Broadband Traffic Report
Traffic Continues to Grow Steadily

1.1 Overview

In this report, we analyze traffic over the broadband access services operated by IIJ and present the results each year*1*2*3*4*5. Here, we again report on changes in traffic trends over the past year, based on daily user traffic and usage by port.

Overall, traffic continued to grow steadily this year, as it has over the past few years. We see no notable changes in the trends at this point.

Figure 1 plots the overall average monthly traffic trends for IIJ's fixed broadband services and mobile services. IN/OUT indicates the direction from the ISP perspective. IN represents uploads from users, and OUT represents user downloads. Because we cannot disclose specific traffic numbers, we have normalized the data, setting the OUT observations for January 2020, just before the COVID-19 pandemic, for both services to 1.

Over the past year, broadband IN traffic increased 9% and broadband OUT traffic increased 4%. The corresponding year-earlier figures were 14% and 12%, so growth has slowed somewhat. The broadband figures include IPv6/IPoE traffic. IPv6 traffic on IIJ's broadband services comprises both IPoE and PPPoE traffic. As of June 2025, IPoE accounted for a bit under 50% of all traffic, at 42% of IN and 49% of OUT broadband traffic overall. This represents a year-on-year decrease of 1 percentage point for IN and an increase of 1 point for OUT, so the figures are virtually unchanged, suggesting that migration to IPoE has run its course.

Mobile services traffic was largely range-bound in the first year or so of COVID as people went out less, but it has subsequently been in an uptrend. Over the past year, mobile IN traffic increased 29% and mobile OUT traffic increased 9%. The year-earlier figures were 29% and 20%. Mobile services IN traffic accounts for a high proportion of total because of the high volume of uploads on services for enterprise customers. Looking solely at personal services, IN accounts for around a tenth of the total, similar to the situation for broadband.

We now look at broadband traffic by time of day on weekdays over the past year. Figure 2 plots hourly average

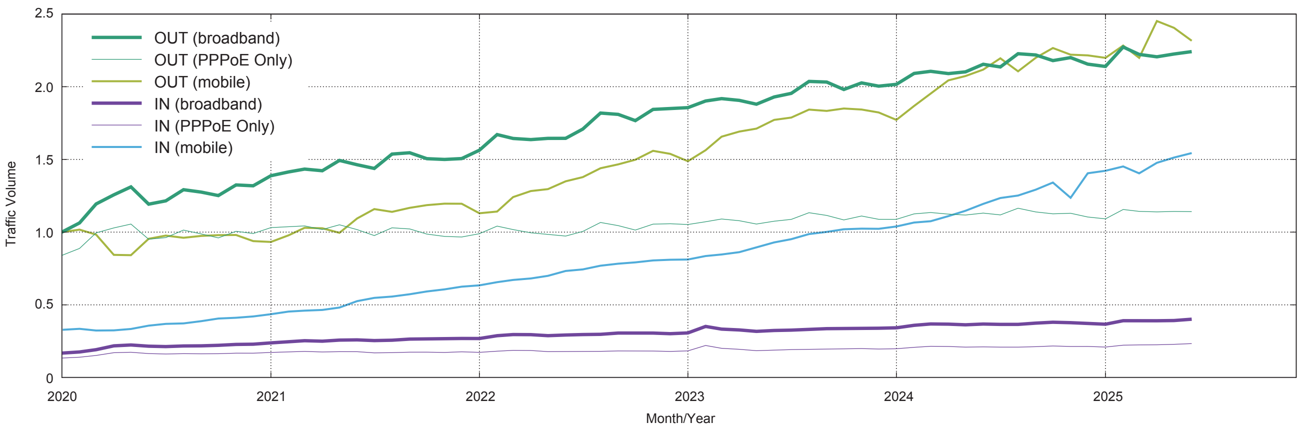

Figure 1: Monthly Broadband and Mobile Traffic

*1 Kenjiro Cho. Broadband Traffic Report: Looking Back on the Past 5 Years. Internet Infrastructure Review. Vol. 64. pp4–11. September 2024.
*2 Kenjiro Cho. Broadband Traffic Report: Traffic in a Stable Uptrend Post-COVID. Internet Infrastructure Review. Vol. 60. pp4–9. September 2023.
*3 Kenjiro Cho. Broadband Traffic Report: COVID's 3rd Year Brings Lull in Traffic. Internet Infrastructure Review. Vol. 56. pp4–11. September 2022.
*4 Kenjiro Cho. Broadband Traffic Report: COVID-19's Impact in its 2nd Year. Internet Infrastructure Review. Vol. 52. pp4–11. September 2021.
*5 Kenjiro Cho. Broadband Traffic Report: The Impact of COVID-19. Internet Infrastructure Review. Vol. 48. pp4–9. September 2020.

