The Mobile Internet
Phenomena Report

May 2021

Welcome

About Sandvine

Sandvine's market leading Service Innovation and Intelligence portfolio helps customers deliver exceptional digital experiences and grow revenues. Our ability to classify over 95% of network traffic across mobile and fixed networks by user, application, device, location, and other parameters creates uniquely rich, real-time network and service data. We then apply machine learning-based contextual insights to improve performance and enhance digital services.

Our real-time data and extensive global deployments with over 160 global service providers covering 2.5 billion users have made us a global authority on evolving internet phenomena.

We are committed to delivering the preeminent view of global trends and distilled insights into the internet application ecosystem. As our global reach continues to expand across fixed, mobile, cable, satellite, and WiFi networks, we will bring you viewpoints on these trends and special topics through our report series.

Our goal with this report is to inform our customers and the global community on the mobile 'internet phenomena' we live through every day, and to expose both challenges and opportunities to build a more collaborative ecosystem, providing a robust connected experience for users.

We hope you enjoy the report. If you have feedback or suggestions on how we can make this report better, contact us at phenomena@sandvine.com. If you're an OTT content provider and have an application you want covered in the phenomena report, click here.

About The Mobile Internet Phenomena Data

The data in this edition of The Mobile Internet Phenomena Report is drawn from Sandvine's installed base of mobile operators worldwide. The report does not include significant data from either China or India, but the data represents a portion of Sandvine's installed base, a statistically significant segment of the internet population.

This edition is solely focused on mobile data in order to provide a targeted model that mobile operators can draw from to begin their planning process.

The Mobile Internet Phenomena Report ranks applications based on their "traffic share." The fascinating data that fuels the report illustrates the disconnect between "market share" for companies defined by subscriber counts and how often subscribers use a service.

Traffic share is defined as the percentage of network resources used by a specific application relative to other applications.

The internet and key applications keep everyone connected in challenging times

The COVID-19 pandemic is continuing to accelerate mobile traffic growth and profoundly change how we engage, communicate, interact, and transact in our daily lives.

New 5G and cloud technologies will be pivotal for mobile operators to capture the opportunities presented by these transformative changes.

Sandvine is privileged to work with network operators to help deliver a better experience and ultimately connectivity to many internet users.

Never before have consumers, enterprises and network operators given network quality as much attention as they are now.

It is now clear that network users are able to do more than ever while on the move. This edition of the report covers global views of the composition of traffic on the internet.

Download previous Internet Phenomena Reports

See what trends and data shaped global and mobile internet usage in the recent past. Click here to visit Sandvine's Internet Phenomena Report library and download previous Internet Phenomena Reports.

Data Lexicon

Downstream: Traffic volume downloaded from the internet. Examples would be a video stream, a file download, or an app download from iTunes.

% Downstream: Percent of application traffic taken from all downstream traffic on the data sample.

Upstream: Traffic volume uploaded to the internet. Examples would be requests for content, interactive messaging sessions, or streams of a gaming session from a console.

% Upstream: Percent of application traffic taken from all upstream traffic on the data sample.

Connections: Represents the number of "conversations" occurring for an application. Some applications use a single connection for all traffic, others use many connections to transfer data or video to the end user.

2

Section Overview

Section 1: Global News

EXECUTIVE OVERVIEW
A brief overview of the key findings in this issue of The Mobile Internet Phenomena Report.

MOBILE APPLICATION CATEGORY TRAFFIC SHARE
What application categories are the leading consumers of internet bandwidth? The real question is, how much traffic on the internet is video?

MOBILE TRENDS: GLOBAL TOP MOVERS
Who are the biggest movers beyond the top 10? With visibility to over 5000+ applications, we take a look at how the new normal on the network is shaking up which application usage.

Section 2: Phenomena Spotlights

7 **VIDEO-FIRST ECONOMY**
What is a video-first economy? Take a deeper dive into what services have changed in the past year and how to engineer the network of the future. With the transition to work-from-home, how have mobile networks been affected?

8 **VIDEO SPOTLIGHT**
As short-form video takes over, video quality and constant connectivity are key. Video is now over 48% of all traffic happening on a network, so understanding hourly trends matters to ensure network subscribers have a great experience. Take a deep dive and understand how YouTube, on a regular day, compares to overall video trends on a mobile network.

9 **SOCIAL SPOTLIGHT**
Social usage overall has grown in 2021 and has become more critical, with people looking to stay connected together more than ever during the stay-at-home orders. Take a look at the top five 'social' services and how social is being experienced on a mobile network.

10 **TIKTOK VS SNAPCHAT**
With TikTok becoming a behemoth in the social sharing and entertainment category, how do TikTok and Snachap stack up?

11 **MESSAGING SPOTLIGHT**
Take a look at the top five messaging services and the transformations within messaging with a spotlight on Zoom.

Section 3: Looking Forward

12 **DAY IN THE LIFE OF A MOBILE NETWORK**
Mobile operators are focused on providing differentiated experiences. How do operators ensure quality of experience (QoE) in today's changing applications landscape?

17 **5G INNOVATE**
The era of 5G and the Internet of Things (IoT) is upon us. The time to act is now to ensure that service innovation and intelligence at the core of 5G business decisions.

Executive Global Overview

Video Streaming, Social Networking and Web Browsing continue to be the categories driving growth

The interactive network is driven by applications that help keep us, our businesses, and our families connected. Video Streaming, Web, and Social are the three top categories. These categories include the most 'QoE-sensitive' applications with which consumers often have poor experiences – whether it is a web page not loading or a video stalling.

GLOBAL APPLICATION CATEGORY TRAFFIC SHARE

	Rank Change	Category	Downstream	Upstream
1	-	Video Streaming	48.9%	19.4%
2	-	Social Networking	19.3%	16.6%
3	2	Web	13.1%	23.1%
4	-1	Messaging	6.7%	20.4%
5	-	Gaming	4.3%	1.9%
6	-2	Marketplace	4.1%	1.2%
7	2	File Sharing	1.3%	6.6%
8	-1	Cloud	1.1%	6.7%
9	-3	VPN and Security	0.9%	3.9%
10	-	Audio	0.2%	0.2%

Category highlights

Video Streaming:
Consumer mobile networks have become more critical to our personal and professional relationships. Relationships are now being built and nurtured online, predominately through video. It is therefore no surprise that Video Streaming continues to take the top traffic spot. YouTube and TikTok reign this category with tremendous growth in the past year. Their easy to watch, ever-changing new content continue to capture the imagination.

What is surprising is the shift in the ranking of applications within this category. Read more in the video spotlight.

Social Sharing:
Social Sharing has been slowly evolving from a static to a dynamic medium. Now more than ever, dynamic content such as reels, video snaps, and stories are helping people feel connected when being together just isn't possible. The increased reliance on social sharing to build and maintain connections has made a high quality of experience critical in this category.

This introduces new challenges for networks worldwide. TikTok, Zoom, Skype, Snapchat, FaceTime, and even Facebook Live were all in the top 50 upstream applications as part of the new video-first economy. The use of social applications on mobile networks is matching typical work and school hours again as stay-at-home orders are lifted. Learn more in the social spotlight.

Messaging:
Out with the old, in with the new. Gone are the days of SMS texting as messaging applications and video-based messaging become prevalent. Especially on the upstream, we are seeing messaging applications become a critical part of the mobile experience. Memes, voice messages, and reactions are enriching the content we share via messaging. Learn more in the messaging spotlight.

Video chatting is now done on the move

5G Experience Expectations

The improved performance of 4G and the coming promise of 5G will continue to drive consumers to adopt new technology to have the best experience.

Unlike best-effort 4G networks, 5G allows service providers to design network slices around applications to deliver a unique enterprise and consumer experience.

Global Mobile Application Traffic Share

What are the top 10 applications on mobile networks?

It is no surprise that YouTube remains on the throne with its short-form videos dominating mobile networks. YouTube, Facebook Video, and TikTok lead the way, driven by consumers who are less likely to purchase a cable subscription or pay for over-the-top services.

Fresh and new content, from current events and new recipes to fitness programs, are valued at a premium. YouTube remains the clear leader in this category.

