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The Global Internet Phenomena Report

September 2019

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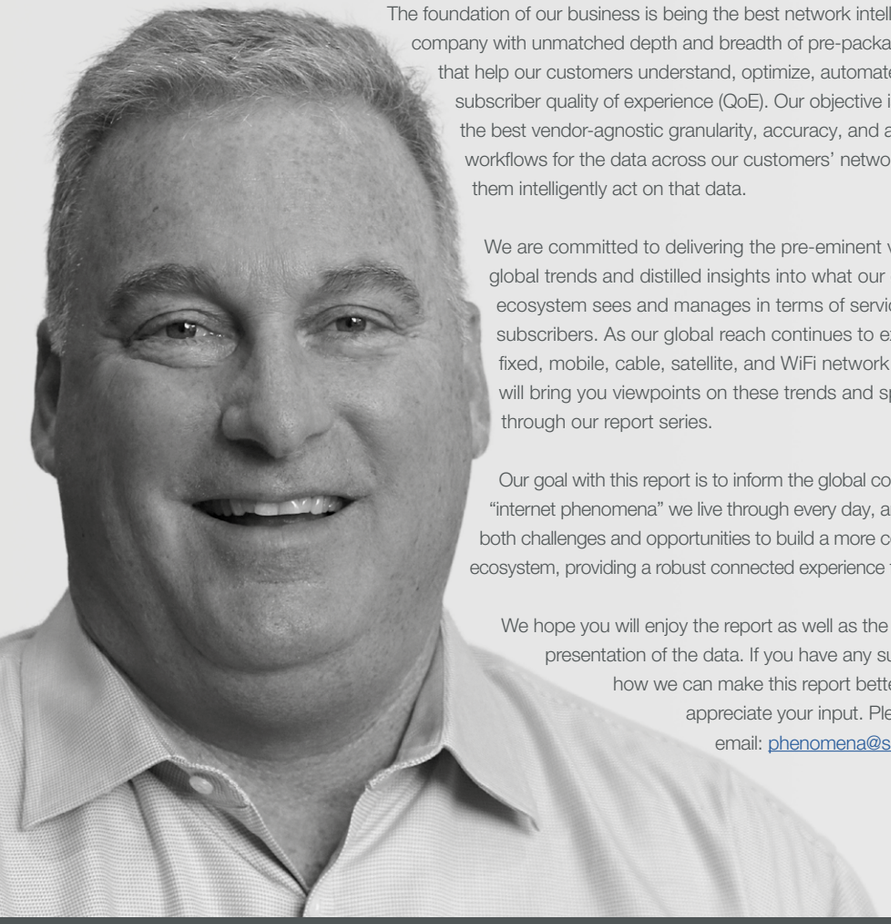
Welcome!

A word from Lyn Cantor, CEO, Sandvine

Sandvine is a global leader in the network intelligence market segment. Our customer base represents over 160 Tier 1 and Tier 2 global network operators (fixed, mobile, satellite, WiFi, and enterprise) and our solutions touch over 2.5 billion internet subscribers worldwide.



The foundation of our business is being the best network intelligence company with unmatched depth and breadth of pre-packaged use cases, that help our customers understand, optimize, automate, and manage subscriber quality of experience (QoE). Our objective is to provide the best vendor-agnostic granularity, accuracy, and automated workflows for the data across our customers' networks, and help them intelligently act on that data.

We are committed to delivering the pre-eminent view of global trends and distilled insights into what our operator ecosystem sees and manages in terms of services delivered to subscribers. As our global reach continues to expand across fixed, mobile, cable, satellite, and WiFi network domains, we will bring you viewpoints on these trends and special topics through our report series.

Our goal with this report is to inform the global community on the "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 subscribers.

We hope you will enjoy the report as well as the enhanced presentation of the data. If you have any suggestions on how we can make this report better, we would appreciate your input. Please feel free to email: phenomena@sandvine.com.

Lyn Cantor,
CEO, Sandvine

Welcome to the 2019 Global Internet Phenomena Report

The 2019 version of the Global Internet Phenomena Report was truly a labor of love for me. Last year, we built a new foundation for the report with more exploration of traffic not only at the regional level, but also for different classes of application traffic. This started us down some interesting paths that we are exploring further this year, and has highlighted some trends that we will go into more detail on in this and in future reports.

There were some predictions and some controversial positions that we took last year, and the data from this year bears out our thesis on how consumers are reacting to some of the new trends, especially in video and file sharing.

This report is a bit more comprehensive than the 2018 edition. There were a lot of high profile events that occurred during the first half of 2019, namely the final season of Game of Thrones, the FIFA Women's World Cup, the release of Avengers: Endgame; as well as new series releases, the Super Bowl, new streaming services, etc. So rather than pick a single month during the first half of 2019, which would likely result in some data bias, this report covers the entire first half of 2019 in all categories. This has the effect of smoothing out the impact that a special event has on traffic across a six month period.

Some of the events that occurred have clearly had an impact on the global share of specific traffic types, but the data is speaking pretty clearly on the trends, and it is impossible to dismiss the data when it is taken from such a large sample size.

The data mixes traffic from all around the world, from all different sizes of networks. Traffic on large networks in large countries drives global share – just as in any market – so, applications and content providers that have worldwide user bases and are popular in the US, South Korea, and Japan (all countries with fast connections and millions of users) do well. Regional applications or language-specific applications tend to not show strongly in global rankings.

This is why, in addition to global data, we release regional data. If you are in Asia, your network will act differently than the US. We want to give you the data that is relevant for your network planning or just because you are the curious type – like I am! If you're an over-the-top (OTT) content provider and have an application you want covered in the phenomena report, click here.

Cam Cullen, VP of Marketing, Sandvine

About the Global Internet Phenomena Data

The data in this edition of the Global Internet Phenomena Report is drawn from Sandvine's installed base of over 160 Tier 1 and Tier 2 fixed, mobile, and WiFi operators worldwide. The report does not include significant data from either China or India, but the data represents a portion of Sandvine's 2.5B subscribers installed base, a statistically significant segment of the internet population.

This edition combines fixed and mobile data into a single comprehensive view of internet traffic across all network types. The volume of traffic on the internet is dominated by fixed line networks, so even though this report includes mobile and WiFi data, the trends on fixed networks dominate traffic share.

Within each section, Sandvine measured the global traffic share for applications from several different perspectives:

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

Upstream: this is the traffic volume uploaded to the Internet. It could be requests for content, an interactive messaging session, or a Twitch stream of a gaming session from a console.

Connections: this 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.

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Want to use some of this data? We have a handy collection of resources to simplify re-use of the data in the Phenomena Report, as well as links to more information if you have questions for us.

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Highlights in this edition

Do OTT video content providers have a fight on their hands?

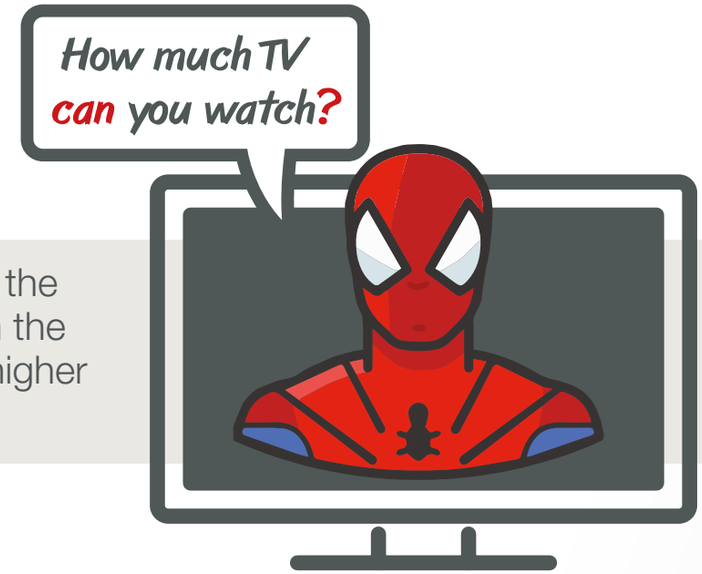
facebook
>15%
of all APAC Traffic

CLOUD TRAFFIC

is more than **50%** of all APAC upstream traffic

TikTok
34th Worldwide (up from 65th in 2018)

Alexa **vs** Siri



Spidey gives the low-down on the true cost of higher resolutions

Plus spotlights on:

Traffic share leaders for video, social networking, messaging, audio streaming, and gaming

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Coming Attractions

There are a number of new services that will be launching in the next year that may yet again change the traffic landscape by the next Phenomena Report:

- **Disney+:** Star Wars, Marvel, Pixar, and decades of TV and movies, all priced extremely well with compelling original content. How could this fail?
- **Apple:** With the offer of free original content with purchase of an Apple device, this could drive up usage in Apple-heavy markets.
- **Universal:** Another library with decades of content, with attention being given to "The Office," which was one of Netflix's most watched TV shows.
- **HBO Max:** Warner Bro's offer with another massive content library that will build on HBO Go and will leverage popular TV series, especially "Friends", this service promises to be, "there for you when the rain starts to fall."
- **Other video services:** DC Universe, Facebook Watch, and Discovery have all announced planned services.
- **Google Stadia:** It's not just streaming video that is coming, Stadia is maybe the "Netflix of Gaming," perhaps something totally unique with bandwidth requirements between 10-35Mbps and expectations of low latency. Could this be the first tangible monetization opportunity for QoE?

The massive impact of OTT fragmentation

In the 2018 report, we said: "We will talk quite a bit about video in this report, but it is important to highlight the diversity of video streaming traffic around the world. Although Netflix and YouTube are still the largest names in streaming (as you will see in the reports), there is an ever growing number of other streaming providers capturing consumer screen time." Well, not only were we right, but it is highly likely to be getting worse, with some big changes on the way as major new services launch soon.

The data in this year's report is conclusive that this fragmentation is already happening in the market, even before some large new players enter the market (see sidebar). The surprising result is that it is not just the big streaming networks that are growing, it is the rest of the pack that are represented by some of our generic streaming protocols for the thousands of content providers worldwide.

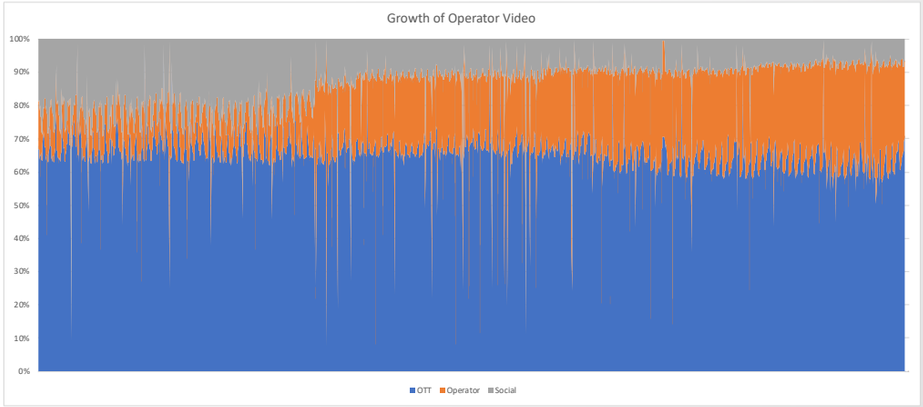
There has also been a marked increase in operator IPTV services that are being taken advantage of by consumers. As you will see in the numbers, the overall percentage of video has not increased (there are only so many viewing hours in the day!), but consumers are shifting some time from Netflix to their IPTV services, and the operator is delivering greater value in their set-top boxes. As shown in the graph to the right, the share of the major OTT players remained fairly consistent through the year, but on fixed networks at least, the share of mobile video declined as the share of operator video grew.