traffic volume for Monday–Friday for four one-week blocks selected at intervals of roughly four months since early June 2024. Weekday daytime traffic volumes have increased during school holiday periods in recent years, so we selected school weeks. Traffic volume here is the sum of PPPoE and IPoE. The dotted lines in the lower part of the plot represent uploads for each week, but focusing again on download volumes in this edition, we see that while traffic volumes have not increased much for the hours from late night through early morning, they have steadily increased during the hours from morning through evening.

1.2 About the Data

As with previous reports, for broadband traffic, our analysis uses data sampled using Sampled NetFlow from the routers that accommodate the fiber-optic and DSL broadband customers of our personal and enterprise broadband access services. For mobile traffic, we use access gateway billing information to determine usage volumes for personal and enterprise mobile services, and we use Sampled NetFlow data from the routers used to accommodate these services to determine the ports used.

Because traffic trends differ between weekdays and weekends, we analyze traffic in one-week chunks. In this report, we look at data for the week of June 2–8, 2025, and compare those data with data for the week of June 3–9, 2024, which we analyzed in the previous edition of this report.

Results are aggregated by subscription for broadband traffic, and by phone number for mobile traffic as some subscriptions cover multiple phone numbers. The usage volume for each broadband user was obtained by matching the IP addresses assigned to users with the IP addresses observed. Note that IPoE traffic is not included in the analysis of traffic by port, as detailed data are not available because we use Internet Multifeed Co.'s transix service for IPoE.

1.3 Users' Daily Usage

First, we examine daily usage volumes for broadband and mobile users from several angles. Daily usage indicates the average daily usage calculated from a week's worth of data for each user.

Since our 2019 report, we have used daily usage data only on services provided to individuals. The distribution is heavily distorted if we include enterprise services, where usage patterns are highly varied. So to form a picture of overall usage trends, we determined that using only the personal user data would yield more generally applicable, easily interpretable conclusions. Note that the analysis of usage by port in the next section does include enterprise data because of the difficulty of distinguishing between individual and enterprise usage. Note also that we have included IPoE user data in the broadband figures since 2021, so the broadband data comprise both PPPoE and IPoE[*6].

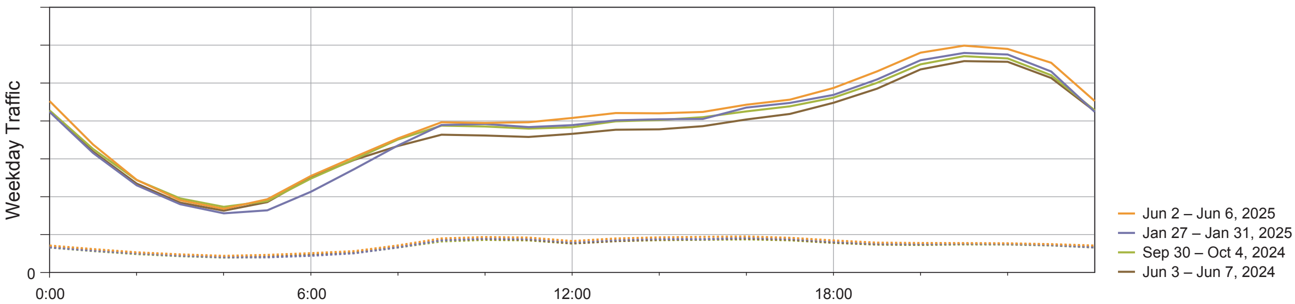

Figure 2: Hourly Average Broadband Traffic on Weekdays in the Past Year

*6 The PPPoE and IPoE usage figures of users who use both protocols are treated as coming from separate users.

