



# Conviva's All-Screen Streaming TV CENSUS REPORT Q2 2018

Measuring the Quantity and Quality of Streaming Video

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## *Measuring the Quantity and Quality of Streaming Video*

Conviva is the real-time measurement and intelligence platform for many of the world's largest streaming TV publishers. In North America, Conviva measures four out of the top five vMVPDs (Statista), and five out of the top 10 SVOD providers (Parks Associates). Globally, on an annualized basis, the Conviva sensor is installed in 3 billion streaming video applications for over 200 brands. This represents the largest multi-publisher, independent census data collection and measurement network in the world. The data in this report is a fully anonymized census measuring every second of every stream from Conviva's customer base between April 1 and June 30, 2018 (or, Q2 2018), and comparing it to the data from the same time period last year, Q2 2017.

The data captured in the following report will cover QUANTITY & QUALITY as it relates to the industry's streaming data for the quarter – **quantity** metrics like the number of streams played, viewing hours, devices, and regions, as well as **quality** metrics like video start time, buffering time, and bit rate. These metrics are the key KPIs for the world's largest streaming TV providers looking to deliver perfect streaming experiences for their viewers. The content Conviva measures includes movies, episodic TV shows, live linear television, and live sports.

In Q2 2018, Conviva's continuous measurement, all-screen census confirmed three important trends:

1. **Content consumption more than doubled over the last 12 months.** Growth across all key KPI's proved a very healthy appetite among consumers for streaming TV.
2. **The device landscape continues to evolve towards mobile and connected TVs.** The data showed a continued shift away from PCs and towards smartphone and tablet devices, especially for short-form content. Meanwhile long-form content has swung decidedly towards larger screens and connected TV platforms – especially those which connect to TVs externally.
3. **The quality of the streams delivered continues to improve** demonstrating a dedication from all ecosystem partners to improve the viewer experience and drive engagement growth. Nevertheless, with geographical variation such as North America and Europe improving across the board while Asia lags behind in both picture quality and buffering, it's clear that additional improvements are possible and would yield higher engagement and monetization for publishers and distributors alike.

## PART I: QUANTITY

The primary metrics streaming TV publishers use to measure the growth of their audience and business include:

- **Total Unique Devices:** The number of publisher-branded applications found across unique devices. This is a measure of the unique audience size.
- **Peak Concurrent Plays:** The peak number of simultaneous active sessions at any given second. This is a real-time measure of the audience scale (concurrency).
- **Plays:** The total number of times a viewer successfully starts a video stream.
- **Viewing Hours:** The total number of hours of video content streamed from all plays. This measure is most indicative of the size of the streaming market.

### QUANTITY OVERVIEW

METRIC	Q2 2017	Q2 2018	% INCREASE
Total Unique Devices	672,333,972	973,424,032	45%
Peak Concurrent Plays	3,657,016	7,966,302	118%
Plays	8,517,589,810	17,203,553,254	102%
Viewing Hours	2,569,034,513	5,515,374,166	115%
Attempted Plays	10,307,957,539	20,328,028,609	97%