Is this a good thing? For IPTV operators, it means that they are getting consumers to stick with their service rather than cut the cord – which is a win. It means in the home, people will need more bandwidth as long form and large screen video requires more bandwidth to achieve high quality versus social video on smaller screens. It does, however, raise the bar and expectations for network quality – as if a consumer is paying for a video service, they expect quality. Failure to deliver on that quality expectation, and the cord will be cut. As 4K and 8K enter the market, the expectations will grow even more, and network operators will need to not only sell high speed packages, but also to deliver on QoE expectations during peak hours.

This video diversity trend has led directly to the continued relevance of file sharing, which is still a major source of internet traffic. Consumers that cannot afford to subscribe to all of the different services turn to file sharing to get the latest original content, even as governments attempt to shut down sharing sites.

Last year, we reported that we saw an uptick in file sharing for the first time in many years. Since we had a bit of a lapse in the reports between 2016 and 2018, and the dataset we were drawing on was a bit different, it was hard to give concrete proof. But this year, we have rock solid numbers that can't be dismissed, even if you discount the final season of Game of Thrones (GoT) (more on that later!) as an outlier. We saw the impact of our prediction, so hang on for a bumpy ride over the next few years as the market shakes out!

Operator IPTV Growth: Driven by live streaming and VOD "catchup"



The first half of 2019 shows a marked growth of operator streaming traffic as a percentage of overall video traffic on the internet. Operator streaming in this context is when an operator allows users to stream video-on-demand (VOD) or even live broadcasts to their TVs, iPads, phones, etc. For an operator, this means even if they retain cord cutters, the usage on their networks will go up for high bandwidth video. The rise in this traffic shows that consumers are getting more comfortable with cloud DVR services and streaming from their set-top boxes. Comcast has invested heavily in the X1 offering, and other operators are using various systems to offer similar services.

The spikes up and down represent events that shift viewing – the Super Bowl, new Netflix series releases, the release of Avengers, Game of Thrones, etc. These events shift video from one source to another then typically go back to normal. There are few events that completely change the landscape, but it remains to be seen if the launch of Disney+, which is being hyped and is expected to be full of both attractive existing content as well as original content, can change the landscape, even if for a short time.

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Global Application Category Traffic Share

GLOBAL APPLICATION CATEGORY TRAFFIC SHARE

1	VIDEO STREAMING	60.6%(+2.9) ⬇	22.2%(-0.1) ⬆
2	WEB	13.1%(-3.8) ⬇	10.3%(-10.6) ⬆
3	GAMING	8.0%(0.2) ⬇	4.9%(+2.2) ⬆
4	SOCIAL	6.1%(+1.1) ⬇	7.6%(+3.8) ⬆
5	FILE SHARING	4.2%(+1.4) ⬇	30.2%(+8.1) ⬆
6	MARKETPLACE	2.6%(-1.9) ⬇	1.6%(-0.2) ⬆
7	SECURITY AND VPN	1.6%(+0.2) ⬇	5.3%(-2.1) ⬆
8	MESSAGING	1.6%(-0.1) ⬇	8.3%(-0.1) ⬆
9	CLOUD	1.4%(+0.01) ⬇	9.0%(-0.3) ⬆
10	AUDIO STREAMING	0.4%(-0.5) ⬇	0.3%(-0.1) ⬆

How much video can you watch?

There are many predictions about how much video will be on the internet, with numbers as high as 80% quoted by some reports. This year, there was a small jump (from 58% to 60%) in the overall percentage of video traffic, but it sparked a few questions in our minds: "How much video can a consumer watch?", "Will 4K/8K be the tipping point to hit 70%?", "What else is coming that changes the consumption equation?" (I know, curiosity killed the cat, but we need to know these things!). There were not huge shifts from last year, but some significant movement occurred that signal further shifts in how bandwidth is being consumed.

The dynamic in the 2019 Global Internet Phenomena Report is not that more video is being consumed, but the shift in where that video is coming from. The number of hours that a consumer can watch video is limited, and other traffic types are still growing, especially social networking and gaming.

As we will see in the individual application breakdown, the percentage of internet traffic consumed by video is pretty consistent with last year. Overall, traffic volume is up (as it always is in broadband networks), but the comparative usage by different applications has shifted only slightly from 2018. The thing that can change this will be when 4K and 8K go mainstream. When 4K hits, a single video will grow 3-5x in size from a HD video. 8K videos grow another 3-5x from a 4K video. In this scenario, a single user will not only consume more volume, but the rate they consume this will increase, driving peak bandwidth requirements up for network operators.

There will always be web browsing – although increasingly through applications and embedded browsers (like in social networking applications). This number fell from 17% downstream and ~21% upstream to much lower numbers this year, reflecting increasing social networking and gaming volume.

As mentioned in last years' report, a single download of Call of Duty: Black Ops is equivalent to 14 hours of 4K viewing, and because of the continued drive to digital game delivery, gaming volume is up slightly on the downstream, and more on the upstream in 2019. The popularity and mainstreaming of eSports is growing, and now this shows not only in the growth of Twitch and gaming traffic, but also the prize money awarded in eSports competitions (Bugha winning $3M for the Fortnite championship held in Arthur Ashe Stadium was a game changer). This growth is occurring even before the launch of Google Stadia, which promises to change the landscape for gaming, possibly forever.

Standard Definition 1.4GB

High Definition 6GB

Ultra-High Definition 18GB

We will talk more about file sharing later, but the consumption is growing and shows no signs of slowing due to all of the fragmentation and changes in the video streaming landscape. The percentage for this traffic type topped 4% downstream and over 30% on the upstream, both larger than last year.

Outside the main categories, there were small shifts in the rest of the traffic with marketplace, VPNs, messaging, cloud, and audio streaming filling out the traffic categories but essentially being lost in the noise of massive amounts of video streaming, gaming, and social networking.

Conservative video sizes for a service like Amazon Prime to stream different video resolutions. Netflix is generally the most efficient video streaming service on the market.

4K - 54GB

8K - 162GB

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GLOBAL APPLICATION TRAFFIC SHARE

1	HTTP MEDIA STREAM	12.8%(-0.1) ⬇	6.3%(+1.4) ⬆
2	NETFLIX	12.6%(-2.3) ⬇	2.1%(-0.8) ⬆
3	YOUTUBE	8.7%(-2.9) ⬇	2.4%(-0.6) ⬆
4	OPERATOR IPTV	7.2%(+2.8) ⬇	3.5%(-0.6) ⬆
5	HTTP DOWNLOAD	4.5%(+0.8) ⬇	1.0%(-0.3) ⬆
6	HTTP (TLS)	4.4%(+0.4) ⬇	2.2%(+0.1) ⬆
7	HTTP	3.0%(-0.1) ⬇	3.5%(-1.2) ⬆
8	FACEBOOK	3.0%(+1.2) ⬇	2.2%(+0.7) ⬆
9	PLAYSTATION DOWNLOAD	2.8%(+0.2) ⬇	0.4%(+0.0) ⬆
10	BITTORRENT	2.4%(+0.2) ⬇	27.5%(+6.4) ⬆

The long tail overtakes the short tail

For every action, there is an equal and opposite reaction – and the market success of Netflix has caused a massive pendulum swing in the market. Netflix grew popular as an aggregator of video, essentially giving users the ability to watch a wide variety of content in from a single account. Amazon and Hulu followed, and now every content owner is looking to monetize their content and deliver originals as part of an exclusive streaming service.

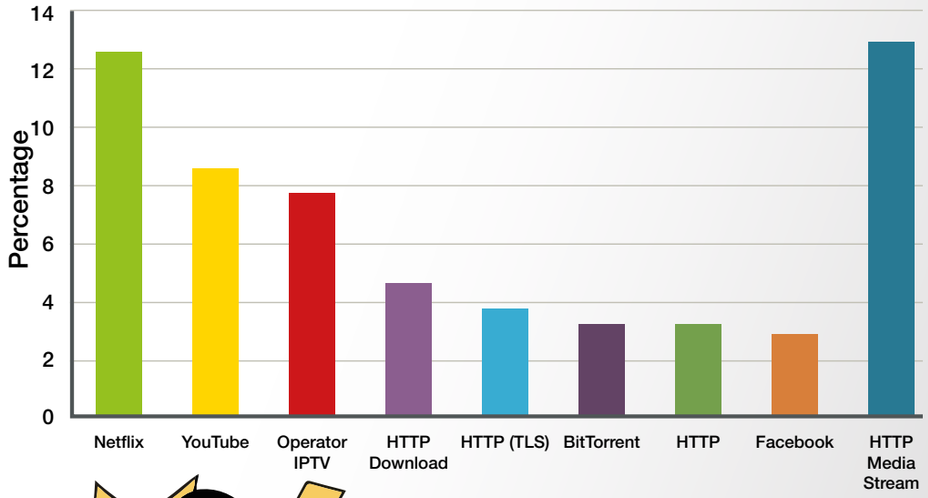
In statistics and big data, we often talk about the long tail and the short tail. Well, this year, the aggregate volume of the long tail is actually greater than the largest of the short tail providers. Last year, Netflix was the largest traffic source with almost 15% of downstream traffic. In 2019, Netflix was edged out (slightly) by HTTP Media Stream, which represents that long tail (which was a few percentage points behind last year).

Sandvine has over 250 unique video signatures in this report, and we are barely touching the surface (something for us to expand on next year!). Our signatures include the big services that you expect: Netflix, YouTube, Twitch, Hulu, HBO Go, Instagram, Facebook, BBC iPlayer, and DirecTV Now. It also includes international channels and services like Rakuten TV, Azteca TV, Daum Pot Player, Sky Go, ZDF Mediathek, Kartina TV, and even Red Bull TV.

So, what video content and providers are in the long tail? Since we are covering the global market, this is not only something like Adult Swim and AMC in the US, but NHK in Japan, Canal+ in France, and Foxtel in Australia, which historically have not registered enough volume both globally or in their own countries. The long tail includes video ads that you see (seemingly everywhere in your browser) when you are on most websites. It also includes video sharing sites that are all over the internet.

We are also seeing a big uptick in operator IPTV traffic, driven by big volumes mostly in North America. When we say “operator IPTV,” what we mean is when your fixed line operator offers both live TV streaming and VOD/catch up video offerings through their set-top box or through app/web portal. This is also where cloud DVR offerings come into play, and these replay options are helping retain cord cutters who value live TV and DVR playback.