Figures 3 and 4 show the average daily usage distributions (probability density functions) for broadband and mobile users. Each compares data for 2024 and 2025 split into IN (upload) and OUT (download), with user traffic volume plotted along the X-axis and user frequency along the Y-axis. The X-axis shows volumes between 10KB (104) and 1TB (1012) using a logarithmic scale. Most users fall within the 1TB (1012) range, with a few exceptions.

The IN and OUT traffic distributions in the figures are close to a log-normal distribution, which looks like a normal distribution on a semi-log plot. A linear plot would show a long-tailed distribution, with the peak close to the left. The OUT distribution is further to the right than the IN distribution, indicating that download volume is more than an order of magnitude larger than upload volume.

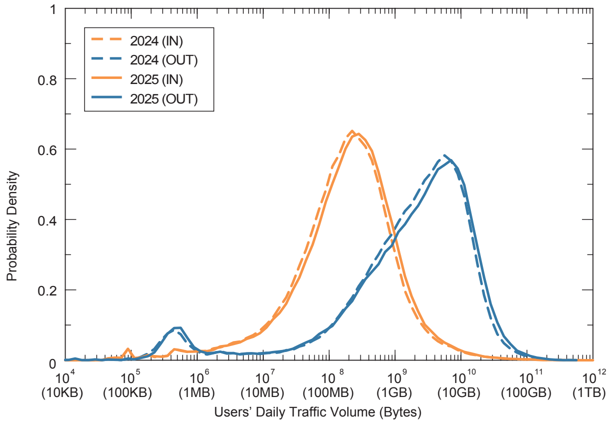

Figure 3: Daily Broadband User Traffic Volume Distribution Comparison of 2024 and 2025

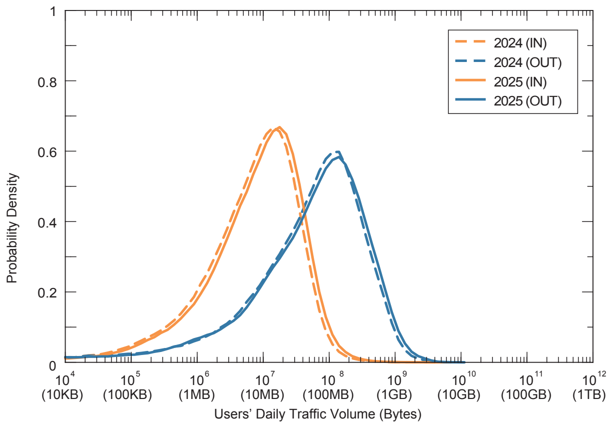

Figure 4: Daily Mobile User Traffic Volume Distribution Comparison of 2024 and 2025

First, we look at the broadband distributions in Figure 3. Comparing 2024 and 2025, both the IN and OUT distributions have moved slightly to the right, indicating that overall traffic volume has increased.

The peaks of the mobile distributions in Figure 4 have also moved a little to the right since last year, indicating that overall traffic has increased. Mobile usage volumes are significantly lower than for broadband, and limits on mobile data usage mean that heavy users, which fall on the right-hand side of the distribution, account for only a small proportion of the total. There are also no extremely heavy users. The variability in each user's daily usage volume is higher for mobile than for broadband owing to there being users who only use mobile data when out of the home/office as well as limits on mobile data.

Table 1 shows trends in the mean and median daily traffic values for broadband users as well as the mode (the most frequent value, which represents the peak of the distribution). When the peak is slightly off the center of the distribution, the mode is adjusted to bring it

	IN (MB/day)			OUT (MB/day)		
Year	Mean	Median	Mode	Mean	Median	Mode
2007	436	5	5	718	59	56
2008	490	6	6	807	75	79
2009	561	6	6	973	91	100
2010	442	7	7	878	111	126
2011	398	9	9	931	144	200
2012	364	11	13	945	176	251
2013	320	13	16	928	208	355
2014	348	21	28	1124	311	501
2015	351	32	45	1399	443	708
2016	361	48	63	1808	726	1000
2017	391	63	79	2285	900	1259
2018	428	66	79	2664	1083	1585
2019	479	75	89	2986	1187	1995
2020	609	122	158	3810	1638	3162
2021	714	143	200	4432	2004	3981
2022	727	142	178	4610	2010	3981
2023	804	166	224	5456	2369	5012
2024	834	178	224	5743	2372	5620
2025	886	202	282	6538	2615	6310

