

Access Network Quality as Fitness for Purpose

Kenjiro Cho (IIJ/WIDE)

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Old automotive ads and broadband



automotive ad in 1963

- in old days, quality cars were large, heavy, and powerful
 - ads featured engine specs (but not any more)
- today's broadband ads have only capacity and price!



today's broadband ad (source: tpg.com.au)

- it's time for us to change current mindset about network service quality!

quick recap: “fit for purpose” 2021 talk

- speedtest is very popular, but not suitable to quantify poor network services
 - may not be the right tool for improving access network quality
 - speedtest: good as performance measurement for engineers but not as quality measurement for end-users
 - speedtests introduce a psychological bias towards a higher-number
 - also, we are obsessed with speed because of the obsolete expression “the Internet is SLOW!”
- speedtests may interfere with netflix or zoom; automated ones could lead to a network collapse
 - then, users should blame who promoted (automated) speedtests (that is YOU!)
- it’s time to change our mindset about network service quality
- possible approach: fit-for-purpose criteria
 - defining a standard quality that would satisfy vast majority of households
 - developing a pass/fail testing tool for standard quality

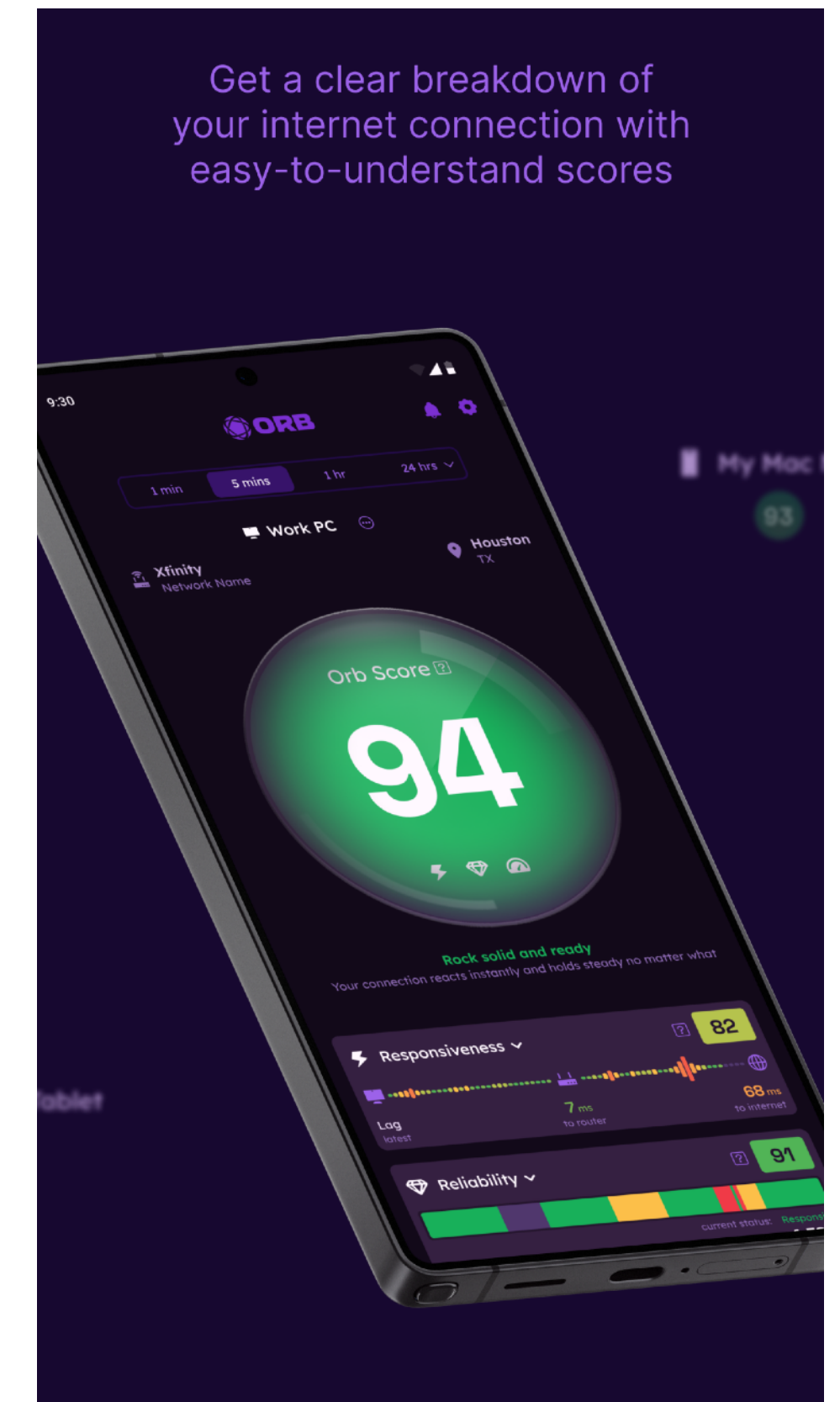
appendix: [orb.net](#) experience report

Kenjiro Cho
2025-11-25



orb.net overview

- network quality measurement tool/service launched in April
 - orb: a startup by ex-CEO of ookla
- continuous monitoring: on responsiveness, reliability, (content) speed
 - scoring total (and each) metric, out of 100 (for 1min,5min,1hour,24hours)
 - light weight: quality monitoring at many locations as business target
- diverse platform support
 - app: with UI, free up to 5 devices, automated background measurement
 - ios, android, windows, mac, linux
 - sensors: without UI, for 24x7 measurement
 - Linux,macOS,RaspberryPi,OpenWrt,Docker,Proxmox,Synology/QNAP NAS, etc
 - cloud: (customizable) analytic services for business users (paid service)