The other big story is the continued growth in file sharing, which is up significantly from last year, with BitTorrent alone representing 2.46% of downstream and 27.58% of upstream traffic. When Netflix aggregated video, we saw a decline in file sharing worldwide, especially in the US, where Netflix’s library was large and comprehensive. As new original content has become more exclusive to other streaming services, consumers are turning to file sharing to get access to those exclusives since they can’t or won’t pay money just for a few shows. File sharing is growing in all regions, and one of the drivers during this report period was GoT (which we will spotlight later). Is this the new normal, or is GoT a unicorn?



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Global Trends: Beyond the Top 10

HIGHLIGHTS

Nest Thermostat: The most significant IoT device pops up as 37th on the list of connections at .36% and 298th on the list of upload bandwidth at .01% – up from last year's numbers just a bit.

Voice Assistants: Siri (80th) pulls a little ahead of Alexa (96th) this year in the race for the most frequent use and volume of bandwidth.

Mobile Advertising: DoubleClick is 22nd worldwide for number of connections, showing just how powerful Google advertising is.

Mobile Crashes: Crashlytics was .44% of all connections (33rd worldwide), and it was also .06% of upload traffic (110th worldwide) for upstream bandwidth – actually moving up from last year's numbers.

Tik Tok: Mobile-centric applications tend to do poorly in the Global Report, but Tik Tok, which was 11th worldwide in the Mobile Report, rode video traffic all the way to 34th worldwide (right behind Snapchat) with a strong growth from last year, when it was not even in the top 50 worldwide.

Nest Thermostat:
37th place for connections at 0.36% and at
of 298th of all upload bandwidth at 0.01% - up from last year

crashlytics

0.44% of all connections
0.06% of upstream bandwidth

Alexa

96th position in connections worldwide

>0.01% of all upstream
448th worldwide

vs

Siri

80th position in connections worldwide

0.04% of all upstream
143rd worldwide

TikTok

34th Worldwide (up from 65th in 2018)

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Americas: Downstream Application Traffic Share

AMERICAS ⬇ TRAFFIC SHARE **TOP 10**

1. **HTTP MEDIA STREAM** 17.3%
2. **OPERATOR IPTV** 15.0%
3. **NETFLIX** 12.87%
4. **YOUTUBE** 6.3%
5. **HTTP DOWNLOAD** 4.5%
6. **HTTP (TLS)** 4.4%
7. **HTTP** 3.2%
8. **PLAYSTATION DOWNLOAD** 2.6%
9. **XBOX LIVE DOWNLOAD** 2.6%
10. **FACEBOOK** 2.2%

Video and gaming drive the Americas downstream

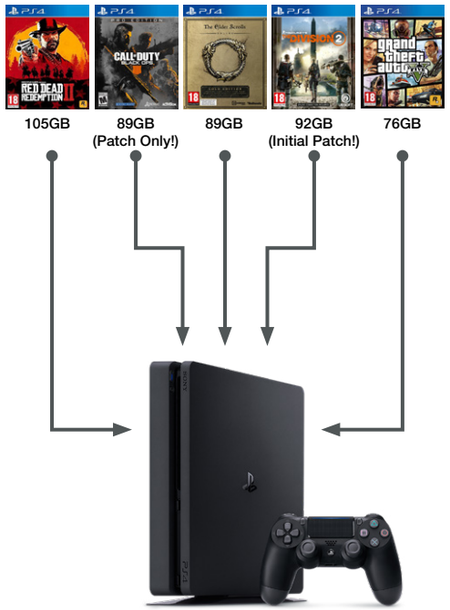
The Americas, like the other regions, is led by streaming video on the downstream, but with more operator IPTV than other regions. Sandvine has a very good installed base in cable and fixed line operators in the Americas that feed this report, and that certainly colors the regional results heavily towards video, but gaming is also an important player driving consumption.

Netflix is down from last year's number in the Americas, with viewing patterns diversifying from mostly "netflix and chill" back to "what's on tonight?". Many households have multiple streaming options – both paid and free – that they take advantage of. The cord cutting services in the US (DirecTV Now, PlayStation Vue, Hulu + Live TV, and YouTube TV among others) are still a drop in the bucket compared to other streaming services, and operator IPTV has grown significantly (see sidebar).

Gaming is very popular in the Americas, with both PlayStation and Xbox download traffic in the top 10. With game delivery increasingly digital rather than through the purchase of discs, and the size of games (not to mention the frequency of updates and expansion packs) escalating usage. As the graphic shows, the size of downloads and the frequency of patches is growing. The Division 2 initial patch (even if you bought the disc) was 92BG, a big hit for any consumer on a capped plan!

Twitch (which was in the top 20 in the Americas) is actually lower in the region than others because many eSports competitions can be viewed on broadcast TV channels, but the popularity of eSports among teens is growing (especially as the potential for sponsorships and prize money grows) and driving franchise growth.

PLAYSTATION® Network



IPTV and Cloud DVRs

What do we mean by IPTV and how is this different from other video streaming? As the image below shows, the set-top boxes deployed by most cable video operators not only support the classic CATV video streaming, but also VOD and increasingly other video applications (like Netflix, Amazon, and YouTube).

When the user is watching normal live TV channels, the video is delivered via the standard CATV video distribution system. When the VOD menu is launched and a video is selected, the set-top box gets an IPTV stream from the operator's internal IPTV system. When a video application is launched, the video is fed from the content provider's video CDN (or a cache if one is deployed in the operator network). If the operator is not a cable operator, then even live TV is delivered via an IPTV stream (e.g., like a Verizon FIOS customer). The operator has ultimate flexibility in this scenario, as they can even deliver live channels or content that they cannot offer through their existing video delivery system simply by loading an application on the set-top box.

One possible resolution to the fragmentation of video providers is an application or set-top box that not only aggregates selection of shows and video providers though a single interface, but also billing. In this scenario, the consumer has a single visual and billing interface, simplifying the experience and removing friction for consumers.

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Americas: Upstream Application Traffic Share

AMERICAS ⬆ TRAFFIC SHARE **TOP 10**

1. **OPERATOR IPTV** 9.4%
2. **BITTORRENT UPLOAD** 8.5%
3. **IPSEC VPN** 7.7%
4. **NETFLIX** 4.5%
5. **HTTP** 4.4%
6. **RTP** 4.3%
7. **HTTP MEDIA STREAM** 3.9%
8. **ICLOUD** 3.7%
9. **HTTP (TLS)** 3.6%
10. **DROPBOX** 2.5%

Exclusive content from the Americas

The US is the source for a large quantity of the highly desired video content in the world, so it is not surprising that BitTorrent is growing again as the exclusives begin to flood the market. As shown in the image to the right, when GoT aired in the US, an hour after the episode, you would see over 100,000 shares of the episodes on file sharing sites. Every single episode of GoT generated similar volumes of traffic (more on that in a spotlight later!).

Some of the exclusives that drove the increase in filesharing (if you didn't have the OTT server) included: Jack Ryan and The Boys on Amazon Prime, The Handmaid's Tale on Hulu, Stranger Things on Netflix, GoT on HBO, Star Trek Discovery on CBS All Access, and Cobra Kai on YouTube. Disney+ has a number of Marvel and Star Wars exclusives planned that will also fuel this growth.

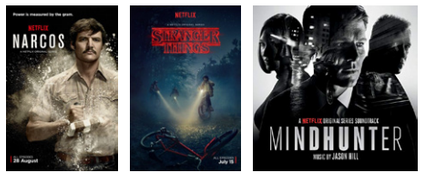
What is unexpected and interesting in the Americas is the growth of IPSec VPN traffic, which is almost as large as the volume of BitTorrent. Last year, IPSec was just at ~2.5%, and this year it is 3x that percentage. With the rising popularity of VPN services designed to hide consumer activities, the usage volume of VPNs has grown significantly.

Any consumer that has received a DMCA notice from their service provider has quickly invested in a $5-$15 a month VPN service, and then tunnelled their file sharing (and sometimes ALL) traffic through the VPN. The performance of the VPN services has improved dramatically over the past few years to support location shifting of video streaming (to get around region locks for many streaming services) and also works well to hide file sharing activities. Some VPN usage is business traffic, as telecommuting and remote work is growing, but not nearly enough to account for this volume of traffic.

Other significant upstream traffic in the region is for RTP (for voice and video messaging) and cloud services from Apple (iCloud) and Dropbox, which are widely used and integrated in with photo and video devices for automated uploads by consumers. Several other cloud services sit right outside the top 10, demonstrating not only the popularity of the services, but also the volume of data that consumers are syncing to the cloud for backup and security purposes.

Popular Exclusives by OTT Service

NETFLIX



amazon

hulu

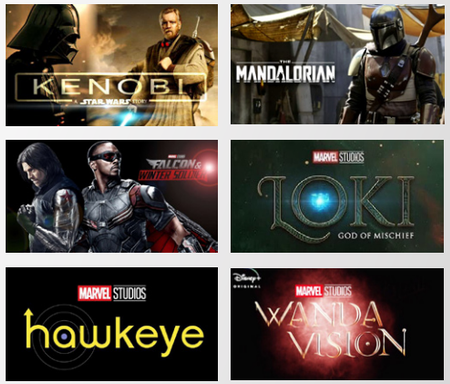
YouTube

HBO GO

CBS ALL ACCESS

Coming soon!

Disney+



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Spotlight: Video and IPTV Fraud

Video Piracy: It's as easy as 1, 2, 3!

Over the past 10 years, the landscape for video services has changed massively for consumers. The simple choice of cable versus satellite has morphed into a massively confusing array of choices of providers and channel packages. Basic packages are often quite expensive, and Netflix has slowly but steadily chipped away with cord cutters. Over the past two years, streaming replacements for live TV have begun to penetrate the market (still very small amounts of traffic) from Hulu, DirecTV, YouTube, and Sony. Broadband speeds have increased and experience has improved to the point at which consumers are willing to completely cut the cord.

Today, despite the continued growth in licensed services, there are still consumers committing content fraud and using piracy services offered for below the cost of legal content. This new breed of piracy providers is penetrating the market, and their network usage is of the same order of magnitude as many live TV streaming services.

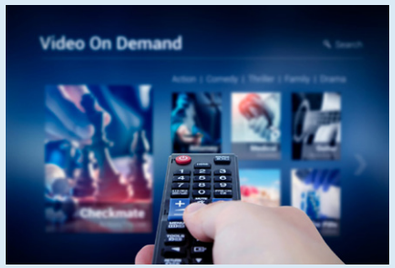
We refer to these as fraudulent IPTV services and fully-loaded Kodi boxes. Both platforms can use completely legal, fee-paid services, as an alternative to a cable or satellite connection, but modified with piracy configured add-ons to access premium content. Pirate IPTV and Kodi providers take live TV streams from legitimate services and rebroadcast them from cloud CDNs to subscribers that pay anywhere from $5-$50/month, often for a channel selection that is better than they can get from their local provider, at a lower price; live sporting events (including pay-per-view events), premium channels like HBO, and international content that often costs as much as $15/channel from cable operators. The channel guides look almost exactly the same as the one on your cable or satellite system, and the boxes you can buy (even from places like Amazon.com) are easy to install and operate.