GLOBAL APPLICATION TRAFFIC SHARE

	Rank Change	Category	Downstream	Upstream
1	-	YouTube	20.4%	4.2%
2	-	Facebook Video	11.3%	2.9%
3	7	TikTok	6.8%	2.7%
4	-	Facebook	6.2%	2.3%
5		Google	5.4%	0.9%
6	-3	Instagram	5.1%	0.7%
7		iTunes	4.7%	0.5%
8	1	WhatsApp	1.8%	0.7%
9	-6	Netflix	1.8%	1.0%
10	-3	Google Play	1.6%	0.4%

Holding steady

YouTube: YouTube maintains the number one position on mobile networks despite the continued rise of WiFi usage and alternative social network video sources.

Facebook Video: Facebook Video meets the consumer demand for short-form video as well as serving as a way to keep us connected.

Facebook: Facebook continues to be the 'go-to' daily social network for billions of people. It has become a powerful targeted advertising machine and marketplace.

Moving up

WhatsApp: WhatsApp continues to be the leading mobile messaging platform worldwide. The fourth Facebook property in the top 10, it has replaced text messaging for over 1.5B users a month and is strong in every region of the world.

TikTok: TikTok shows the largest rank change among the top 10, moving up the charts and continuing strong growth and engagement during 2020. TikTok beat records for app downloads. In the first quarter of 2020, the platform generated the most downloads for any app ever with more than 315 million installs globally across iTunes and Google Play.

Moving down

Instagram: Instagram continues to grow in importance in the social landscape, with video being a central part of the value offering for users, influencers, and advertisers. However, while its total usage has increased, Instagram's overall traffic share has fallen as WhatsApp and TikTok take over.

Netflix: Netflix is decreasing in popularity on mobile networks. Users have increasingly moved to fixed networks to stream their favorite shows as they spend more time in their homes working and learning remotely.

Global Top Movers

Zoom
Global Ranking **41**
(+10)

Microsoft Teams
Global Ranking **49**
(+20)

Enterprises are relying heavily on applications that connect their workforces. Business-grade QoE is now critical to keep workers connected and able to conduct business on the go. The surge in taking meetings while walking is driving a rise in the use of business communication applications on mobile networks.
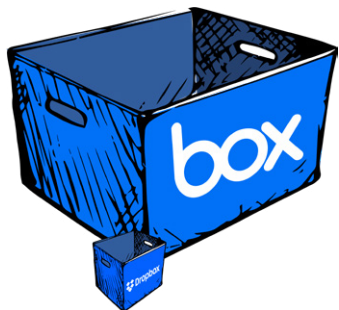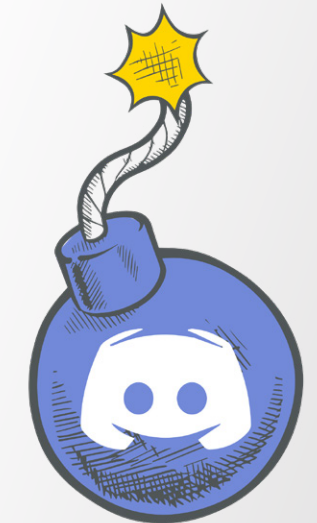
Box
Global Ranking **328** (+82)

Box, a content management and file sharing service for large enterprise businesses, has shown notable growth over the last year. As businesses move to the cloud, this is an application to watch.
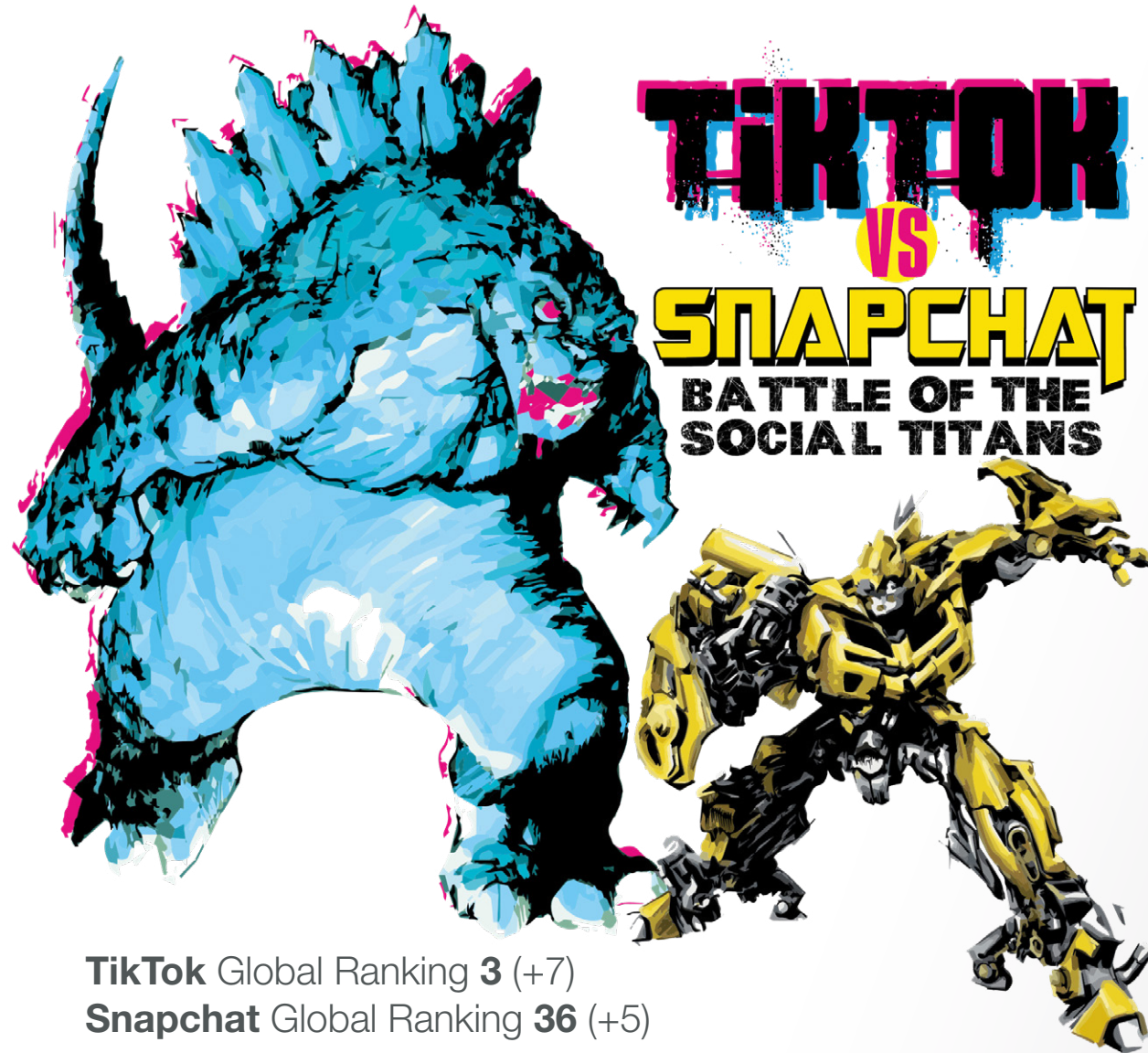
TikTok Global Ranking **3** (+7)
Snapchat Global Ranking **36** (+5)

TikTok is now a giant compared to Snapchat.

Discord
Global Ranking **19** (+42)

Discord has been growing explosively with over 14 million active daily users. By partnering with Fortnite and Twitch, Discord is shaping up to be a place where hanging out is easy and fun.

Global Video-First Economy in 2021

What is a video-first economy?

Network operators need to understand the video-first economy to meet the needs of consumer and enterprises networks.

As enterprises go digital, they are increasingly delivering services over video rather than in-person. Remote workers are also using video as their primary way of communicating with customers, partners, and peers. Large companies such as Microsoft are making work-from-home permanent. This will have a lasting effect on internet traffic.

Connected video is keeping schools, healthcare, and businesses functioning by providing critical links among teachers, students, patients, and employees alike.

What applications define a video-first economy?

- Video conferencing
- Online learning, with connected video
- Remote work productivity tools, with enriched communication
- Remote medical consultations

Looking forward – what does this mean for the mobile network?

WhatsApp Global Ranking **8**
Line Global Ranking **28**
Zoom Global Ranking **41**
MS Teams Global Ranking **49**
Skype Global Ranking **54**

How have mobile networks been affected by the transition to work-from-home? Business video conferencing, on-line learning, and remote productivity tools are becoming more prevalent on mobile networks. These applications require a consistent upstream and downstream network connection.

As these video-first economy applications become more popular on mobile networks, mobile operators need to understand not just what applications are dominating, but also the experience consumers have with them. They also need to look to 5G Fixed Wireless Access as a significant opportunity to meet home network demands.