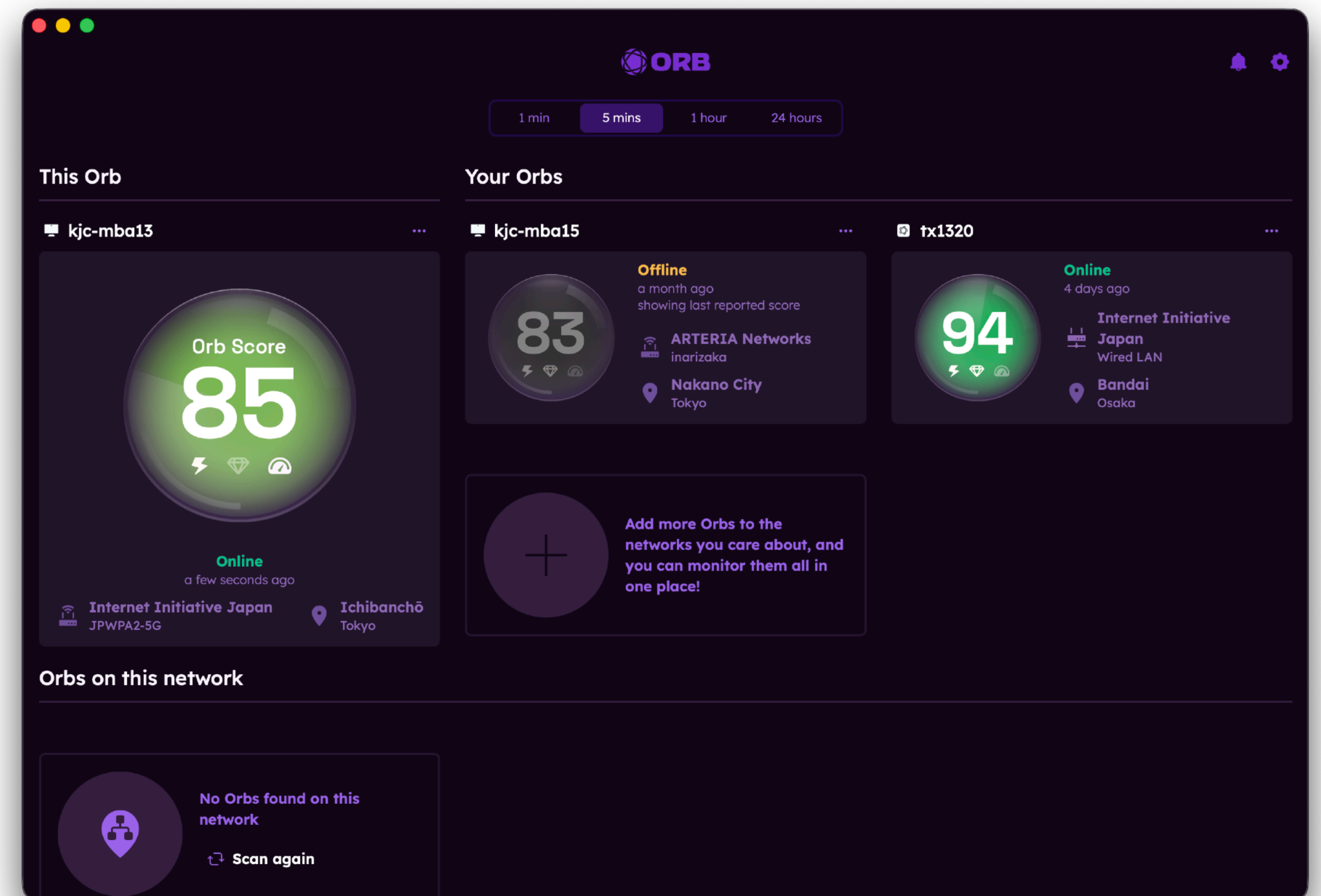


methodologies

- measurement methodology (by observations)
 - responsiveness: every sec, ping to default router, 1.1.1.1(or 1.0.0.1), 8.8.8.8
 - shown as “rag to router” and “rag to Internet”
 - use quic or tls based ping if available
 - stability: time-series of packet-loss
 - content speed:
 - every hour (default): download/upload a 10MB file
- pros: proves that ping(+content speed) is enough for quality measurement
 - easy to try with app, sensors, easy to monitor multiple devices
 - allows to run a normal speedtest by 1 click (for comparing with content speed)
- cons: only up to 24 hours (there’s an api for saving data)
 - ping to public DNS (common practice but may not work in the future)
 - no IPv6 support, no buffer-bloat detection
 - business model?

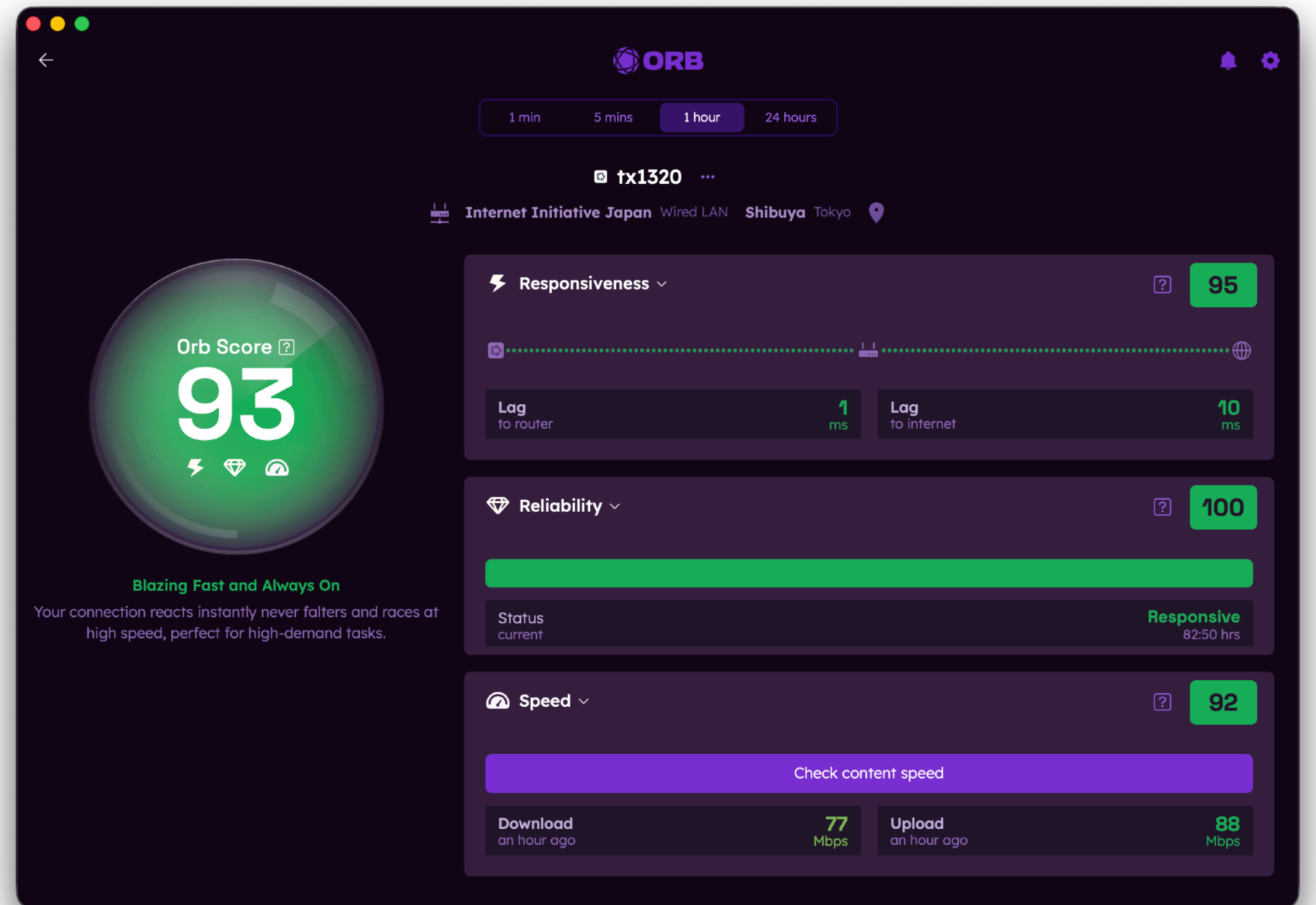
orb dashboard (account view)

- allows to monitor multiple devices
 - associated with an account



orb dashboard (device view)

