


A person in a dark jacket and hat stands on a paved road, looking towards a vibrant green aurora borealis in a dark, mountainous landscape. The scene is illuminated by the green light of the aurora, creating a surreal atmosphere. The background features rolling hills and mountains under a starry night sky.

The Global Internet Phenomena Report

October 2018

A word from Lyn Cantor, CEO, Sandvine

The new Sandvine is a combination of the former Sandvine and Procera businesses, now fully integrated and aligned as a global leader in the Network Intelligence market segment. Our customer base represents over 150 T1 and T2 global network operators and our solutions touch over 2.1B internet subscribers worldwide.



The foundation of our business model is being 'the best' telco network data analytics company with use cases that help our customers understand, optimize, and manage subscriber quality of experience (QoE). Fundamentally, our objective is to always provide the best vendor agnostic granularity and accuracy for the data flowing across our customers' networks and help them intelligently act on that data.

You will see an ongoing commitment to deliver the pre-eminent view of global trends and distilled insights on what our operator eco-system 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 the latest 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 in every day and to expose both challenges and opportunities to build a more collaborative eco-system, 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 reach out to phenomena@sandvine.com.

Lyn Cantor, CEO, Sandvine

Welcome to the New Phenomena Report



I'd like to reintroduce you to the Sandvine Global Internet Phenomena Report! We have worked hard on this edition to bring you a comprehensive view

of what is happening on the internet to help the industry as a whole get a reality check on how the hype on specific applications translates to network impact. With the attention of both consumers and network operators focused on network quality, it is more important than ever for operators to understand how their bandwidth is being consumed.

This edition of the report will cover both global macro and regional micro views of the composition of traffic on the internet. Sandvine's value proposition to our customers is the accuracy and granularity of our network intelligence, so we focus on identifying as many applications as we can, despite how the internet is becoming more encrypted.

Why is this important?

When networks get congested (and they always end up congested), the solution to the problem depends on the root cause. That

sounds logical, but network operators are limited today by both regulatory issues and a lack of visibility, and are struggling to retain the visibility that they need to make the right network investments that deliver a high quality experience to their subscribers. Different applications require different network resources to achieve good quality, and without accurate visibility into network traffic composition, network operators cannot deliver for consumers.

The Global 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.

For Global and Regional overall reports, we rank all applications that Sandvine can see. For the Spotlight reports, we compare applications of a specific type (streaming video, messaging, etc.) to see which ones lead their categories.

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 150 Tier 1 and Tier 2 fixed and mobile operators worldwide. The report does not include significant data from either China or India, but the data represents a portion of Sandvine's 2.1B 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. A future edition will break out separate fixed and mobile traffic composition.

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 iTunes.

Upstream: This is the traffic volume uploaded to the internet. It could be requests for content (i.e., browsing the Netflix library), 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 (like Netflix, BitTorrent, or Pokemon Go) use many connections to transfer data or video to the end user.

Section 1: Global News

HIGHLIGHTS IN THIS EDITION

A brief overview of some of key findings in this issue of the Global Internet Phenomena Report.

EXECUTIVE OVERVIEW

What are the phenomena that are dominating the internet in 2018? You can bet the video streaming is one, but which video providers, and what other applications are heating up?

GLOBAL APPLICATION TRAFFIC SHARE

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

GLOBAL APPLICATION RANKINGS

Drilling a bit deeper, what specific applications are internet users engaging with and spending their valuable gigabytes on? The usual suspects are on the lists, but in what order?

GLOBAL TRENDS: BEYOND THE TOP 10

What happens outside the top 10? With over 5300 signatures present in this Global Internet Phenomena Report, there are bound to be some interesting factoids out there. We look at Nest thermostats, Alexa versus Siri, Ethereum and Bitcoin, as well as some other apps that caught the eye in the data.

Section 2: Regional News

AMERICAS DOWNSTREAM TRAFFIC SHARE

Netflix once again takes the Americas crown, despite improvements in efficiency, video traffic management, and increased competition. Who else is in the top 10?

AMERICAS UPSTREAM TRAFFIC SHARE

Video is the top upstream source of traffic in the Americas – how can that be?

SPOTLIGHT: CONNECTED FITNESS

Ever heard of Peloton? If you run a network, you should check it out.

EMEA DOWNSTREAM TRAFFIC SHARE

Gaming is having major impact on networks in EMEA, with 3 in the top 10.

EMEA UPSTREAM TRAFFIC SHARE

BitTorrent leads EMEA upstream traffic share by a large margin.

SPOTLIGHT: WORLD CUP 2018

The 2018 World Cup was a major force on the internet, with impact felt not only with the games themselves streaming online, but also in social networking and other video streaming sites.

APAC DOWNSTREAM TRAFFIC SHARE

Social networking is a driving force in APAC networking, with Facebook Video leading YouTube.

APAC UPSTREAM TRAFFIC SHARE

P2P applications besides BitTorrent make an appearance in the Phenomena report in APAC.

SPOTLIGHT: GOOGLE

How dominant is Google in APAC? It has over 40% of all connections in the region.

Section 3: Spotlights

SPOTLIGHT STREAMING VIDEO

Not all regions are created equal when it comes to streaming video traffic share. Netflix and YouTube are everywhere, but local streaming is increasing.

SPOTLIGHT GAMING

What individual games are generating the most traffic on networks? Since the number of players does not always align with traffic share, we look at each region to determine the winners.

SPOTLIGHT SOCIAL NETWORKING

Facebook or Instagram? What about Snapchat? Or VK and YouTube? Although the leaders are obvious, there are some surprising names that pop up in this edition.

SPOTLIGHT MESSAGING

Skype is the global traffic share in messaging, but there are other strong contenders not far behind that may shift the share rankings in the next edition.

SPOTLIGHT STREAMING AUDIO

“And the winner in streaming audio is...Spotify.” The market share numbers for streaming audio do not align with the traffic share, so what services are being used by consumers more often?

INFOGRAPHIC COLLECTION AND RESOURCES

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.

Highlights in this edition

Video is almost
58% of the total downstream volume
of traffic on the internet

NETFLIX is **15%**
of the total downstream volume of traffic
across the entire internet

More than
50%



of internet traffic
is encrypted, and
TLS 1.3 adoption
is growing

Alphabet / **Google**
applications make up over
40% of the total internet
connections in APAC

 BITTORRENT
is almost
22%

of total upstream volume
of traffic, and over
31% in EMEA alone

GAMING



is becoming a significant force in traffic volume
as gaming downloads, Twitch streaming, and
professional gaming go mainstream

Plus spotlights on:

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

HIGHLIGHTS IN THIS EDITION

The trends driving the internet this year are showing significant changes from previous years:

- Video is still dominant with almost 58% of overall downstream traffic, despite operators more aggressively managing video traffic.
- Over 50% of traffic on the internet is encrypted, and it will continue to grow. The majority of web traffic is encrypted, and more applications are leveraging secure connections from end-to-end.
- Gaming is becoming a significant contributor to traffic. More games are delivering a good mobile experience and are designed with ubiquitous connectivity, capturing more mind share with consumers.
- File sharing is not dead. With more content choices and channels than ever before, consumers do not have good options to get access to all the content that may interest them and are still resorting to piracy.
- Live events are beginning to have a noticeable effect on networks. The World Cup and Super Bowl generate spikes in networks worldwide, exceeding YouTube and other video applications.

The internet is more diverse than ever

Previous Global Internet Phenomena reports highlighted a few applications that dominated the world scene: Netflix, YouTube, Facebook, and BitTorrent were the biggest historical traffic sources. All of those applications are still big players, but the internet landscape has significantly diversified; regional variations are showing up throughout this report, creating a new tenet for network operators that “all internet trends are local.”

If there is one common theme to this Global Internet Phenomena, it is that the traffic on the internet is more encrypted than ever. A conservative estimate of the data shows that over 50% of the traffic on the internet is encrypted. Some applications are not always encrypted, and Sandvine did not count these as part of that 50% number. Even with the conservative view, TLS traffic has grown (showing a shift to a more secure protocol than SSL).

For consumers, this is great – their traffic has better privacy than ever before. This does not protect them from hacks or data breaches, but at least ensures that their traffic cannot be “read” by anyone that gets access to network traffic, especially with the increasing use of public WiFi connectivity.

For network operators, this trend creates a huge challenge. Network operators – fixed, mobile, WiFi, and even satellite – need to understand the composition of traffic (not the content) so that they can build out a network capable of meeting a consumer’s quality expectations. With a higher percentage of traffic encrypted every day, operators are struggling to gain a holistic view of their networks.

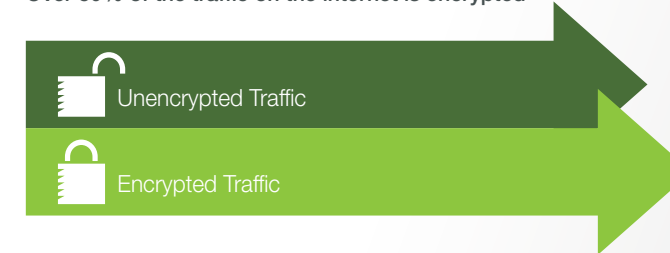
We will talk quite a bit about video in this report, but it is important to highlight the diversity of video streaming traffic around the world. Although Netflix and YouTube are still the largest names in streaming (as you will see in the reports) there is an ever growing number of other streaming providers capturing consumer screen time.

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 content, even as governments attempt to shut down sharing sites.

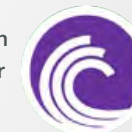
Gaming traffic continues to grow. This report has a specific highlight on gaming, which is now the third largest contributor to downstream bandwidth usage.

Finally, live events are registering on the “internet Richter scale,” causing major traffic spikes during the World Cup and Super Bowl. These traffic spikes are truly “local,” and they need to be planned for by operators, or else quality of experience (QoE) will suffer for consumers.

Over 50% of the traffic on the internet is encrypted



File sharing is not dead: BitTorrent is #1 in Europe and APAC, and #2 in Americas for upstream bandwidth consumption.



GLOBAL APPLICATION CATEGORY TRAFFIC SHARE

1	VIDEO STREAMING	57.69% ↓	22.43% ↑
2	WEB	17.01% ↓	20.98% ↑
3	GAMING	7.78% ↓	2.68% ↑
4	SOCIAL	5.10% ↓	3.73% ↑
5	MARKETPLACE	4.61% ↓	1.90% ↑
6	FILE SHARING	2.84% ↓	22.05% ↑
7	MESSAGING	1.72% ↓	8.12% ↑
8	SECURITY	1.41% ↓	7.48% ↑
9	STORAGE	1.41% ↓	9.37% ↑
10	AUDIO STREAMING	1.05% ↓	0.46% ↑

Video is bigger than ever

It is not a surprise that streaming video is the top application type on the internet. If you had asked anyone what category of application they thought would be at the top, video would win by a landslide. What might not have been expected is the gains that other application types have made even while video continues to drive downstream bandwidth usage. Gaming has gained in relevance, and file sharing has experienced a bit of a resurgence.