Openload is a service that takes pirated movies and original content from BitTorrent networks and offering them as VOD. "Three weeks ago the new Avengers movie came out, watch it on your box now!" is a pretty compelling service offering. They also build up a similar library for the latest seasons of shows from broadcast, cable, and OTT providers – GoT, Stranger Things, NCIS, Saturday Night Live – just about anything you can think of.

We will be doing a special Phenomena Report on this later in 2019, but we have seen anywhere from 4-25% of subscribers partaking in at least one illegal stream on a weekly basis in networks surveyed in North America, Europe, and the Middle East. Consumption and participation vary by region, in rural and metropolitan areas, by access type, and even in hospitality networks, where travellers cannot get legal access to content (especially sports) that they want to watch while traveling. These services are concerning to both network operators (who struggle with bandwidth consumed) and content providers (who are not getting revenue for their content), and with increasing fragmentation of the market, we expect this to grow over the next few years.

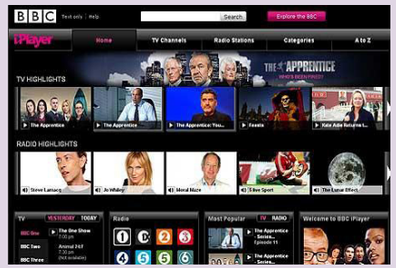
Video on Demand

An extensive content library of select television shows and movies available for playback at any time.
Example: All GoT episodes



Catch-Up

A sliding window of on-demand content, acting like a DVR in the cloud.
Example: All programs that aired on a channel in the previous seven days



Live Video

Video streams that are available as something is aired/broadcast/transmitted.
Example: Sunday night's new episode of GoT; professional sports

Today, reliable broadband connections and simplified technology let users easily access content (including live TV) in a manner that violates content licensing agreements. This trend is expected to grow due to the ease and relative low cost of accessing unlicensed content.

Top Devices by Tonnage

1	Amazon Fire TV Stick
2	MAG Box
3	Android Device
4	Windows PC
5	Apple Device

Top Applications by Tonnage

1	Kodi
2	Infomir (Stalker Middleware)
3	App (APK-based)
4	Browser
5	VLC

Note: Though the devices are called "Kodi boxes" in common parlance, Kodi is actually the application and can run on different kinds of hardware including set-top boxes such as MAGbox but also Android, Windows, Amazon Fire TV, etc.

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EMEA: Downstream Application Traffic Share

EMEA ⬇ APPLICATION TRAFFIC SHARE **TOP 10**

1. **HTTP MEDIA STREAM** 16.4%
2. **NETFLIX** 13.8%
3. **YOUTUBE** 11.8%
4. **BITTORRENT** 5.3%
5. **AMAZON PRIME** 4.2%
6. **FACEBOOK** 3.2%
7. **PLAYSTATION DOWNLOAD** 3.1%
8. **QUIC** 3.1%
9. **HTTP (TLS)** 3.0%
10. **TWITCH** 3.0%

Amazon, Twitch, and eSports

In EMEA, if you combine Amazon Prime and Twitch, Amazon is #4 overall behind YouTube for video streaming on the downstream. The popularity of Twitch has grown in concert with the rise of eSports, and the purchase of Twitch looks like a great buy for Amazon as it is in a fast growing market. As with any new market though, new competitors in this space are popping up and will likely continue to arise until the market is saturated and settles down.

Microsoft recently signed eSports star Ninja, a major Twitch attraction, to their Mixer service to raise its profile. Other prominent names in the space include Caffeine and YouTube Gaming, all who are seeking to attract the attention of eSports stars through exclusive deals in the same way that athletes are pursued by athletic shoes and clothing lines (eSports stars get laptop and mouse endorsements instead!).

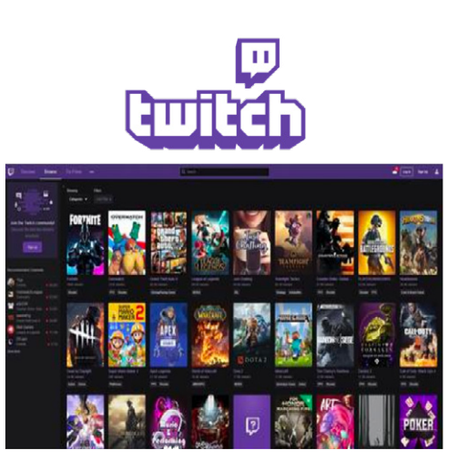
Continuing the theme from the Americas, PlayStation Download is again higher in volume than the Xbox, helping drive the sales of hard drive upgrades to PS4s all over EMEA! In the Mobile Report, we actually saw PlayStation Download in the Middle East reach the top 10, so this is likely a factor even in the Global Report.

The rest of the top 10 in EMEA when it comes to video is similar to the rest of the world. HTTP Media Stream, Netflix, and YouTube are the top 3, and Amazon Prime makes its best worldwide showing at #5 with 4.21% of overall downstream traffic. The popularity of several new series and ongoing acquisition of content has enabled Amazon to take market share in EMEA from other streaming services. Amazon is investing in a highly anticipated Lord of the Rings series, so we expect to see that impact traffic when it is released.

Amazon is also attempting to offer aggregation services by allowing users to purchase other streaming services content inside the Amazon interface (like HBO Go, Starz, Showtime, BritBox, and a host of other small content providers). This does not show up as Amazon traffic, but may give Amazon a usability advantage as a content aggregator. It will be interesting to see if Amazon traffic builds as a result of being the “interface of choice” and leveraging that position as a way to increase the viewing of their own content.

The other notable traffic contributor in EMEA on the downstream is BitTorrent, which was not in the top 10 last year on the downstream. The obvious question (which we will discuss more in a minute) is if 2019 is an outlier due to the final season of GoT, or is this the new normal? Time will tell, and we look forward to learning the outcome!

Facebook makes an appearance in EMEA at #6 (not Facebook Video). Interestingly enough, in the Mobile Report, Instagram was a bigger contributor to traffic in EMEA, but there is still a lot of Facebook on non-mobile devices, where there is very little Instagram on non-mobile devices. Generally speaking, mobile-specific applications tend to perform poorly in the Global Report because they get lost in the flood of video traffic. Facebook is often the exemption to that rule as it has become an integral part of the desktop experience for many users, especially older Facebook users, who can’t see those small mobile screens.



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EMEA: Upstream Application Traffic Share

EMEA ⬆ APPLICATION TRAFFIC SHARE **TOP 10**

1. **BITTORRENT TRANSFER** 44.2%
2. **HTTP MEDIA STREAM** 10.6%
3. **WEB RTC** 3.8%
4. **GOOGLE** 3.8%
5. **YOUTUBE** 2.1%
6. **RTP** 2.1%
7. **IPSEC VPN** 1.9%
8. **FACEBOOK** 1.8%
9. **WHATSAPP** 1.7%
10. **HTTP** 1.3%

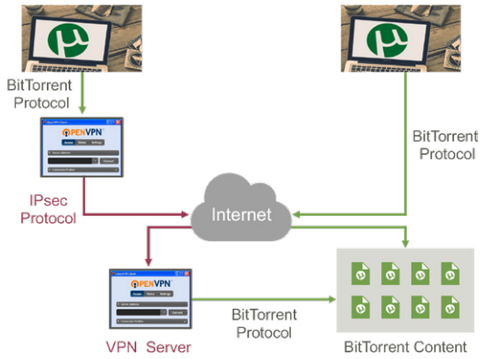
Can you share Game of Thrones? Message me!

We will specifically explore GoT on the next spotlight, but it is absolutely impossible to talk about the EMEA upstream without mentioning it. Last year, we were shocked to see BitTorrent hit 31% on the upstream and, in 2019, it crushed that number with almost 45% of upstream volume being consumed by file sharing. Those kind of numbers have not been seen for years, especially in EMEA.

EMEA also had a top 10 appearance by IPSec VPN traffic at #7, and it is likely that file sharing and location shifting was a big part of this traffic volume. The Middle East is always larger than other regions for VPN traffic, as users seek to avoid content and application filtering.

The other trend that stands out in EMEA is the volume of messaging traffic on the upstream. Web RTC, RTP, and WhatsApp are all in the top 10 on the upstream. The Mobile Report earlier in 2019 showed that messaging applications are specifically very popular in the Middle East region, as they are used to avoid voice tolls and high international charges.

Even though the cost of voice calls is now approaching zero, the ubiquity of messaging capabilities in browsers, in apps, and as companions to social networking applications, consumers are using voice and messaging services from network operators far less and turning to OTT applications. Increasingly, these calls are not just text or even voice, but the volume and percentage of calls that are video is growing as well. The main challenge in this space is that there the market is still very fragmented with hundreds of messaging applications.



BitTorrent in the clear and through an IPsec VPN

SE	LE
44489	43814
25817	1933

Type	Name (Order by: Uploaded, Size, ULed by, SE, LE) View: Single / Double	SE	LE
Video (HD - TV shows)	Game.of.Thrones.S08E03.720p.WEB.H264-MEMENTO[ettv] Uploaded Today 03:05, Size 2.32 GiB, ULed by EtHD	44489	43814
Video (HD - TV shows)	Game.of.Thrones.S08E02.1080p.WEB.x264-ADRENALiNE[ettv] Uploaded 04-22 02:53, Size 1.31 GiB, ULed by EtHD	25817	1933
Video (HD - TV shows)	Game.of.Thrones.S08E03.1080p.WEB.H264-MEMENTO[ettv] Uploaded Today 03:11, Size 4.93 GiB, ULed by EtHD	24797	35341
Video (HD - TV shows)	Game.of.Thrones.S08E01.1080p.WEB.H264-MEMENTO[ettv] Uploaded 04-15 03:20, Size 3.34 GiB, ULed by EtHD	15329	1140
Video (TV shows)	Game.of.Thrones.S08E03.WEB.H264-MEMENTO[ettv] Uploaded Today 03:11, Size 524 MiB, ULed by ettv	13255	9770
Video (HD - TV shows)	Game.of.Thrones.S08E02.1080p.WEB.H264-MEMENTO[ettv] Uploaded 04-22 03:05, Size 3.45 GiB, ULed by EtHD	7788	542
Video (TV shows)	Game.of.Thrones.S08E01.WEB.H264-MEMENTO[ettv] Uploaded 04-15 03:19, Size 365.53 MiB, ULed by ettv	7534	165
Video (HD - TV shows)	Game.of.Thrones.S08E03.720p.WEB.x265-MiNX[TGx] Uploaded Today 04:26, Size 415.1 MiB, ULed by sotnikam	7290	6799
Video (TV shows)	Game.Of.Thrones.S08E02.LEAKED.x264-LUMI Uploaded 04-21 22:31, Size 332.4 MiB, ULed by SeekNDstroy	6582	297
Video (HD - TV shows)	Game.of.Thrones.S08E01.720p.WEB.H264-MEMENTO[ettv] Uploaded 04-15 03:19, Size 1.69 GiB, ULed by EtHD	5080	271
Video (HD - TV shows)	Game.of.Thrones.S08E03.720p.AMZN.WEB-DL.DDP5.1.H.264-GoT Uploaded Today 04:03, Size 2.04 GiB, ULed by MrStark	4655	4904
Video (TV shows)	Game.of.Thrones.S08E02.540p.WEB-DL.x264-HETeam Uploaded 04-21 20:11, Size 328.99 MiB, ULed by mvtube	3878	159
Video (HD - TV shows)	Game.of.Thrones.S08E01.REPACK.720p.WEB.H264-MEMENTO Uploaded 04-15 04:10, Size 1.59 GiB, ULed by MrStark	3725	574
Video (HD - TV shows)	Game.of.Thrones.S08E02.720p.WEB.H264-MEMENTO Uploaded 04-22 03:28, Size 1.45 GiB, ULed by MrStark	3548	248
Video (HD - TV shows)	Game of Thrones S07 Complete Season 7 720p x264 AC3 5.1 (MP4) Uploaded 08-28 2017, Size 4.33 GiB, ULed by Iznogoud9	3515	725
Video (TV shows)	Game.of.Thrones.S08E01.WEB.H264-MEMENTO Uploaded 04-15 04:03, Size 365.53 MiB, ULed by MrStark	2847	128

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Is Game of Thrones an anomaly or the new normal?