As regions re-open their economies, some morning and evening commuting will resume as consumers returning to their typical lifestyles. At the same time, several consumers will continue working and learning remotely on a more permanent basis. For this reason, business and learning applications will continue to grab a larger share of traffic on mobile networks throughout the day.

Looking back at 2020 fixed networks

The Mobile Internet Phenomena COVID-19 Spotlight Report issued in May 2020 highlighted the video-first economy phenomena. Upstream video traffic surged 135% while downstream traffic grew 68%.

Overall Work-From-Home Application Traffic Growth
Downstream Growth ▲**68%**
Upstream Growth ▲**135%**

Virtual Schooling
Google Classroom Downstream Traffic **204% growth**
Google Classroom Upstream Traffic **161% growth**

Online Gaming
Twitch Downstream Traffic **178% growth**
Twitch Upstream Traffic **238% growth**

Video Conferencing and Telemedicine
Overall Downstream Traffic **390% growth**
Overall Upstream Traffic **233% growth**

Zoom Downstream Traffic **1940% growth**
Zoom Upstream Traffic **1700% growth**

Video Streaming
Overall Downstream Traffic **66% growth**
Overall Upstream Traffic **67% growth**

Fixed network growth has been dominated by a video-first economy with massive growth over the first part of 2020. This represents a significant opportunity for future 5G fixed wireless acess networks.

Global Video Spotlight

Short-form video content at your fingertips is dominating the internet

Video is now 48% of all traffic on mobile networks as short-form video grows in popularity.

The top three has a newcomer now that TikTok has climbed the charts and joined YouTube and Facebook. TikTok has grown dramatically during 2020, as people unleashed their creativity in the application. Many videos went viral, making headlines worldwide. Now that video is almost 50% of all traffic, network operators need to keep a close eye on the latest trends. As live sports and new entertainment content make a come back, video QoE is top of mind, especially during evening peak hours.

Hourly video trends on mobile networks

Video streaming has multiple peaks throughout the day, with the highest peak between 5-6pm.

Mobile

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
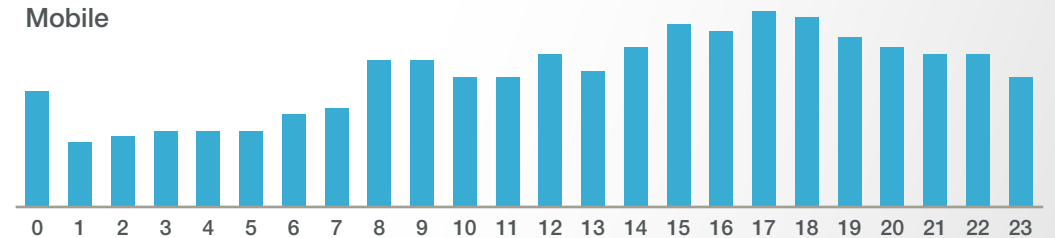
YouTube trends on mobile networks

YouTube follows a similar trend as video streaming overall, with some key differences. Since it encompasses short-form and long-form content, peaks form at the start of the day and when the work and learning day is finished.

YouTube

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

GLOBAL VIDEO TRAFFIC SHARE

	Application	⬇ Downstream	⬆ Upstream
1	YouTube	47.9%	25.8%
2	TikTok	16.1%	7.8%
3	Facebook Video	14.6%	43.1%
4	Instagram	12.1%	12.0%
5	Netflix	4.3%	2.4%
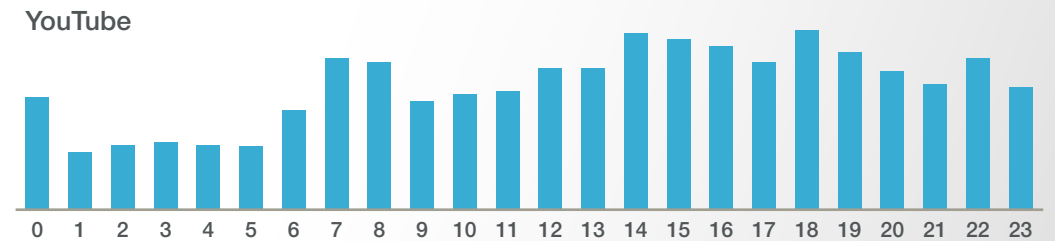
Mobile Video

Video streaming aligns with the natural movements of consumers throughout the day with peaks before work, mid-day, and especially during the late afternoon commute. Mobile operators need to understand how these peaks are affecting video performance to best optimize their networks for video content during peak usage. Without video streaming optimization, users will experience lags or buffer stalls.

Optimizing applications in a mobile network is critical, since every network is unique and the trends vary by location.

Global Social Spotlight

Social applications are keeping us connected more than ever before

Social usage overall has grown in 2021 and become more critical – with people looking to stay on-line more than ever during the stay-at-home orders.
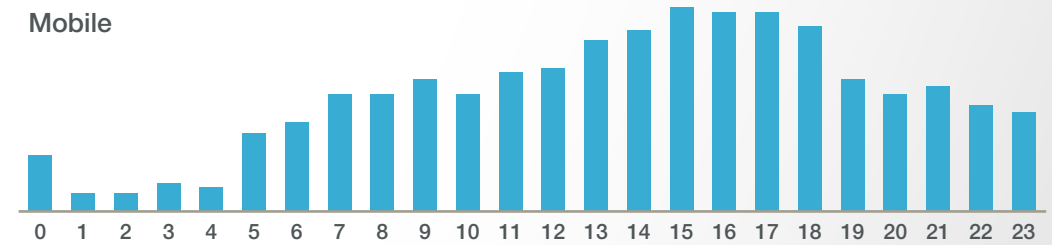
Facebook continues to be the main way the world keeps connected. Social networks have fallen into a demographic cycle where Facebook is catering to a more mature audience, Instagram appeals to the millennials, and Twitter is all the rage for Gen Z. Instagram, Facebook's sibling, is #2 worldwide and is

becoming the marketing channel of choice for brands going after younger audiences, who only want to see relevant ads.

International social networks such as Odnoklassniki and QQ, also dominate mobile networks and are in the top five by traffic volume. This is a reminder that local social networks have gained in popularity.

GLOBAL SOCIAL TRAFFIC SHARE

	Application	Downstream ⬇	Upstream ⬆
1	Facebook	50.5%	75.0%
2	Instagram	41.9%	20.8%
3	Twitter	2.4%	1.6%
4	Odnoklassniki	1.9%	0.4%
5	QQ	0.7%	0.3%

Hourly social trends on mobile

Social usage peaks after 3pm – 5pm on a mobile network as consumers switch to off mode and catch up with friends and family.

Mobile

Mobile social

Social application usage on a mobile network peaks from 3pm – 6pm as consumers move from a typical work or school day to catching up or chatting with friends and family. Interestingly, in comparison to fixed networks where consumers often leave applications running in the background, users will
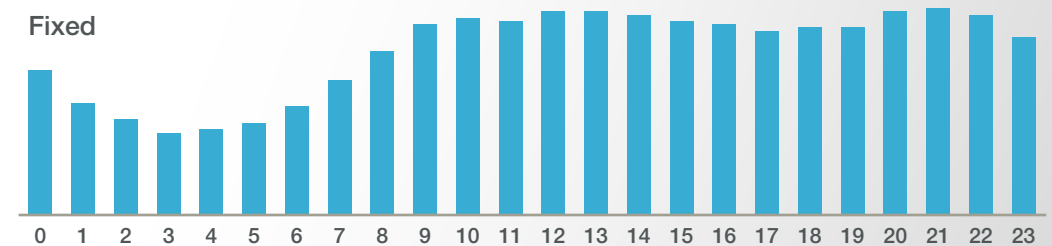
close and only intermittently interact with their social applications which causes dynamic usage.

Understanding these trends is key to providing a high quality of experience to consumers. With enriched video options, memes, and the ability to

send video, these applications require operators to be very aware of the services customers are interested in using and design the network to meet these needs.

Hourly social trends on fixed

In a typical fixed network, social usage is fairly consistent throughout the day as people are working from home, while keeping several of their social applications going in the background.

