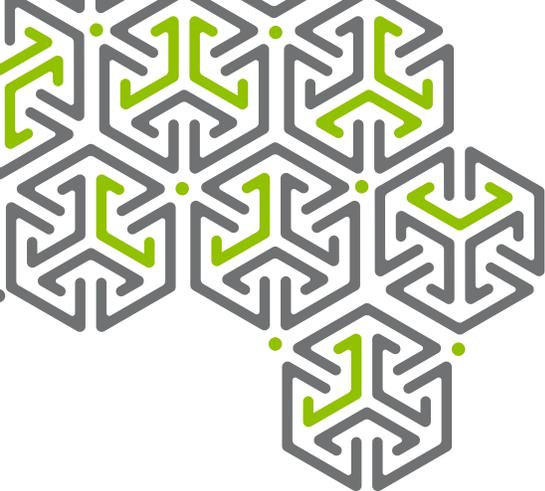




CONVIVA

Q1
2021

**Conviva's
State of
Streaming**



Conviva's State of Streaming – Q1 2021

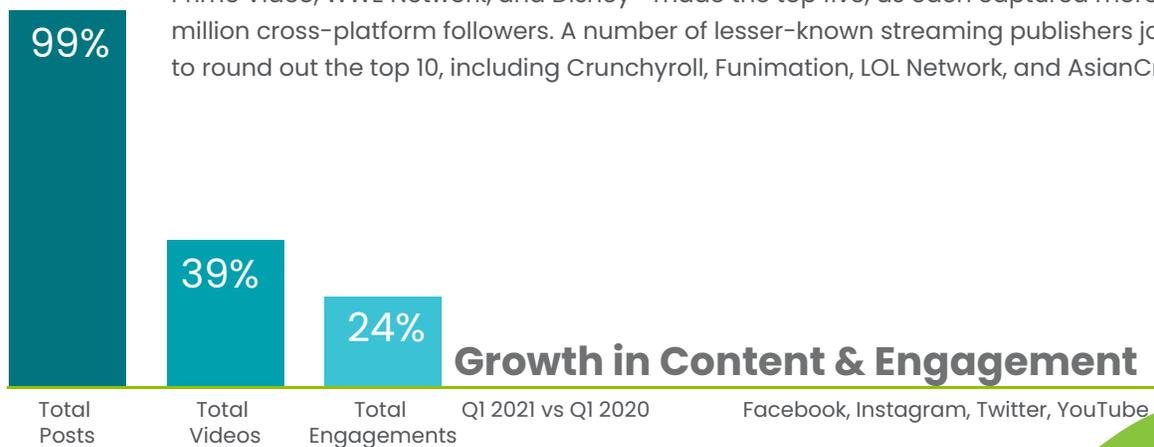
2021 came with some optimism for a return to normalcy but there might be a new normal for streaming. A new normal that sees big screens dominate viewing as people watch less on smaller, mobile devices. A new normal where social investment is paramount and the powerful confluence of social, streaming, and advertising can no longer be ignored. A new normal where viewers watch when it's convenient for them rather than following regularly scheduled programming live. While many trends continued in the first quarter of 2021, new directions appeared for the burgeoning industry.

- **Streaming continued to grow:** Global viewing time grew by 36% year over year led by South America, Europe, and Africa with triple-digit growth, while the more established streaming regions of North America and Asia saw moderate growth on larger denominators.
- **Big screens are here to stay:** Streaming on big screens accounted for 73% of global viewing time. While people are streaming more, they are at home on larger screens as smart TVs saw the biggest expansion of viewership with a 115% increase over Q1 of last year. In contrast, mobile phones, tablets, and desktops saw growth in line with the global average.
- **Roku's lack of international penetration:** While Roku captured a significant 30% share of global big screen viewing time, this dominance was primarily driven by North America where it commanded 37% share in Q1 2021. In Europe, the second largest market for Roku, Roku only accounted for 8% share of the big screen, and it did not fare any better in other regions, with 4% share or less in Africa, Asia, Oceania, and South America.
- **Streaming publishers' investment on social pays off:** Total social media posts by streaming publishers was up 99% over Q1 last year—with more content translating to more followers. The overall social audience was up 60% for streaming publishers like Netflix, Disney+, Hulu, and Crunchyroll, with TikTok a major factor in that growth.
- **Super ad lift:** The Super Bowl was again a massive television event and advertisers who activated their ads on social as well as during the big game had three times more engagement up to six weeks after the Super Bowl than they did pre-Super Bowl.

Streaming publishers reap big rewards on social media

Video is prime social content, so it's no surprise that streaming publishers have gone all in on social in new and exciting ways to kick off 2021. Total posts from streaming publishers on Facebook, Instagram, Twitter, and YouTube nearly doubled from Q1 of last year, up 99%, and publishers posted 39% more video content. While engagements dropped in many categories towards the end of Q4, streaming publishers saw success of their content-heavy strategy with total engagements up 24%.

The additional content didn't only increase engagement, it also boosted audience growth by 61% across Facebook, Instagram, TikTok, Twitter, and YouTube, with TikTok driving much of the growth for streaming publishers. Unsurprisingly, Netflix handily dominated the list of streaming publishers in terms of cross-platform total audience with 234 million followers across Facebook, Instagram, TikTok, Twitter, and YouTube as of Q1 2021. Apple TV, Amazon Prime Video, WWE Network, and Disney+ made the top five, as each captured more than 10 million cross-platform followers. A number of lesser-known streaming publishers join Hulu to round out the top 10, including Crunchyroll, Funimation, LOL Network, and AsianCrush.