Last year, we reported that we saw an uptick in file sharing for the first time in several years. Since we had changed the way that we do the Global Internet Phenomena Report, specifically from a much larger sample size, it was hard to compare apples to apples to provide hard proof. Well, this year we have it, and a big driver was exactly what you would expect it to be – Game of Thrones (GoT).

One of my favorite topics is file sharing (along with gaming!). Last year, I made an assertion in the Phenomena Report that the reason we saw that uptick in file sharing was due to the beginning of the fragmentation of video streaming providers. With so many high quality exclusive shows on different streaming services, as an avid consumer of video content, it is challenging for me to get access to all the shows I want to watch without purchasing not just one or two streaming services, but sometimes even four or five.

Here's what I consider must watch off the top of my head in the past year: Jack Ryan and The Boys on Amazon Prime, The Handmaid's Tale on Hulu, Stranger Things on Netflix, GoT on HBO, Star Trek Discovery on CBS All Access, and Cobra Kai on YouTube Red. Last year, Hulu and Amazon Prime made major investments in content, and more and more streaming services are launching and announced (like Disney+) that will continue this trend.

But the king of 2019 has been GoT. No matter your opinion of the final season, it was hotly anticipated, and people wanted to watch it immediately. They knew that if they waited, they would be spoiled by tweets, articles, social networking posts, and even broadcast news stories. So, people endeavored to get access to the shows through whatever means necessary. For old school video consumers, they had HBO on their cable or maybe IPTV package. Some cord cutters had HBO Go service. Yet others used piracy, either a Kodi service offering or using BitTorrent file sharing. Let's look at how these different services appeared to network operators from a usage perspective.

The top graph on the right is how both HBO Go and Kodi traffic changed over the first half 2019. As you would expect, HBO Go peaked during the GoT season, and has fallen precipitously since then. The interesting thing to note is that the volume of Kodi traffic (which is typically a pirated IPTV service) exceeds the volume of HBO Go normally.

What is slightly scary is that if you look at the file sharing trends for 2019, it shows a very similar pattern that aligns with GoT in the bottom graph. Notice the big spike during the GoT season (it is also worth noting that on April 22, Avengers: Endgame was released). It is also important to note that I could not make these graphs overlay each other, because the volume of file sharing was orders of magnitude greater than both Kodi and HBO Go and they would have appeared to almost be zero by comparison.

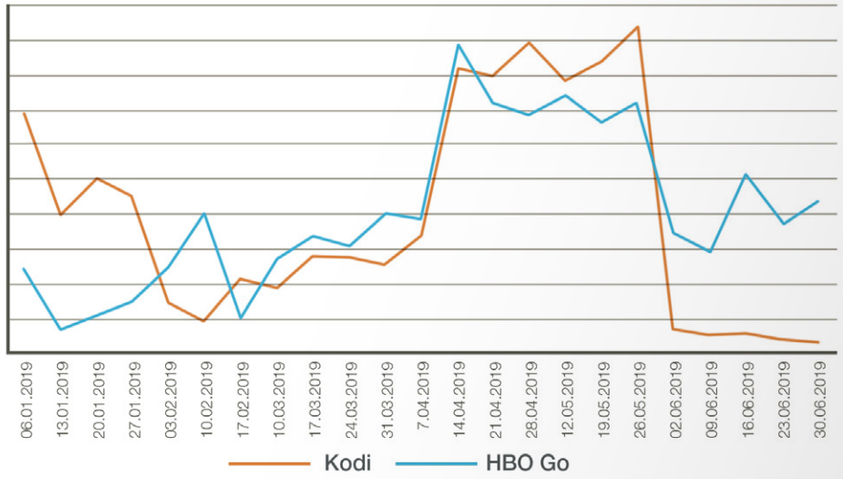
This is a stark demonstration of what the "streaming wars" will result in for network operators — not just more video streaming, but the revival of file sharing, which will take every bit of bandwidth that it can when it is used. GoT is something special, but as more and more event content hits the market, this pattern will repeat.

So, the question for both content owners and network operators – "is this the new normal?". If it is, then network operators are in for a rough road, as streaming video traffic is actually easier for their network to handle than file sharing. With network neutrality and traffic management a topic of much interest worldwide, many network operators have restrictions on how they can manage QoE, and growth in file sharing will result in poor QoE.

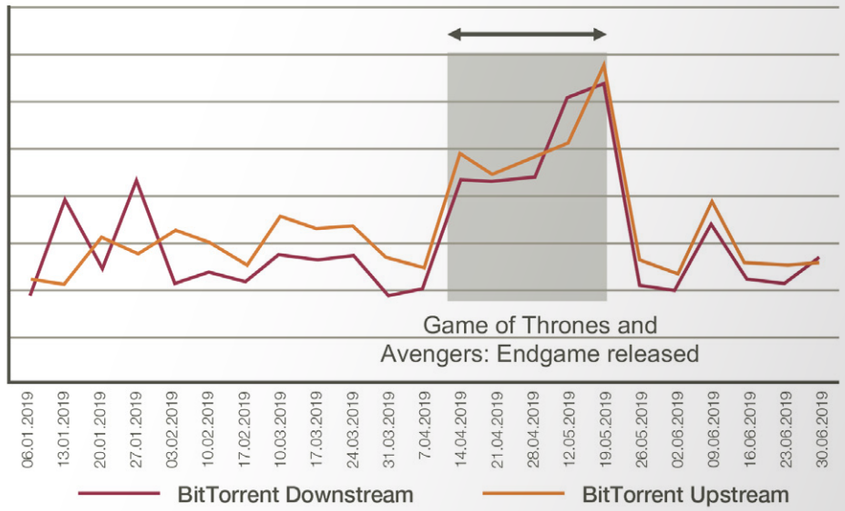
Video streaming (especially adaptive streaming) is generally well behaved, and will burst to fill the media player buffer but then back off until the buffer is partially drained (giving a sawtooth pattern of usage). If the buffer cannot keep up with playback, the video will downshift to a lower resolution to avoid a stall and therefore deliver a bad experience to the consumer.

File sharing is designed to take as much bandwidth as possible from as many sources (often ~300) that it can as fast as the network can deliver it. Many clients have speed controls built in, but they are seldom used by consumers, who want to download as fast as possible to leave minimal footprint on the P2P network. Bad behaving applications can wreak havoc on network QoE, and visibility into this is critical.

HBO Go and Kodi Traffic 1H 2019



BitTorrent 1H 2019



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APAC: Downstream Application Traffic Share

APAC ⬇ APPLICATION TRAFFIC SHARE **TOP 10**

1. HTTP MEDIA STREAM 10.9%
2. HTTP DOWNLOAD 7.3%
3. HTTP (TLS) 6.8%
4. NETFLIX 6.4%
5. FACEBOOK VIDEO 6.0%
6. FACEBOOK 5.5%
7. INSTAGRAM 5.3%
8. WINDOWS UPDATE 4.6%
9. YOUTUBE 4.6%
10. BITTORRENT 4.5%

Facebook: The Brand

Brands are powerful on the internet (more on that in the next spotlight), but in APAC, Facebook rules the roost with over 17% of all regional downstream traffic. Three of Facebook's attractions are in the top 10 in APAC: Facebook Video, Facebook, and Instagram. While the power of Facebook's brand is demonstrated by applications like WhatsApp, Facebook Messenger, and Oculus also being in the top 100, "By Facebook" is being added to Instagram and WhatsApp (it already has for Oculus) to build the brand further.

APAC is one of the biggest markets for Facebook, with India, Indonesia, Phillipines, Vietnam, and Thailand all usually listed in the top 10 for active users worldwide. For Instagram, India, Indonesia, and Japan are in the top 10 globally by user count. APAC is the top region for Facebook Video traffic, with direct traffic share being taken from YouTube as users replace YouTube shares with Facebook video sharing, as Sandvine distinguishes between the two traffic types since they do require different QoE measurements and QoE assurance techniques for consumers. Facebook Video showed very strongly in APAC in the Mobile Report, and also increased shared in the Global Report.

As targeted advertising on social media becomes the medium of choice to attract young buyers, we expect to see the social networking numbers in APAC continue to grow, which will grow Facebook's share in the region even more. The region has an abundance of bandwidth in many countries (South Korea, Japan, and Singapore to name a few) and broadband plans are increasingly generous in volume allowances. Despite the presence of many regional- or country-focused social networks (WeChat, Sina Weibo, LINE, SNOW, Naver, Tencent QQ, and Youku among many), the pure global brand of Facebook is still very strong, and is expected to remain that way for some time, unless regulatory changes hit the company.

As in the other regions, HTTP Media Stream is the top video source, with Netflix, Facebook Video, and YouTube as the other video streaming leaders. The long tail of video sources continues to grow in the region as more content owners, including international streamers, seek regional offerings to expats and travellers in APAC. This is an application that again takes advantage of the high speed of broadband access in the region, and video will grow in this region, especially in Japan, South Korea, and Singapore.

Windows Update is in the top 10 in APAC, the only region it makes a top 10 appearance. As shown in the Phenomena Spotlight on this topic, Windows Update generates steady traffic, but the sheer number of devices in the region push the updates into the top tier of bandwidth consumption. Windows Update traffic is a constant "background noise" on all fixed broadband networks, and can be considered a necessary evil to help keep Windows applications both up-to-date and secure.

Continuing the file sharing trend, BitTorrent is #10 in the region with almost 5% of downstream traffic, as the appetite for out-of-region pirated content grows. Historically, APAC has avidly utilized BitTorrrent through the years, and this has not changed.

facebook

>15%

of All APAC Traffic

Internet Brand	Connections	Downstream	Upstream	Overall
facebook	7.10%	5.53%	4.44%	5.34%
LIVE	0.17%	6.00%	1.07%	5.26%
facebook Messenger	1.10%	0.0001%	0.002%	0.12%
Instagram	1.58%	5.31%	2.61%	4.90%
WhatsApp	3.80%	0.0001%	6.11%	0.21%
oculus	0.005%	0.0002%	0.005%	0.02%

Facebook is a major force in APAC, with some of the largest Facebook cities and countries worldwide. Facebook Video is also strongest in this region compared to the rest of the world.