Streaming Video: Streaming video includes not only over-the-top (OTT) video streaming services like Netflix, YouTube, and Amazon Prime, but also operator-based streaming and direct consumer streaming. Many operators offer streaming of the content that they own the rights to (DirectTV, Comcast, etc.) as well as just about every network streaming their content in some way. Social network video sharing and direct video connectivity (like FaceTime) are also included.

Web: Web traffic is the container for all web traffic that Sandvine does not attribute to an individual application. This includes web browsing, HTTP downloads, mobile applications that are simply web front ends, or applications that have not been classified by Sandvine yet that use HTTP as a transport protocol. However, with over 5300 signatures making up the data for this report, that "bucket" is pretty small.

Gaming: Gaming traffic includes downloads from major gaming networks (PlayStation Network, Xbox Live, Steam, Nintendo, etc.) as well as traffic from specific games. The actual "gaming" traffic on the network when downloads are included is likely higher due to marketplace downloads.

Social: The largest social networks worldwide (43 for this edition) were uniquely tracked in this report.

Marketplace: Includes iTunes, Google Play, and Windows Store, as well as updates for major device types.

File Sharing: BitTorrent is the dominant file sharing protocol on the internet, and continues to remain a significant source of internet traffic.

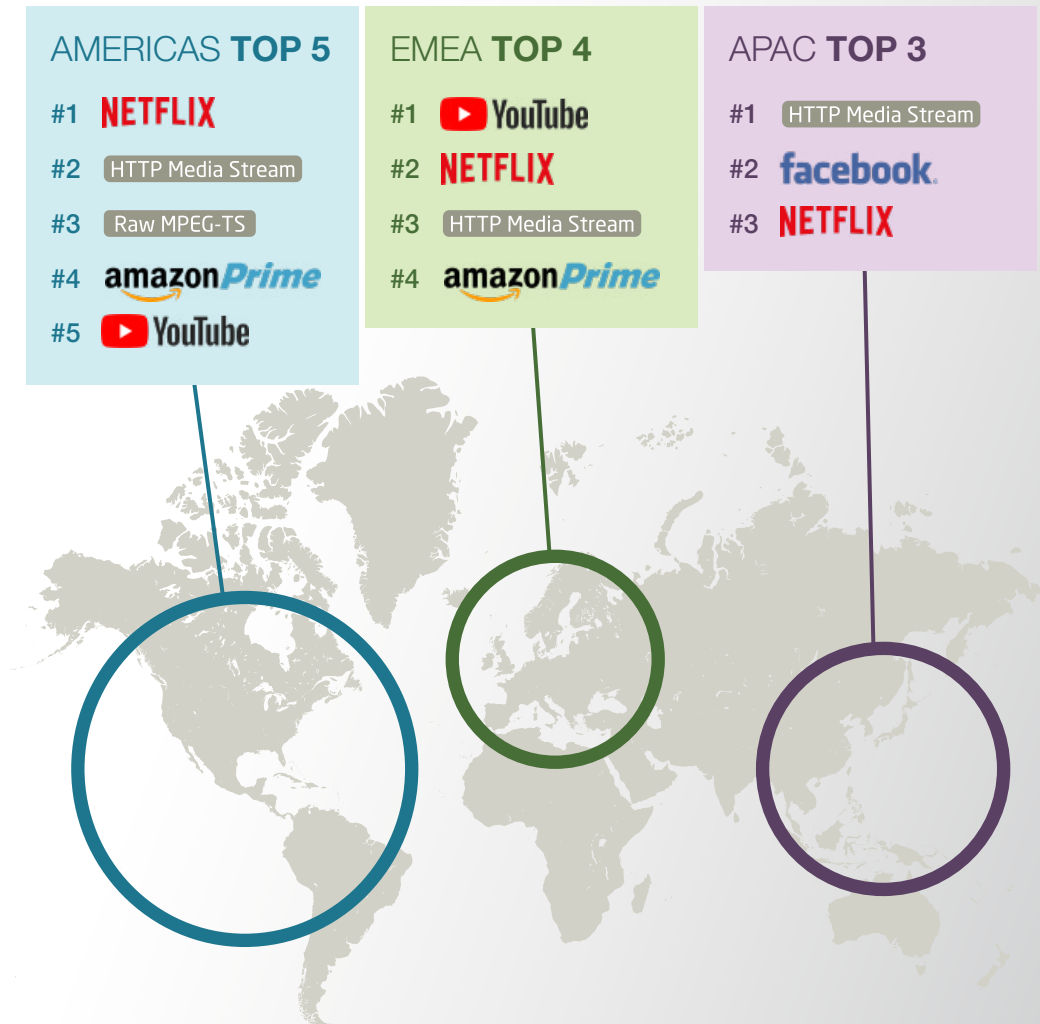
Storage: Cloud storage usage is becoming a ubiquitous service for consumers. Dropbox, iCloud, Google Drive, SharePoint, and many others have become an integral part of the mobile experience.

Security: This category is a bucket for security network infrastructure traffic as well as VPN traffic.

Messaging: Messaging includes both VoIP as well as chat applications; whether this is an operator delivered voice service, an OTT offering, or a social network offering, consumers use these apps daily.

Audio Streaming: Spotify, Apple Music, Google Play Music, and other audio streaming services are included in this category.

Almost 58% of downstream traffic on the internet is video



GLOBAL APPLICATION TRAFFIC SHARE

1	NETFLIX	14.97% ↓	2.92% ↑
2	HTTP MEDIA STREAM	13.07% ↓	4.84% ↑
3	YOUTUBE	11.35% ↓	3.03% ↑
4	RAW MPEG-TS	4.39% ↓	4.11% ↑
5	HTTP (TLS)	4.06% ↓	2.06% ↑
6	QUIC	3.87% ↓	1.43% ↑
7	AMAZON PRIME	3.69% ↓	0.87% ↑
8	HTTP DOWNLOAD	3.69% ↓	1.45% ↑
9	HTTP	3.22% ↓	4.80% ↑
10	PLAYSTATION DOWNLOAD	2.67% ↓	0.45% ↑

Web and video traffic dominate

The top 9 applications worldwide are either web or video, clearly indicating where consumers spend their data allowances on networks, if not necessarily their time.

Netflix: No introduction is needed for Netflix. The streaming giant is available in all but four countries worldwide, and appears in the top 10 of all the regions in this report. The sheer volume of Netflix on fixed networks propels it to this spot as the top video site in the world.

HTTP Media Stream: A “protocol” category rather than a specific application that collects video streaming not separately classified by Sandvine. This category has been growing rapidly as more video services are launched.

YouTube: YouTube is still the dominant video streaming application consumed on mobile. Netflix takes the lead due to sheer volume in fixed networks as well as higher resolution videos being the norm. YouTube benefits from being the most commonly “embedded” video on other sites, including Facebook.

Raw MPEG-TS: Another video “protocol” used by streaming services, MPEG-TS is commonly used by operators streaming video to their subscribers from broadcast channels, as well as for many security video camera systems.

QUIC: QUIC is a User Datagram Protocol (UDP) protocol championed by Google. QUIC has security protection equivalent to TLS/SSL, and can support

multiplexed connections to reduce latency. Although not exactly a proxy, the most popular sites that use QUIC are Google sites.

Amazon Prime: Amazon’s Prime service has been a huge market success, and Prime Video has been increasing its footprint not only in the US, but is now available in 200 countries worldwide and is increasing its share of global traffic.

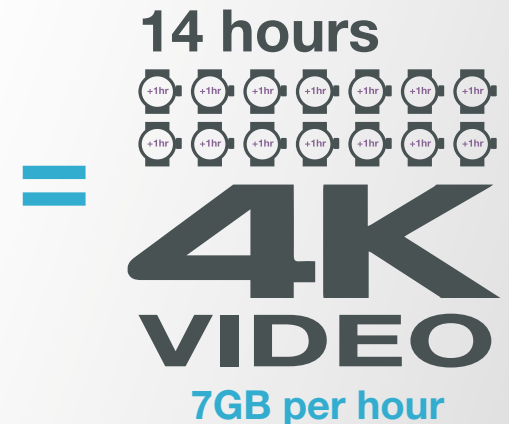
HTTP Download: Sandvine breaks out HTTP download from web browsing, as it has different QoE expectations. Examples of HTTP download would be when you download a PDF or file directly from a website, which is a very common user activity.

HTTP: Plain old HTTP browsing with no security. Google has aggressively moved to penalize sites that do not offer secure connections, but many applications that use HTTP as a transport protocol still use plain text for data.

PlayStation Network Download: Most games are sold via download now, and some games are huge. Call of Duty: Black Ops 3 is 101GB, and Grand Theft Auto V is 65GB. In contrast, an hour of 4K video on Netflix is about 7GB per hour, making a Call of Duty download equivalent to watching over 14 hours of 4K video!



101GB download



Call of Duty: Black Ops 3 is a 101GB download. In contrast, an hour of 4K video on Netflix is about 7GB per hour, making a Call of Duty download equivalent to watching over 14 hours of 4K video!

Global Trends: Beyond the Top 10

HIGHLIGHTS

Nest Thermostat: The most significant IoT device pops up as 55th on the list of connections at .16% and .01% of upload bandwidth.

Voice Assistants: Alexa versus Siri is a network dead heat, with each one representing .05% of connections worldwide, and Alexa at 97th and Siri at 102nd.

Mobile Advertising: DoubleClick (Google), Flurry, AppsFlyer, Adjust, and AppLovin all made the top 200 applications, showing that advertising is still powering the monetization of a lot of mobile applications.

Mobile Crashes: Crashlytics was .32% of all connections (40th worldwide), and it was also .05% of upload traffic (137th worldwide) for upstream bandwidth.

Cryptocurrency: Bitcoin and Ethereum have been in the news quite a bit lately. They are also growing on the internet. Bitcoin was .02% (224th worldwide) of upstream traffic, likely representing Bitcoin miners reporting back to servers. Ethereum was .01% of all connections (277th worldwide), showing it is gaining market momentum.