- click to see details



local measurements

- installed a linux sensor v1.3 in our office global segment
 - 202.32.0.113 (IPv4 only), 100baseT
- tcpdump on the (firewall) bridge
 - includes other traffic on the linux
 - (no other app installed on the linux)

conversations: IPv4

Wireshark · Conversations · tx1320-20251021-1658.pcap

Ethernet · 3 **IPv4 · 26** IPv6 TCP · 64 UDP · 31

Address A	Address B	Packets	Bytes	Stream ID	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A
66.240.236.109	202.32.0.113	2	124 bytes	24	1	62 bytes	1	62 bytes	734.775100	0.0002		
146.242.36.14	202.32.0.113	6	492 bytes	17	3	246 bytes	3	246 bytes	247.687873	0.3999	4920 bits/s	4920 bits/s
146.242.36.17	202.32.0.113	12	984 bytes	13	6	492 bytes	6	492 bytes	243.887737	15.2009	258 bits/s	258 bits/s
146.242.36.18	202.32.0.113	12	984 bytes	14	6	492 bytes	6	492 bytes	244.088171	16.0008	245 bits/s	245 bits/s
146.242.36.21	202.32.0.113	12	984 bytes	15	6	492 bytes	6	492 bytes	244.287679	16.8009	234 bits/s	234 bits/s
146.242.36.22	202.32.0.113	12	984 bytes	16	6	492 bytes	6	492 bytes	244.488094	17.6006	223 bits/s	223 bits/s
146.242.37.49	202.32.0.113	2	164 bytes	19	1	82 bytes	1	82 bytes	364.853493	0.0002		
146.242.37.50	202.32.0.113	2	164 bytes	20	1	82 bytes	1	82 bytes	365.829997	0.0002		
146.242.37.53	202.32.0.113	2	164 bytes	21	1	82 bytes	1	82 bytes	366.854313	0.0002		
202.32.0.113	1.0.0.1	2	179 bytes	25	1	77 bytes	1	102 bytes	795.418905	0.0026		
202.32.0.113	1.1.1.1	1,650	137 kB	3	825	67 kB	825	69 kB	0.092451	797.0318	676 bits/s	695 bits/s
202.32.0.113	8.8.4.4	22	8 kB	23	11	2 kB	11	5 kB	498.127891	30.0557	605 bits/s	1425 bits/s
202.32.0.113	8.8.8.8	1,722	163 kB	2	866	74 kB	856	90 kB	0.085912	797.0279	739 bits/s	900 bits/s
202.32.0.113	35.164.126.77	480	150 kB	5	320	136 kB	160	14 kB	3.248786	791.9272	1375 bits/s	139 bits/s
202.32.0.113	104.18.12.244	612	185 kB	6	360	104 kB	252	81 kB	5.670186	788.6292	1053 bits/s	822 bits/s
202.32.0.113	104.18.13.244	480	145 kB	4	280	81 kB	200	64 kB	2.744715	786.1282	823 bits/s	654 bits/s
202.32.0.113	104.30.146.211	11,126	4 MB	1	5,785	2 MB	5,341	2 MB	0.084936	396.6353	40 kbps	30 kbps
202.32.0.113	141.101.90.1	235	22 kB	7	126	14 kB	109	8 kB	10.708869	386.0155	285 bits/s	169 bits/s
202.32.0.113	142.251.42.138	53	36 kB	12	27	15 kB	26	21 kB	197.776853	300.3769	392 bits/s	567 bits/s
202.32.0.113	162.159.140.220	239	96 kB	8	123	26 kB	116	70 kB	14.986087	780.1766	265 bits/s	720 bits/s
202.32.0.113	172.66.0.218	103	39 kB	18	54	11 kB	49	28 kB	254.995849	480.0812	177 bits/s	470 bits/s
202.32.0.113	202.32.0.65	1,605	106 kB	0	801	53 kB	804	53 kB	0.000000	797.0299	530 bits/s	532 bits/s
202.32.0.113	202.32.0.91	6	2 kB	11	3	999 bytes	3	1 kB	130.967437	601.8641	13 bits/s	13 bits/s
202.32.0.113	202.214.97.26	32	3 kB	10	16	1 kB	16	2 kB	120.495046	608.9133	15 bits/s	24 bits/s
202.32.0.113	208.67.222.222	2	168 bytes	22	1	76 bytes	1	92 bytes	495.408703	0.0083	73 kbps	88 kbps
202.32.0.113	224.0.0.251	26	9 kB	9	26	9 kB	0	0 bytes	74.991285	722.0273	96 bits/s	0 bits/s

Conversation Settings

- Name resolution
- Absolute start time
- Display raw data
- Limit to display filter

Copy

Follow Stream...

Graph...

I/O Graphs

Protocol

- Bluetooth
- BPv7
- DCCP
- DNP 3.0
- Ethernet
- FC
- FDDI
- IEEE 802.11
- IEEE 802.15.4

Filter list for specific type

Help

Close

conversations: tcp

Wireshark · Conversations · tx1320-20251021-1658.pcap

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I/O Graphs

Protocol

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- IEEE 802.11
- IEEE 802.15.4
- ILNP
- IPv4
- IPv6
- IPX
- JXTA
- LTP
- MPTCP
- NCP
- openSAFETY
- RSVP
- SCTP
- SLL
- TCP
- Token-Ring
- UDP
- USB
- ZigBee