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APAC: Upstream Application Traffic Share

APAC ⬆ APPLICATION TRAFFIC SHARE **TOP 10**

1. BITTORRENT UPLOAD 24.8%
2. GOOGLE 15.9%
3. HTTP 7.9%
4. HTTP MEDIA STREAM 4.8%
5. ICLOUD 4.8%
6. FACEBOOK 4.4%
7. YOUTUBE 4.2%
8. KGRID 3.5%
9. ICLOUD PHOTO STREAM 2.8%
10. INSTAGRAM 2.2%

Let's put it all in the Cloud

When we think about the upstream in most regions, we see a lot of video traffic consisting of packet acknowledgements and bookmarking of progress in watching videos as well as messaging traffic. In APAC, cloud traffic consumes more than 50% of all upstream traffic. In this context, we are defining three types of cloud traffic:

Cloud Storage: Services that are used to automatically or manually store files for a consumer or business to enable access from multiple systems, as well as to have backup in case of local system failures. This includes services like iCloud, Google Cloud, and Samsung Cloud that are commonly offered as part of a mobile device and automatically sync files, videos, and pictures as an integral part of the OS.

Cloud Sharing: This can be thought of in this context as file sharing. Technically peer-to-peer file sharing is a cloud application – just the cloud is literally anyone's computer that is connected to the P2P mesh rather than specific servers in a datacenter somewhere. Any device connected becomes part of the cloud and available to all.

Cloud Updates: We included this category as cloud, because essentially the upstream traffic for this type of traffic is the result of either a system checking with the software update server to see if there is a newer version of an application available or the acknowledgement during a download (and since Windows Update was in the top 10 for download, this is statistically significant!).

Outside file sharing and cloud, social networking through Facebook and YouTube make up much of the rest of the top 10 in APAC. As we saw on the downstream, Facebook's brand is strong in the region, and to keep a social network vibrant, you need upload traffic to feed browsing. Facebook Video is right outside the top 10, so that contributes to the overall volume of Facebook in the region.

One interesting result for APAC is that there are no messaging applications in the top 10 on the upstream. As popular as we know that messaging is in the region, there are too many messaging applications for one to build enough critical mass to break the top 10. This is another example of fragmentation and a difference in APAC patterns.

CLOUD TRAFFIC

is more than **50%** of all APAC upstream traffic

CLOUD STORAGE

SAMSUNG
iCloud
Dropbox
SharePoint

CLOUD SHARING

BitTorrent™
방송놀이 신대륙 afreeca
NAVER

CLOUD UPDATES

Available on the App Store
GET IT ON Google Play
Windows Update
PLAYSTATION Network

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Brands on the internet

We often talk about the big brands on the internet and their dominance. Last year, I did a spotlight on Asia that showed that Google was over 40% of the connections in Asia, and in the Mobile Report, Facebook was over 20% of all mobile traffic. I decided to dig through the Phenomena data to discover how the internet brands would stack up against each other.

The internet brand giants are not always just a single thing anymore. For each of these brands, there is a collection of content and applications that combine to build the overall brand. I took all of the statistically significant contributors from each brand (essentially anything that contributed over .01% of connections or volume) and decided to compare their impact on internet traffic. Some of the biggest bandwidth consumption for each brand included:

Google (Alphabet): YouTube, Google Cloud, Google Play, Google Search, Google Docs, Google Drive, DoubleClick, Gmail, and Crashlytics

Netflix: Netflix Video

Facebook: Facebook, Instagram, Facebook Video, WhatsApp, Facebook Messenger, Oculus Rift

Microsoft: Xbox Live, Windows Update, Skype, Outlook 365, Office 365, SharePoint, OneDrive, Windows Store, LinkedIn

Apple: iTunes, iCloud, Apple Software Update, FaceTime, Apple Music, Apple.com, iCloud Photo Stream, Mac App Store

The brands with video traffic have a significant advantage on the downstream. Google (YouTube), Netflix, Facebook, and Amazon (Amazon Prime) have strong video offerings. Apple soon will, and Microsoft's entry into gaming streaming (Mixer) will likely move them up this list if they can continue to recruit high profile gamers.

As shown in the chart, Google is #1 overall and on the upstream. The combination of YouTube, Google Search, and Google Cloud are the biggest contributors to the upstream traffic, as they are an integral part of any Android device's experience.

Netflix is the #1 on the downstream and #2 overall as the only pure play in the bunch. As we mentioned last year, if Netflix was not the most efficient streamer at every resolution, their total could easily be twice what it is today, and they continue to excel in video codec work and efficiency in resolution downshifts and upshifts.

Google is also #1 on connections. This is a much more collaborative effort among Google apps. YouTube, Google Cloud Messaging, Google Search, Crashlytics, DoubleClick, and even Nest are the biggest contributors to Google connections per device.

Amazon: Amazon Prime, Twitch, Amazon.com, Alexa, Amazon Glacier, Amazon Music

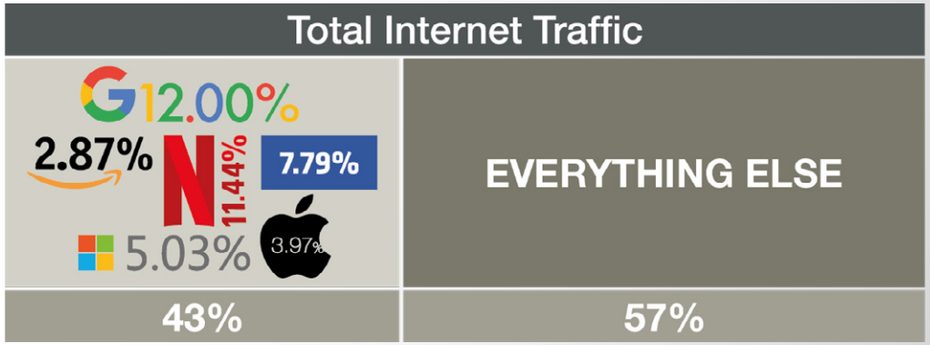
When combined, these brands took up over 43% of all traffic volume on the internet: The details are interesting. Overall, Google edged out Netflix as the top consumer of bandwidth on the internet (as well as upstream) and dominated in the percentage of connections. Unsurprisingly, Netflix was the single largest consumer of traffic downstream, but Google was not far behind. This is confirmation that brands can build synergies, expand their business, and succeed.

The obvious outlier in this case is Netflix, which does one thing and does it exceedingly well, albeit at very high volume. With new streaming services coming out from Facebook and Apple, with 4K and live streaming taking hold, these numbers might climb even higher next year.

Each brand's connection, downstream, and upstream share, as well as overall share is shown in the table. Google (on the strength of YouTube) is the overall leader (as well as the upstream leader, followed closely by Netflix). Google is also the leader in connections, not only fuelled by Google Search, but also DoubleClick and the Android Market. Netflix, the one "pure play" in the group, is #1 on the downstream with 12.60% of overall volume.

The rest of the internet combined is barely larger than the traffic from this collection of powerhouse brands. If you do the math, these brands are also over 45% of the total connections on the internet as well.

Internet Brand	Connections	Downstream	Upstream	Overall
Google	30.35%	12.33%	9.82%	12.00%
NETFLIX	0.99%	12.60%	2.19%	11.44%
facebook	7.52%	8.14%	5.48%	7.79%
Microsoft	2.70%	5.42%	2.45%	5.03%
	3.80%	3.65%	6.11%	3.97%
amazon	0.47%	3.15%	1.02%	2.87%



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Spotlight: Streaming Video Traffic Share

GLOBAL VIDEO STREAMING TRAFFIC SHARE

1. HTTP MEDIA STREAM 23.8% ⬇
2. NETFLIX 23.1% ⬇
3. YOUTUBE 12.7% ⬇
4. OPERATOR IPTV 10.0% ⬇
5. FACEBOOK VIDEO 5.0% ⬇
6. AMAZON PRIME 4.3% ⬇
7. TWITCH 4.2% ⬇
8. TIK TOK 3.4% ⬇
9. OPENLOAD 2.4% ⬇
10. DAILY MOTION 1.3% ⬇

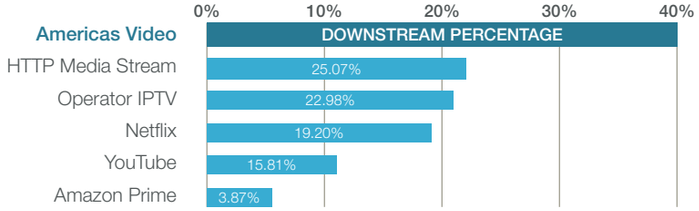
Streaming Video

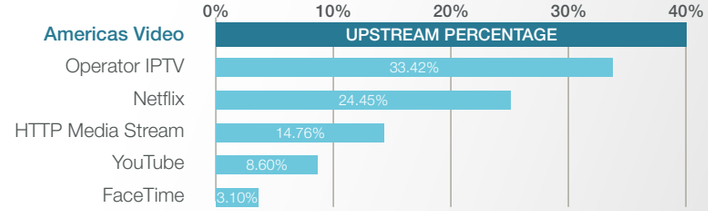
With video being over 60% of all traffic on the internet, operators clearly need visibility into which providers are dominating their network, as each provider has different requirements for bandwidth at different resolutions. Even more frightening is that 4K content streams are a drop in the bucket so far, and 8K is not yet a reality – when it is, all bets are off!

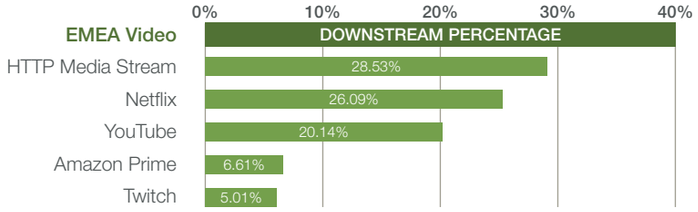
This spotlight takes all video traffic and measures market share of streaming video in each region. HTTP Media Stream, Netflix, and YouTube are in the top 5 for downstream bandwidth in each region, and they drive overall video consumption.

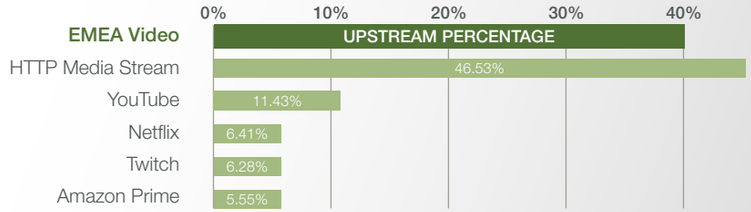
As mentioned previously, this year takes the trend we saw last year in the increase in the number of video streaming services that are offered to consumers. HTTP Media Stream represents the growth in streaming services that Sandvine has not yet tracked individually (like we do Netflix, Hulu, etc.). In general, you can think of these as services where content owners (often cable or broadcast channels) stream their content to users. Some of these services require the user authenticate with a TV provider account to stream traffic (like ESPN does for example), others are simply free to all.