Nest Thermostat:
55th of all connections
at 0.16%
344th of all upload
bandwidth at 0.01%



Alexa

0.05% of all connections
97th worldwide

>0.01% of all Upstream
448th worldwide

vs

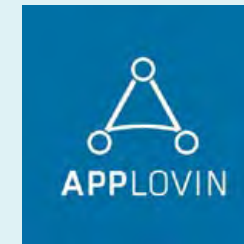


Siri

0.05% of all connections
102nd worldwide

0.04% of all Upstream
143rd worldwide

Mobile Advertising
Applications in **Top 200**



0.32% of all connections
0.05% of Upstream Bandwidth



ethereum

0.01% of all connections
277th worldwide



0.02% of Upstream Bandwidth
224th worldwide

AMERICAS ↓ TRAFFIC SHARE TOP 10

- 1 **NETFLIX**
19.10% ↓
- 2 **HTTP MEDIA STREAM**
16.51% ↓
- 3 **RAW MPEG-TS**
10.05% ↓
- 4 **AMAZON PRIME**
7.74% ↓
- 5 **YOUTUBE**
7.53% ↓
- 6 **HTTP (TLS)**
4.49% ↓
- 7 **HTTP DOWNLOAD**
4.87% ↓
- 8 **HTTP**
4.46% ↓
- 9 **XBOX LIVE DOWNLOAD**
2.09% ↓
- 10 **QUIC**
2.07% ↓

Netflix, anyone?

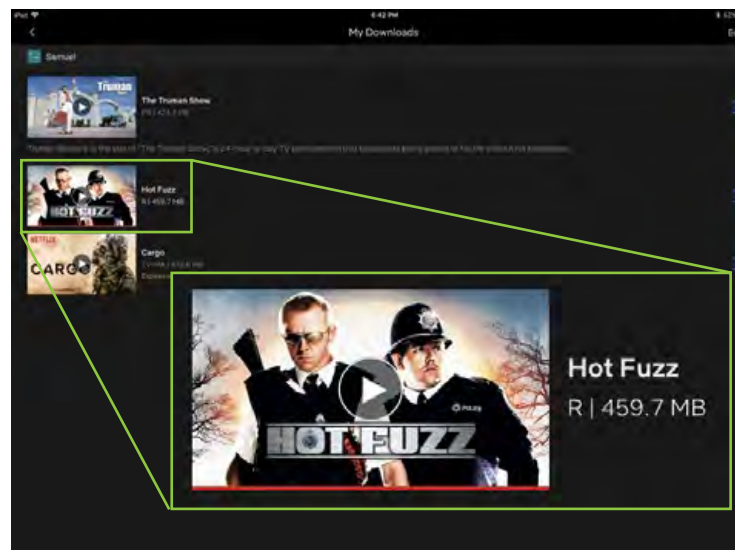
Netflix has consistently been at the top of the rankings in the Americas, and that continues with 19.10% of total downstream traffic being Netflix. The sheer volume of Netflix traffic in the Americas is what propels it to worldwide leadership. At peak hour on fixed networks, this number can spike as high as 40% on some operator networks in the region.

Although Netflix is at the top, other video services are starting to make an impact. HTTP Media Stream and Raw MPEG-TS represent a generic bucket for other OTT or operator streaming video services, showing diversity outside the top OTT services.

Amazon Prime continues to grow their bandwidth share in the Americas, and several other major OTT players sit right outside the top 10 – more on that later!

YouTube sits fifth, and has a much stronger showing on mobile networks than on fixed, and since this report has more fixed bandwidth than mobile for the Americas, it biases the Americas numbers for the OTT content providers.

Gaming makes an appearance, with Xbox Live downloads making up 2.09% of downstream traffic, narrowly beating out the PlayStation Network at 1.56% (13th) in the region. Gaming downloads are an increasing amount of downstream, and Twitch is also in this ecosystem.

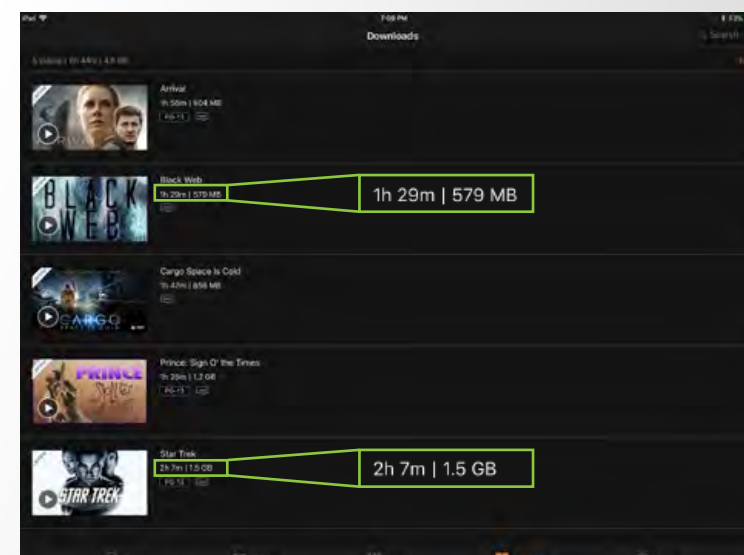
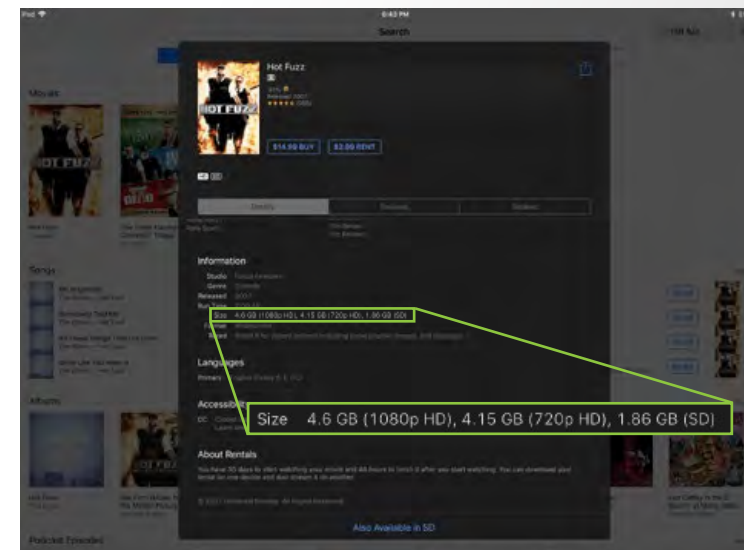


Netflix's dominance is even more impressive when you examine how they have the best efficiency for video streaming of the major video providers.

The **top left image** shows Netflix's Hot Fuzz at 459MB for a ~2 hour movie. The **top right** shows iTunes download – 4.6GB for 1080, 4.15GB for 720, and 1.86GB for SD. The **bottom right** shows a few Amazon Prime videos, which range from 579MB for 1hr 29mins to 1.5GB for 2hr 7min.

Even with Netflix's efficiency, they are still the leader not only in the Americas, but worldwide. Netflix deserves a lot of credit for reducing the throughput needed to stream their services. This means that Netflix could easily be 3x their current volume and at 40% of network traffic — all the time.

It also bears mentioning that the number of mobile operators managing video traffic by offering unlimited viewing for reduced resolutions, which is also depressing the volume of video traffic worldwide.



AMERICAS ↑ TRAFFIC SHARE TOP 10

- 1 RAW MPEG-TS 9.99% ↑
- 2 BITTORRENT UPLOAD 9.21% ↑
- 3 NETFLIX 5.13% ↑
- 4 RTP 4.82% ↑
- 5 HTTP 4.79% ↑
- 6 HTTP MEDIA STREAM 3.63% ↑
- 7 GOOGLE 3.48% ↑
- 8 HTTP (TLS) 3.20% ↑
- 9 ICLOUD PHOTO STREAM 3.07% ↑
- 10 IPSEC VPN 2.65% ↑

Video on the upstream?

We often think of video as a downstream phenomena on networks, but consumers are also sending more video into the internet than ever before.

Raw MPEG-TS is the top upstream application, and it is joined by Netflix and HTTP media streaming in the top 10. MPEG (video cameras/surveillance) and

HTTP media streaming (many different live streaming services) make sense, but why Netflix? Netflix is constantly “bookmarking” your location; as users browse the library, Netflix interactively starts video previews, which has had a huge impact on the upstream. This has made video a major player in the upstream, even with social networking video having less impact than expected on networks.

File sharing appears on the upstream at #2, but we’ll talk more about file sharing in other regions where it is the dominant force for upstream traffic utilization.

RTP also pops up, representing a collection of VoIP services using generic VoIP protocols, mainly operator-branded VoIP services (not OTT VoIP).

iCloud Photo Stream makes the first appearance for an Apple product as well as a storage application, illustrating the popularity of mobile photos that immediately get uploaded to the cloud. Photo traffic is also part of the Google number from Androids. There are also lots of VPNs in the Americas, as IPSec is 10th on the list at 2.65%, representing both business users and privacy VPN services.



Netflix user watching video



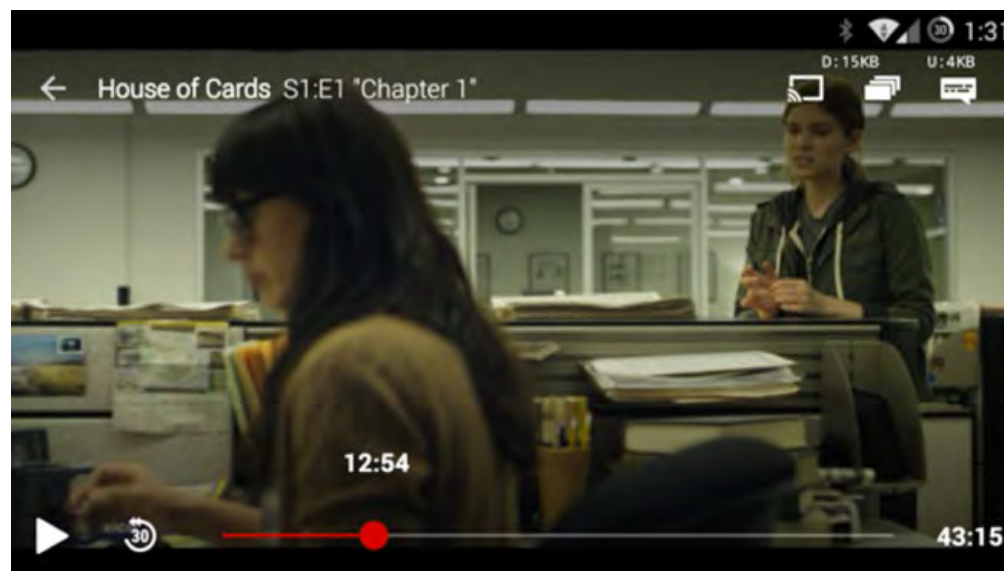
User's sytem sends a bookmark for location



User moves cursor to new movie



Netflix updates screen and shows preview



Get on your bikes and ride!