61%

Growth in Audience

Q1 2021 vs Q1 2020



| | | |
|----|-------------|-------|
| 4 | WWE Network | 17.1M |
| 5 | Disney+ | 10.3M |
| 6 | Crunchyroll | 9.95M |
| 7 | Funimation | 9.90M |
| 8 | LOL Network | 9.87M |
| 9 | Hulu | 7.49M |
| 10 | AsianCrush | 6.18M |

Top 10 Streaming Publishers by Total Audience

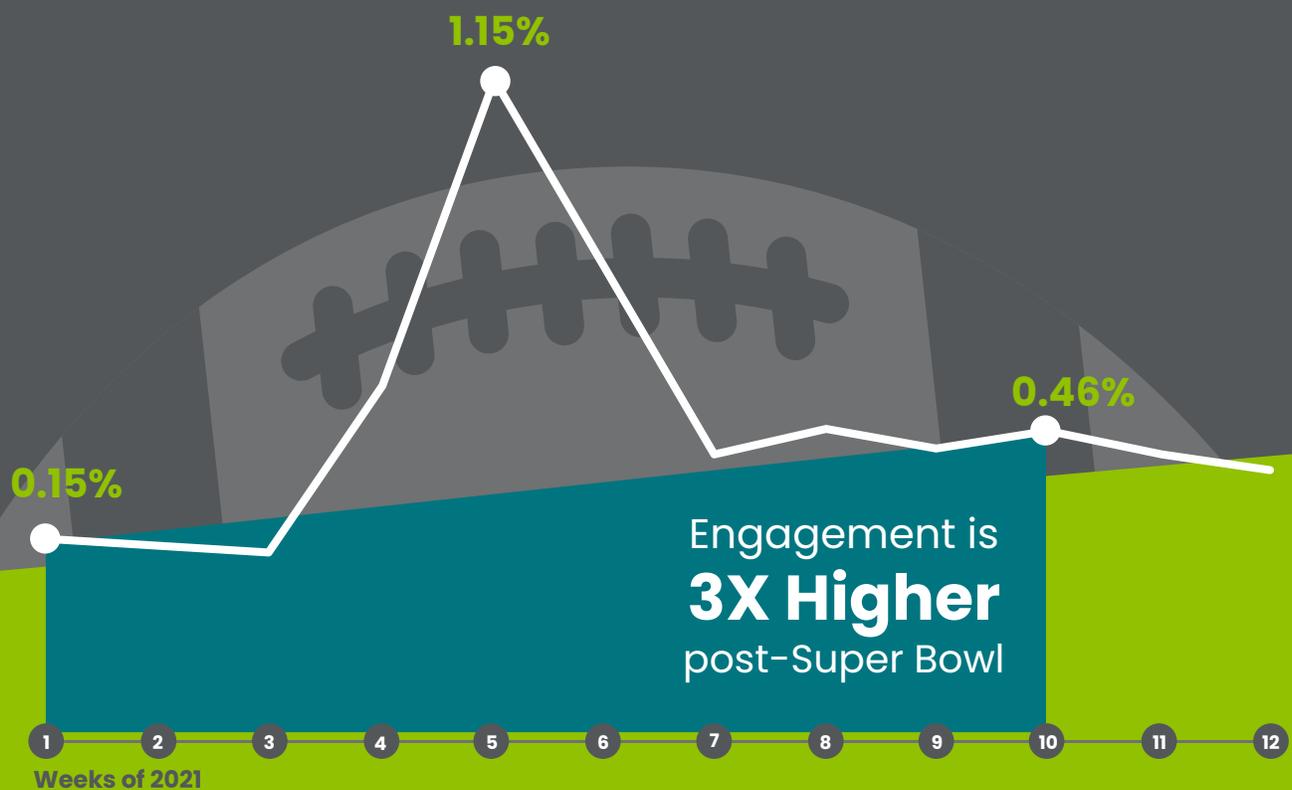
Facebook, Instagram, TikTok, Twitter, YouTube

Super Bowl advertisers see second life on social

Super Bowl ads, trailers, and teasers generated more than half a billion views across Facebook, Twitter, Instagram, and YouTube over the first 6 weeks of the year. More impressively, the lift in social engagement rate for the 60 Super Bowl advertisers we measured continued long after the big game, at three times higher than pre-game averages. Cross-platform engagement rate was .15% for Super Bowl advertisers in the first few weeks of 2021 before it peaked at 1.51% in the week leading up to the big game and dropped slightly to .95% during the week of the Super Bowl.

The average cross-platform engagement rate for all Super Bowl advertisers was .50% in Q1.

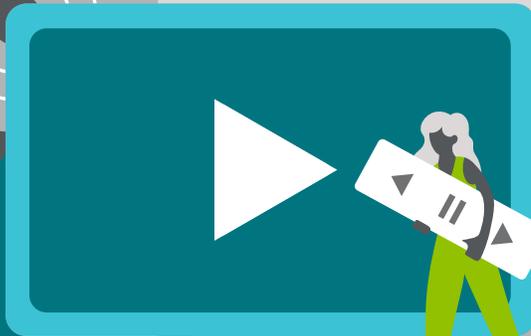
While it's expected that the advertisers who activated their Super Bowl ads heavily on social would see a bump around the big game, it's unexpected that the ads had such a sustained increase in average cross-platform engagement rate well after the game. Future Super Bowl advertisers should note the ROI of video content on social to increase engagement and build audiences even in the weeks following their Super Bowl ad.



The Super Bowl Advertising Lift

Tracking Average Social Engagement Rate for Super Bowl Advertisers in Q1 2021

Streaming advertising bounced back



| | Q1 2021 | QoQ Change |
|-------------------------|---------|------------|
| Ad Bitrate | 4.94 | 57% |
| Ad Start Time | 0.5 sec | -50% |
| Ad Buffering | 1.91% | 9% |
| Ad Duration | 28 sec | -11% |
| Missed Ad Opportunities | 28% | -16% |
| Ad Impressions | | 13% |
| Ad Attempts | | 4% |