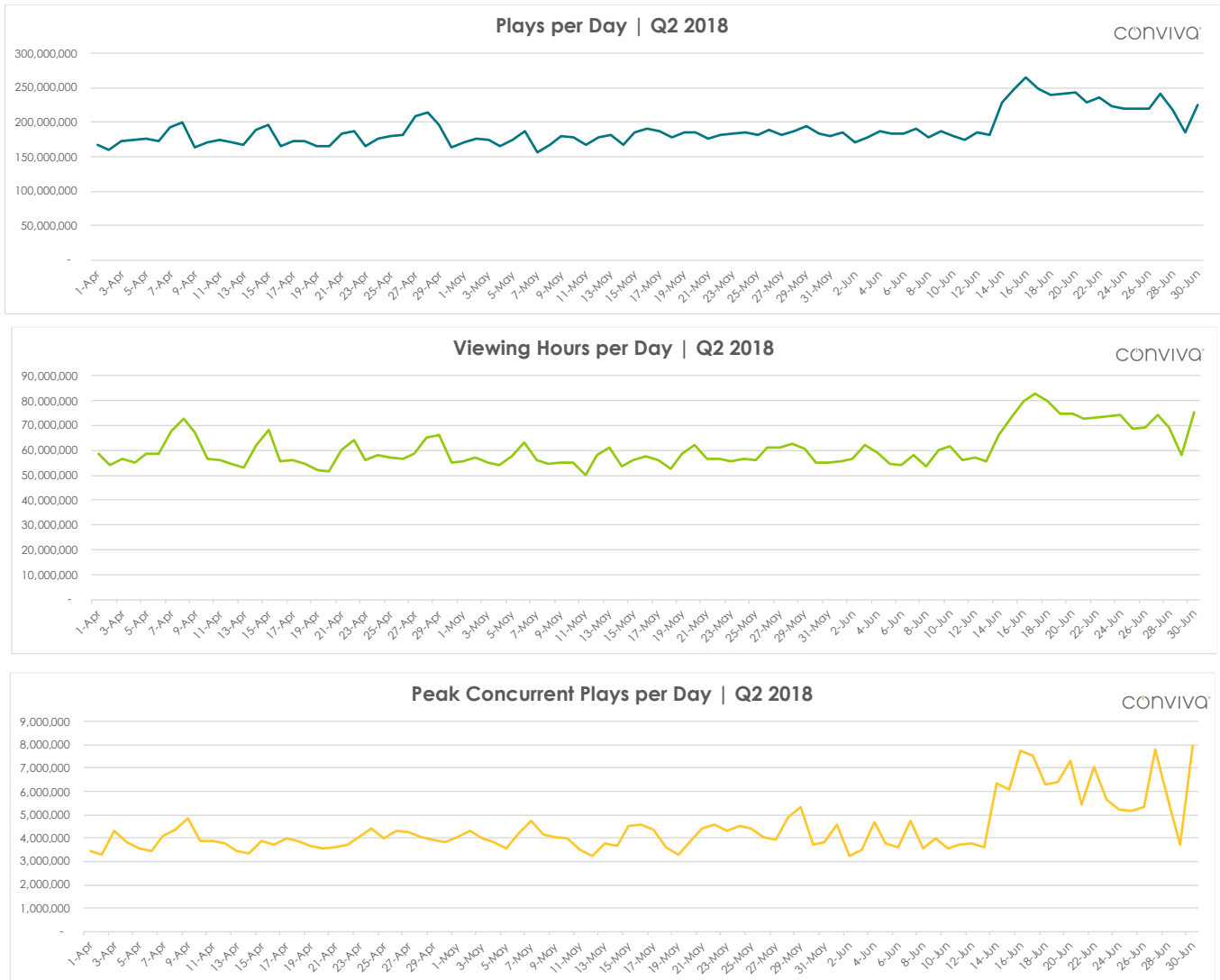
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Across the board, Conviva KPIs showed that **streaming TV consumption more than doubled YoY**. In Q2 2018, **viewing hours increased by 115%** as compared to the same period last year indicative of impressive market growth, as represented by Conviva's customer base. Another indication of the growth in streaming TV is the impressive increase Conviva saw in peak concurrent plays, as **7.9 million people tuned in during the World Cup**, which amounted to **118% growth in peak concurrency** from the same time period last year. Even when excluding the World Cup, peak concurrency in Q2 2018 was up by 45% YoY, spiking to 5.3 million concurrent plays during the winner-take-all 7<sup>th</sup> game of the NBA Western Conference Finals.

These spikes demonstrate that sports continue to drive “appointment TV” – even in the streaming TV space. This has significant implications for the leagues, publishers, and advertisers – all of which should expect to derive incremental value from these types of events as they grow over time. Of course, these events also create massive loads on the video delivery ecosystem, which must continue to improve in order to meet growing demand.

The following graphs show the day-to-day variation in plays, viewing hours, and peak concurrent plays during Q2 2018. There is a visible correlation between the three graphs and the start of the World Cup which ran from mid-June into Q3 (read more about it in Conviva's [World Cup blogs](#)). The group stage of the World Cup (June 14-28) saw the highest total daily engagement as World Cup fever kicked off with 3-4 games per day. **Plays were 31% higher** during this two-week period as compared to the rest of the quarter, averaging 235 million plays. Once the World Cup moved into the knockout stage on June 30, total engagement was down slightly due to fewer scheduled games, but concurrency was up, ballooning to 7.9 million during the France vs. Argentina game. Though it occurred in Q3, it is worth mentioning that the final game between

France and Croatia on July 15 drove a **peak concurrency of 9.12 million plays**, shattering previous records.



