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Streaming video – from megabits to gigabytes

Extract from the Ericsson Mobility Report
November 2018

Streaming video – from megabits to gigabytes

Smartphone traffic per subscription will continue to grow, driven by increasing video quality and immersive formats.

By the end of 2024, it is estimated that a smartphone will consume more than 21GB of data per month on average – nearly 4 times the amount consumed in 2018. In addition to this increased usage, the number of smartphone subscriptions is set to increase by 45 percent, reaching a total of 7.2 billion.

New video-watching behaviors drive data consumption

Video currently stands out as the most significant traffic type consumed by smartphone users, at a current average of 60 percent of total traffic. The importance of video will only increase; by the end of 2024, it is projected to account for 74 percent of traffic.

The increase in video data traffic per smartphone user has three main drivers: increased viewing time, more video content embedded in news media and social networking, and an evolution to higher resolutions and more demanding formats.

Today, most mobile video is streamed at low-definition and standard-definition formats 360p and 480p respectively. This is due to restrictions introduced by both content and communications service providers, as well as customers selecting formats with lower bitrates to get the most out of their data bucket. But user behaviors are shifting as network capabilities expand and are projected to change more dramatically as 5G services are made available. The streaming of high-definition (HD) video in 720p and 1080p resolutions is increasing, and the average resolution of a YouTube video in some LTE networks is already up to 720p.

21GB

At the end of 2024, average data consumption per smartphone is projected to be 21GB per month.

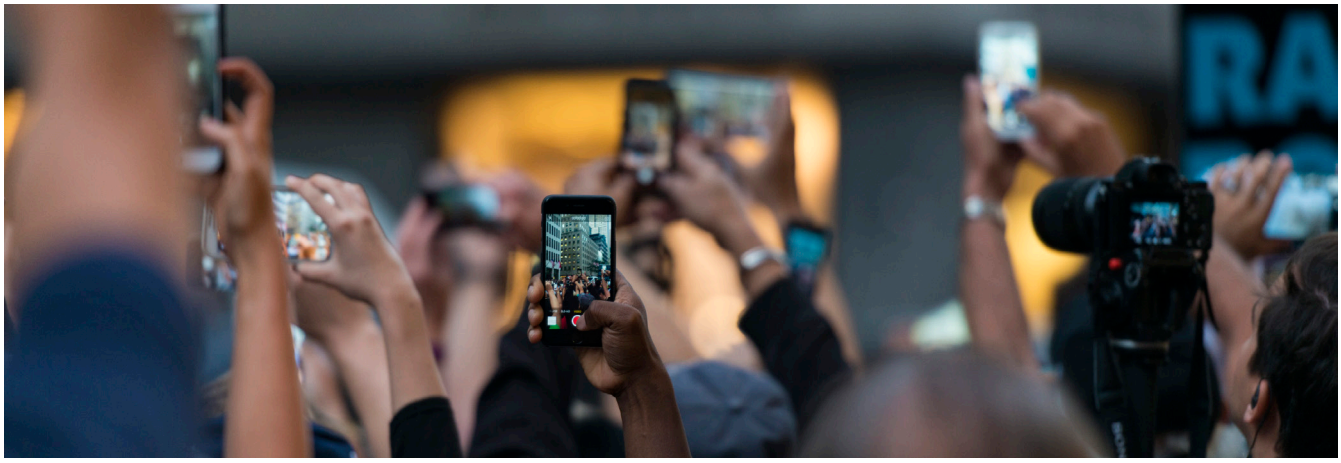
Evolution of the average smartphone user's data consumption

Traffic category	World average data consumption (GB per month)	
	2018	2024
Downloads	0.6	1.2
Messaging	0.5	0.9
App traffic	1.0	2.1
Audio streaming	0.1	0.4
Video streaming	3.4	16.3
Total	**5.6**	**21**