There is a new “streaming” service on the horizon that has the potential to change streaming patterns on networks worldwide. In the US, a new service has achieved cult status, and is rapidly moving into the mainstream as followers pile on behind it. That trend is connected fitness. I am not talking about Fitbit-style connected fitness, I am talking about “let me workout with a streaming video from a remote class” connected fitness.

The pioneer in this space is Peloton, who has one of the highest Net Promoter Scores (NPS) in the market, for their connected bike. The bike comes with a gorgeous 22 in HD display with a resolution of 1080 x 1920 pixels, and all of the video content is streamed in 1080p HD. Peloton streams up to 14 classes a day, and has an ever-changing library of ~4000 on demand classes. Peloton is valued at \$4B – highlighting the growing popularity of connected fitness, and Peloton boasts over one million paying subscribers in the US. Most classes show several thousand participants within the first week after being recorded, and many continue to get rides for months or even a few years (theme rides are extremely popular — Jennifer Jacob’s Guns and Roses Ride is highly rated!).

Why are we covering them in the Global Internet Phenomena report? In July, during their “All For One” ride, over 18,000 people joined in live to stream a single workout. Since each stream is an HD stream (~8Mbps and over 800MB of volume), this is a pretty significant live event on par with other sporting events. For their provider, that was 144Gbps of throughput and ~14.4TB of volume. Since then (as shown in the screenshot), over 56,000 people have streamed that ride, totalling

over 45TB of volume. Some riders have taken the ride multiple times, but only their top score is shown and they are only counted once as a participant.

With a growing installed base, a connected treadmill on the way, and many competitors following the connected fitness craze, operators should keep an eye on connected fitness as a trend to watch out for. Global expansion begins with Canada and Europe in the fall of 2018.



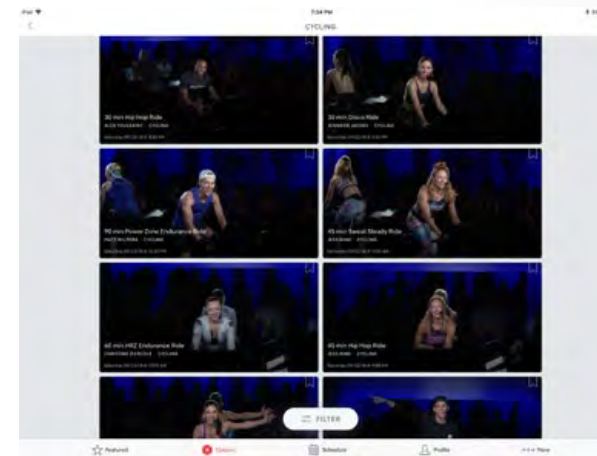
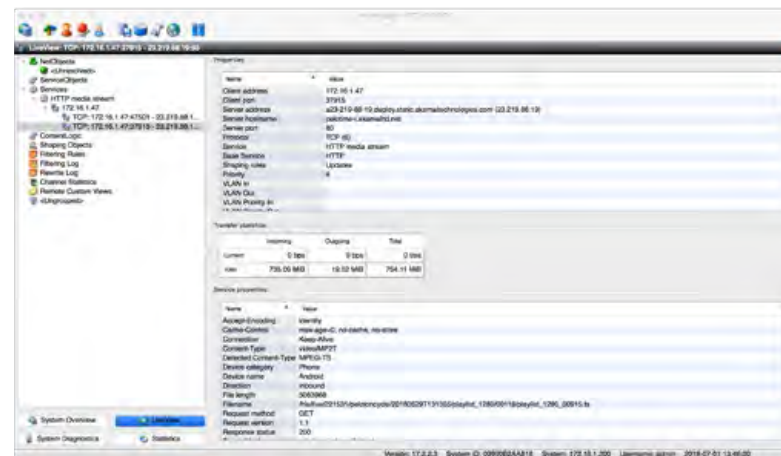
Peloton’s *All For One* online ride

Live:

18,000 participants
~144Gbps throughput
~14.4TB of volume

Overall:

56,000 participants
~45TB of volume



EMEA ↓ APPLICATION TRAFFIC SHARE TOP 10

- 1 **YOUTUBE** 16.10% ↓
- 2 **NETFLIX** 12.99% ↓
- 3 **HTTP MEDIA STREAM** 10.30% ↓
- 4 **AMAZON PRIME** 6.06% ↓
- 5 **QUIC** 5.41% ↓
- 6 **PLAYSTATION DOWNLOAD** 3.75% ↓
- 7 **TWITCH** 3.11% ↓
- 8 **HTTP (TLS)** 2.93% ↓
- 9 **STEAM DOWNLOAD** 2.84% ↓
- 10 **HTTP DOWNLOAD** 2.44% ↓

Got time for a game?

Video is huge in EMEA just like the rest of the world, but with a different order than others, and gaming contributes a significant portion of traffic to the overall downstream traffic volume.

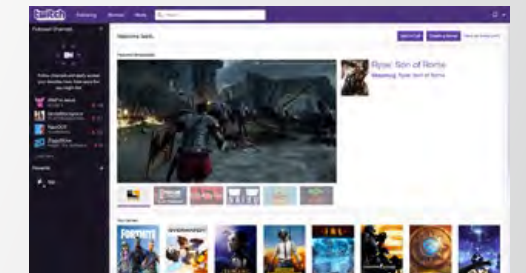
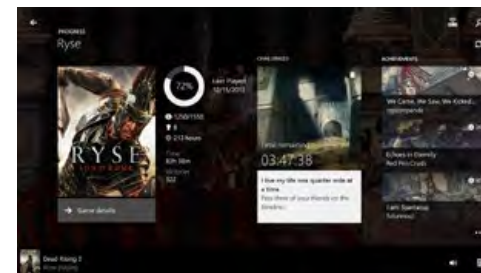
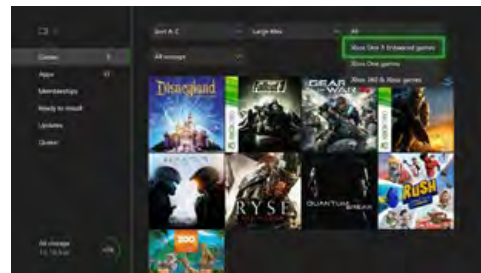
YouTube reigns in EMEA, which is a very mobile-centric market. Netflix, HTTP streaming, and Amazon appear in the top 10, albeit with lower

percentages than they had in the Americas due to more diversity in content. Twitch, owned by Amazon, appears at #7 in the list as a video source. Twitch's biggest content draw is actually gaming, which makes two other appearances in the EMEA top 10 – PlayStation download and Steam download. Twitch is a popular platform for gamers to stream their games live, as well as the platform

that is most often utilized by gaming companies to broadcast their sponsored tournaments.

Steam makes an appearance in the Phenomena gaming for the first time in EMEA, and can be directly compared to the Xbox traffic in the Americas and the PlayStation that is higher up on the list in EMEA, except that Steam is focused on PC-based

gaming. PC games can also reach 100GB in size, so digital downloads, which are the preferred delivery mechanism for PCs, will continue to grow as games become more immersive and rich. Just wait until virtual (and/or augmented) reality games start becoming commonplace! Not to mention Niantic's upcoming Harry Potter game modeled off of Pokemon Go.



EMEA ↑ APPLICATION TRAFFIC SHARE TOP 10

- 1 BITTORRENT TRANSFER 31.73% ↑
- 2 GOOGLE 9.42% ↑
- 3 HTTP MEDIA STREAM 6.44% ↑
- 4 YOUTUBE 4.09% ↑
- 5 RTP 2.31% ↑
- 6 WHATSAPP 2.16% ↑
- 7 WEBRTC 1.88% ↑
- 8 HTTP 1.83% ↑
- 9 FACEBOOK 1.80% ↑
- 10 NETFLIX 1.69% ↑

Can you share Game of Thrones?

EMEA often has a delay to get the latest and greatest content, especially American content. As a result, file sharing has always been higher in EMEA than other parts of the world.

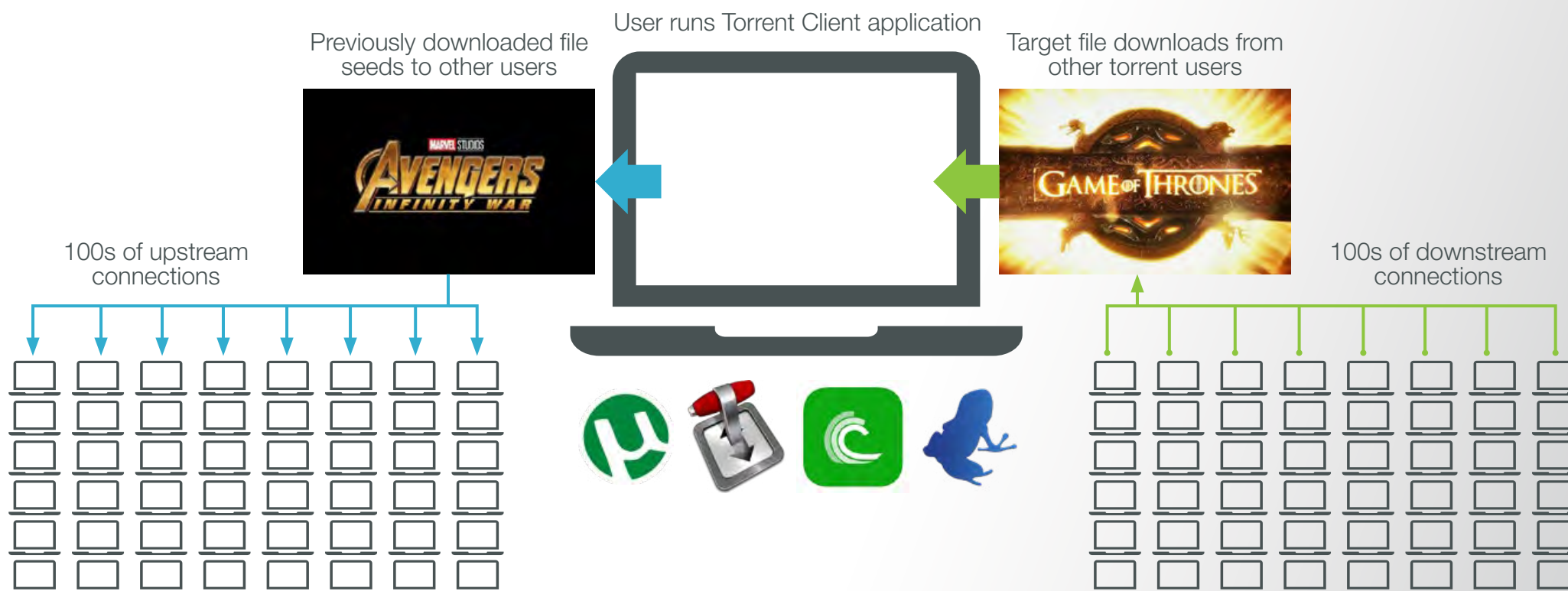
With over 30% of upstream traffic, BitTorrent dominates upstream with a higher ratio of traffic than in any other region. Content rights in EMEA

can be complicated, and consumers are savvy on how to get content using file sharing sites. The EU is attempting to require ISPs to block file sharing sites, but it seems to be a game of whack-a-mole, where when one site gets taken down, another pops up to replace it. Note that this was taken outside of a Game of Thrones season, so the number is lower than it could be!