Filter list for specific type

Help

Address A	Port A	Address B	Port B	Packets	Bytes	Stream ID	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A	Flows
202.32.0.113	46030	8.8.4.4	443	22	8 kB	43	11	2 kB	11	5 kB	498.127891	30.0557	605 bits/s	1425 bits/s	8
202.32.0.113	37126	8.8.8.8	443	22	8 kB	42	13	2 kB	9	6 kB	498.029687	0.1523	131 kbps	292 kbps	10
202.32.0.113	46956	8.8.8.8	443	23	8 kB	19	13	2 kB	10	6 kB	197.741609	0.0957	208 kbps	471 kbps	10
202.32.0.113	46970	8.8.8.8	443	21	8 kB	20	11	2 kB	10	5 kB	197.790031	30.0490	605 bits/s	1408 bits/s	8
202.32.0.113	37584	35.164.126.77	1883	480	150 kB	1	320	136 kB	160	14 kB	3.248786	791.9272	1375 bits/s	139 bits/s	320
202.32.0.113	33802	104.18.12.244	443	26	9 kB	33	15	5 kB	11	3 kB	425.892224	6.2463	6626 bits/s	4372 bits/s	13
202.32.0.113	33892	104.18.12.244	443	25	7 kB	26	15	4 kB	10	3 kB	309.191764	4.7966	6332 bits/s	5582 bits/s	12
202.32.0.113	35070	104.18.12.244	443	25	7 kB	11	15	4 kB	10	3 kB	120.510792	4.4729	6966 bits/s	5984 bits/s	12
202.32.0.113	35086	104.18.12.244	443	25	7 kB	12	15	4 kB	10	3 kB	124.981327	0.2391	127 kbps	112 kbps	12
202.32.0.113	37734	104.18.12.244	443	27	7 kB	23	16	4 kB	11	3 kB	251.383347	30.1763	1024 bits/s	904 bits/s	12
202.32.0.113	38250	104.18.12.244	443	25	7 kB	56	15	4 kB	10	3 kB	722.364474	1.1971	26 kbps	22 kbps	12
202.32.0.113	38606	104.18.12.244	443	26	9 kB	61	15	5 kB	11	3 kB	788.872311	5.2077	7989 bits/s	5241 bits/s	13
202.32.0.113	39416	104.18.12.244	443	25	7 kB	52	15	4 kB	10	3 kB	661.211732	0.2131	146 kbps	125 kbps	12
202.32.0.113	39430	104.18.12.244	443	26	8 kB	54	16	5 kB	10	3 kB	664.886064	30.1930	1357 bits/s	886 bits/s	13
202.32.0.113	41970	104.18.12.244	443	24	7 kB	22	14	4 kB	10	3 kB	241.809081	9.5745	3204 bits/s	2797 bits/s	12
202.32.0.113	44486	104.18.12.244	443	26	7 kB	30	15	4 kB	11	3 kB	363.685410	4.0925	7416 bits/s	6669 bits/s	12
202.32.0.113	45170	104.18.12.244	443	26	9 kB	45	15	5 kB	11	3 kB	551.282320	1.9801	21 kbps	13 kbps	13
202.32.0.113	45176	104.18.12.244	443	26	7 kB	46	15	4 kB	11	3 kB	553.261317	30.1735	1006 bits/s	904 bits/s	12
202.32.0.113	47654	104.18.12.244	443	25	7 kB	35	15	4 kB	10	3 kB	434.373666	0.6297	48 kbps	42 kbps	12
202.32.0.113	47658	104.18.12.244	443	27	7 kB	36	16	4 kB	11	3 kB	435.001601	30.1608	1072 bits/s	904 bits/s	12
202.32.0.113	49310	104.18.12.244	443	25	7 kB	7	15	4 kB	10	3 kB	60.272526	4.1060	7600 bits/s	6521 bits/s	12
202.32.0.113	49312	104.18.12.244	443	24	7 kB	8	14	4 kB	10	3 kB	64.377252	8.1205	3675 bits/s	3297 bits/s	12
202.32.0.113	49848	104.18.12.244	443	19	7 kB	62	11	4 kB	8	3 kB	794.077296	0.2221	130 kbps	115 kbps	11
202.32.0.113	49902	104.18.12.244	443	28	9 kB	9	16	5 kB	12	3 kB	72.497227	30.1708	1447 bits/s	922 bits/s	13
202.32.0.113	50890	104.18.12.244	443	26	9 kB	16	15	5 kB	11	3 kB	189.722431	4.8139	8885 bits/s	5670 bits/s	13
202.32.0.113	53738	104.18.12.244	443	26	9 kB	2	15	5 kB	11	3 kB	5.670186	5.0210	8387 bits/s	5437 bits/s	13
202.32.0.113	55476	104.18.12.244	443	28	7 kB	3	16	4 kB	12	3 kB	10.688378	30.1773	1050 bits/s	922 bits/s	12
202.32.0.113	55936	104.18.12.244	443	25	7 kB	44	15	4 kB	10	3 kB	548.856256	2.4278	12 kbps	11 kbps	12
202.32.0.113	59308	104.18.12.244	443	27	9 kB	58	16	5 kB	11	3 kB	729.409831	30.1765	1432 bits/s	905 bits/s	13
202.32.0.113	32798	104.18.13.244	443	24	7 kB	0	14	4 kB	10	3 kB	2.744715	2.9289	10 kbps	9144 bits/s	12
202.32.0.113	34240	104.18.13.244	443	23	7 kB	57	14	4 kB	9	3 kB	723.560025	5.8243	5123 bits/s	4506 bits/s	12
202.32.0.113	35584	104.18.13.244	443	27	9 kB	21	16	5 kB	11	3 kB	240.951420	0.8591	47 kbps	31 kbps	13
202.32.0.113	36882	104.18.13.244	443	26	7 kB	40	15	4 kB	11	3 kB	490.219690	30.1779	1033 bits/s	904 bits/s	12
202.32.0.113	41514	104.18.13.244	443	24	7 kB	34	14	4 kB	10	3 kB	432.136738	2.2397	13 kbps	11 kbps	12
202.32.0.113	43992	104.18.13.244	443	24	7 kB	25	15	4 kB	9	3 kB	304.013915	5.1790	6024 bits/s	5071 bits/s	12
202.32.0.113	44888	104.18.13.244	443	24	7 kB	29	14	4 kB	10	3 kB	363.018059	0.6708	45 kbps	39 kbps	12
202.32.0.113	44896	104.18.13.244	443	27	9 kB	31	16	5 kB	11	3 kB	367.777504	30.1881	1370 bits/s	904 bits/s	13
202.32.0.113	45716	104.18.13.244	443	24	7 kB	49	14	4 kB	10	3 kB	609.210105	4.1269	7232 bits/s	6488 bits/s	12
202.32.0.113	45724	104.18.13.244	443	28	9 kB	50	16	5 kB	12	3 kB	613.336296	30.1831	1409 bits/s	922 bits/s	13
202.32.0.113	51590	104.18.13.244	443	27	7 kB	17	15	4 kB	12	3 kB	194.533697	30.1662	1034 bits/s	926 bits/s	12
202.32.0.113	51896	104.18.13.244	443	24	7 kB	60	14	4 kB	10	3 kB	783.507734	5.3652	5560 bits/s	4990 bits/s	12
202.32.0.113	53184	104.18.13.244	443	29	9 kB	27	16	6 kB	13	4 kB	313.985247	30.1968	1475 bits/s	939 bits/s	13
202.32.0.113	53760	104.18.13.244	443	24	7 kB	48	14	4 kB	10	3 kB	604.296611	4.9151	6245 bits/s	5447 bits/s	12
202.32.0.113	54924	104.18.13.244	443	28	9 kB	13	16	5 kB	12	3 kB	125.218486	30.1876	1364 bits/s	921 bits/s	13
202.32.0.113	56188	104.18.13.244	443	24	7 kB	38	14	4 kB	10	3 kB	480.466126	6.3621	4690 bits/s	4207 bits/s	12
202.32.0.113	56192	104.18.13.244	443	26	9 kB	39	15	5 kB	11	3 kB	486.825949	3.3945	12 kbps	8074 bits/s	13
202.32.0.113	57960	104.18.13.244	443	23	7 kB	15	14	4 kB	9	3 kB	184.519981	5.2035	5736 bits/s	5044 bits/s	12
202.32.0.113	58058	104.18.13.244	443	24	7 kB	53	14	4 kB	10	3 kB	661.424125	3.4627	8617 bits/s	7735 bits/s	12
202.32.0.113	33642	141.101.90.1	5349	112	10 kB	4	60	6 kB	52	4 kB	10.708869	386.0155	122 bits/s	81 bits/s	16
202.32.0.113	38272	141.101.90.1	3478	108	9 kB	5	58	6 kB	50	4 kB	10.708873	386.0142	116 bits/s	75 bits/s	14
202.32.0.113	32958	162.159.140.220	443	26	10 kB	47	13	3 kB	13	7 kB	555.014800	0.0760	277 kbps	748 kbps	12
202.32.0.113	36160	162.159.140.220	443	22	10 kB	55	12	3 kB	10	7 kB	675.014248	0.0600	342 kbps	925 kbps	11
202.32.0.113	37128	162.159.140.220	443	23	10 kB	41	12	3 kB	11	7 kB	495.008980	0.0565	364 kbps	988 kbps	11
202.32.0.113	44158	162.159.140.220	443	25	10 kB	28	12	3 kB	13	7 kB	314.996505	0.0499	412 kbps	1143 kbps	13
202.32.0.113	47068	162.159.140.220	443	25	10 kB	6	12	3 kB	13	7 kB	14.986087	0.1165	176 kbps	488 kbps	12
202.32.0.113	52792	162.159.140.220	443	22	10 kB	63	12	3 kB	10	7 kB	795.016976	0.1457	141 kbps	380 kbps	11
202.32.0.113	52922	162.159.140.220	443	25	10 kB	10	13	3 kB	12	7 kB	74.988487	0.0628	336 kbps	898 kbps	12
202.32.0.113	53130	162.159.140.220	443	25	10 kB	14	13	3 kB	12	7 kB	134.990691	0.0568	371 kbps	995 kbps	12
202.32.0.113	57380	162.159.140.220	443	24	10 kB	18	12	3 kB	12	7 kB	194.993800	0.0685	300 kbps	826 kbps	13
202.32.0.113	60104	162.159.140.220	443	22	9 kB	32	10	3 kB	10	7 kB	375.000108	0.0441	466 kbps	1254 kbps	11
202.32.0.113	37924	172.66.0.218	443	28	10 kB	51	16	3 kB	12	7 kB	615.014822	0.1063	211 kbps	529 kbps	12
202.32.0.113	56092	172.66.0.218	443	26	10 kB	24	13	3 kB	13	7 kB	254.995849	0.0680	310 kbps	836 kbps	12
202.32.0.113	57924	172.66.0.218	443	24	10 kB	37	12	3 kB	12	7 kB	435.008480	0.0511	402 kbps	1108 kbps	13
202.32.0.113	58178	172.66.0.218	443	25	10 kB	59	13	3 kB	12	7 kB	735.016171	0.0608	346 kbps	926 kbps	12