Table 1: Trends in Mean and Mode of Broadband Users' Daily Traffic Volume

toward the center. Comparing 2024 and 2025, the IN mode rose from 224MB to 282MB while the OUT mode rose from 5,620MB to 6,310MB, translating into growth factors of 1.26 for IN and 1.12 for OUT. Meanwhile, because the means are influenced by heavy users (on the right-hand side of the distribution), they are significantly higher than the corresponding modes, with the IN mean at 886MB and the OUT mean at 6,538MB in 2025. The 2024 means were 834MB and 5,743MB, respectively. As mentioned, up to 2020 the data covered only PPPoE users, and since 2021 the data have covered both PPPoE and IPoE users.

Table 2 shows the mobile traffic metrics. In 2025, the IN mode was 16MB and the OUT mode was 126MB, while the means were IN 19MB and OUT 172MB. The 2024 modes were IN 14MB and OUT 112MB, and the means were IN 16MB and OUT 150MB.

	IN (MB/day)			OUT (MB/day)		
Year	Mean	Median	Mode	Mean	Median	Mode
2015	6.2	3.2	4.5	49.2	23.5	44.7
2016	7.6	4.1	7.1	66.5	32.7	63.1
2017	9.3	4.9	7.9	79.9	41.2	79.4
2018	10.5	5.4	8.9	83.8	44.3	79.4
2019	11.2	5.9	8.9	84.9	46.4	79.4
2020	10.4	4.5	7.1	79.4	35.1	63.1
2021	9.9	4.7	7.9	85.9	37.9	70.8
2022	12.8	6.0	10.0	113.7	49.2	89.1
2023	14.1	6.8	11.2	129.2	56.0	100.0
2024	16.3	8.2	14.1	150.4	66.7	112.2
2025	19.3	9.7	15.8	172.2	73.5	125.9

Table 2: Trends in Mean and Mode of Mobile Users' Daily Traffic Volume

Figures 5 and 6 plot per-user IN/OUT usage volumes for random samples of 5,000 users. The X-axis shows OUT (download volume) and the Y-axis shows IN (upload volume), with both using a logarithmic scale. Users with identical IN/OUT values fall on the diagonal.

The cluster spread out below and parallel to the diagonal in each of these plots represents typical users with download volumes an order of magnitude higher than upload volumes. Variability between users in terms of usage levels and IN/OUT ratios is wide, indicating that there is a diverse range of usage styles. For mobile traffic, the pattern of OUT being an order of magnitude larger also applies, but usage volumes are much lower than for broadband. For both broadband and mobile, there appears to be almost no difference between these plots and those for 2024.

Traffic is heavily skewed across users, such that a small proportion of users accounts for the majority of overall traffic volume. For example, the top 10% of broadband users account for 50% of total OUT and 73% of total IN traffic, while the top 1% of users account for 15% of OUT and 44% of IN traffic. On mobile, the top 10% of users account for 48% of total OUT and 46% of total IN traffic, while the top 1% of users account for 12% of OUT and 13% of IN traffic. These proportions have hardly changed from last year.