Google is second in EMEA, reflecting the power of the search engine to generate requests and traffic on a wide variety of topics. This is the first region that Google properties specifically place in the top.

Messaging makes multiple appearances with RTP, WhatsApp, and WebRTC all making the top 10, playing to the mobile and voice centrality of the

region. WebRTC is used in both browsers and applications for streaming video and audio, and is making inroads in the market. WhatsApp makes its first appearance in the Phenomena report, as does their parent company Facebook. Interestingly enough, the use and popularity of WhatsApp globally does not always align with the popularity of Facebook.



EMEA Spotlight: World Cup

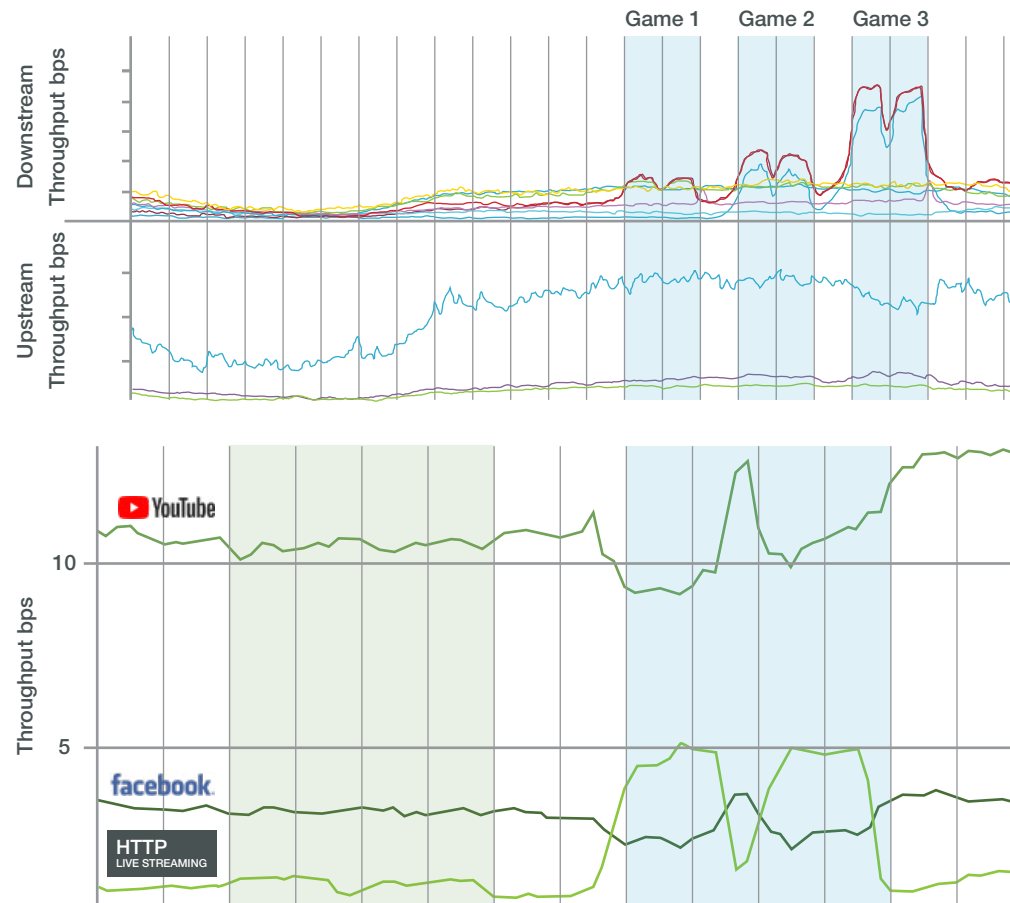
In June, the World Cup was held in Russia, and the entire world was watching. In past World Cups, streaming was a very small amount of traffic, often not even registering as a blip on most networks – either fixed or mobile.

In 2018, that all changed. In multiple countries around Europe, World Cup games were the #1 downstream bandwidth consumer on both fixed and mobile networks. When the home team played, the streaming video from the rights holder for football streaming was the #1 bandwidth consumer during the game by a large margin – bypassing YouTube and all other streaming services.

Interestingly enough, during half-time, YouTube traffic would often spike up as viewers wanted to see replays of key plays during the game, but would immediately fall off again once the second half started (see the full blog [here](#)). The normal video watching patterns usually went back to normal immediately after the game, but social networking continued to rise as people talked about the game, whether it was the heartbreak of defeat or the jubilation of victory.

We also saw a great deal of piracy of the video streams occurring, with up to 40% of all streams pirated from numerous sources, as shown in the diagram on the right (see the full blog [here](#)).

So, if you are an operator of either a fixed or mobile network, when World Cup 2022 is live from Qatar, be ready for your network to be dominated by football watching – you can take that one to the bank!



World Cup streaming in a European country during the “local” team’s game – the last of the three games. You can see that viewership for the games spiked above all other services during the game. The graph below shows how YouTube and Facebook reacted to the games – with YouTube falling during the game and spiking during halftime, and Facebook doing the opposite.

hs8.stream.balkaniyum.tv	66.6 Mbps
nl3.vaders.tv	29.7 Mbps
bhms1.airtel.tv	29.1 Mbps
video.assia.tv	22.5 Mbps
mhms6.airtel.tv	21.8 Mbps
hls6.dnmusic.tv	20.5 Mbps
mhms5.airtel.tv	20.3 Mbps
stream.tvtap.net	17.1 Mbps
bhms2.airtel.tv	16.7 Mbps
live.hls.onplay.tv	16.4 Mbps
ts.cdn.suntv.tv	14.1 Mbps
mhms7.airtel.tv	14.0 Mbps
livecdnh3.tvanywhere.ae	13.4 Mbps
mhms11.airtel.tv	13.4 Mbps
cdn11live20.karpouzi.tv	13.3 Mbps
server2.dnvod.tv	12.5 Mbps
cdn11live20.axladi.tv	11.6 Mbps
s2-r1.dnlive.tv	11.4 Mbps
server6.dnvod.tv	10.5 Mbps
server1.dnvod.tv	9,400.3 kbps
10gb-1.oneiptv.tv	9,364.2 kbps
livecdnh2.tvanywhere.ae	9,051.4 kbps
10gb-3.oneiptv.tv	9,034.1 kbps
s5-r1.dnlive.tv	9,019.2 kbps
s4-r1.dnlive.tv	8,975.0 kbps
vse.ntd.tv	8,623.6 kbps
s7-r1.dnlive.tv	7,968.1 kbps
mhms10.airtel.tv	7,712.8 kbps
cdn11live20.portokali.tv	7,638.8 kbps

Various pirate streams seen during the World Cup in the Middle East.

APAC ↓ APPLICATION TRAFFIC SHARE TOP 10

- 1 HTTP MEDIA STREAM 11.56% ↓
- 2 FACEBOOK VIDEO 6.64% ↓
- 3 NETFLIX 6.32% ↓
- 4 HTTP 5.93% ↓
- 5 HTTP (TLS) 5.54% ↓
- 6 INSTAGRAM 5.48% ↓
- 7 BITTORRENT DOWNLOAD 5.11% ↓
- 8 YOUTUBE 4.91% ↓
- 9 HTTP DOWNLOAD 4.66% ↓
- 10 QUIC 3.99% ↓

The many faces of HTTP

Social networking makes its first big appearance on the downstream traffic top application lists in APAC. Facebook Video and Instagram are both in the top 10, displacing some of the spots taken by video in other regions. With several of the top 10 Facebook cities in the world in APAC, Facebook Video takes a surprising #2 in the region.

Social networking is big in APAC. No other region has social networking so highly placed on the downstream. As we will explore later, it is not just Facebook/Instagram, as many of the local social networks generate statistically significant amounts of data throughout the region. These results likely indicate that videos previously shared on YouTube in the region are now being shared with Facebook, which we have not seen in other regions... yet.

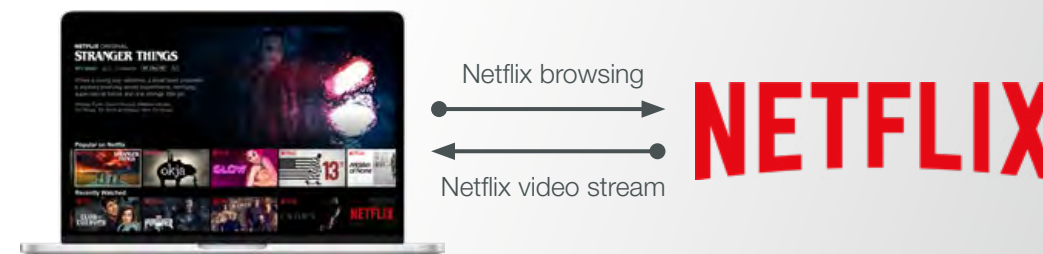
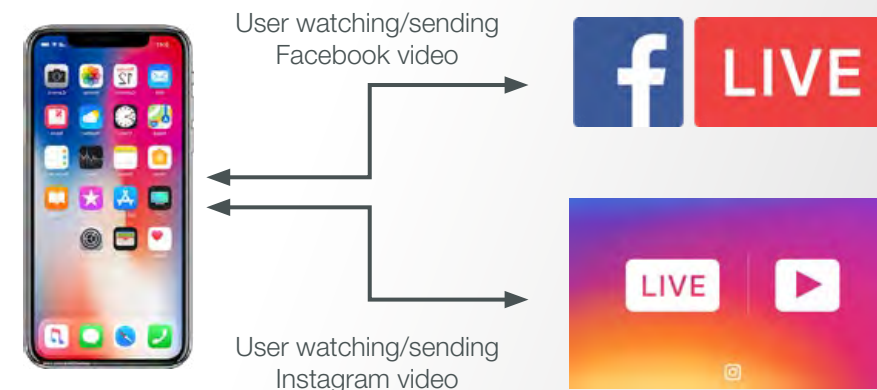
An interesting shift in the region is the rise of regional streaming providers (which are represented by the generic HTTP Media Stream application protocol) and the further reduction in traffic to YouTube as a result. As in the Americas, it is important to note the sheer volume of bandwidth available in parts of APAC (Japan, Korea, Taiwan, Singapore, etc.) can drown out mobile usage, which reduced the YouTube traffic percentage in this version of the Phenomena report.