Close

conversations: udp

Wireshark · Conversations · tx1320-20251021-1658.pcap

Ethernet · 3 IPv4 · 26 IPv6 TCP · 64 **UDP · 31**

Address A	Port A	Address B	Port B	Packets	Bytes	Stream ID	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A
202.32.0.113	44862	1.0.0.1	53	2	179 bytes	30	1	77 bytes	1	102 bytes	795.418905	0.0026		
202.32.0.113	35703	1.1.1.1	443	21	14 kB	24	10	6 kB	11	8 kB	498.033371	0.0113	4211 kbps	5768 kbps
202.32.0.113	38123	1.1.1.1	443	22	14 kB	13	11	6 kB	11	8 kB	197.745544	0.0391	1231 kbps	1660 kbps
202.32.0.113	41462	1.1.1.1	443	2	1 kB	7	1	1 kB	1	84 bytes	197.741817	0.0025		
202.32.0.113	43022	1.1.1.1	53	2	179 bytes	6	1	77 bytes	1	102 bytes	195.398250	0.0030		
202.32.0.113	57321	1.1.1.1	443	2	1 kB	18	1	1 kB	1	77 bytes	498.029876	0.0025		
202.32.0.113	45938	8.8.8.8	443	26	18 kB	20	13	7 kB	13	11 kB	498.030897	0.0757	773 kbps	1140 kbps
202.32.0.113	58509	8.8.8.8	443	24	15 kB	11	12	6 kB	12	9 kB	197.743224	0.0702	683 kbps	1078 kbps
202.32.0.113	36851	104.30.146.211	25767	11,126	4 MB	0	5,785	2 MB	5,341	2 MB	0.084936	396.6353	40 kbps	30 kbps
202.32.0.113	52785	141.101.90.1	3478	14	3 kB	1	7	2 kB	7	626 bytes	23.474483	373.2482	45 bits/s	13 bits/s
202.32.0.113	41675	142.251.42.138	443	28	19 kB	27	14	7 kB	14	12 kB	498.080022	0.0738	804 kbps	1254 kbps
202.32.0.113	42476	142.251.42.138	443	25	17 kB	14	13	7 kB	12	10 kB	197.776853	0.0686	855 kbps	1137 kbps
202.32.0.113	68	202.32.0.91	67	6	2 kB	5	3	999 bytes	3	1 kB	130.967437	601.8641	13 bits/s	13 bits/s
202.32.0.113	39879	202.214.97.26	53	2	192 bytes	22	1	80 bytes	1	112 bytes	498.031325	0.0257	24 kbps	34 kbps
202.32.0.113	40993	202.214.97.26	53	2	176 bytes	16	1	72 bytes	1	104 bytes	425.880067	0.0117	49 kbps	71 kbps
202.32.0.113	41045	202.214.97.26	53	2	200 bytes	15	1	72 bytes	1	128 bytes	425.880006	0.0087	65 kbps	117 kbps
202.32.0.113	42255	202.214.97.26	53	2	176 bytes	10	1	80 bytes	1	96 bytes	197.742816	0.0319	20 kbps	24 kbps
202.32.0.113	44452	202.214.97.26	53	2	200 bytes	3	1	72 bytes	1	128 bytes	120.495046	0.0122	47 kbps	83 kbps
202.32.0.113	46185	202.214.97.26	53	2	192 bytes	12	1	80 bytes	1	112 bytes	197.743512	0.0470	13 kbps	19 kbps
202.32.0.113	48153	202.214.97.26	53	2	176 bytes	29	1	72 bytes	1	104 bytes	729.382352	0.0259	22 kbps	32 kbps
202.32.0.113	49417	202.214.97.26	53	2	216 bytes	9	1	80 bytes	1	136 bytes	197.742553	0.0351	18 kbps	30 kbps
202.32.0.113	49571	202.214.97.26	53	2	172 bytes	26	1	70 bytes	1	102 bytes	498.078761	0.0481	11 kbps	16 kbps
202.32.0.113	51269	202.214.97.26	53	2	176 bytes	23	1	80 bytes	1	96 bytes	498.031970	0.0471	13 kbps	16 kbps
202.32.0.113	55196	202.214.97.26	53	2	188 bytes	8	1	80 bytes	1	108 bytes	197.742274	0.0317	20 kbps	27 kbps
202.32.0.113	55338	202.214.97.26	53	2	176 bytes	4	1	72 bytes	1	104 bytes	120.495366	0.0150	38 kbps	55 kbps
202.32.0.113	55756	202.214.97.26	53	2	196 bytes	25	1	70 bytes	1	126 bytes	498.078643	0.0478	11 kbps	21 kbps
202.32.0.113	55764	202.214.97.26	53	2	188 bytes	19	1	80 bytes	1	108 bytes	498.030758	0.0141	45 kbps	61 kbps
202.32.0.113	57103	202.214.97.26	53	2	200 bytes	28	1	72 bytes	1	128 bytes	729.382044	0.0263	21 kbps	39 kbps
202.32.0.113	58742	202.214.97.26	53	2	216 bytes	21	1	80 bytes	1	136 bytes	498.031063	0.0358	17 kbps	30 kbps
202.32.0.113	38360	208.67.222.222	53	2	168 bytes	17	1	76 bytes	1	92 bytes	495.408703	0.0083	73 kbps	88 kbps
202.32.0.113	5353	224.0.0.251	5353	26	9 kB	2	26	9 kB	0	0 bytes	74.991285	722.0273	96 bits/s	0 bits/s

Conversation Settings

- Name resolution
- Absolute start time
- Display raw data
- Limit to display filter

Copy

Follow Stream...

Graph...