Fixed

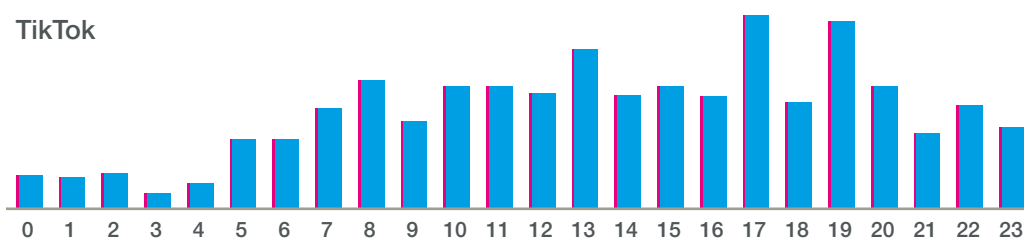# TIKTOK VS SNAPCHAT
BATTLE OF THE SOCIAL TITANS

TikTok isn't just another fleeting trend – it's here to stay. For those unfamiliar with the platform, TikTok is often referred to as "snapchat reboot." The two platforms share similar features. However, TikTok's offering centers on video sharing of short clips set to music, while Snapchat is a photo and video messaging application where users can post 'stories.'

Celebrities have been using TikTok creatively as a means to keep in touch with their fans and this has caused a massive surge in users and application usage. TikTok beat records for app downloads, so much so that in the first quarter of 2020 the platform generated the most downloads for any app ever in a quarter with more than 315 million installs globally across the App Store and Google Play.

Snapchat punches above its weight with "only" ~ 348M monthly users. However, those that do use it are rabid consumers and creators of content, with the app being used frequently for text, voice, and video messages both to individuals as well as groups.
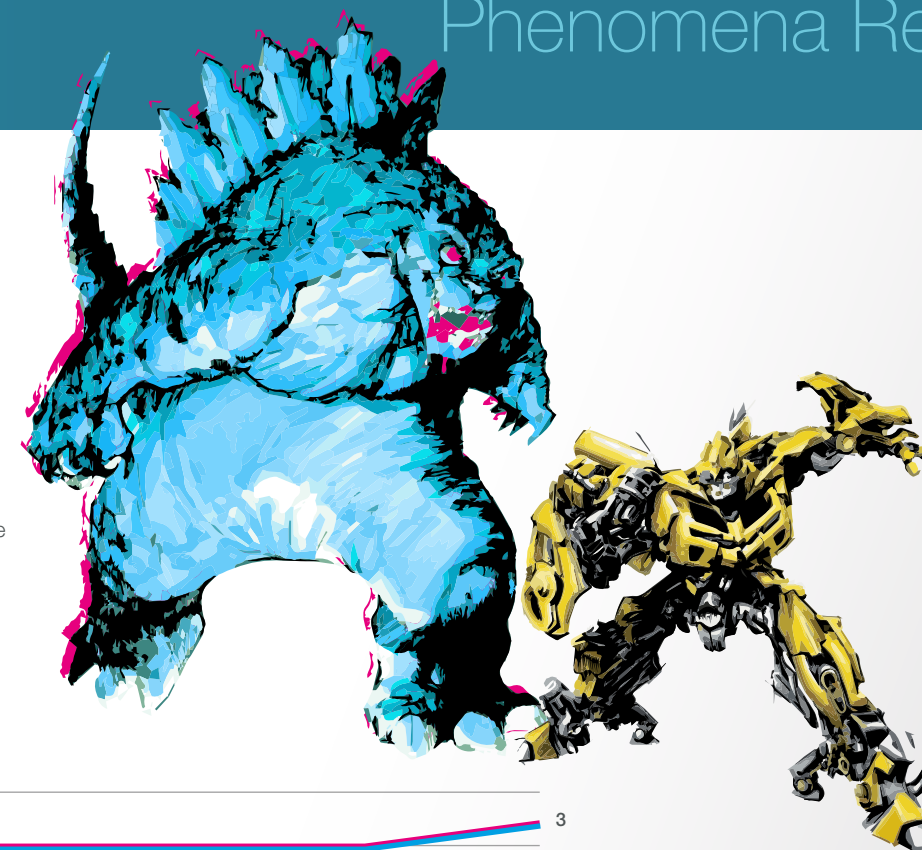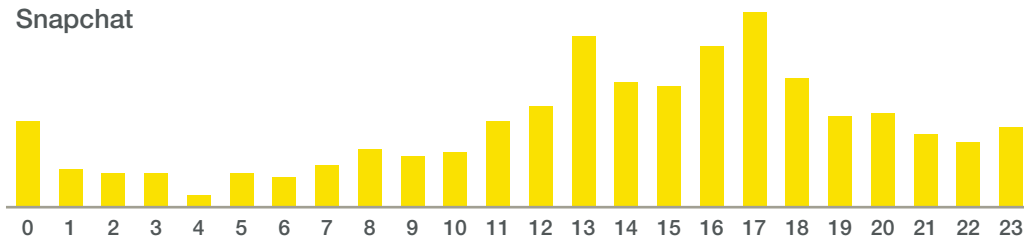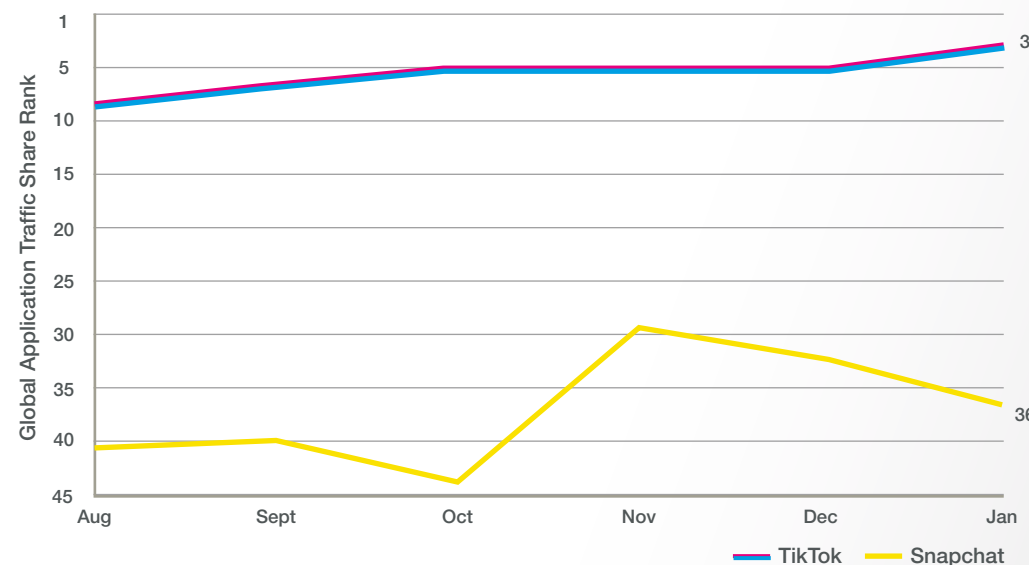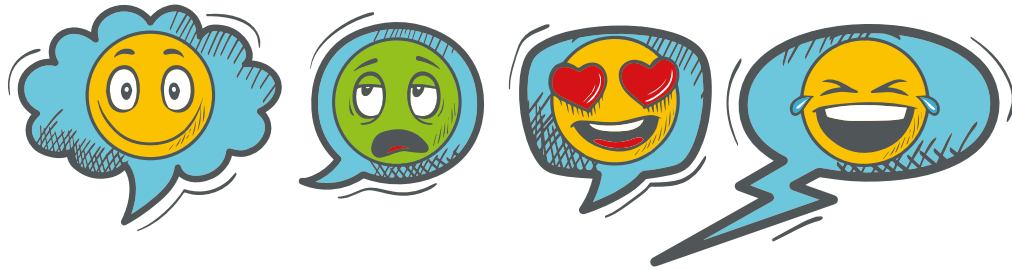
TikTok

TikTok has peaks on usage at 1pm, 5pm, and at 7pm – as people consume short-form video.

Snapchat

Snapchat has peaks at 5pm, aligning to the younger demographic pattern that uses its services.

Global Application Traffic Share Rank — TikTok, Snapchat (Aug, Sept, Oct, Nov, Dec, Jan)

Global Messaging Spotlight

Keeping us connected with enriched content – memes, voice, and reactions.

WhatsApp continues to be the leading mobile messaging platform worldwide. It has replaced text messaging for over 1.5B users a month and is strong in every region of the world. Snapchat, Facebook, Line, and Skype come next in popularity as consumers switch between messaging platforms to stay connected with the world.

Messaging applications are a critical part of the mobile experience. Memes, voice messages, and reactions are continuing to enrich messaging content.