Conviva's customer base spans the globe and represents some of the world's largest streaming TV publishers. Mirroring many other industry reports, Conviva's data aligns with findings that North America remains the largest and fastest growing market, showing YoY growth in both **plays at 124%** and **viewing hours at 139%**. Asia's growth is another to note, as the growth in plays soared YoY by **63%**, but with modest growth of 22% in viewing hours. According to Conviva's [Secret Life of Streamers, Part II study](#), when looking at mobile only, China, which drives much of Asia's traffic, had one of the lowest percentages of long-form viewing at 8%, compared to 14% short-form and 16% live event viewing. The preference towards short-form content could account for the lower YoY growth as compared to plays.



CONTINENTS	PLAYS		VIEWING HOURS	
	Y/Y % GROWTH	Q2 2018 % of TOTAL	Y/Y % GROWTH	Q2 2018 % of TOTAL
North America	124%	61%	139%	69%
Asia	63%	24%	22%	15%
Europe	28%	13%	32%	15%
RoW	33%	3%	90%	1%

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North America, Europe, Asia, and Rest of World (RoW) are noted above. RoW includes the rest of the seven continents: Oceania, South America, Africa, and Antarctica.

When looking at apps versus browsers in the table below, apps clearly dominate with faster growth and a larger share of both total plays and viewing hours. This supports the theory that app-based environments offer a better user experience as compared to browsers. Nevertheless, viewing hours (31%) are growing slightly faster than plays (19%) within browsers while the opposite is true with apps (127% vs 159%). This is likely due to the broader scope of short-form content and search capabilities available on the web versus the limited catalogs and app-specific searches on video-centric apps. Thus, publishers will want to continue to support their browser-based experiences, which offer a critical path for many viewers to explore and try new content.

APP vs. BROWSER	PLAYS		VIEWING HOURS	
	Y/Y % GROWTH	Q2 2018 % OF TOTAL PLAYS	Y/Y % GROWTH	Q2 2018 % OF TOTAL VH
In-App	159%	66%	127%	72%
In-Browser	19%	34%	31%	28%

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One of the most interesting aspects of streaming TV in 2018 is the diversity of devices viewers can use to stream video. Conviva classifies devices into three groups: mobile (smartphone & tablet), desktop computers (PCs), and TVs (internet-connected TV devices that allow streaming). Overall, **all groups experienced growth except PCs which saw a decline in plays, but not in viewing hours.**

**In terms of share of total plays, mobile devices lead the way with 49% of all plays,** followed by TVs and PCs at 27% and 24% respectively. The shift away from PCs and to mobile is unmistakable when comparing this data to Q2 2017 when mobile had a 39% share of plays while PCs had a 38% share. Among connected TV platforms, **Roku continues to emerge as a leader with nearly 8% of all plays,** while **Sony's PlayStation and Google's Chromecast experienced the fastest YoY growth, both north of 150% YoY.**

When breaking down the same classification by viewing hours, mobile only accounted for 29% of the total, while TVs and PCs accounted for 51% and 20% respectively. This highlights how consumers continue to prefer a larger screen to consume long-form episodic content and movies. When considering viewing hours instead of plays, the shift away from PCs is less drastic.

The share of viewing hours on PCs dropped 6 percentage points from 26% in Q2 2017 to 20% in Q2 2018 (vs 14pp in terms of plays). Most of the **shift in viewing hours seems to have transitioned to connected TVs** which gained 4 percentage points over the same time period. That comes in spite of declines in share from Samsung and other TV platforms, which lost share to devices like Apple TV, Roku, and PlayStation. In fact, **Roku devices accounted for a staggering 22% of viewing hours** in Q2 2018 leading all connected TV devices, with **Amazon's Fire TV experiencing the fastest growth at 140%**.