I/O Graphs

Protocol

- Bluetooth
- BPv7
- DCCP
- DNP 3.0
- Ethernet
- FC
- FDDI
- IEEE 802.11
- IEEE 802.15.4
- ILNP
- IPv4
- IPv6
- IPX

Filter list for specific type

Help

Close

conversations: content speedtest

Wireshark - Conversations - tx1320-20251118-1647.pcap

Ethernet · 3 IPv4 · 27 IPv6 **TCP · 20** UDP · 17

Address A	Port A	Address B	Port B	Packets	Bytes	Stream ID	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A	Flows
202.32.0.113	58982	8.8.8.8	443	25	8 kB	9	13	2 kB	12	6 kB	61.893330	0.1740	114 kbps	265 kbps	10
202.32.0.113	58994	8.8.8.8	443	22	8 kB	10	11	2 kB	11	5 kB	62.016642	30.0527	605 bits/s	1426 bits/s	8
202.32.0.113	60710	54.212.36.175	1883	90	28 kB	0	60	26 kB	30	3 kB	1.893834	142.6139	1450 bits/s	145 bits/s	60
202.32.0.113	32796	104.18.12.244	443	24	7 kB	13	14	4 kB	10	3 kB	104.890800	12.5901	2352 bits/s	2125 bits/s	12
202.32.0.113	41162	104.18.12.244	443	25	8 kB	7	15	5 kB	10	3 kB	54.331128	2.7149	15 kbps	9856 bits/s	13
202.32.0.113	41170	104.18.12.244	443	28	7 kB	8	16	4 kB	12	3 kB	57.044820	30.1679	1060 bits/s	925 bits/s	12
202.32.0.113	55612	104.18.12.244	443	24	7 kB	17	14	4 kB	10	3 kB	117.479802	0.7280	40 kbps	36 kbps	12
202.32.0.113	33936	104.18.13.244	443	26	8 kB	12	15	5 kB	11	3 kB	103.810964	1.0807	37 kbps	25 kbps	13
202.32.0.113	48528	104.18.13.244	443	7	486 bytes	5	4	288 bytes	3	198 bytes	13.473457	14.8545	155 bits/s	106 bits/s	1
202.32.0.113	48716	104.18.13.244	443	25	7 kB	6	14	4 kB	11	3 kB	49.393254	4.9394	5994 bits/s	5543 bits/s	12
202.32.0.113	60840	104.18.13.244	443	22	7 kB	18	13	4 kB	9	3 kB	118.207342	15.1638	1977 bits/s	1729 bits/s	11
202.32.0.113	46656	104.18.25.155	443	28	8 kB	16	14	3 kB	14	5 kB	110.847748	30.3871	755 bits/s	1445 bits/s	14
202.32.0.113	33306	141.101.90.1	3478	40	3 kB	1	20	2 kB	20	1 kB	2.208779	131.0823	97 bits/s	83 bits/s	2
202.32.0.113	57594	141.101.90.1	5349	40	3 kB	2	20	2 kB	20	1 kB	2.208795	131.0884	98 bits/s	84 bits/s	2
202.32.0.113	59988	162.159.140.220	443	9,838	11 MB	14	2,905	194 kB	6,933	10 MB	109.000187	0.9268	1670 kbps	90 Mbps	6,933
202.32.0.113	37720	172.66.0.218	443	22	9 kB	4	12	3 kB	10	7 kB	11.638194	0.0446	460 kbps	1238 kbps	10
202.32.0.113	43802	172.66.0.218	443	20	1 kB	3	10	660 bytes	10	660 bytes	3.232834	138.2502	38 bits/s	38 bits/s	0
202.32.0.113	44150	172.66.0.218	443	20	9 kB	11	11	3 kB	9	7 kB	71.642023	0.0475	422 kbps	1153 kbps	10
202.32.0.113	57748	172.66.0.218	443	23	10 kB	19	12	3 kB	11	7 kB	131.645601	0.0429	478 kbps	1300 kbps	11
202.32.0.113	58862	172.66.0.218	443	10,697	11 MB	15	7,239	11 MB	3,458	234 kB	109.927103	31.0436	2708 kbps	60 kbps	7,235

Conversation Settings

- Name resolution
- Absolute start time
- Display raw data
- Limit to display filter

Copy

Follow Stream...

Graph...

I/O Graphs

Protocol

- Bluetooth
- BPv7
- DCCP
- DNP 3.0

Filter list for specific type

Help

Close

latency probing with ping

- every sec, ping to 1st-hop, 8.8.8.8, 1.1.1.1

The screenshot shows a Wireshark interface with a packet capture file named 'tx1320-20251021-1658.pcap'. The main display area shows a list of network packets. The selected packet (Frame 14) is highlighted in pink and shows an ICMP Echo (ping) request from 202.32.0.113 to 8.8.8.8. The packet details pane shows the ICMP header with ID 0xa465, sequence number 0, and TTL 64. The packet bytes pane shows the raw data: 90 1b 0e 32 6e ab e4 37 9f ec 55 f4 08 00 45 00. The status bar at the bottom indicates 'Packets: 18469' and 'Profile: Default'.

Time	Source	Destination	Protocol	Length	Info
6284	162.6031...	202.32.0.113	DTLSv...	107	Application Data
6285	162.6256...	202.32.0.113	STUN	154	Binding Request user: guGeTQmUofskwBWz:vCdy0srvKxyThiHS
6286	162.6337...	104.30.146.211	STUN	154	Binding Request user: vCdy0srvKxyThiHS:guGeTQmUofskwBWz
6287	162.6341...	104.30.146.211	STUN	106	Binding Success Response XOR-MAPPED-ADDRESS: 202.32.0.113:36851
6288	162.6342...	202.32.0.113	STUN	106	Binding Success Response XOR-MAPPED-ADDRESS: 104.30.146.211:25767
6289	162.6343...	202.32.0.113	STUN	154	Binding Request user: guGeTQmUofskwBWz:vCdy0srvKxyThiHS
6290	162.6453...	104.30.146.211	STUN	106	Binding Success Response XOR-MAPPED-ADDRESS: 202.32.0.113:36851
6291	162.7745...	202.32.0.113	DTLSv...	107	Application Data
6292	163.0065...	202.32.0.113	ICMP	66	Echo (ping) request id=0x4e4f, seq=0/0, ttl=64 (reply in 6293)
6293	163.0068...	202.32.0.65	ICMP	66	Echo (ping) reply id=0x4e4f, seq=0/0, ttl=255 (request in 6292)
6294	163.0895...	202.32.0.113	ICMP	66	Echo (ping) request id=0xf298, seq=0/0, ttl=64 (reply in 6295)
6295	163.0911...	8.8.8.8	ICMP	66	Echo (ping) reply id=0xf298, seq=0/0, ttl=117 (request in 6294)
6296	163.0996...	202.32.0.113	ICMP	66	Echo (ping) request id=0xfec9, seq=0/0, ttl=64 (reply in 6297)
6297	163.1016...	1.1.1.1	ICMP	66	Echo (ping) reply id=0xfec9, seq=0/0, ttl=56 (request in 6296)
6298	164.0069...	202.32.0.113	ICMP	66	Echo (ping) request id=0xcb6b, seq=0/0, ttl=64 (reply in 6299)
6299	164.0071...	202.32.0.65	ICMP	66	Echo (ping) reply id=0xcb6b, seq=0/0, ttl=255 (request in 6298)
6300	164.0902...	202.32.0.113	ICMP	66	Echo (ping) request id=0xa465, seq=0/0, ttl=64 (reply in 6301)
6301	164.0918...	8.8.8.8	ICMP	66	Echo (ping) reply id=0xa465, seq=0/0, ttl=117 (request in 6300)
6302	164.0993...	202.32.0.113	ICMP	66	Echo (ping) request id=0x5b9d, seq=0/0, ttl=64 (reply in 6303)
6303	164.1012...	1.1.1.1	ICMP	66	Echo (ping) reply id=0x5b9d, seq=0/0, ttl=56 (request in 6302)
6304	164.1026...	202.32.0.113	DTLSv...	691	Application Data
6305	164.1028...	202.32.0.113	DTLSv...	115	Application Data