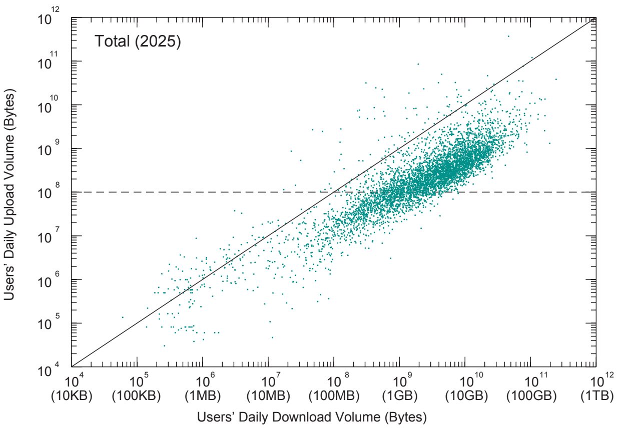

Figure 5: IN/OUT Usage for Each Broadband User

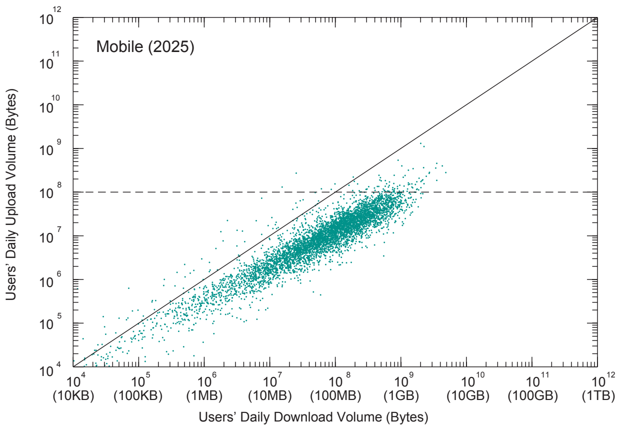

Figure 6: IN/OUT Usage for Each Mobile User

1.4 Usage by Port

Next, we look at a breakdown of traffic and examine usage levels by port. Recently, it has become difficult to identify applications by port number. Many P2P applications use dynamic ports on both ends, and a large number of client/server applications use HTTP ports like port 80 to avoid firewalls. Hence, generally speaking, when both parties are using a dynamic port numbered 1024 or higher, the traffic is likely to be from a P2P application, and when one of the parties is using a well-known port lower than 1024, the traffic is likely to be from a client/server application. In light of this, we take the lower of the source and destination port numbers when breaking down TCP and UDP usage volumes by port.

Table 3 shows the percentage breakdown of broadband users' usage by port over the past five years. In 2025, 66% of all traffic was over TCP connections, down 2 points from 2024. The proportion of traffic over port 443 (HTTPS) was 53%, only a slight drop from 2024. The proportion of traffic over port 80 (HTTP) was 6%, down 1 point. The figure for UDP port 443, which is used by the QUIC protocol, was up 2 points to 23%.

TCP dynamic port traffic fell ever so slightly to 6%. Individual dynamic port numbers account for only a tiny portion, with the most commonly used port 31000 only making up 1.6%.

Table 4 shows the percentage breakdown by port for mobile users. The figures are close to those for broadband on the whole. This is possibly because apps similar to those for PC platforms are now also used on smartphones, and because the proportion of broadband usage on smartphones is rising.

The broadband port data only include PPPoE, not IPoE, and so do not necessarily reflect the trend in fixed broadband overall. Comparing IPv4 and IPv6 on mobile, port 443 accounts for a higher proportion of both TCP

year	2021	2022	2023	2024	2025
protocol port	(%)	(%)	(%)	(%)	(%)
TCP	**71.9**	**71.6**	**70.5**	**67.5**	**65.5**
(< 1024)	65.8	65.4	64.8	61.1	59.8
443 (https)	53.5	55.7	56.9	53.8	53.2
80 (http)	11.6	8.9	7.2	6.5	5.9
993 (imaps)	0.1	0.1	0.1	0.1	0.2
183	0.1	0.2	0.2	0.2	0.1
22 (ssh)	0.2	0.1	0.1	0.1	0.1
(>= 1024)	6.1	6.2	5.7	6.4	5.7
31000	0.6	0.9	1.1	1.2	1.6
8080	0.4	0.3	0.4	0.3	0.3
1935 (rtmp)	0.2	0.2	0.2	0.3	0.2
UDP	**24.5**	**24.3**	**25.4**	**28.2**	**30.6**
443 (https)	15.9	16.3	18.2	21.0	23.1
4500 (nat-t)	0.8	0.8	1.0	0.9	0.7
8801	0.9	0.6	0.4	0.4	0.3
ESP	**3.3**	**3.8**	**3.8**	**4.0**	**3.6**
GRE	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**
IP-ENCAP	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
ICMP	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 3: Broadband Users' Usage by Port

year	2021	2022	2023	2024	2025
protocol port	(%)	(%)	(%)	(%)	(%)
TCP	**70.3**	**71.6**	**71.0**	**71.0**	**69.8**
443 (https)	44.4	42.3	42.1	42.2	37.8
80 (http)	5.0	4.1	3.5	1.8	1.5
993 (imaps)	0.2	0.1	0.1	0.1	0.1
1935 (rtmp)	0.1	0.1	0.2	0.1	0.1
UDP	**23.8**	**24.4**	**26.5**	**27.5**	**29.3**
443 (https)	16.3	17.9	20.9	22.5	24.8
4500 (nat-t)	3.7	2.7	2.5	1.8	1.5
51820	0.0	0.1	0.2	0.3	0.3
53 (dns)	0.2	0.2	0.2	0.2	0.2
8801	0.7	0.3	0.2	0.1	0.1
ESP	**5.8**	**3.9**	**2.4**	**1.4**	**0.8**
ICMP	**0.0**	**0.0**	**0.1**	**0.0**	**0.1**
GRE	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**