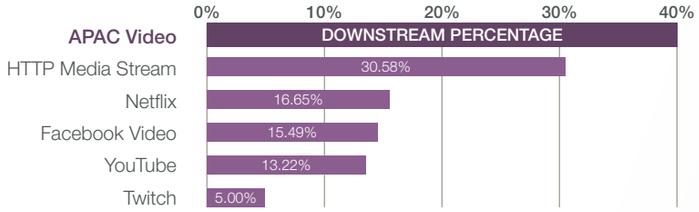
The surprise entrant from last year, Openload, is still on this list, and is actually a higher percentage of overall video traffic than last year. This is the most popular Kodi provider that we see worldwide, and reflects the growing popularity of IPTV piracy.

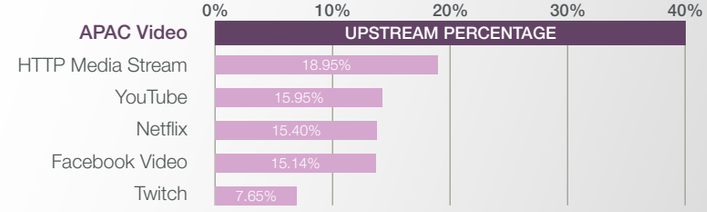












NETFLIX YouTube amazon Prime twitch

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Spotlight: Gaming Traffic Share

GLOBAL GAMING TRAFFIC SHARE

1	LEAGUE OF LEGENDS	14.5 ⬇	8.6% ⬆
2	PLAYER UNKNOWN	10.7% ⬇	12.3% ⬆
3	FORTNITE	9.5% ⬇	5.6% ⬆
4	OVERWATCH	7.8% ⬇	8.9% ⬆
5	DESTINY	6.5% ⬇	1.9% ⬆
6	MINECRAFT	6.4% ⬇	7.2% ⬆
7	RESPAWNABLES	6.3% ⬇	4.9% ⬆
8	WARFRAME	2.9% ⬇	0.8% ⬆
9	CLASH ROYALE/CLANS	2.7% ⬇	1.9% ⬆
10	WORLD OF WARCRAFT	2.6% ⬇	2.2% ⬆

Gaming

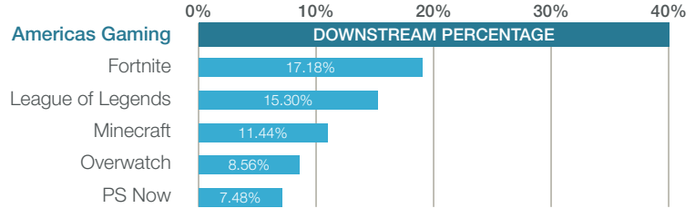
Gaming continues the growth trend from last year, but what is significant and demonstrates the changing of the gaming landscape is the consistency from year to year for the top games.

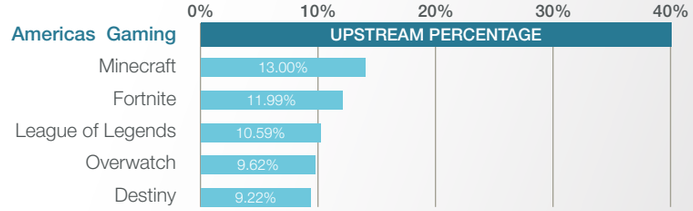
In the old days, gaming companies' success was built on new versions of games on a yearly cadence. This is still the case for many sports games, but for other genres, expansion packs and simple updates to the gameplay are fueling continued dominance.

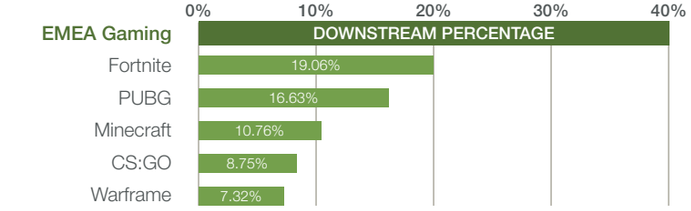
It is no surprise that League of Legends remains #1 worldwide, followed by Player Unknown's Battlegrounds (PUBG) and Fortnite, with Overwatch and Destiny not far behind the leading pack. The prize money given at tournaments in 2019 was staggering, with Fortnite having a pool of $30.4M ($3M for Bugha) in their recent championship.

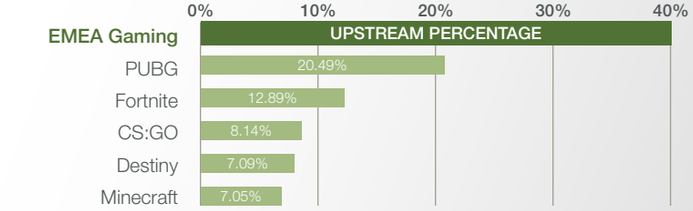
Minecraft, despite its age, is still going strong, and is still updated on a regular basis. It is supported on multiple platforms, and has a dedicated and loyal following has invested a lot of time in their worlds. World of Warcraft (WoW) is also still generating traffic, and WoW Classic might bump that up.

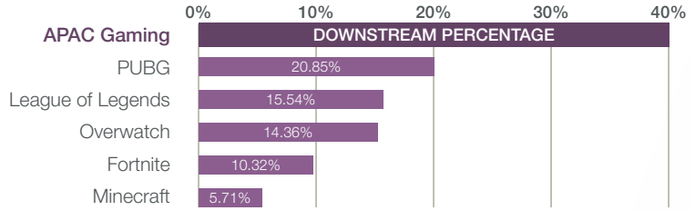
The mobile games Respawnables and Clash Royale/Clash of Clans are both in the top 10, demonstrating how popular real-time strategy games are, despite being mobile-centric. People in airports, restaurants, at work, and at home, are keeping their fortress safe from attack. Mobile games that capture a sense of urgency and "can't-miss," generate substantial traffic as users engage often.

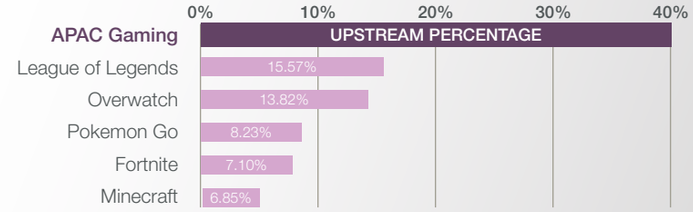












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Spotlight: Social Networking Traffic Share

GLOBAL SOCIAL NETWORKING TRAFFIC SHARE

1	FACEBOOK	60.6% ⬇ 5	8.1%⬆
2	INSTAGRAM	26.2% ⬇	25.1%⬆
3	SNAPCHAT	3.7% ⬇	8.0%⬆
4	VK	2.4% ⬇	2.2%⬆
5	TUMBLR	1.7% ⬇	0.5%⬆
6	TWITTER	0.9% ⬇	1.6%⬆
7	ODNOKLASSNIKI	0.8% ⬇	0.5%⬆
8	PINTEREST	0.4% ⬇	0.3%⬆
9	YY	0.3% ⬇	0.2%⬆
10	YOUKU	0.2% ⬇	0.1%⬆

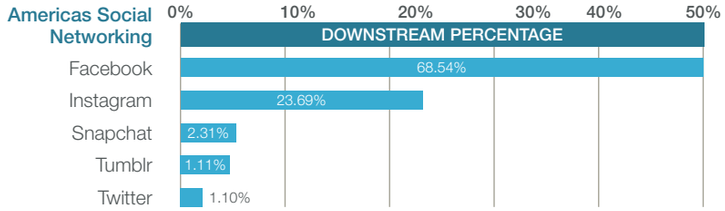
Social Networking

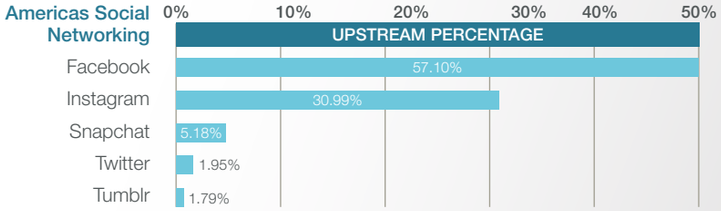
The social network rankings flip a bit this year because of a change made in calculating the usage. To be even-handed, the rankings this year combine all traffic for the service except dedicated messaging apps (which we cover separately). The impact of this is that it rewards social networks that have video offerings, but we excluded both TikTok and YouTube from this category, since they are as much video sharing as pure social networking.

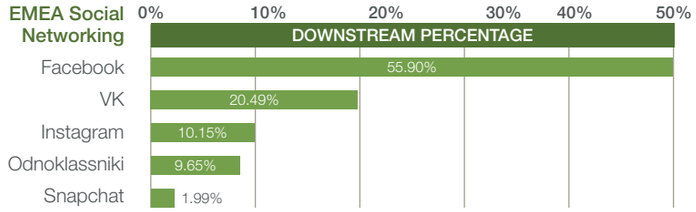
With this setup, it is again no surprise that Facebook, (especially with Facebook Video included) is #1. Facebook shows no signs of slowing down despite some of the issues that have occurred in the past year. Instagram, Facebook's sibling, is #2 worldwide and is becoming the marketing channel of choice for brands going after millennials and the younger generation, who only want to see advertising that is relevant to their interests.

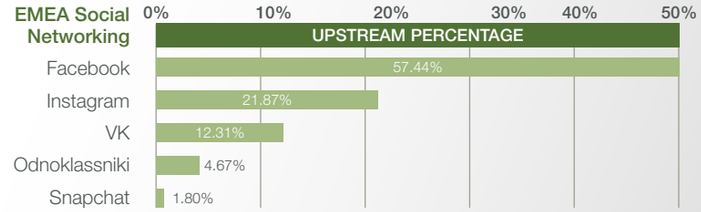
Snapchat (which is covered both as a social network and a messaging app) remains strong, and continues to hog rates of engagement on a smaller installed base. Several international social networks make an appearance in the top 10: VK, Odnoklassniki, YY, and YouKu. Although not at the volume of Facebook and Instagram, today's users have presence on multiple social networks.

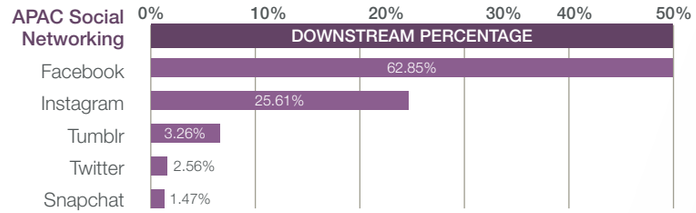
Honorable mention to Tinder which was #11, ensuring that we will continue to see crazy Tinder stories for at least a little longer.