latency probing using udp 443 (quic)

tx1320-20251118-1156.pcap

Apply a display filter ... <?>

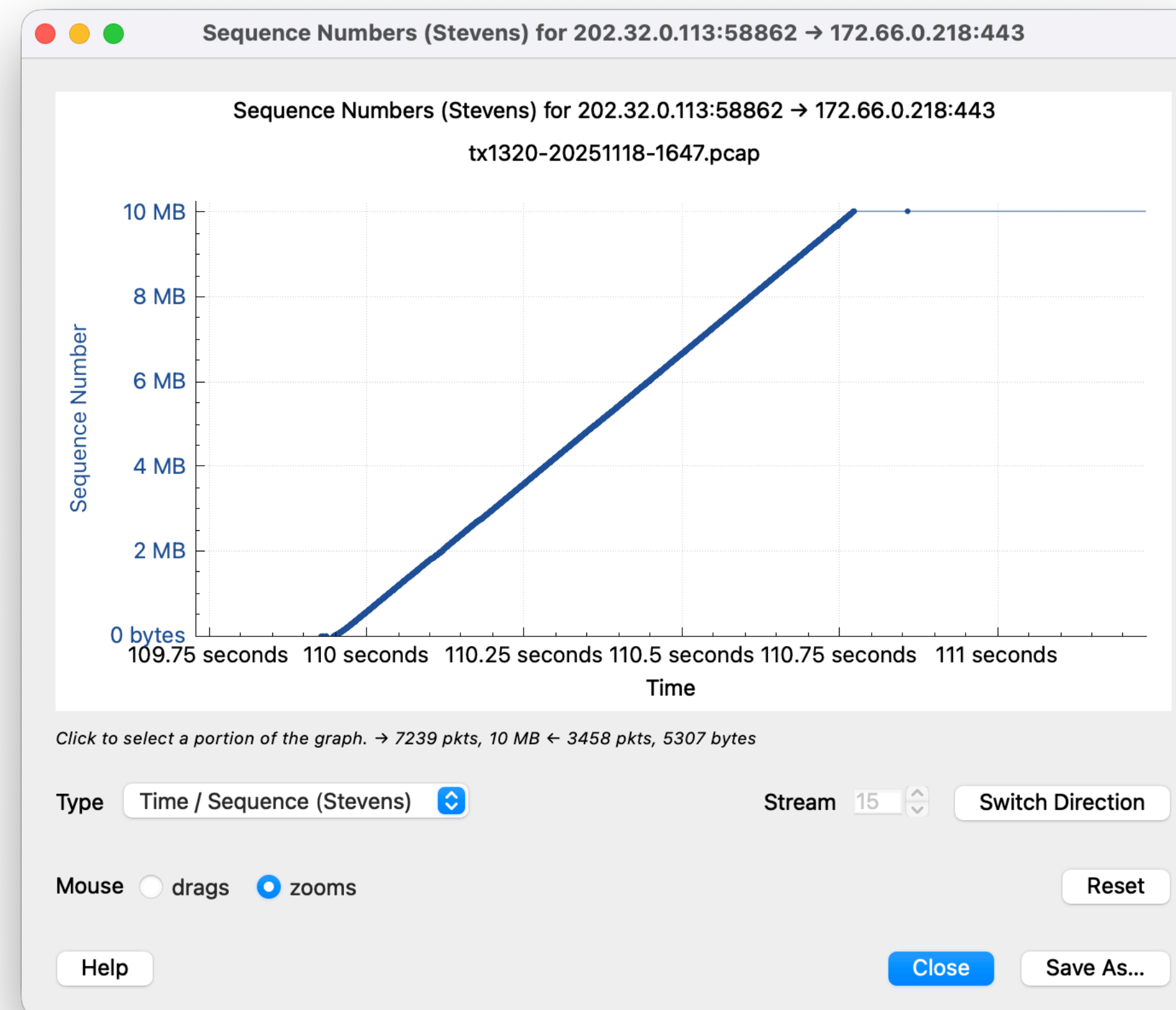
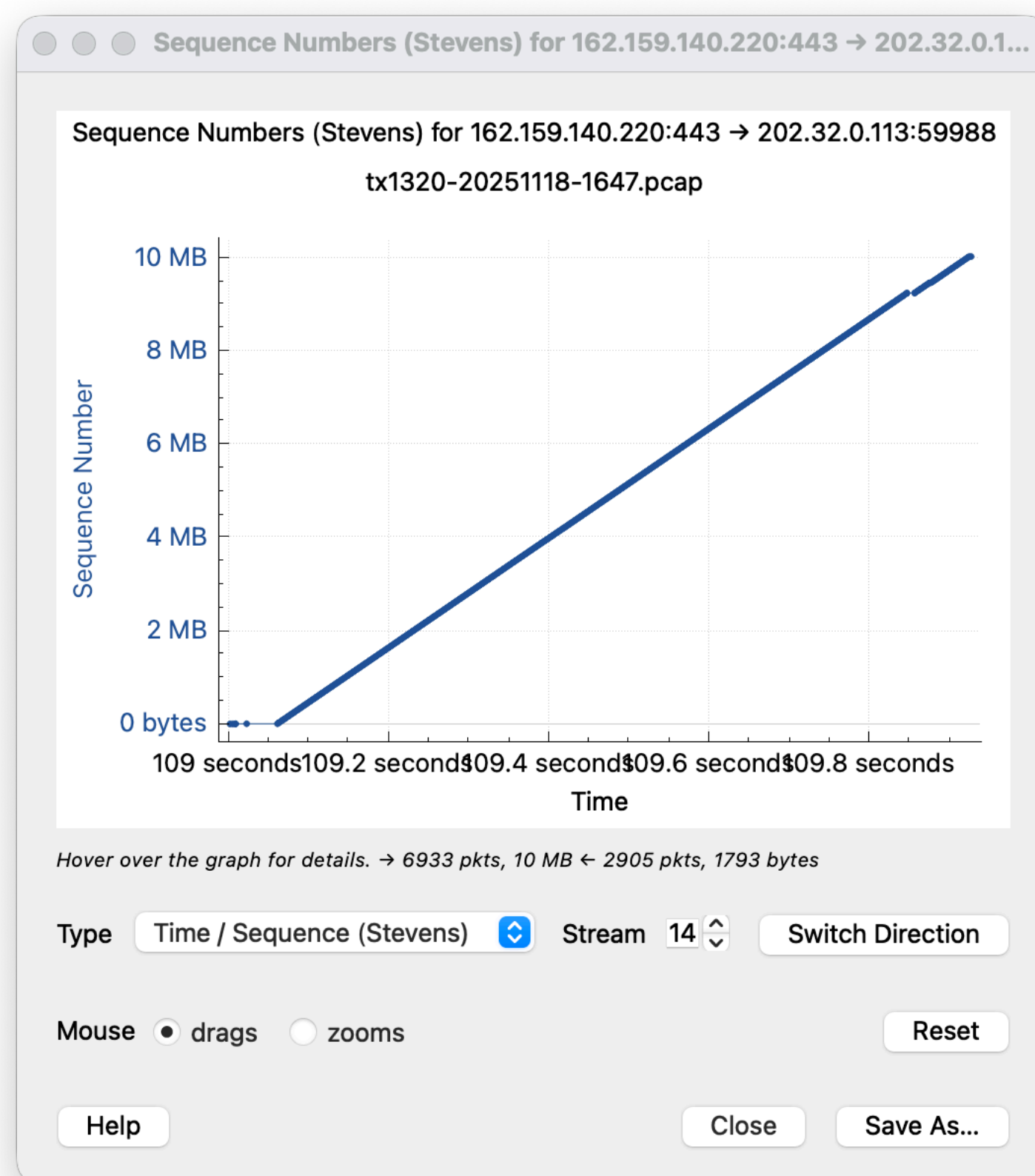
No.	Time	Source	Destination	Protocol	Length	Info
2743	295.0145...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0x3af7, seq=0/0, ttl=64 (reply in 2744)
2744	295.0148...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0x3af7, seq=0/0, ttl=255 (request in 2743)
2745	295.7331...	202.32.0.113	1.0.0.1	UDP	83	47797 → 443 Len=41
2746	295.7349...	1.0.0.1	202.32.0.113	UDP	66	443 → 47797 Len=24
2747	295.7444...	202.32.0.113	1.1.1.1	ICMP	66	Echo (ping) request id=0xe114, seq=0/0, ttl=64 (reply in 2748)
2748	295.7464...	1.1.1.1	202.32.0.113	ICMP	66	Echo (ping) reply id=0xe114, seq=0/0, ttl=56 (request in 2747)
2749	296.0149...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0xb309, seq=0/0, ttl=64 (reply in 2750)
2750	296.0151...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0xb309, seq=0/0, ttl=255 (request in 2749)
2751	296.7330...	202.32.0.113	1.0.0.1	UDP	83	47797 → 443 Len=41
2752	296.7366...	1.0.0.1	202.32.0.113	UDP	66	443 → 47797 Len=24
2753	296.7442...	202.32.0.113	1.1.1.1	ICMP, ...	66	Echo (ping) request id=0x32a1, seq=0/0, ttl=64 (reply in 2754) (SendTTL=2, Round=22)
2754	296.7464...	1.1.1.1	202.32.0.113	ICMP, ...	66	Echo (ping) reply id=0x32a1, seq=0/0, ttl=56 (request in 2753) (SendTTL=2, Round=22)
2755	297.0141...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0x5509, seq=0/0, ttl=64 (reply in 2756)
2756	297.0143...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0x5509, seq=0/0, ttl=255 (request in 2755)
2757	297.2522...	202.32.0.113	9.9.9.9	ICMP	60	Echo (ping) request id=0xf156, seq=1/256, ttl=1 (no response found!)
2758	297.2525...	202.32.0.65	202.32.0.113	ICMP	70	Time-to-live exceeded (Time to live exceeded in transit)
2759	297.2533...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0xfcce, seq=0/0, ttl=64 (reply in 2760)
2760	297.2535...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0xfcce, seq=0/0, ttl=255 (request in 2759)
2761	297.7331...	202.32.0.113	1.0.0.1	UDP	83	47797 → 443 Len=41
2762	297.7349...	1.0.0.1	202.32.0.113	UDP	66	443 → 47797 Len=24
2763	297.7444...	202.32.0.113	1.1.1.1	ICMP	66	Echo (ping) request id=0x6e94, seq=0/0, ttl=64 (reply in 2764)
2764	297.7466...	1.1.1.1	202.32.0.113	ICMP	66	Echo (ping) reply id=0x6e94, seq=0/0, ttl=56 (request in 2763)
2765	298.0148...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0xa6bd, seq=0/0, ttl=64 (reply in 2766)