Table 4: Mobile Users' Usage by Port

and UDP usage on IPv6, and there is probably a similar trend in the case of IPoE.

Figure 7 compares overall broadband traffic for key port categories across the course of the week from which observations were drawn in 2024 and 2025. We break the data into four port buckets: TCP ports 80 and 443, dynamic TCP ports (1024 and up), and UDP port 443. The data are normalized so that peak overall traffic volume on the plot is 1. The overall peak is around 19:00–23:00. There are no major changes overall relative to 2024, but traffic on UDP port 443 increased a little.

Figure 8 shows the trend for TCP ports 80 and 443 and UDP port 443, which account for the bulk of mobile traffic. As was the case with broadband, mobile traffic on UDP port 443 was up slightly compared with 2024. Comparing the plots with those for broadband, usage times evidently differ, with mobile having three separate traffic peaks on weekdays: morning commute, lunch break, and evening.

We now examine weekday time-of-day traffic volumes for major content providers. Figure 9 plots broadband TCP and UDP traffic with source port 443. We mapped source IP addresses to their AS numbers (ASNs), using this to identify the registrant organization, and plotted weekday time-of-day traffic for major providers' ASNs at two-hour intervals. Many major providers operate multiple ASNs, but for each provider we include only the ASN with the largest traffic volume. These providers also deliver content via third-party content delivery networks (CDNs),

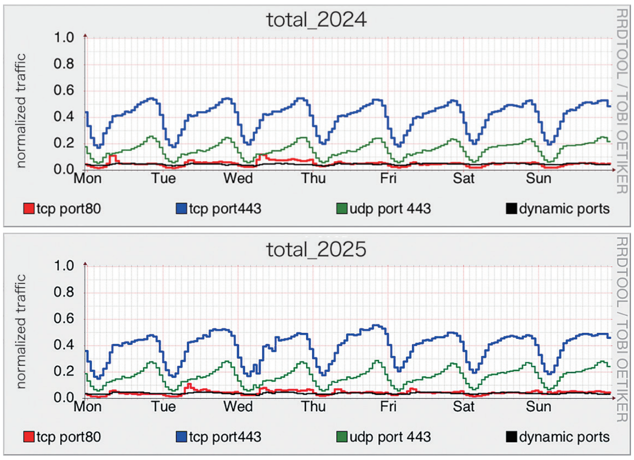

Figure 7: Broadband Users' Port Usage Over a Week
2024 (top) and 2025 (bottom)

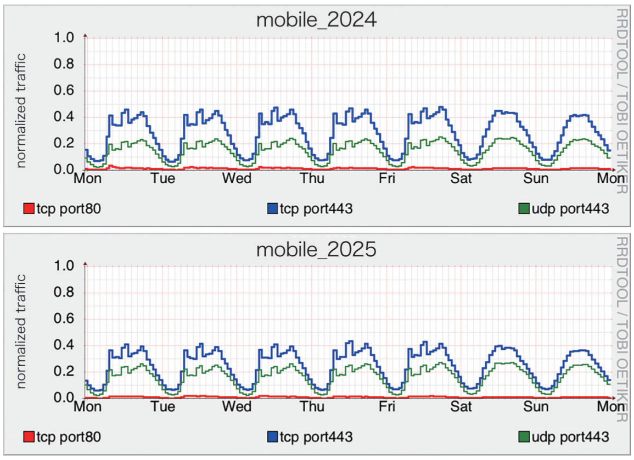

Figure 8: Mobile Users' Port Usage Over a Week
2024 (top) and 2025 (bottom)