Hourly messaging trends on mobile

Messaging applications peak at 5pm on a mobile network as consumers switch to "off" mode and start catching up with friends and family. This is similar to social applications.
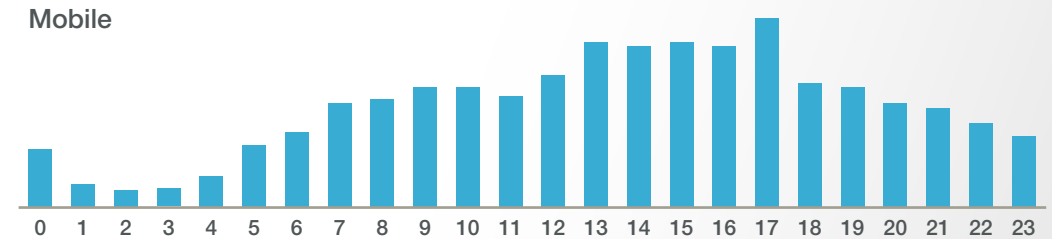
Mobile

Mobile messaging

Messaging application usage peaks at 5pm as consumers shift from a typical work or school day to catching up and chatting with friends or family. Thes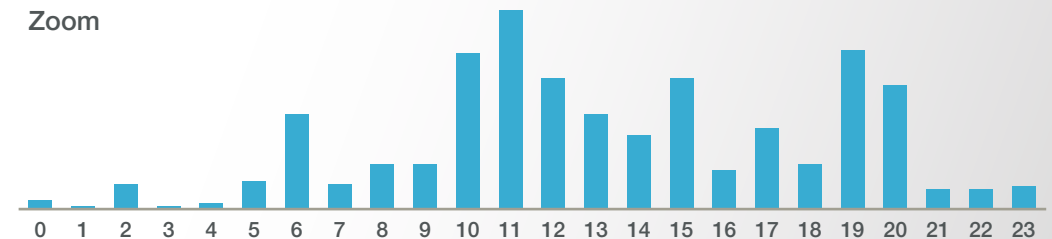e applications require constant connectivity and a high upstream quality of experience. In a mobile network, as consumers move, hand-offs and congestion management are critical for these types of sensitive applications.

The availability of video messaging and other enriched options is driving consumers to use the mobile network like never before.

GLOBAL MESSAGING TRAFFIC SHARE

	Application	Downstream ⬇	Upstream ⬆
1	WhatsApp	31.4%	9.0%
2	Snapchat	16.5%	2.7%
3	Facebook VoIP	14.3%	31.7%
4	LINE	12.1%	24.4%
5	Skype	4.1%	1.3%

Zoom trends on mobile

On a typical mobile network, Zoom usage peaks mid-day as people take calls or join Zoom meetings while grabbing lunch or taking their daily walks. The usage of zoom follows a typical workday with busy hour starting at 10am when the day gets underway, peaking at 3pm, and then again at 5pm as the work day ends.

Peaks in Zoom on mobile networks also aligns with the peak hours for meetings. These peaks in mobile networks could also be a result of a poor QoE on fixed networks during peak times resulting in users switching to mobile networks to have a better connection. Another zoom peak occurs between 7pm and 8pm in the evening where it is used for social and family events.

Zoom

A Day in the Life of a Mobile Network

Mobile network service intelligence

Mobile networks that deliver a great experience to their customers have the best customer satisfaction ratings, the least churn, and users are often willing to pay a premium.

How do mobile operators ensure a differentiated, high quality of experience in today's ever changing landscape of applications? Networks that deliver best effort speeds and then advertise (without delivery) the maximum download speed is a scenario that is likely to disappoint the user.

Video: Video, especially short-form video like YouTube, requires a good downstream throughput to generally deliver an acceptable experience. Keep the buffers on the device full, and the user won't see any momentary network congestion or delay. This is particularly challenging to deal with during heavy congestion events. How can operators ensure that all subscribers are happy with their video experience?

Social Sharing: Isn't this just social networking? Actually no, because the big picture of social networking includes much more than just Facebook and Instagram traffic now. All of those pictures and videos are uploaded directly into a cloud (iCloud, Google Photo, Samsung Cloud, etc.), uploaded to one or many social networks, and then discussed (or shared again) over messaging networks. The ecosystem is no longer just browsing Facebook feeds and posting texts. It has become a rich upstream traffic mix that users are monetizing. As a result, users have become more sensitive to bad QoE and they will churn if their expectations are not met.

Messaging: Messaging applications have created a rich user experience – with more VoIP, video, and chat possibilities than ever to keep in touch. Leading the consumer into the video-first economy, these applications are driving the upstream changes. In particular, these applications need connectivity and throughput on the upstream to keep connected as every packet delivered counts in making sure the connection goes through.

Sandvine Active Network Intelligence Portal
Mobile operators that understand services and how they change over time will be able to deliver the best services to their customers. This understanding allows operators to:
- Know which applications matter to their subscribers and at what time of day
- Assure subscriber quality of experience
- Create and evolve innovative services that delight their subscribers

A Day in the Life of a Mobile Network
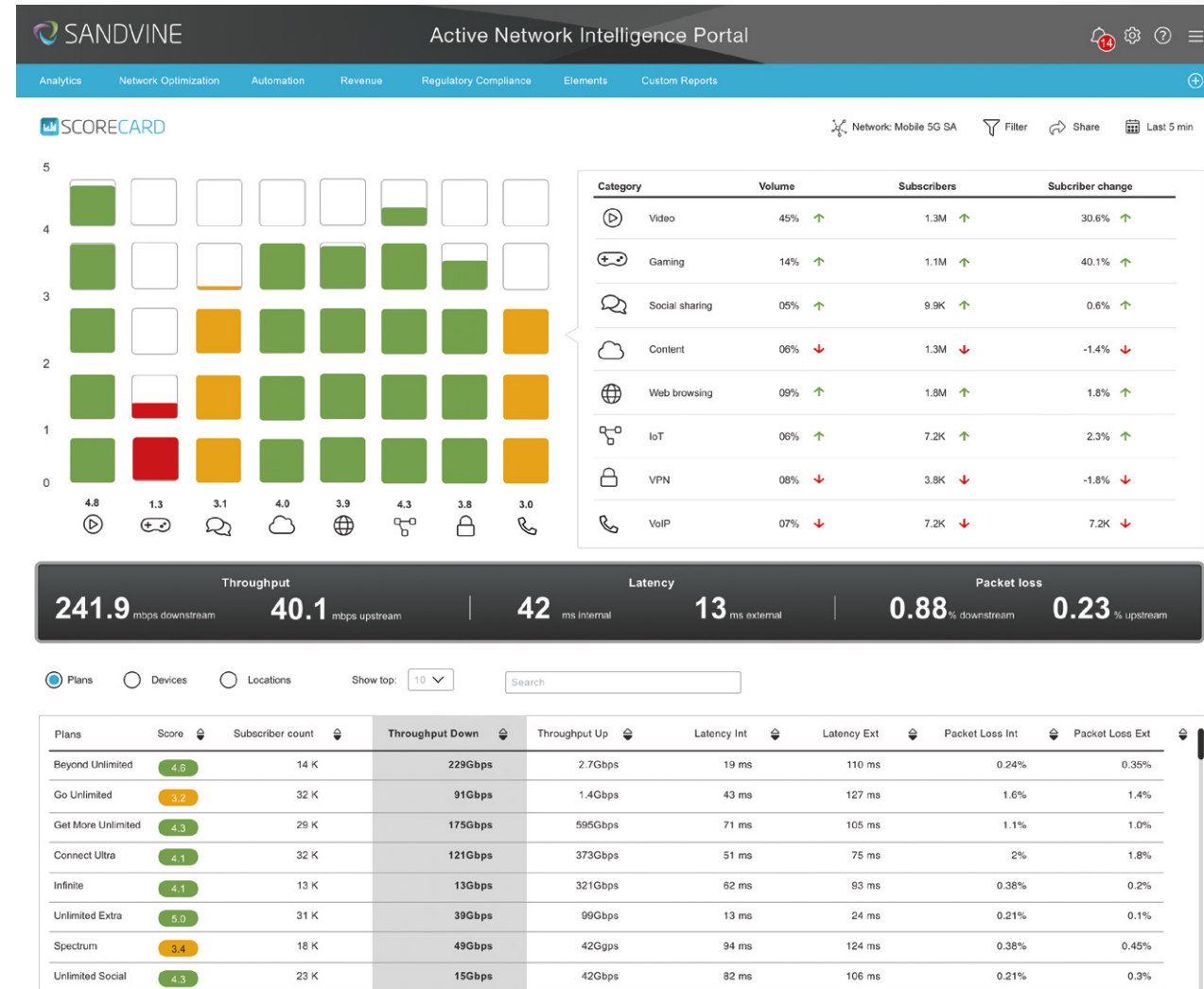
Applications are the heart of the mobile network

The best way to truly understand application quality of experience is to take a deep dive into an average day in a mobile network and understand the evolution of services throughout the day.