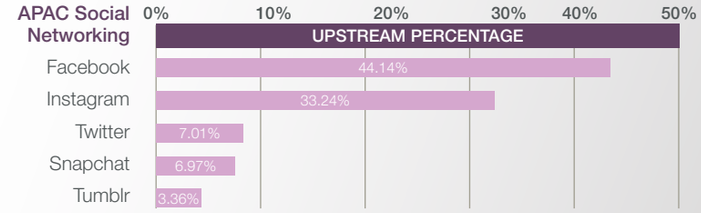












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Spotlight: Messaging Traffic Share

GLOBAL MESSAGING TRAFFIC SHARE

1	SKYPE	21.7% ⬇	6.5% ⬆
2	WHATSAPP	16.2% ⬇	13.1% ⬆
3	WEBRTC	14.4% ⬇	21.3% ⬆
4	SNAPCHAT	13.2% ⬇	4.0% ⬆
5	FACETIME	5.2% ⬇	10.7% ⬆
6	FACEBOOK MESSENGER	2.6% ⬇	5.0% ⬆
7	WECHAT	1.8% ⬇	2.0% ⬆
8	KAKAOTALK	1.3% ⬇	0.6% ⬆
9	DISCORD	1.1% ⬇	0.5% ⬆
10	LINE	0.6% ⬇	0.4% ⬆

Messaging

Messaging and VoIP applications have become staples of the consumer experience, for both business and personal usage. Business usage tends to be more long form, video and voice heavy, and generally higher volume than consumer and social network applications.

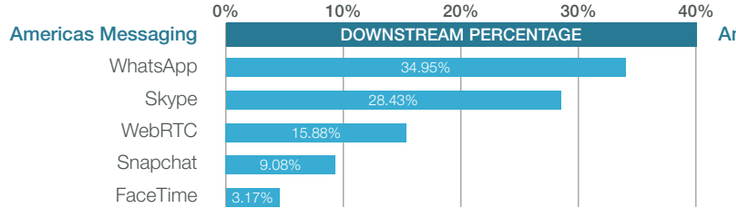
Messaging apps that emphasize voice and video always will occupy more traffic share than pure text applications. This is why Skype, WhatsApp, Snapchat, and FaceTime are the leading sources of downstream and upstream traffic share since video usage is very common among their sizeable user base.

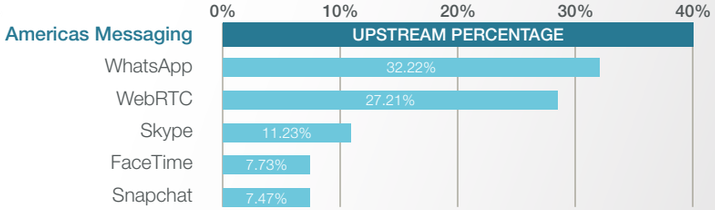
In many parts of the world, messaging apps have essentially replaced voice and SMS traffic on carrier networks, with WhatsApp being a poster child for this type of full replacement of carrier services.

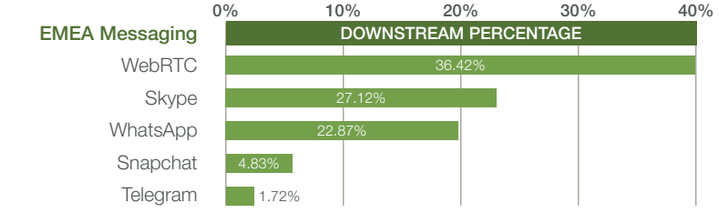
WebRTC moves up to #3 worldwide (from #4 last year) as the leading "open protocol" for messaging. WebRTC is used in services like GoTo Meeting, Amazon Chime, and in major web browsers. The usage of WebRTC is growing rapidly worldwide, and the generic use of this will likely begin to be broken out into unique applications as they gain popularity.

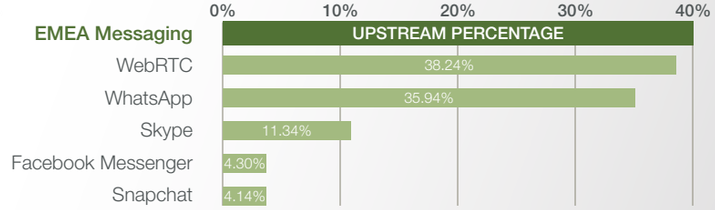
WeChat, KakaoTalk, and Line are all popular regional applications that are used worldwide.

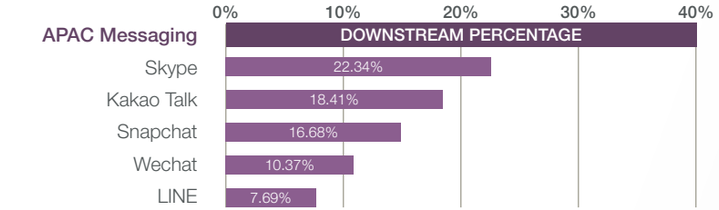
Discord is a popular messaging service that is often used in concert with gaming, both to communicate in real-time games as well as forums to discuss gaming strategy.

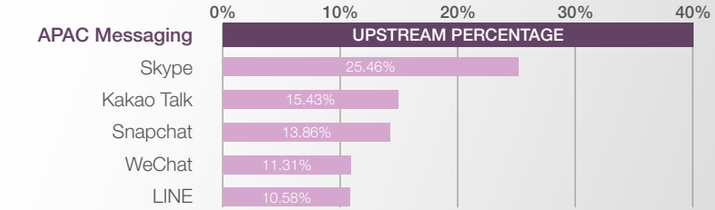












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Audio Streaming Traffic Share

GLOBAL AUDIO STREAMING TRAFFIC SHARE

1	SPOTIFY	28.0% ⬇	26.8% ⬆
2	HTTP AUDIO STREAMING	22.8% ⬇	31.4% ⬆
3	SHOUTCAST	22.8% ⬇	31.1% ⬆
4	APPLE MUSIC	15.6% ⬇	4.40% ⬆
5	SOUNDCLOUD	3.9% ⬇	1.7% ⬆
6	DEEZER	1.7% ⬇	0.6% ⬆
7	PANDORA	1.5% ⬇	1.3% ⬆
8	TIDAL	1.1% ⬇	0.3% ⬆
9	GOOGLE PLAY MUSIC	1.1% ⬇	0.4% ⬆
10	NETEASE CLOUD MUSIC	0.2% ⬇	0.2% ⬆

Audio Streaming

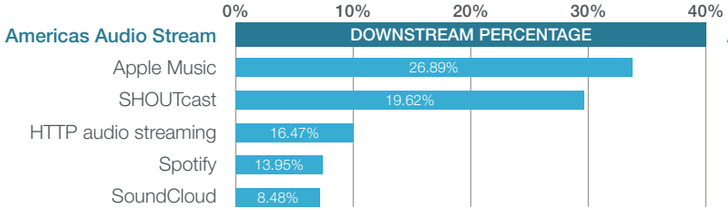
The interesting result of a traffic share analysis for audio streaming is how it does not align with a subscriber-based view of market share. Instead, it shows how much users consume on their subscriptions, which is a better gauge for a network operator and usually why audio streaming is one of the first applications that is offered as zero-rated.

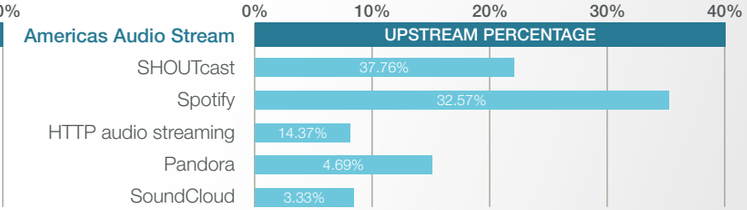
Spotify remains the leading audio streaming provider in the world, maintaining their position from 2018.

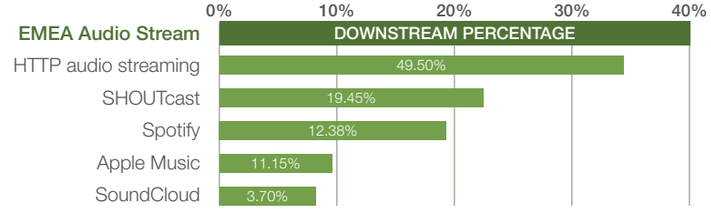
SHOUTcast, HTTP audio streaming, and SoundCloud are all top sources of audio streaming that reflect the popularity of podcasts and internet radio services (often directly from the station's app or web page). Podcasts continue to be popular content, and both HTTP audio streaming and SoundCloud benefit from this, most noticeably on the upstream.

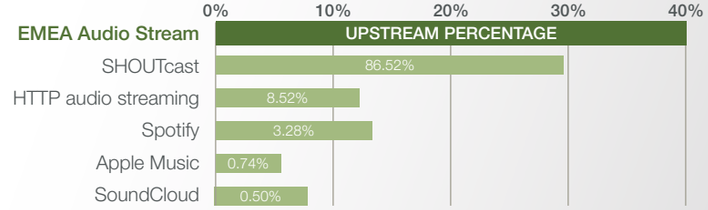
Apple Music is up significantly from last year, clocking in at #3 and #1 in the Americas, which the Mobile Report showed as an Apple-heavy market. Apple has been pushing the service, and the market effort is paying off in traffic share.

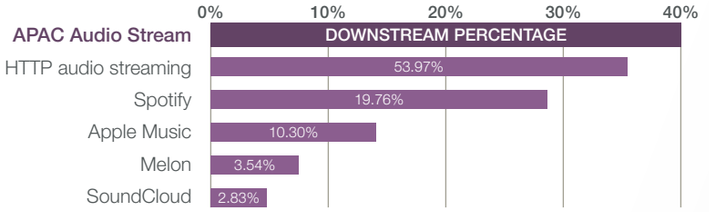
The rest of the rankings represent many of the more popular music streaming services. Tidal, Deezer, Google Play Music, Pandora, and NetEase Cloud Music (a Chinese streaming service) are all top 10 audio services worldwide. Amazon Music is right outside the top 10, benefiting from the pervasive Prime services presence and most specifically from the ease of asking Alexa to "play rock music."

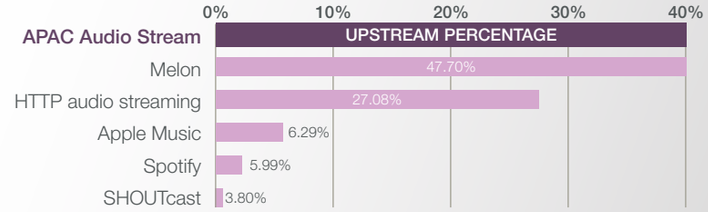












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Resources: Infographics and Other Links

Infographic links

GRAPH PACK
Top 10 lists for all sections if you want to show the traffic share for any specific geography or class of application.
CLICK HERE

INFOGRAPHICS PACK
What application categories are the leading consumers of internet bandwidth? The real question is, how much traffic on the internet is video?
CLICK HERE

SANDVINE LOGO PACK
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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
Visit **www.sandvine.com** to learn about our Active Network Intelligence solutions.

ACTIONABLE DATA
How can the Global 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 Global Internet Phenomena Report 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 mobile and a fixed network report later this year or early next year to break out the differences between the two network types. We believed it was important to start with a global view of network traffic, as consumers do not care what network they are on anymore when they access data – unless the network fails to deliver a good experience, and then they notice.

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

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