2766	298.0150...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0xa6bd, seq=0/0, ttl=255 (request in 2765)
2767	298.7333...	202.32.0.113	1.0.0.1	UDP	83	47797 → 443 Len=41
2768	298.7393...	1.0.0.1	202.32.0.113	UDP	66	443 → 47797 Len=24
2769	298.7440...	202.32.0.113	1.1.1.1	ICMP	66	Echo (ping) request id=0x06d4, seq=0/0, ttl=64 (reply in 2770)
2770	298.7512...	1.1.1.1	202.32.0.113	ICMP	66	Echo (ping) reply id=0x06d4, seq=0/0, ttl=56 (request in 2769)
2771	298.7549...	202.32.0.113	1.1.1.1	ICMP	66	Echo (ping) request id=0xeeb5, seq=0/0, ttl=64 (reply in 2772)
2772	298.7623...	1.1.1.1	202.32.0.113	ICMP	66	Echo (ping) reply id=0xeeb5, seq=0/0, ttl=56 (request in 2771)
2773	299.0149...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0xe79e, seq=0/0, ttl=64 (reply in 2774)
2774	299.0152...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0xe79e, seq=0/0, ttl=255 (request in 2773)
2775	299.3050...	140.179.226.162	202.32.0.113	ICMP	82	Echo (ping) request id=0x0014, seq=15175/18235, ttl=27 (reply in 2776)
2776	299.3052...	202.32.0.113	140.179.226.162	ICMP	82	Echo (ping) reply id=0x0014, seq=15175/18235, ttl=64 (request in 2775)
2777	299.7334...	202.32.0.113	1.0.0.1	UDP	83	47797 → 443 Len=41
2778	299.7354...	1.0.0.1	202.32.0.113	UDP	66	443 → 47797 Len=24
2779	299.7446...	202.32.0.113	1.1.1.1	ICMP	66	Echo (ping) request id=0x595e, seq=0/0, ttl=64 (reply in 2780)
2780	299.7466...	1.1.1.1	202.32.0.113	ICMP	66	Echo (ping) reply id=0x595e, seq=0/0, ttl=56 (request in 2779)
2781	300.0145...	202.32.0.113	202.32.0.65	ICMP	66	Echo (ping) request id=0xdd8f, seq=0/0, ttl=64 (reply in 2782)
2782	300.0147...	202.32.0.65	202.32.0.113	ICMP	66	Echo (ping) reply id=0xdd8f, seq=0/0, ttl=255 (request in 2781)
2783	300.2689...	202.32.0.113	54.212.36.175	TCP	90	60710 → 1883 [PSH, ACK] Seq=43075 Ack=1221 Win=501 Len=24 TSval=4274398078 TSecr=24996104

> Frame 1: Packet, 66 bytes on wire (0000 e4 37 9f ec 55 f4 90 1b 0e 32 6e ab 08 00 45 00 ·7·U····2n··E·)

tx1320-20251118-1156.pcap Packets: 5147 Profile: Default

content speedtest

- 10MB download, and then, 10MB upload using tcp



summary

- orb: nice simple tool for quality measurement
- simple methodologies: continuous monitoring of ping + content speed
- excellent packaging: app/sensor/cloud on various platforms
 - easy to experiment, and then, upgrade
 - possible to re-implement a similar tool for internal use
 - but hard to build a competitive public service
- shows a new direction for network quality monitoring to end-users
- business model: good potential, but uncertain profitability