Mobile Network Data Sample
The data presented is a summary analysis of multiple North American mobile networks analyzed over the month of January 2021 at hourly intervals.

A day in the life of your network

Sandvine's panel of network experts are ready to help you understand the applications that are driving a day in the life of your network.
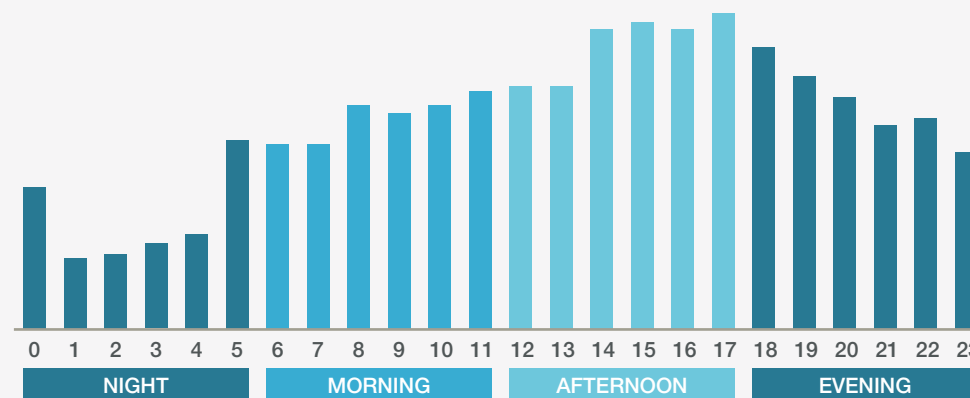
Click here to learn more and speak with our experts.

Click here
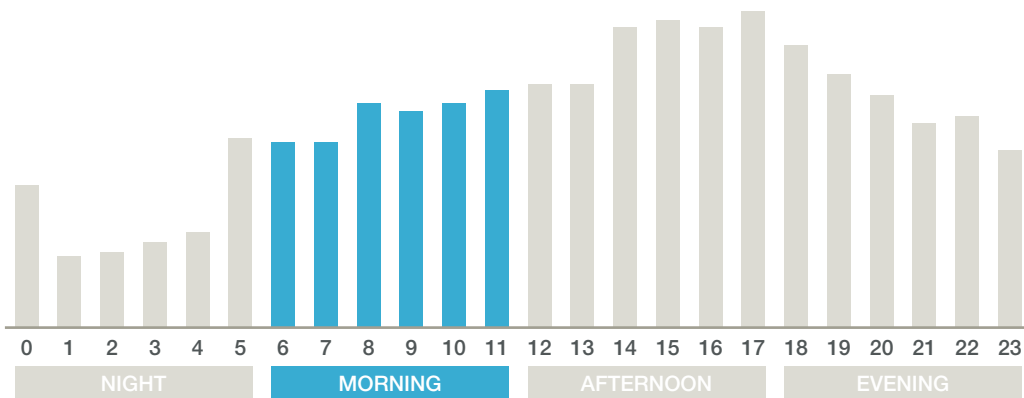
Mobile network of today

By looking at an average day in a mobile network, we are going to sample different time periods to understand how applications and services change throughout the day. We are mapping three distinct time periods – the morning when the traffic picks up, the afternoon with a peak at around 5pm, and the evening when there is a change in application usage.

Peak Times
Understanding peak times is vital to delivering a great application quality of experience. It comes as little surprise that mobile network traffic peaks between 3pm and 6pm when work and school are finishing up. However, different services peak during different times of the day and it is vital for network operators to understand what matters to subscribers and when.

0 1 2 3 4 5	6 7 8 9 10 11	12 13 14 15 16 17	18 19 20 21 22 23
NIGHT	MORNING	AFTERNOON	EVENING

A Day in the Life of a Mobile Network

Morning has broken

Facebook, Facebook Video, and Instagram usage peaks in the morning as users start their commutes to work and school and catch up on changes in their social networks.

Two applications make the top 10 for the first time – Spotify and iCloud. This can be attributed to an increase in users listening to music/podcasts while driving, as well as users switching over from their home networks to the mobile networks.

Skype makes it to the highest rank in the top 10, as people make calls and message colleagues as the day begins.

Service Breakdown in the Morning
What services do consumers use most as they start their day?

Messaging services and Audio applications peak in the morning. As people are getting started with their day, messaging services keep them connected to workplaces and schools.

Social Networking comes in at number one with 29% of traffic, followed by Web browsing as consumers catch up and start their day reading the latest news, trends and updates.
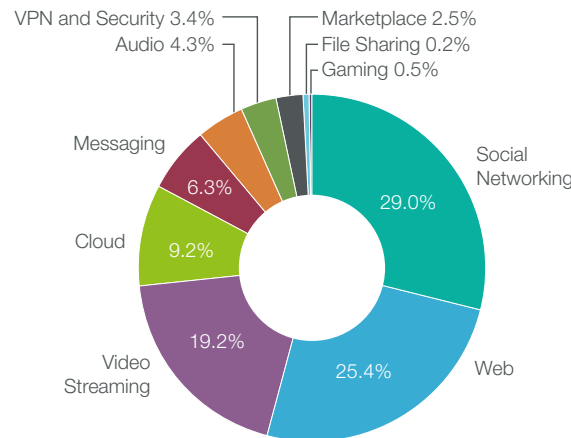
Delight your customers

Understanding how your network is delivering services and applications to your subscribers is key for a good subscriber experience on your network.

Speak with our experts to see a day in the life of your network and how Sandvine enables operators to delight their customers.
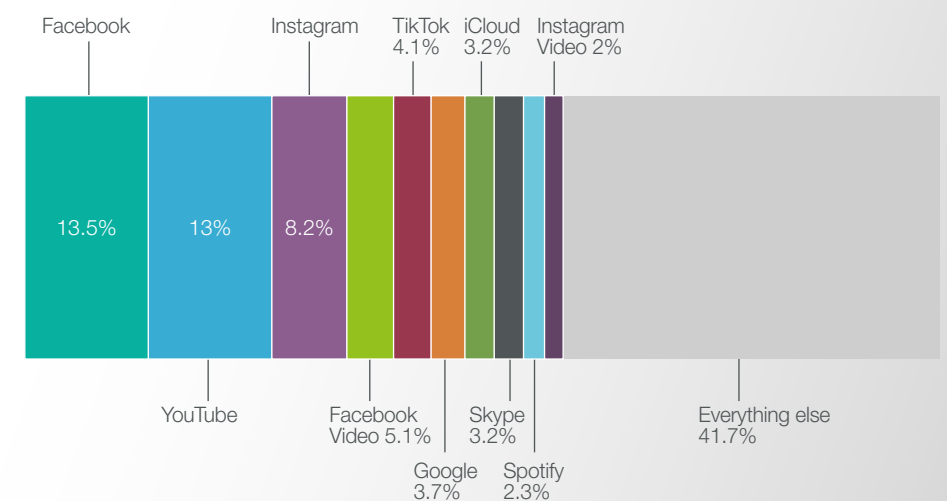
Click here

Application Traffic Category

- VPN and Security 3.4%
- Audio 4.3%
- Marketplace 2.5%
- File Sharing 0.2%
- Gaming 0.5%
- Messaging 6.3%
- Cloud 9.2%
- Video Streaming 19.2%
- Web 25.4%
- Social Networking 29.0%

Top 10 Applications

- Facebook 13.5%
- YouTube 13%
- Instagram 8.2%
- Facebook Video 5.1%
- TikTok 4.1%
- Google 3.7%
- iCloud 3.2%
- Skype 3.2%
- Spotify 2.3%
- Instagram Video 2%
- Everything else 41.7%

Time of day bar chart: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

NIGHT | MORNING | AFTERNOON | EVENING

A Day in the Life of a Mobile Network

Afternoon delight

Sky rockets in flight!

YouTube takes over the number one spot in the afternoon as people catch up with video highlights and their favorite podcasts.

Netflix also makes an appearance in the top 10 as mobile consumers entertain themselves and as students make their way home and catch up on the latest shows.