Latest Range of SPI for Streaming Ads

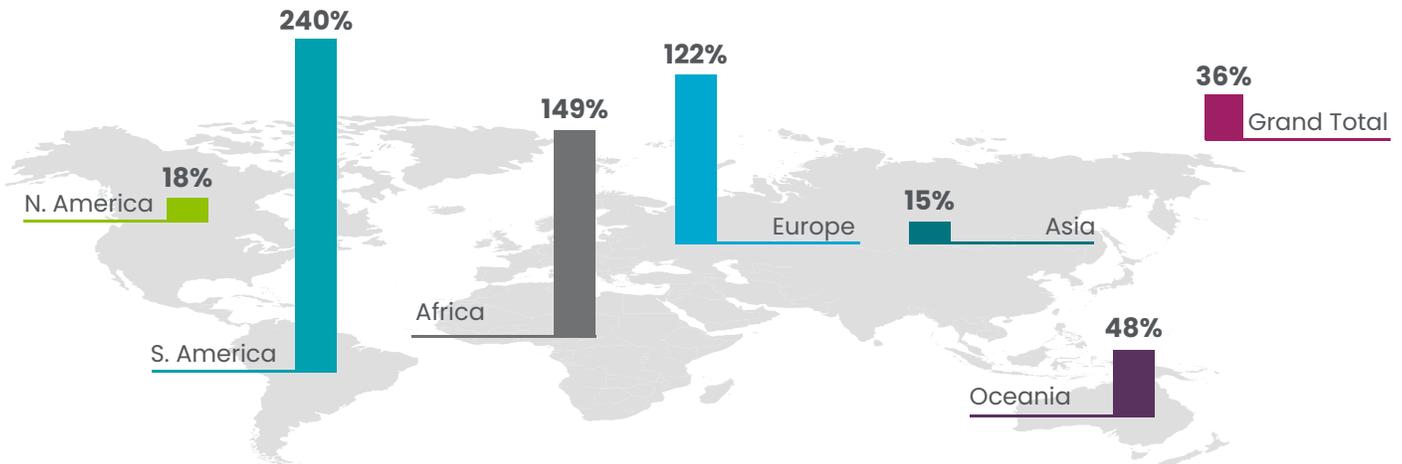


In more great news for streaming advertising this quarter, ad demand rebounded from the challenging second half of 2020 with improvements in quality and fewer missed opportunities, along with more ad attempts, up 4%, and ad impressions, up 13% from Q4 2020. Ad picture quality and ad start times delivered significant improvements of more than 50% higher bitrate and less time waiting for ads to start. Ad buffering was the lone quality metric to falter a bit with a 9% increase in buffering in Q1 2021 as compared to the previous quarter. Meanwhile, ad duration decreased 11% to 28 seconds, with more 15-second ads than the previous quarter.

There is more work to be done on the advertising front as publishers and advertisers continued to deliver a mixed bag in terms of ad quality. Conviva's Streaming Performance Index (SPI) for ads is a unified metric that rates what percentage of ad experiences were good for viewers. In our latest review of SPI for ads, scores varied between 45% and 81% for publishers. The SPI score considers buffering, bitrate, abandonment during the ad break, and excessive frequency defined as viewing the same ad more than three times per session. While SPI varies significantly across the different platforms, and live content consistently has a lower score, even the best is only delivering a good experience for viewers 81% of the time, while on the opposite end of the spectrum more than half of viewers are not having a good experience with ads.

Big screens dominate globally

As viewers flocked to streaming with time spent streaming up 36% globally year over year in Q1, it's no wonder that advertisers are making the shift as well, especially as the uncertainty felt throughout the pandemic has begun to lift. Impressive triple-digit gains continued again in Q1 in multiple regions, spurred by new streaming providers driving significant viewing internationally. In Q1 2021, South America saw a 240% increase in time spent streaming, followed by Africa, up 149%, and Europe with a 122% increase over last year. The more established streaming markets of North America and Asia both had comparatively meager growth in time spent at 18% and 15%, respectively.



Growth in Viewing Time by Region

Q1 2021 vs Q1 2020

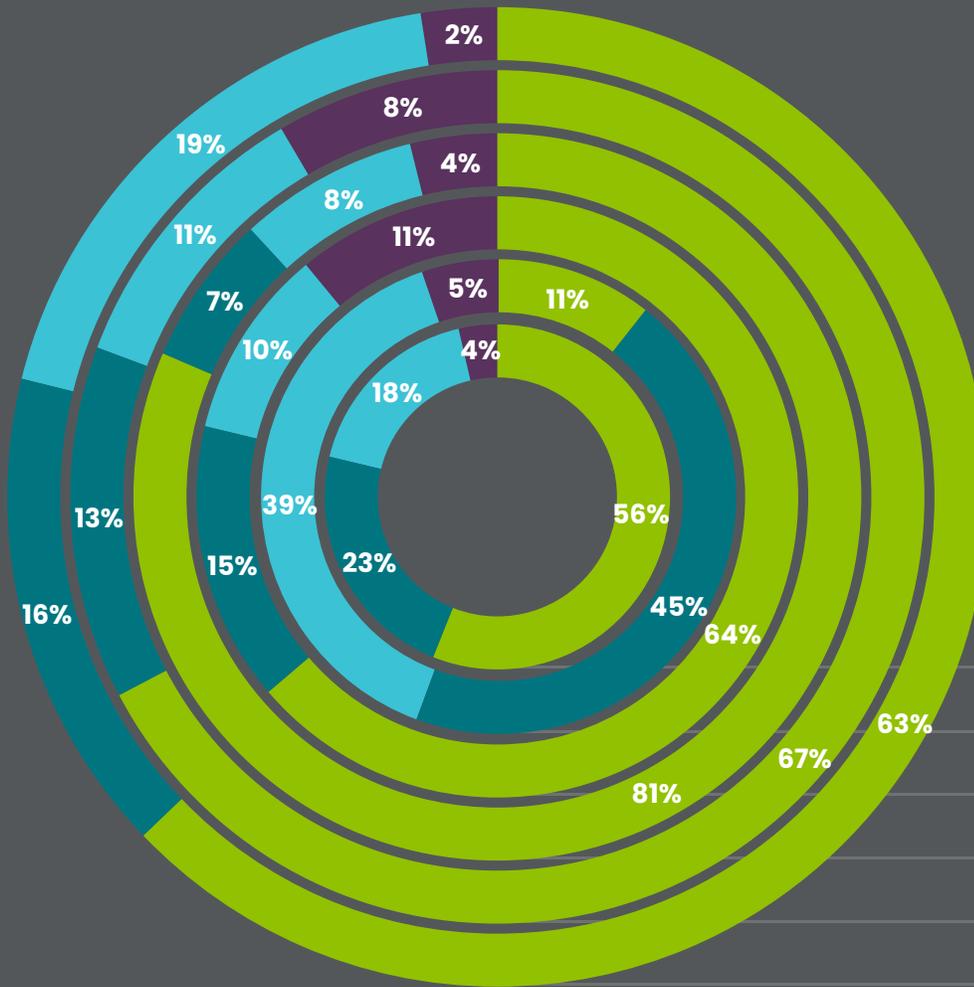
In nearly every region, big screens dominated streaming as connected TV devices, smart TVs, and gaming consoles captured the lion's share of viewing time. Big screens were most dominant in North America capturing a massive 81% share, however in most regions big screens accounted for at least 50% of all viewing time. At the opposite end of the spectrum, big screens captured just 11% share of viewing time in Asia while desktop and mobile phones dominated with a combined 84% of viewing time.

