as a Service Credit an amount calculated as follows: Service Credit = (Outage Period minutes * Affected Customer Ratio) ÷ Scheduled Availability minutes					99,98
6	Dyn	100	Affected Client Ratio= (Unique visitors as measured by IP address affected by Unscheduled Service Outage)					99,95
			Total unique visitors as measured by IP address					
7	F5	99,9 (n HA)	Кредиты выписываются поминутно + реакция на инцидент	> 60 секунд	> 60 минут	> суток		
8	Godaddy	99,9						99,98
9	UltraDNS (neustar)	100	55 млрд запросов в сутки (30 узлов)					99,99

Questions ?