Social networking dominates the top five, with people glued to mobile screens to consume interesting, ever-changing content.

Service Breakdown in the Afternoon
As the day progresses, consumers turn to mobile networks for more Video Streaming services. These service rise two places to take the number one spot with a 10% increase in traffic since the morning. This is an important trend for mobile operators to take into account to provide a great quality of experience on their network.

Social Networking is still the second most used service. We see Web applications usage reducing as consumers turn to other services for their entertainment. Messaging applications take over Cloud as the work day winds down.

Plan for the network of the future

Balancing capacity expansion and coverage extensions while maintaining the best possible application experience for your subscribers makes planning for the future difficult.

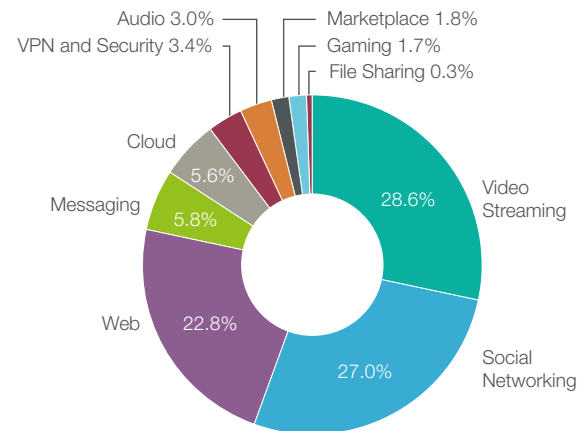Speak with our experts to see a day in the life of your network and how Sandvine enables operators to plan for the network of the future.
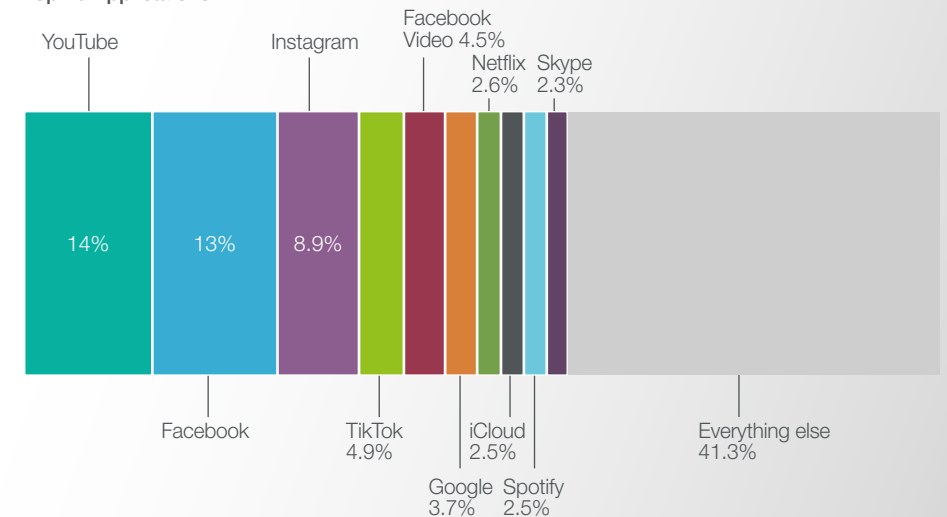
Click here

Time of Day (hours)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

NIGHT | MORNING | AFTERNOON | EVENING

Application Traffic Category

- Video Streaming 28.6%
- Social Networking 27.0%
- Web 22.8%
- Messaging 5.8%
- Cloud 5.6%
- VPN and Security 3.4%
- Audio 3.0%
- Marketplace 1.8%
- Gaming 1.7%
- File Sharing 0.3%

Top 10 Applications

- YouTube 14%
- Facebook 13%
- Instagram 8.9%
- TikTok 4.9%
- Facebook Video 4.5%
- Google 3.7%
- Netflix 2.6%
- iCloud 2.5%
- Spotify 2.5%
- Skype 2.3%
- Everything else 41.3%
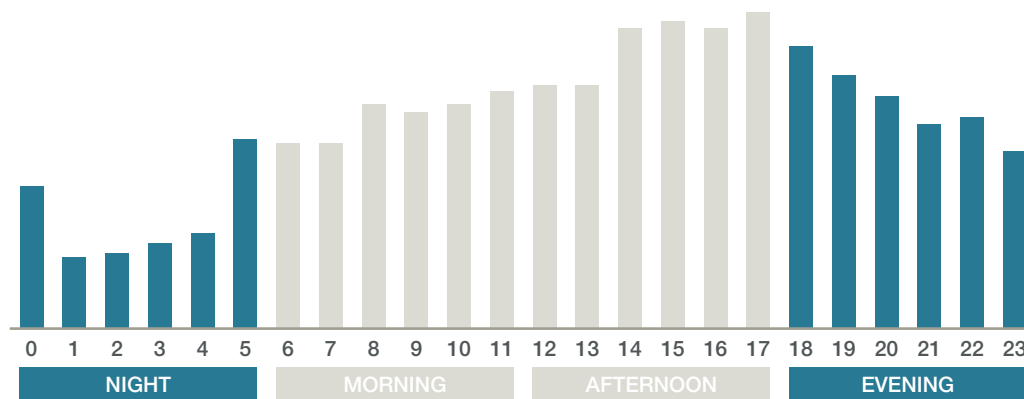
A Day in the Life of a Mobile Network

From dusk till dawn

In the evening, YouTube stays in the number one spot with Netflix making its first appearance in the top five. Consumers are looking for video-first content as Facebook, Instagram, TikTok, and Facebook Video round out the top 6.

As a reflection of the changing dynamics of how we remain connected to the world with video, FaceTime and Snapchat make it into the top 10. Social Networking remains the second most used service, with Web following closely behind. Messaging, Cloud, and Audio round out the top five services that are being used on the mobile network in the evening hours.

Service Breakdown in the Evening
As the evening commute winds down, Video Streaming services take over the network. The bulk of the network is going towards entertainment video and video-first application types as consumers are looking to unwind after a busy day.

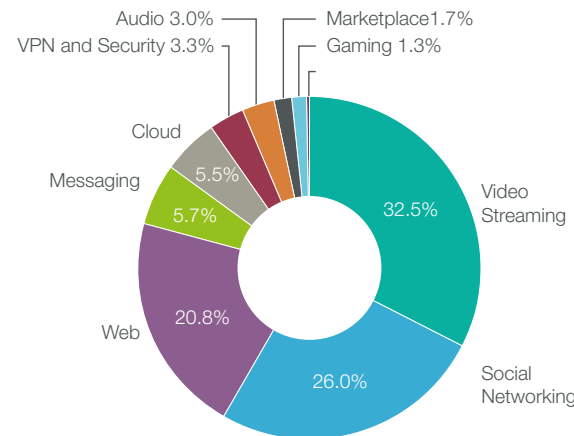### Provide a world class customer experience

Understanding the overall customer experience is critical for service planning as well as customer engagement management.

Speak with our experts to see a day in the life of your network, and how Sandvine enables marketing teams to provide a world class customer experience.
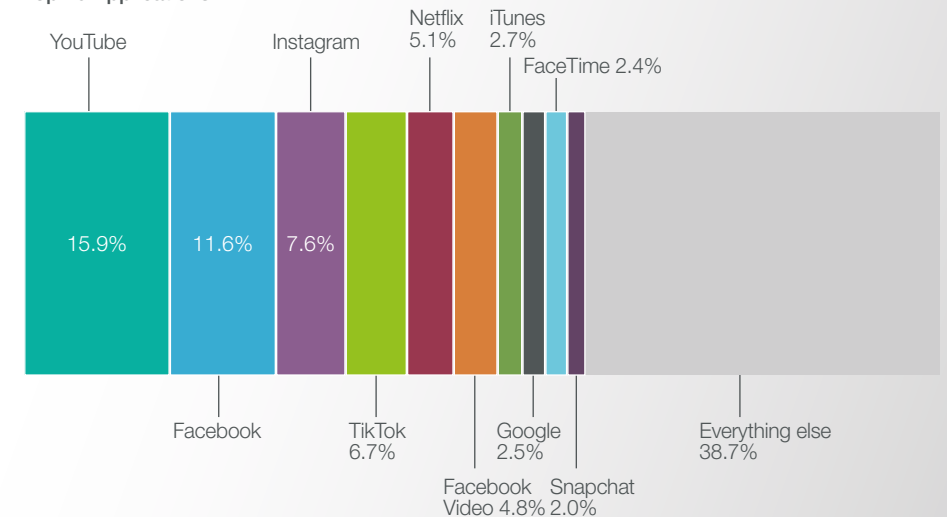
Click here

Hours (x-axis): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

NIGHT · MORNING · AFTERNOON · EVENING

Application Traffic Category

- Video Streaming 32.5%
- Social Networking 26.0%
- Web 20.8%
- Messaging 5.7%
- Cloud 5.5%
- VPN and Security 3.3%
- Audio 3.0%
- Marketplace 1.7%
- Gaming 1.3%

Top 10 Applications

- YouTube 15.9%
- Facebook 11.6%
- Instagram 7.6%
- TikTok 6.7%
- Netflix 5.1%
- Facebook Video 4.8%
- iTunes 2.7%
- Google 2.5%
- FaceTime 2.4%
- Snapchat 2.0%
- Everything else 38.7%

5G Innovate

Are you ready?