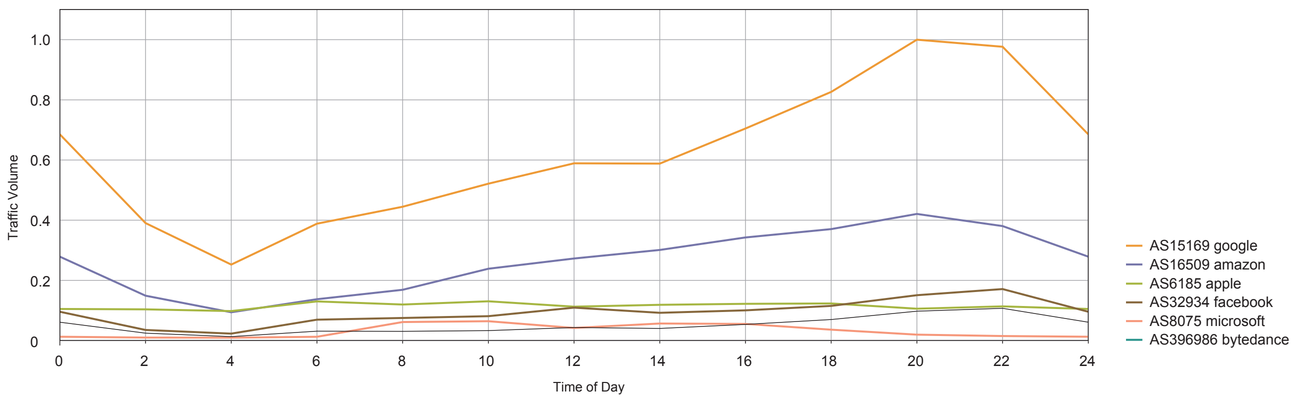

Figure 9: Major Content Providers' Hourly Average Broadband Traffic on Weekdays

and as we are unable to capture and count traffic served through such CDNs the volumes shown do not represent each provider's total traffic; they are strictly per-ASN figures.

Google, which includes YouTube, has the highest traffic volume. Second is Amazon, which includes Amazon Prime Video as well as traffic from other companies using Amazon Web Services. Google, Amazon, Facebook, and ByteDance, which operates TikTok, are all video-heavy providers, with traffic peaking from evening into night, reflecting household video viewing patterns. By contrast, Apple's traffic remains steady throughout the day, likely due to automatic app updates and the like. Microsoft sees more traffic during daytime hours, suggesting work-related usage such as for remote work. Looking only at UDP port 443, Google accounts for 67%, Facebook for 13%, and ByteDance for 6%.

1.5 Conclusion

Broadband traffic has been growing relatively steadily over the past few years, with very little change in the overall trend. But looking back, we have repeatedly seen several years of little change in traffic then being followed by the next shift, so the next wave might be on the way soon.

One possible such wave could come from the currently hot topic of AI, but even if AI usage among users in general rises, the impact on broadband traffic is likely to be limited. We can expect, for instance, users to shift from keyword searches to AI chatbots, but this would not entail any major change in data size, so there would not be much impact on traffic volume.

Another possibility is a scenario in which a major terrorist incident or similar event sparks the rapid adoption of cloud-based AI services for analyzing surveillance camera footage, resulting in a sharp rise in upload traffic. While such services are likely to expand ahead, rapid growth may be unlikely due to privacy concerns about providing surveillance camera footage to third parties.

Behind the scenes, some organizations developing large-scale AI models appear to be fetching vast amounts of content for use as AI training data, which in turn is increasing load and causing other impacts for content providers.

Broadband traffic growth is currently driven by increases in data-heavy video content. In recent years, watching Internet video has become smooth and hassle-free both at home and on mobile; you can see many people watching videos on their smartphones even on the train. Even if the pace of traffic growth does not change markedly, the number of video users, per-person viewing time, and the data volume associated with higher video quality are all likely to continue increasing for the time being.

These are merely quantitative changes, but the fact that anyone can now shoot video on a smartphone and easily edit and share it is a qualitative change, and as AI makes working with video even easier, rapid progress can be expected. This phenomenon goes beyond a mere increase in online video viewing. We see it as a broader social phenomenon whereby technology is fundamentally changing the way we communicate, and indeed our culture itself, with the shift from a text-centric culture to one of photos plus short posts on social media, and onward to video and animation.

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