Further explore the relationship between the usage of various app types and monthly traffic per subscription with Ericsson's Mobility Calculator:

www.ericsson.com/mobility-report/mobility-calculator

Video data traffic per smartphone user is increasing fast



New immersive formats are on the horizon

Shifting behaviors

User behaviors are shifting, with low- and standard-definition video formats being overtaken by HD and Full HD formats. Higher resolutions and complex formats – including 4K, 8K, virtual reality (VR) and augmented reality (AR) – are now on the horizon but have not generated a significant amount of traffic to date. Use cases driving large-scale streaming of 4K, 8K or VR to smartphones have not yet emerged. AR has many potential applications. Industrial manufacturing and maintenance, sports events, architecture, navigation and tourism are just a few of the areas where AR is expected to have a big impact. Traffic generated by AR will depend on many factors, and will vary across a wide spectrum from very little to extreme. For illustrative purposes we use 25Mbps in the graph below.

Two key factors in enabling new immersive formats to go mainstream will be reductions in latency and support for more symmetrical uplink/downlink throughput – both of which are attributes of 5G. The graph below compares the amount of monthly traffic generated over an incremental five minutes per day of video viewing at each resolution/format. It should be noted that AR applications will have a wide range of bitrates dependent on many factors beyond quality, including the form and amount of augmentation.

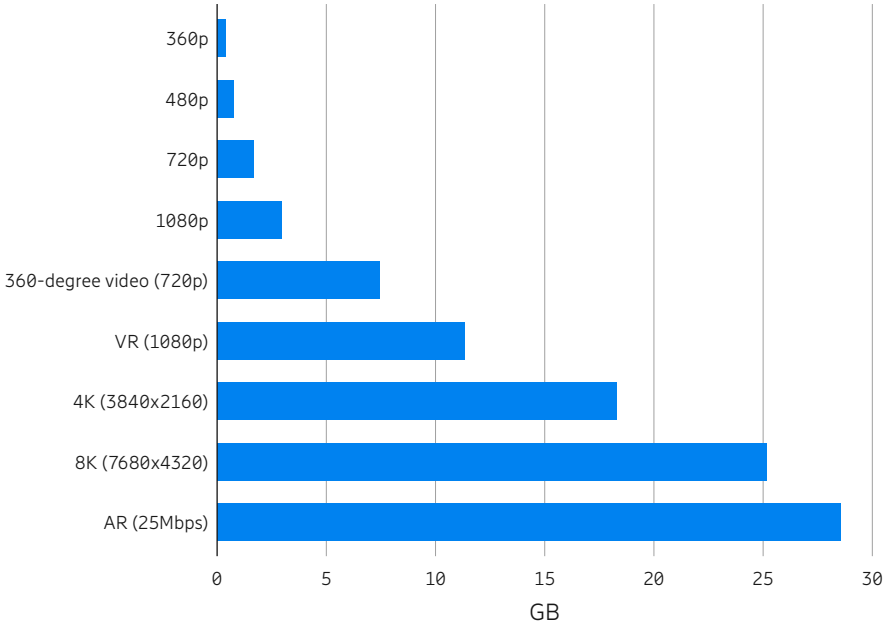
Video traffic and throughput

There is a difference between data traffic (consumption) and the network performance needed to deliver a good user experience. Traffic is the product of the bitrate (media data plus signaling overheads) through time. Required performance is related to adaptive streaming mechanisms, and is a function of the selection of media quality and the avoidance of stalls and re-buffering.

There is no definitive "media rate" for any given resolution. The bitrates used to calculate the traffic in the graph below are for comparison purposes and take a wide range of variables into consideration – including container, codec, profile, audio coding, overheads and, not least, content. In addition, AR is a special case, as the bitrate is dependent on a further range of factors, including the amount of data sent in the uplink.

Given the rate of change in both mobile technology and video media streaming, we expect a continued high growth rate in smartphone traffic on mobile broadband networks over our forecast horizon through 2024.

Monthly traffic generated by five minutes of streaming per day



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EAB-18:012366 Uen, Revision A