5G networks are expected to deliver up to 50x more speed, 10x less in end-to-end latency, and 1,000x more capacity than 4G.

The era of 5G and the Internet of Things is upon us. The time to act is now to ensure that 5G networks have service innovation and intelligence at the core of business decisions.

5G is transforming the communications landscape as smart cities, smart vehicles, smart industries, and smart homes change the way people engage, transact, and share information. This places enormous performance and traffic demands on both mobile consumer and private enterprise networks and opens up innovative service opportunities.

For consumers, it allows service providers to go beyond charging for faster data to delivering personalized services and engaging immersive experiences such as augmented reality games and entertainment, remote healthcare, and automated home and vehicle services.

For enterprises, it enables real-time communications, precision production lines and asset tracking, secure smart city transportation, public safety and healthcare applications, and enhanced financial and retail experiences and transactions. Many of these services will be enabled by connected machines and sensors.

Getting 5G ready

Service Innovation and Intelligence is critical in helping mobile operators with the three key pillars of 5G success: 5G Innovation, 5G Transition, and 5G Automation

5G Service Innovation

- Personalize services based on what subscribers really want from their network
- Unlock new 5G services using machine learning-based application understanding
- Unleash the full power of the 5G network by improving the quality of experience for applications and services on the network

5G Transition

- Optimize 4G to 5G rollout
- Understand quality of experience and ensure service continuity
- Key application metrics to understand 5G penetration – subscriber, devices, and service quality of experience
- Improve capacity planning based on application needs and network subscriber experience

5G Automation

- Enriched Network Data Analytics Function (NWDAF) with contextual insights for slice analysis, performance management, and predicting and detecting network behaviors
- Optimize 5G network slice service with predictive network intelligence
- Dynamically self-optimize, matching current network resources with changing application and subscriber quality of experience needs

Understanding 5G services

Video is the #1 use case for immediate 5G opportunities.

Video detection versus video streaming seems simple enough. However, the needs of each service, user expectations, and network traffic impacts vary significantly.

About 75% of businesses use video monitoring today. Service providers have an opportunity to transform the landscape by offering bundles that add more value. These bundles can focus on real-time detection using sensors that monitor risk, recognize faces, and highlight incidents.

How does this impact 5G networks? Network operators need to create services that are valued by the end user, understand the quality of experience, and meet user needs.

Let's take a deep dive into two popular smart home applications for consumers – Nest and Ring – to understand how each application/category has specific QoE requirements on the 5G network of the future.

Understanding 5G applications and services

Understanding different application requirements is key to successfully launching services that customers care about.

For video surveillance: For Nest Cam usage, the slice and service needs to be tuned for bulk video streaming and storage. With an average upstream/downstream ratio of 7%, video surveillance applications require good throughput to perform well. Since the usage of these services is 10x higher than detection services, understanding the traffic impact of this service is key as it grows on the network. The end user can optimize their experience with local storage options as well. This can offset some of their network utilization.

Video Surveillance **Nest: Rank 138**
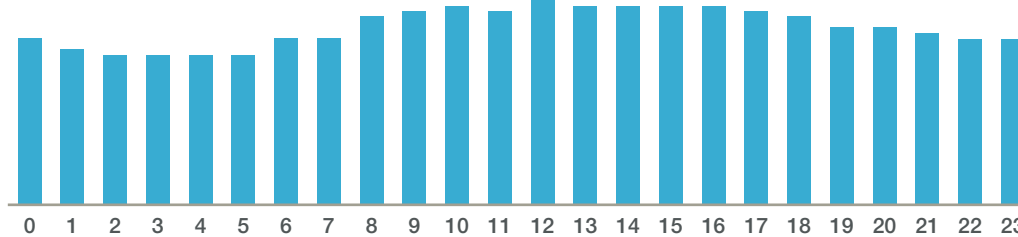
For video detection: The slice and performance needs to be tuned very differently. In the case of Ring utilization, usage spikes when threats are detected. The service uses analytics and off-premises machine learning to determine the level of action needed. This requires constant connectivity. Given an upstream ratio of 37%, if services are not properly tuned, there is the possibility of interrupted services. While this traffic is 10x smaller than surveillance traffic, it is highly sensitive and must be closely watched to ensure a good quality of experience.

Video Detection **Ring: Rank 261**
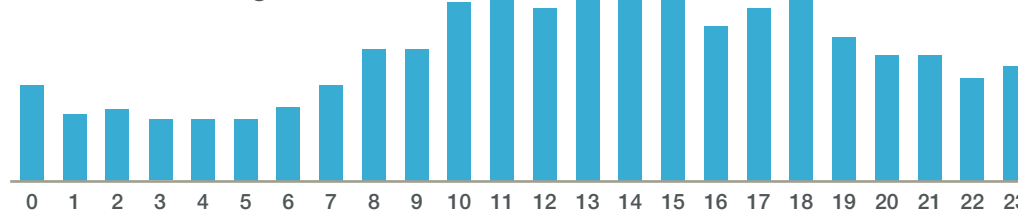
As innovative services are launched on the network, the typical cycle has been to add users until capacity has been met and then add more. Since services such as video detection are mission-critical, it is important to keep the service experience in mind and tune the slice and network on a high priority basis.

Now that initial 5G services have been launched, operators and subscribers can start to appreciate the full power of 5G. Innovative services such as Ring have grown over 50% in the past six months. Given the lower latency requirements needed to deliver such service, mobile operators need to tune the application experience to deliver the services users expect.

Dealing with service growth, ensuring QoE

Changing market dynamics: Understanding the applications that deliver video surveillance and threat detection will help 5G networks deliver the needed experience for mission critical applications. Since applications geared towards the home consumer differ from industrial IoT users, there are limitless possibilities to improve/automate our worlds.

Delivering services with application intelligence

Contact us

NEXT STEPS WITH SANDVINE
Now that you know what applications are driving internet consumer trends, plan for 2021 with Sandvine.

Reach out to **phenomena@sandvine.com** if you have any questions or to meet with our team of experts.

DO YOU HAVE REQUESTS FOR INSIGHTS?
We love inbound requests for data from our customers, prospects, industry analysts, and press. Many of the topics we cover in the Phenomena Report cross boundaries from tech into entertainment, and we welcome inquiries where we can help give clarity to the market. If you have questions, please reach out to Sandvine at **phenomena@sandvine.com**

We will also blog regularly; if you missed some of our recent ones, check out the Phenomena Spotlights:
https://www.sandvine.com/blog

Want to know more about Sandvine?

If you are a Sandvine customer or prospect, please contact us for a detailed view of your region and access type. Our capability is unmatched in the industry for classifying traffic in your network and helping you via pre-packaged use cases with strong ROI or TCO.

SANDVINE'S API GATEWAY
Want to make sure Sandvine has your application covered in our report? We have an API that you can use to keep us up-to-date:
https://www.sandvine.com/api-gateway

ACTIVE NETWORK INTELLIGENCE (ANI)
Visit **www.sandvine.com** to learn about our ANI solutions.

ACTIONABLE DATA
How can The Mobile Internet Phenomena data become actionable in your network? Check out our Use Case eBook to find out.
https://www.sandvine.com/use-case-ebook

RESOURCES
Come see our Resources page for a wide range of videos, webinars, and whitepapers:
www.sandvine.com/resources

Phenomena Roadmap

WHERE TO NEXT?
The plan for The Internet Phenomena Reports is to regain a regular cadence with two main reports each year, and several spotlight reports when the data speaks to us.

We have plans for a fixed network report later this year or early next year to break out the differences between the two network types.