Diving deeper into the big screen devices that made up so much of the world's viewing time, the diversity in preferred devices was strikingly different regionally. While Roku captured a significant share of global viewing time, this dominance was primarily driven by North America where it commanded 37% of big screen viewing time in Q1 2021. In the second largest market for Roku, Europe, the company only accounted for 8% share of the big screen, trailing a number of other devices including Samsung with 19%, Chromecast with 12%, Amazon Fire TV with 10%, LG TV with 10%, and Android TV with 9%. Roku does not fare any better in other regions, with 4% share or less in Africa, Asia, Oceania, and South America. Some interesting leaders emerged as the top big screen device in different regions including the CanalPlus set top box with 54% share of viewing time in Africa, Android TV's 49% share in Asia, Chromecast in Oceania with 24%, or Samsung TV in South America at 30% share in Q1 2021.

Share of Viewing Time by Region

Q1 2021 vs Q1 2020

- Big Screen
- Desktop
- Mobile
- Tablet



Africa

Asia

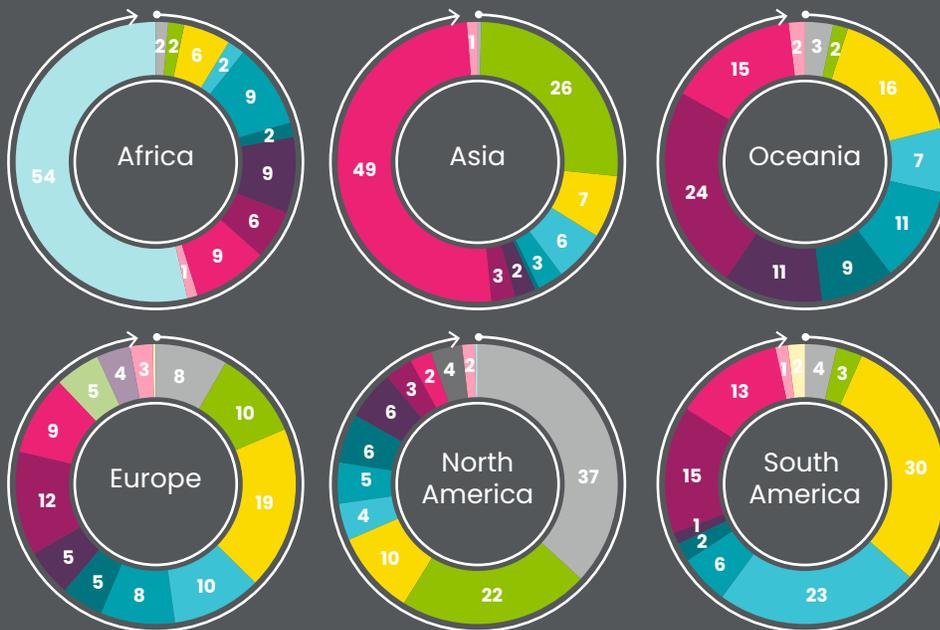
Europe

N. America

Oceania

S. America

% of Big Screen



- Roku
- Amazon Fire TV
- Samsung TV
- LG TV
- PlayStation
- Xbox
- Apple TV
- Chromecast
- Android TV
- Vizio TV
- Humax
- SkyQ
- Other
- Linux
- CanalPlus

Regional quality variance

While moderate, overall quality of the experience improved globally with 13% higher picture quality, 5% less video start failures, and 5% less time waiting for buffering, as start time held steady. Overall, improvements in quality typically result in viewers engaging for longer amounts of time and this remained true as minutes per play increased by 5% to an average of 20.8 across all regions.

To be expected, quality varied across regions. All regions except Asia delivered a year-over-year increase in minutes per play, decrease in video start time, and decrease in buffering. Where Asia declined, Africa made the biggest year-over-year improvements in all key metrics except video start failures, where it was actually the worst. Africa also lagged in almost every metric when comparing each region in Q1 of 2021. Conversely, North America had the lowest video start failures and least buffering, while Asia had the lowest video start time and Oceania had the best bitrate. Europe had the highest minutes per play at 23.7 in Q1.