Netflix is making inroads in the region, improving the library of titles and delivering more local content, and it shows in their statistics. In this data, we don't separate Netflix download, so some of this increase may be that Netflix offers a download option. This extends reach to networks that cannot sustain good streaming quality, as well as world travellers accessing Netflix while in region.

Another interesting data point is that unencrypted HTTP is higher in APAC than any other region for downstream traffic. This may simply mean that many local apps are using web protocols without leveraging SSL or TLS, but it is definitely not good for consumers. HTTP/TLS, QUIC, and HTTP Download are present as they are in the other regions.

As in EMEA, BitTorrent is still in the top 10 on the downstream, indicating that users in APAC still do not have good access to the content that they want, and are still turning to file sharing to get access to the content. As Netflix and other local streaming services increase the density of popular content in their libraries, we would expect to see this number decrease over time.

The final note on APAC traffic is that there is more diversity in the region due to the many localized applications present throughout the region. APAC registered over 4000 active signatures, more than any other region in the report. The HTTP Media Stream category captures a number of the local streaming services that are not broken out, and others register as operator defined signatures. This will be an area of focus for Sandvine in the coming months and we will add more regional video signatures to capture more unique services.



APAC ↑ APPLICATION TRAFFIC SHARE TOP 10

- 1 BITTORRENT UPLOAD 19.11% ↑
- 2 GOOGLE 13.57% ↑
- 3 HTTP 10.26% ↑
- 4 K GRID 7.14% ↑
- 5 HTTP MEDIA STREAM 4.29% ↑
- 6 ICLOUD PHOTO STREAM 3.02% ↑
- 7 YOUTUBE 3.00% ↑
- 8 HTTP (TLS) 2.61% ↑
- 9 AFREECA TV 2.41% ↑
- 10 FACEBOOK 1.69% ↑

P2P rules on the upstream

APAC has three different P2P applications on the upstream – BitTorrent, K Grid, and Afreeca TV. K Grid is similar to BitTorrent for file sharing, and Afreeca TV is a P2P video streaming service.

BitTorrent is #1 in APAC, not as extreme in volume as EMEA, but still a significant portion of upstream network bandwidth. Unlike EMEA, BitTorrent was also in the downstream top 10, so there is symmetry in the region for users that are both downloading and uploading. For those not familiar with BitTorrent, a user can stop uploading when they finish a download, but many users “pay it forward” and keep uploading once their download is finished. With many networks in APAC delivering very high bandwidth services to consumers, uploads from the region are not limited by access, but by the peering bandwidth (and cost) to deliver the traffic to other parts of the world. Within a country, downloads and uploads would be lightning fast.

When you add the other P2P solutions in the top 10, APAC is in the same neighborhood as EMEA with total P2P upstream volume of near 30%. K Grid is significant because it is the only non-BitTorrent application to register on the P2P scale in any region of the world, and it highlights the need for awareness of regional (and local) trends for network operators. K Grid is a Korean app, and its share of traffic is even higher than these totals in Korea, but approaching zero outside Korea.

Just as in EMEA, Google is #2 on the upstream list. With the strength of Android in the region, this is not a surprising result. When combined with the HTTP and HTTP (TLS) traffic, the ongoing strength of web

traffic in the region on the upstream is apparent.

iCloud also is in the top 10, as well as Google Photo Upload (as part of the Google traffic volume), illustrating the popularity of cloud storage in the region for consumers. If you combine this with the popularity of social networking in the region, the implication is that there are lots of social networking media being captured by consumers, uploaded to popular social networks, and then also uploaded to a cloud service for long term storage.

Video is also a significant portion of the upstream in the region. HTTP Media Stream, YouTube, and Afreeca TV are all in the top 10. You are familiar with HTTP Media Stream and YouTube, but Afreeca TV may be new to you. Afreeca TV is short for “Any FREE broadCasting,” and uses P2P technology to stream video to users. The videos on the service include TV broadcasts, video game broadcasts, live performances, and even daily-life video blogs. Gaming is so popular in Korea that there used to be (and still may be) a StarCraft channel on local TV, and this service would compete with Twitch in Korea.

Rounding out the top 10 and aligning with popularity of social networking in the region is Facebook. As we will see in the social networking spotlight, there are many regional social networks in APAC, but the Facebook properties are still dominant (Instagram is right outside the top 10 in addition to Facebook).

P2P is ~30% of upstream traffic in APAC



Afreeca TV: a P2P video streaming service in Korea.

When a noun becomes a verb

We always think of Google as a dominant force on the internet. We have talked a lot about traffic share in this edition of the Phenomena report, and mentioned several data points related to connection volume for applications (the full tables are linked in the resources page at the end of this report). In APAC, Google holds a commanding position for user connections, with 40.20% of all connections in the region connecting to Google services.

The graphic to the right shows the percentage of volume for each service, but let's explore the Google Services in a bit more detail, and how they are used by consumers. The list below is an example of how Sandvine can classify traffic at a fine granularity:

Google (14.75%): This signature represents the catchall bucket for Google services that can not be broken out as an individual Google service; this includes Google search.

YouTube (12.72%): No explanation needed!

Google Cloud Messaging (Firebase Cloud Messaging now): Can be used by both Chrome browsers and Android by developers to send messages to devices to their apps.

DoubleClick (1.96%): Google's advertising arm, you may not be familiar with them directly, but you have definitely experienced their services through internet advertising.

Crashlytics (1.04%): Google's software development kit for crash reporting, application logging, online review, and statistical analysis of application logs.

GMail (0.49%): Google's popular mail service.

Google Docs (0.37%): Free word processing, spreadsheets, and presentation software suite.

Google Play (0.28%): The Android market where

applications can be downloaded.

Google Proxy (0.08%): A compression proxy service for Chrome.

Google Allo (0.06%): Instant messaging application supporting messages, files, voice notes, and images.

Google Drive (.05%): File storage and synchronization.

Google Maps (0.03%): Maps and navigation services using Google Maps.

Google Safe Browsing (0.02%): Blacklist service from Google that contains malware and phishing.

Some other Google Apps with less than 0.01% that are present in APAC: **Google Play Music, Google AD, Google Duo, Google Earth, Google Music Manager, Google Hangouts, Google Sync, Google Goggles.**

By any metric, over 40% "market share" is pretty impressive. There are only a few other metrics close to that in the Phenomena data that reflect that level of dominance. Google's ongoing success with Android will continue to expand that dominance in the region, since the majority of the region is mobile connected through lower cost phones rather than iPhones.

40.2% of all connections in the APAC region connect to Google services



GLOBAL VIDEO STREAMING TRAFFIC SHARE

- 1 NETFLIX 26.58% ↓
- 2 HTTP MEDIA STREAM 24.40% ↓
- 3 YOUTUBE 21.30% ↓
- 4 RAW MPEG-TS 8.04% ↓
- 5 AMAZON PRIME 5.73% ↓
- 6 TWITCH 3.45% ↓
- 7 FACEBOOK VIDEO 3.42% ↓
- 8 OPENLOAD 0.80% ↓
- 9 SKY GO 0.50% ↓
- 10 HULU 0.43% ↓

Streaming Video

With video being 56% of all traffic on the internet, operators clearly need visibility into which providers are dominating their network. Even more frightening is that 4K content streams are a drop in the bucket.

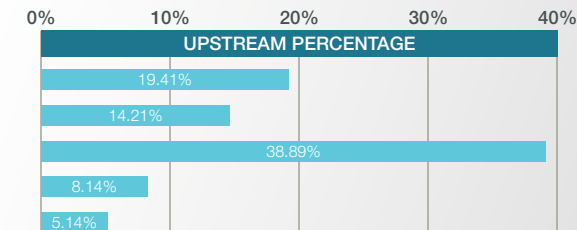
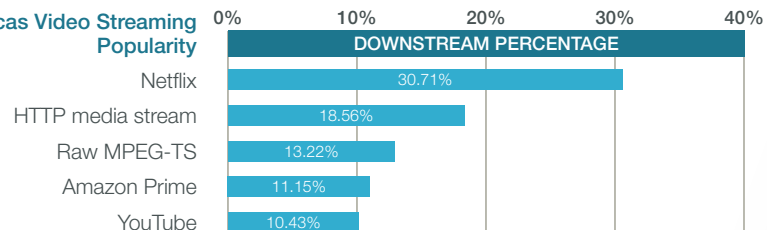
All video streaming services are not equal. The bandwidth for a Netflix movie is different than a YouTube video, and they need different behavior from the network to receive good quality during times of congestion.

This spotlight takes all video traffic and measures “market share” of streaming video in each region. Netflix and YouTube are consistently in the top 5 for downstream bandwidth in each region (and usually country) that they are active in.

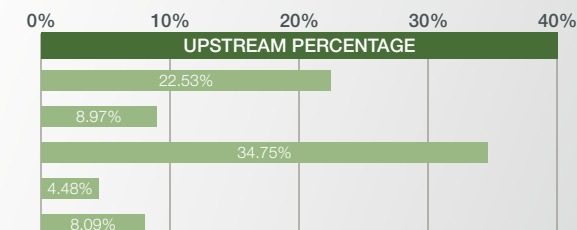
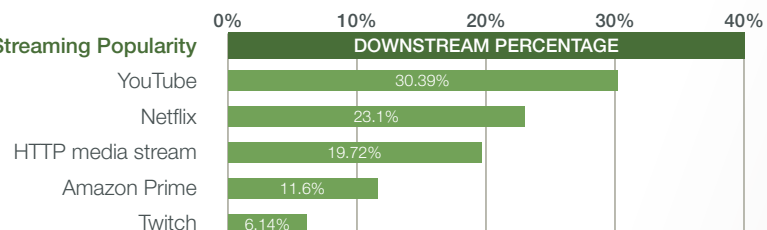
The biggest change in this report is the drastic increase in the number of video streaming services and content available to consumers. HTTP Media Stream represents the growth in streaming services that Sandvine has not yet tracked individually, but in aggregate it is clear that consumers are taking advantage of a wide variety of streaming services (free or paid).

One interesting appearance in the top 10 is Openload, which is #8 with 0.80% of video traffic worldwide ahead of services like Hulu, HBO Go, and BBC iPlayer with a service that likely will not make movie studios happy.