Quality by Region

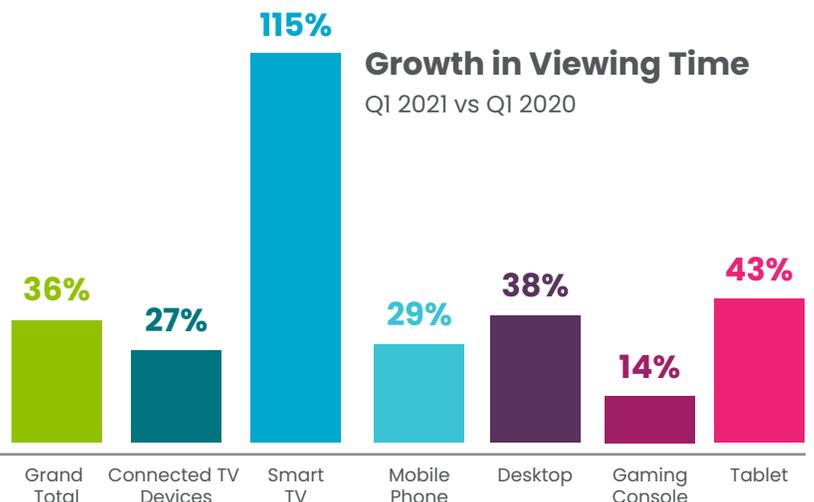
Real Time Global Region Filters Metrics Q1 2021 vs Q1 2020

| | Minutes / Play | | Video Start Failures | | Video Start Time | | Buffering | | Bitrate | |
|-------------|----------------|------|----------------------|------|------------------|------|-----------|------|-----------|------|
| Africa | 9.9 | 176% | 3.88 % | 24% | 6.83 sec | -15% | 1.92 % | -63% | 6.74 Mbps | 206% |
| Asia | 10.9 | -6% | 0.56 % | -35% | 2.67 sec | 7% | 1.30 % | 30% | 1.97 Mbps | 10% |
| Europe | 23.7 | 12% | 1.24 % | -14% | 3.78 sec | -3% | 0.31 % | -31% | 6.89 Mbps | 58% |
| N. America | 21.8 | 4% | 0.44 % | -18% | 4.41 sec | -1% | 0.25 % | -13% | 6.71 Mbps | 7% |
| Oceania | 20.4 | 8% | 1.18 % | -25% | 4.88 sec | -5% | 0.33 % | -29% | 9.16 Mbps | 21% |
| S. America | 19.0 | 59% | 2.88 % | -18% | 6.25 sec | -8% | 0.84 % | -29% | 4.67 Mbps | -29% |
| Grand Total | 20.8 | 5% | 0.70 % | -5% | 4.24 sec | 0% | 0.34 % | -5% | 6.55 Mbps | 13% |

YoY YoY YoY YoY YoY YoY

Big screens are here to stay

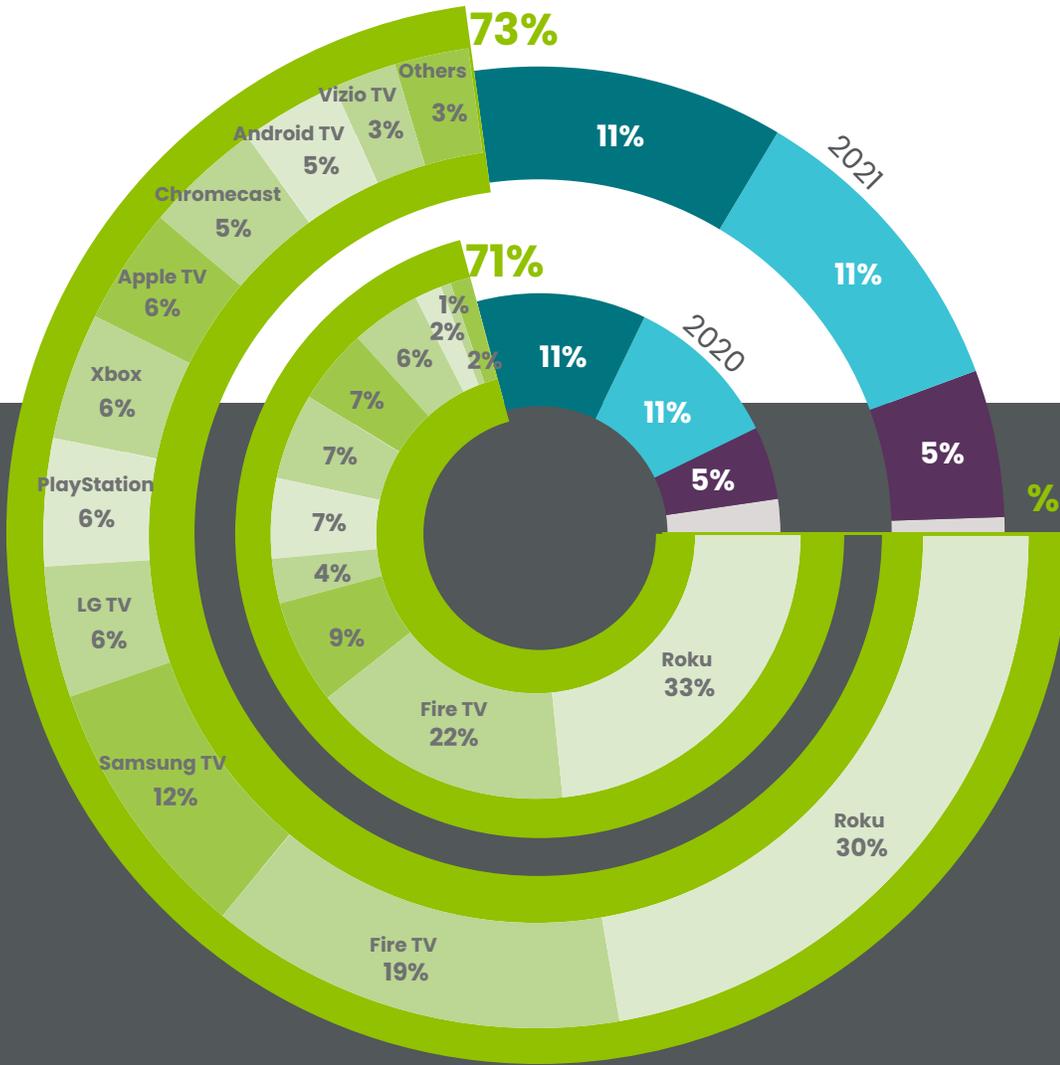
Smart TVs engaged viewers with the biggest expansion of time spent over Q1 of last year with a 115% increase, while tablets followed with an increase of 43%, and desktops rounded out the top three with 38% more viewing time to beat the 36% global average. Growing less than the average, mobile phones were up 29% in time spent streaming, connected TV devices up 27%, and gaming consoles up just 14% over the span of a year.



Global Share of Viewing Time

Q1 2021 vs Q1 2020

- Big Screen
- Mobile
- Desktop
- Tablet
- Others



% of Big Screen

| Others<1% Share | 2021 | 2020 |
|-----------------|-------|-------|
| Xfinity X1 | 0.9 | 0.01 |
| Humax | 0.8 | 0.8 |
| SkyQ | 0.6 | 0.1 |
| Other | 0.4 | 0.4 |
| Linux | 0.3 | 0 |
| Sagemcom | 0.2 | 0.2 |
| CanalPlus | 0.1 | 0 |
| Philips TV | 0.1 | 0.1 |
| Huawei | 0.041 | 0.003 |
| Panasonic TV | 0.038 | 0.029 |
| Sony TV | 0.037 | 0.027 |
| TiVo | 0.033 | 0.074 |
| Hisense TV | 0.004 | 0.001 |
| YouView | 0.002 | 0.008 |
| Netgem | 0.001 | 0.001 |

Streaming on big screens accounted for a massive 73% of viewing share in Q1 2021, up from 71% share the previous Q1. While people are streaming more, more and more, they are at home on larger screens. When it comes to which big screens led the pack in Q1 2021, it was definitely Roku with more than 30% share of global big screen viewing time, although this is the result of a strong North American streaming market today. International growth of streaming overall, in regions where other players dominate, resulted in Roku’s 2.9% drop in share from the previous Q1. Amazon Fire TV, which also decreased in global share from last year, maintained a solid second place with nearly 19% share of big screen viewing time. While native smart TVs commanded less global share, Samsung TV, LG TV, and Vizio each experienced significant growth over the past year to grow their share to 12%, 6%, and 3% respectively.

Devices return mixed quality improvements

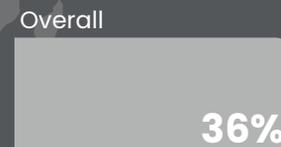
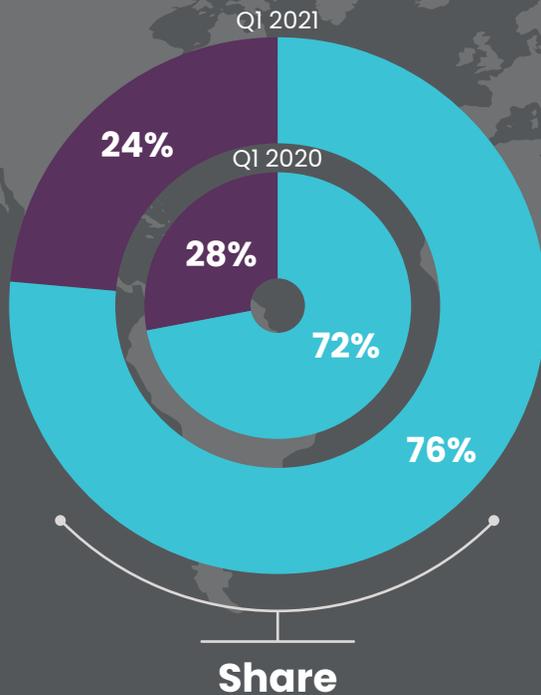
Big screens historically have more stable, higher quality. Case in point, smart TVs improved in every quality metric and also had by far the highest picture quality with a bitrate of 8.35 in Q1 2021. While connected TVs experienced some declines in quality over the last year, they still delivered the least video start failures of any device and captured most minutes per play. Gaming consoles continued to impress with the least buffering of any device at 0.14% in Q1 2021 after a significant 36% improvement over the past year.

Mobile remained static in video start time but declined in overall quality with 5% more video start failures and 10% worse buffering year over year to top all devices at .96% buffering rate. It was also the only device to decline in minutes per play, down 2% to just 9.1 minutes on average. Tablets delivered improvements in all quality categories but still tallied the most video start failures of any device at 1.38%. Desktop improved in most categories, but video start time increased 15% for the worst performance at 4.84 seconds in Q1.

| | Min/Play | Video Start Failures | Video Start Time | Buffering | Bitrate |
|--|------------------|----------------------|-------------------|---------------------|-------------------|
|  Overall | 20.8 5% | 0.70% -5% | 4.24 0% | 0.34% -5% | 6.55 13% |
|  Connected TV Devices | 29.0 2% | 0.44% 11% | 4.35 -4% | 0.23% 5% | 7.11 9% |
|  Smart TV | 27.3 3% | 0.53% -16% | 4.70 -3% | 0.19% -18% | 8.35 9% |
|  Mobile Phone | 9.1 -2% | 0.83% 5% | 3.55 0% | 0.96% 10% | 3.55 6% |
|  Desktop | 15.9 20% | 0.84% -20% | 4.84 15% | 0.61% -5% | 2.96 13% |
|  Gaming Console | 25.9 2% | 0.59% 11% | 4.10 -9% | 0.14% -36% | 7.19 6% |
|  Tablet | 16.0 4% | 1.38% -11% | 3.82 -1% | 0.44% -5% | 5.64 21% |

Global Viewing Time

Live vs On Demand



Growth

Global Quality Q1 2021

| | Minute/Play | Video Start Failures | Video Start Time | Buffering | Bitrate |
|-----------|-------------|----------------------|------------------|-----------|-----------|
| Live | 19.6 | 0.64% | 4.54 sec | 0.35% | 7.04 Mbps |
| On-Demand | 25.7 | 0.92% | 2.94 sec | 0.34% | 4.95 Mbps |

On-demand and live streaming get big boosts

Overall growth over the last year was 36%, as on-demand content grew much faster with an almost 45% increase, while live streaming was up 14%. On demand now accounted for more than three quarters of all time spent streaming in Q1 with 76% share to live's 24% share.