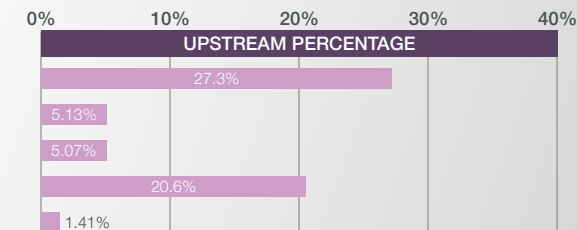
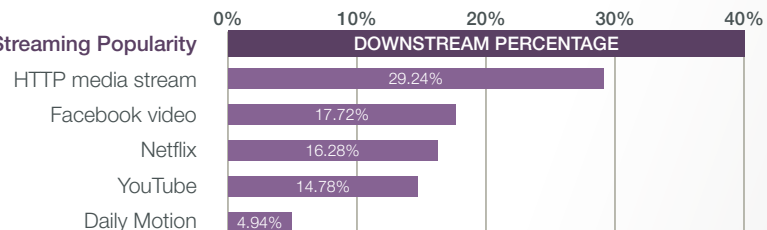
Americas Video Streaming Popularity



EMEA Video Streaming Popularity



APAC Video Streaming Popularity



GLOBAL GAMING TRAFFIC SHARE

- 1 LEAGUE OF LEGENDS
26.42% ↓
- 2 FORTNITE
14.85% ↓
- 3 OVERWATCH
12.05% ↓
- 4 MINECRAFT
7.01% ↓
- 5 PLAYER UNKNOWN
6.02% ↓
- 6 DESTINY
4.56% ↓
- 7 WORLD OF WARCRAFT
3.27% ↓
- 8 WARFRAME
2.91% ↓
- 9 BLACK DESERT ONLINE
2.57% ↓
- 10 CLASH OF CLANS
2.40% ↓

Gaming

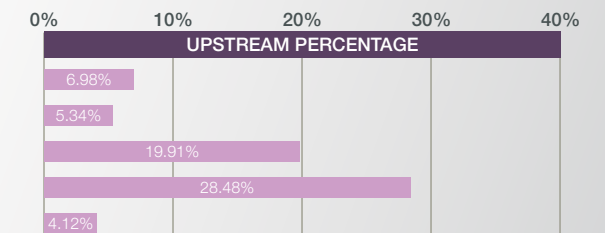
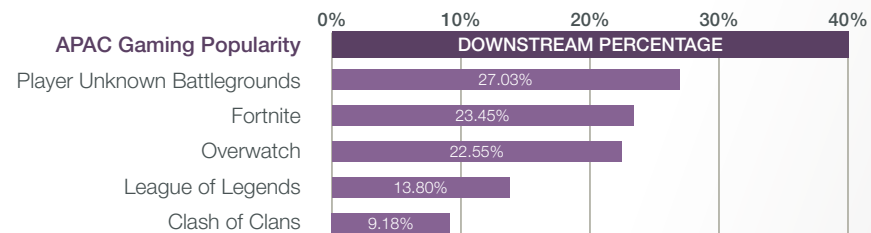
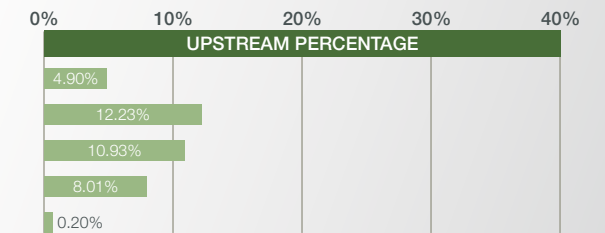
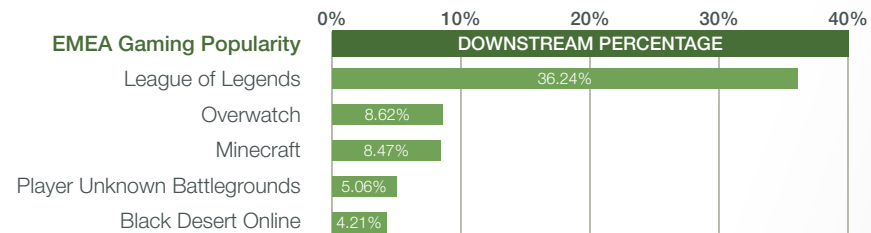
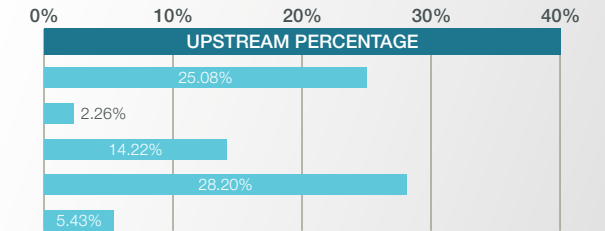
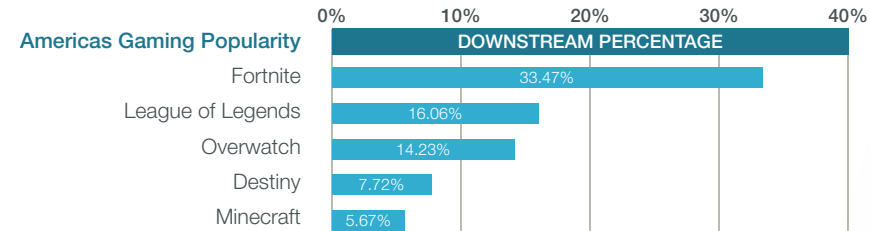
Gaming has always been big business, but over the past few years it has begun to soar as professional gaming has taken off and Twitch has created a larger audience for gamers.

The biggest statistic that jumps out is that League of Legends is over half of the gaming connections worldwide at 51.53%. That is either a very noisy application, or there are a **lot** of people playing.

It is no surprise that League of Legends is #1 worldwide as well as in EMEA. Fortnite however, takes the crown in the Americas, and Player Unknown BattleGrounds (PUBG) takes APAC.

Other games that appear in the rankings are Overwatch (top 3 in all three regions and 3rd overall), Destiny, Minecraft, and Clash of Clans. Outside the top 5 in regions are some lesser known games like Rocket League and Grand Theft Auto V in the Americas, Counterstrike: Source and Counterstrike: Go in Europe, and War Robots and Pokemon Go in APAC.

This spotlight was on individual games rather than the networks (Steam, PSN, and Xbox Live), since that is where the attention is now. It is also important to know that just because a game has lots of connections or even lots of bandwidth does not mean it is popular — it just reflects how the game was coded. However, these rankings are comparable to Twitch gaming popularity charts, and some games are more network intensive than others.



GLOBAL SOCIAL NETWORKING TRAFFIC SHARE

1	INSTAGRAM	42.19% ↓	27.06% ↑
2	FACEBOOK	38.02% ↓	48.77% ↑
3	SNAPCHAT	7.54% ↓	14.13% ↑
4	TUMBLR	5.24% ↓	1.38% ↑
5	VK	2.62% ↓	1.59% ↑
6	TWITTER	1.10% ↓	1.37% ↑
7	ODNOKLASSNIKI	0.91% ↓	0.42% ↑
8	PINTEREST	0.60% ↓	0.66% ↑
9	IMGUR	0.39% ↓	0.01% ↑
10	YOUKU	0.26% ↓	0.26% ↑

Social Networking

The social network rankings are interesting, because user population does not always translate to network usage.

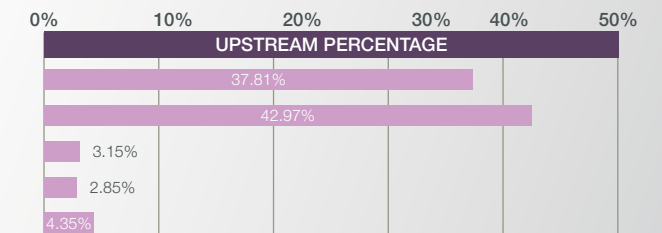
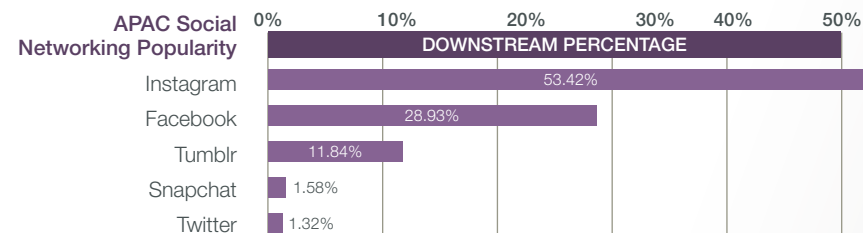
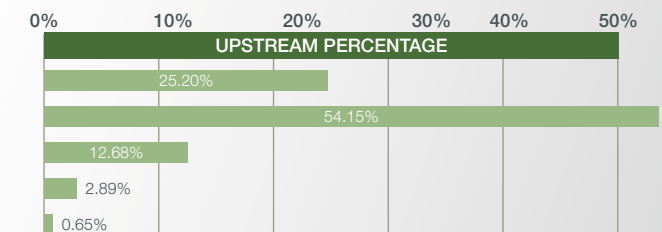
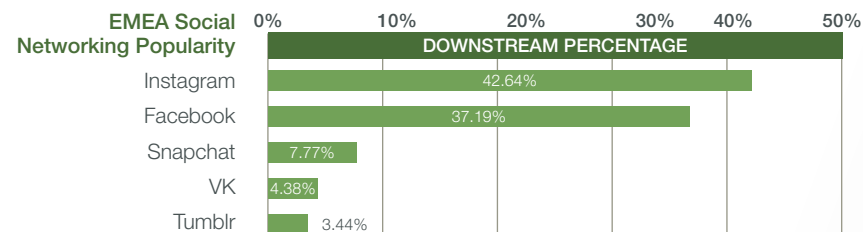
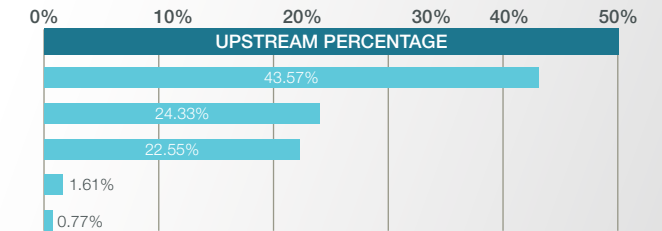
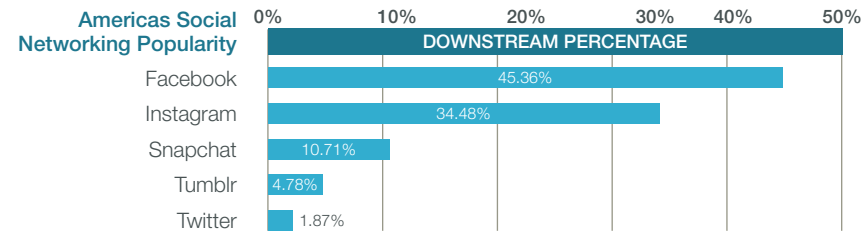
The caveat on this specific measurement is that this specific metric is extremely dependent on the regionality of the sample. This also does not consider YouTube a social network, simply because it would skew the results so far.