When it comes to quality, live streaming is technically very challenging, but the stakes are often higher for a good experience. Sports is a main driver of live content and there's nothing worse than a quality breakdown in the middle of a touchdown. Head-to-head quality comparison put live on top in two of the key experience metrics, buffering and video start time, while live also captured significantly more minutes per play at 25.7 versus 19.6 for on demand. On demand won in video start failures at just 0.64% and a much higher bitrate at 7.04 versus live streaming's 4.95.

Things aren't back to normal just yet

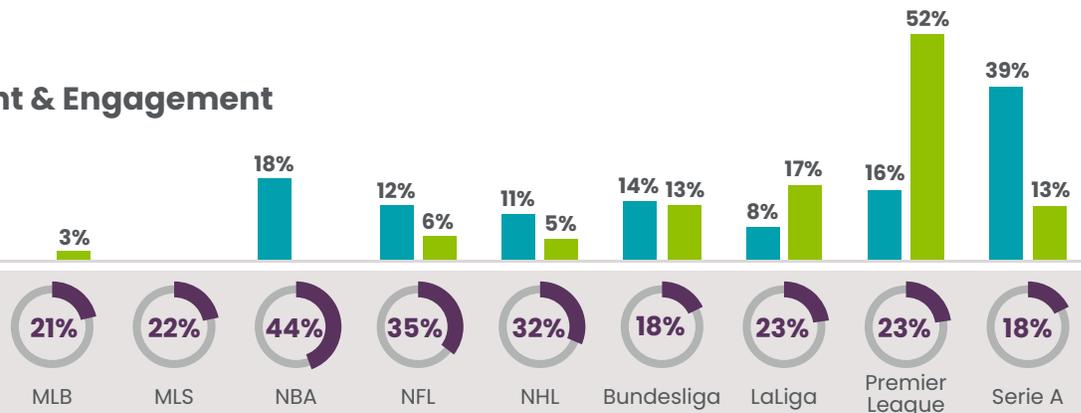
The first quarter of 2020 saw sports provide the last few normal moments before the pandemic caused sweeping changes in everything from programming to attendance to promotion. It is interesting to see then where sports leagues are a year later. A number of leagues have been able to not only recover from the mid-pandemic lows, but also thrive. The Premier League teams tallied a 52% increase in total engagements, even with just a 16% increase in posts. They weren't alone in their success, all European leagues, including Bundesliga, La Liga, Premier League, and Serie A, saw increases in engagement and posts created from their teams.

North American leagues were a bit more volatile. While the NFL and NHL grabbed increases in both posts, up 12% and 11%, and engagements, up 6% and 5%, other American leagues didn't fare so well. MLS teams saw the largest decrease in both total average posts, down 44%, and total engagements, down 54%. The MLB was the only league to chart a decrease in posts, down 19%, with an increase in engagements, up just 3% year over year. Despite increasing posts by the most of any league, NBA teams saw a 10% decrease in engagements. In parallel with stadiums beginning to allow a trickle of fans back in the stands, it might also be a few more quarters until things are running as they once were on social.

Increase in Content & Engagement

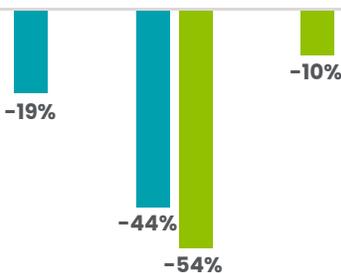
Q1 2021 vs Q1 2020

■ Total Posts
■ Total Engagements



Share of Video on Social

■ Video Only
■ Other Type of Post

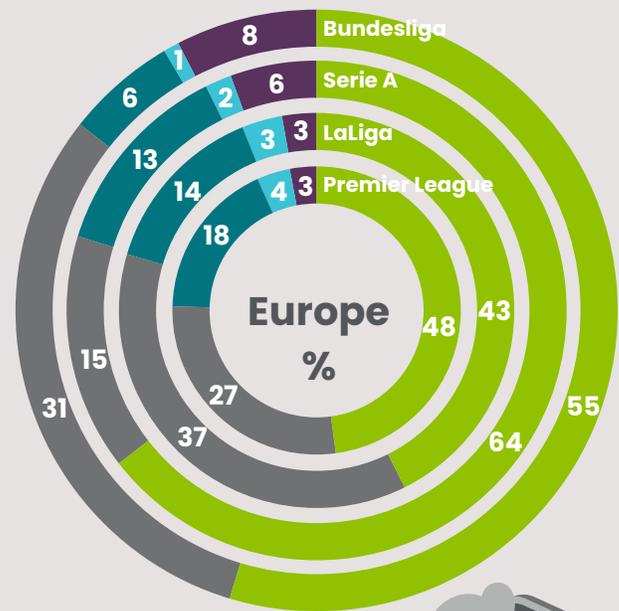
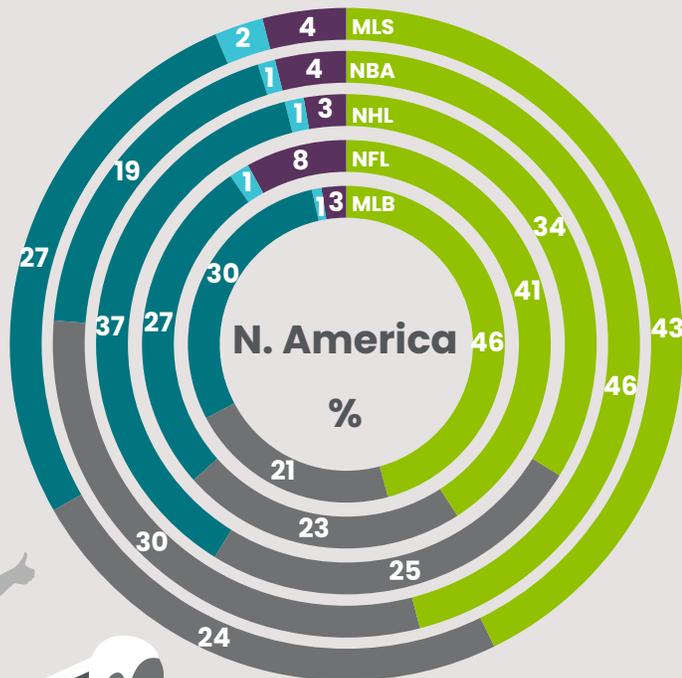