That being said, having Instagram and Facebook as #1 and #2 is no surprise. Facebook Video is not counted in this number (as you have already seen that separately), but Instagram is, so you could argue that the numbers are closer. But, since Facebook owns both — it's a wash!

Snapchat at #3 might be a surprise, but Snapchat users are noisy — always going back and forth. Snapchat is also measured in the messaging application category, but it fits in both categories.

Beyond that, strong regional networks start to pop up — VK, Odnoklassniki, and Youku. Interestingly enough, there are statistically significant volumes of these “regional” social networks all around the world, as students, expats, travellers, and immigrants communicate on a language-centric social network.

Finally, Twitter, Pinterest, and Imgur all make an appearance in the top 10 globally and in regions.



GLOBAL MESSAGING TRAFFIC SHARE

1	SKYPE	28.14% ↓	12.21% ↑
2	WHATSAPP	23.15% ↓	17.58% ↑
3	SNAPCHAT	22.60% ↓	8.96% ↑
4	WEBRTC	7.90% ↓	16.23% ↑
5	FACETIME	5.27% ↓	15.63% ↑
6	FACEBOOK MESSENGER	1.97% ↓	5.55% ↑
7	ROUNDS	1.92% ↓	5.57% ↑
8	KAKAOTALK	1.55% ↓	1.11% ↑
9	WECHAT	1.33% ↓	2.53% ↑
10	LINE	0.95% ↓	1.55% ↑

Messaging

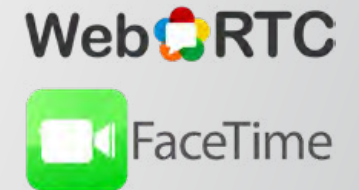
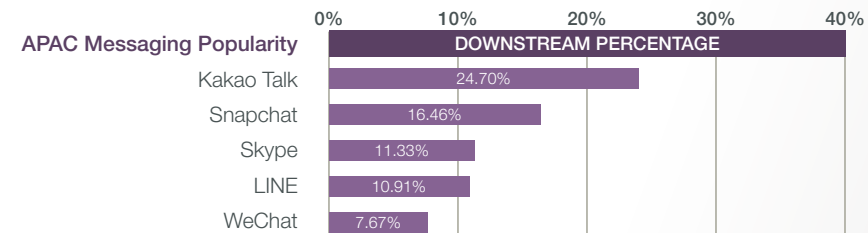
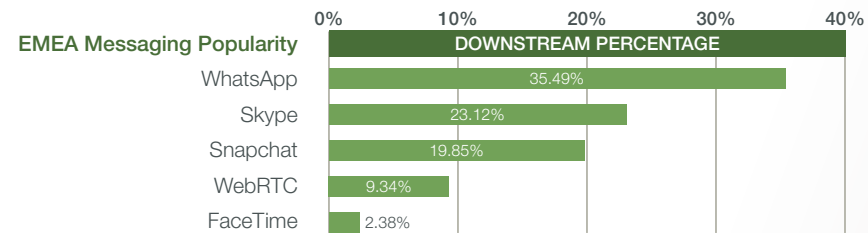
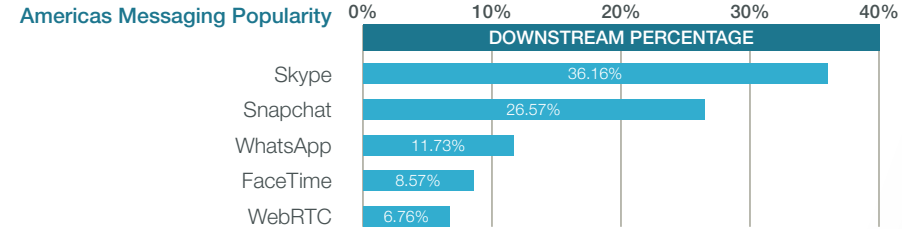
Messaging and VoIP applications have become staples of the consumer experience, for business and personal usage.

OTT applications that combine VoIP and “chat” are the clear market share leaders worldwide. Skype leads in downstream, WhatsApp in upstream, and Facebook Messenger in connections.

The traffic share for these applications combines the three different types of messaging into a single bucket per application – chat, voice, and video. This is why Skype, WhatsApp, Snapchat, and FaceTime are leading sources of downstream and upstream traffic share since video usage is very common among a sizeable user base.

WebRTC is #4 worldwide and in the top 10 as the leading “open protocol” for messaging. In addition to being used in Google Hangouts and Facebook Messenger, WebRTC is used in services like GoTo Meeting, Amazon Chime, and in major web browsers. The usage of WebRTC is growing rapidly worldwide, and it is definitely one we will be watching.

The rest of the top 10 begins to reflect not only regional messaging powerhouses, but also the globalization of messaging. Rounds, Line, WeChat, and KakaoTalk not only appeared in the global lists, but outside of their primary regions in the top 10 as well. Whether through students, expats, travellers, or people maintaining contact with family, the messaging traffic share reinforces the diversity theme that was discussed earlier in the Phenomena report.



GLOBAL AUDIO STREAMING TRAFFIC SHARE

1	SPOTIFY	33.07% ↓	24.21% ↑
2	SHOUTCAST	18.01% ↓	21.92% ↑
3	HTTP AUDIO STREAMING	16.94% ↓	32.40% ↑
4	TIKTOK (MUSIC.LY)	15.66% ↓	8.66% ↑
5	APPLE MUSIC	8.91% ↓	6.24% ↑
6	SOUNDCLOUD	2.34% ↓	1.52% ↑
7	DEEZER	1.65% ↓	0.73% ↑
8	GOOGLE PLAY MUSIC	1.40% ↓	0.63% ↑
9	PANDORA	0.92% ↓	1.13% ↑
10	TIDAL	0.70% ↓	0.23% ↑

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 an network operator.

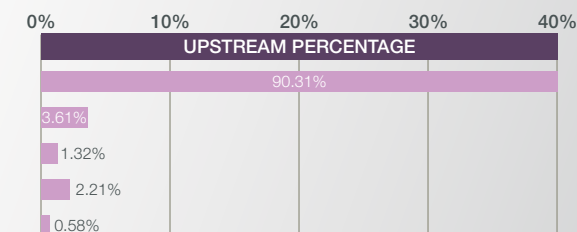
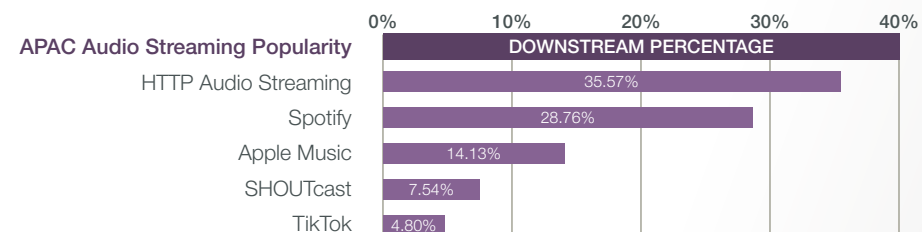
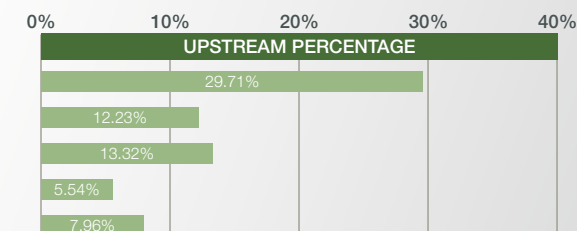
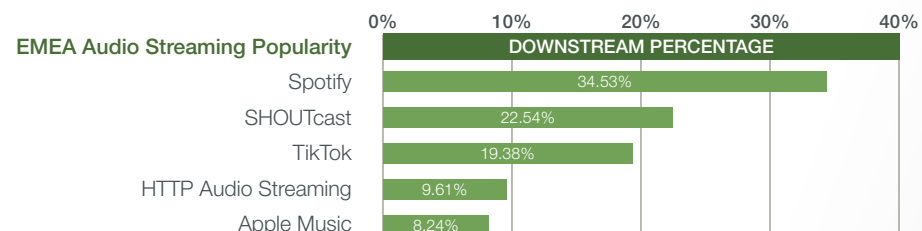
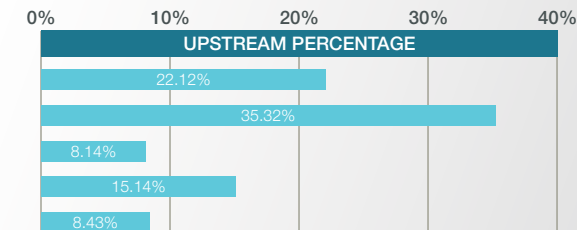
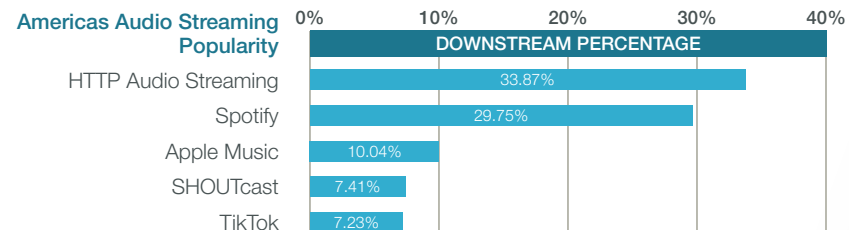
Spotify as the leading audio streaming resource is not a surprise with its worldwide popularity, as it not only ranks #1 worldwide, but is in the top 2 in each region.

SHOUTcast, HTTP Audio Streaming, and TikTok (specifically the Music.ly component) are all top sources of audio streaming that reflect the popularity of internet radio services (often directly from the station's app or web page).

Even though TikTok is video-centric, it is included with its focus on music, but not included is YouTube or Vimeo, both of which are often used to play music videos — even when the user is just listening to the music (many teenagers do this)!

Podcasts continue to be popular content, and both HTTP audio streaming and SoundCloud benefit from this, most noticeably on the upstream.

The rest of the rankings represent many of the more popular music streaming services. Apple Music, Deezer, Google Play Music, Pandora, and Tidal.



Spotify®

NULLSOFT
SHOUTcast



Tik Tok

APPLE MUSIC



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?

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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 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?

Although putting out the Phenomena report is only one of our contributions to the market, 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, here are some links (all recent Phenomena Blogs):

[Netflix is 15% of Downstream traffic](#)

[BitTorrent rules the Upstream](#)

[Alexa versus Siri](#)

[PlayStation versus Xbox Live](#)

[Ookla Speedtest](#)

[Crashlytics](#)

[Peloton](#)

[Tesla](#)