Social video creates magic for some sports leagues

Video is an important part of any brand's strategy on social media and can be even more critical for sports franchises as they promote highlights, players, and fans. In Q1 2021, NBA teams posted a far higher share of

Facebook, Instagram, Twitter, YouTube

videos, at 44% of total posts, than any other sports league measured. The NFL came in second at 35%, followed by the NHL at 32%, while MLS and MLB relied less on video at 22% and 21% respectively. Comparatively, European leagues posted fewer videos than North American leagues with 23% of Premier League and La Liga's posts as videos and Serie A and Bundesliga at just 18%. As different sports have varied highlights and ways of commenting live during games, it's interesting to note the reliance on video and potential for teams to optimize by post type depending on their social strategy.



Social Sports Audience

Share of Followers by Platform for Sports Leagues

Q1 2021

- Facebook
- Instagram
- Twitter
- YouTube
- TikTok

Sports league audiences shift on social media

Social audience has shifted. A large factor is the growing prominence of TikTok. In Q1 of 2020, TikTok accounted for only 1% of total sports audiences; this year, that grew to 4%. With the largest share of any North American league, NFL won on TikTok which represented 8% of NFL teams' total social audience in Q1. In Europe, Bundesliga holds that title as TikTok also captured 8% share of audience for those teams.

For more established platforms, Facebook maintained a clear dominance in terms of total average audience for nearly all leagues. In Q1, the NHL was the only league to have a larger average Twitter audience, at 37% share, than Facebook at 34% share. Serie A had the highest average percentage audience share of Facebook audience at 64%. La Liga had the highest average share of Instagram followers per team at 37%, and the NBA

came in second on Instagram netting a 30% share of audience there in Q1.

The North American leagues dominated Twitter as the NHL, MLB, MLS, NFL, and NBA all landed more audience on the platform than their European counterparts. The NHL topped audience share with 37%, followed by MLB at 30%, then MLS and NFL both at 27%.

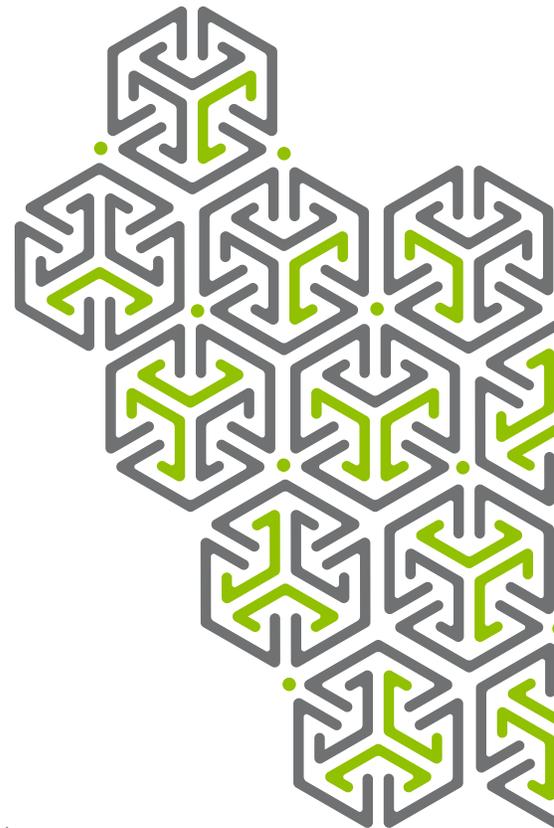
The Premier League teams utilized YouTube the most, charting a 4% share of audience on the platform, up 1% from the previous year. While 4% might not seem like a large number, Premier League teams averaged 1.1 million subscribers on YouTube. La Liga came in second on YouTube audience share with 3%, followed by Serie A at 2%.

Conclusion

As we get our first glimpse of the year-over-year pandemic impact, it is clear that consumer interaction with streaming, advertising, and social media have been altered by the course of the past year. It is almost inconceivable to imagine what the world would have looked like under similar circumstances in some other time. Without the flexibility of streaming as people escaped to different rooms and into different worlds via their devices. Without the virtual interaction on social media that provided a creative outlet, a way to connect across distances. These pandemic lifelines have become fixtures of our daily lives, and show no signs of subsiding as the world inches towards a new normal in 2021.

Methodology

Data for Conviva's State of Streaming report was primarily collected from Conviva's proprietary sensor technology currently embedded in 3.3 billion streaming video applications, measuring in excess of 500 million unique viewers watching 180 billion streams per year with 1.8 trillion real-time transactions per day across more than 180 countries. Year-over-year comparisons were normalized at the customer level for accurate representations of industry growth. The social media data consists of data from over 900 accounts, over 1.8 million posts, 910 thousand videos, 6 billion video views, and over 35 billion engagements across Facebook, Instagram, TikTok, Twitter, and YouTube.



Q1 2021

Conviva's
State of
Streaming



About Conviva

Conviva is the intelligence cloud for streaming media. Powered by our patented Stream Sensor™ and StreamID™, our real-time platform enables marketers, advertisers, tech ops, engineering and customer care teams to build, engage and monetize their audiences. Conviva is dedicated to supporting brands like CCTV, DAZN, Disney+, Hulu, Paramount+, Peacock, Sky, Sling TV, TED and WarnerMedia as they unlock the incredible opportunity in streaming media. Today our platform processes nearly 2 trillion streaming data events daily, supporting more than 500 million unique viewers watching 180 billion streams per year across 3.3 billion applications streaming on devices. Conviva ensures digital businesses of all sizes can stream better—every stream, every screen, every second.

Any Questions?

Visit www.conviva.com or contact Conviva at pr@conviva.com.