Overall, viewers continue to prefer mobile devices for consuming short-form content and connected TVs for consuming long form programming. PCs are losing share to mobile devices, while **among connected TV platforms, Samsung and other TV platforms are losing ground to Roku, Google's Chromecast, Sony's PlayStation, and Amazon's Fire TV.**

## PLAYS & VIEWING HOURS BY DEVICE | Q2 2018

Screen Type	Device Type	PLAYS		VIEWING HOURS	
		% of Total	Y/Y % Growth	% of Total	Y/Y % Growth
PC	Mac, Chrome, Windows	24.5%	-7.6%	20.5%	8.1%
SMARTPHONE / TABLET	Android	28.0%	86.5%	17.0%	45.2%
SMARTPHONE / TABLET	iOS	20.8%	72.8%	12.0%	47.3%
TV	AppleTV	4.1%	96.8%	6.1%	64.5%
TV	Chromecast	1.8%	153.9%	3.3%	101.7%
TV	FireTV	1.9%	106.5%	3.4%	139.8%
TV	Other TV	1.4%	-7.4%	1.9%	-42.6%
TV	PlayStation	5.0%	165.6%	6.9%	101.6%
TV	Roku	7.8%	25.5%	22.1%	39.3%
TV	Samsung	0.3%	-12.8%	0.4%	-15.7%
TV	Xbox	4.6%	60.1%	6.5%	43.0%

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## PART II: QUALITY

The five global quality of experience (QoE) metrics that streaming TV publishers monitor closely to drive increased engagement and subscriber retention include:

- **Video Start Failure (VSF):** The percentage of attempts terminated during video startup before the first video frame was played.
- **Exits Before Video Start (EBVS):** Video plays that a viewer terminated before the video started to play.
- **Video Startup Time (VST):** The number of seconds it takes from when the viewer clicks play to when the first frame appears.
- **Rebuffering Ratio:** The percentage of time the video stream is interrupted and freezes versus the percentage of time the video plays error-free.
- **Bit Rate:** The picture quality of the video stream as measured in megabits per second. The higher the bit rate, the higher the image quality of the stream.

### QUALITY OVERVIEW

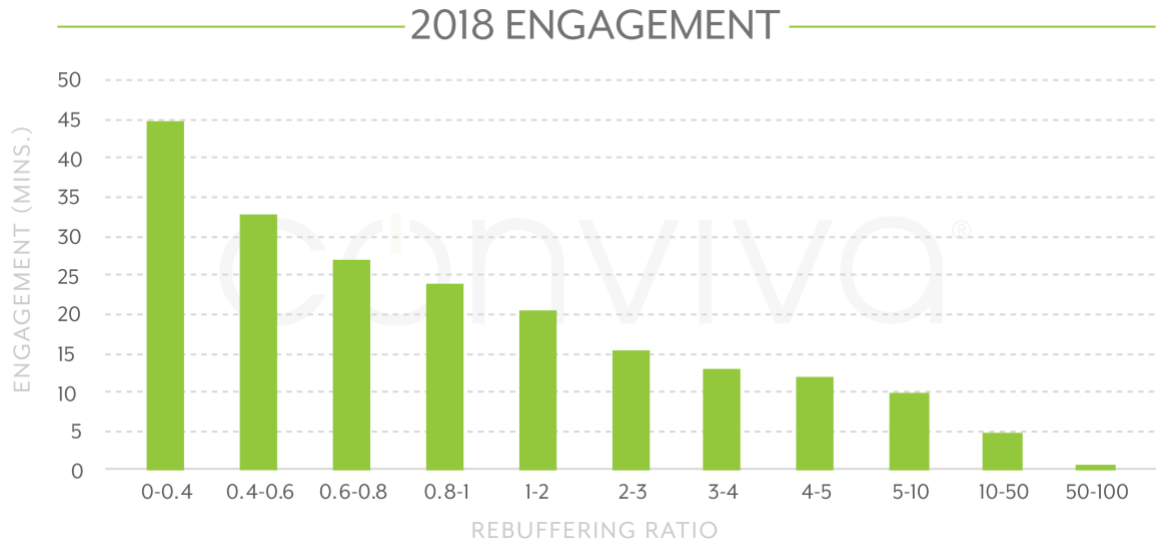
METRIC	Q2 2017	Q2 2018	% IMPROVEMENT
Video Start Failure	3.21%	2.69%	16%
Exits Before Video Start	14.16%	12.68%	10%
Video Start Time (sec)	4.84	4.16	14%
Rebuffering Ratio	1.02%	0.78%	24%
Bit Rate (Mbps)	3.29	4.08	24%

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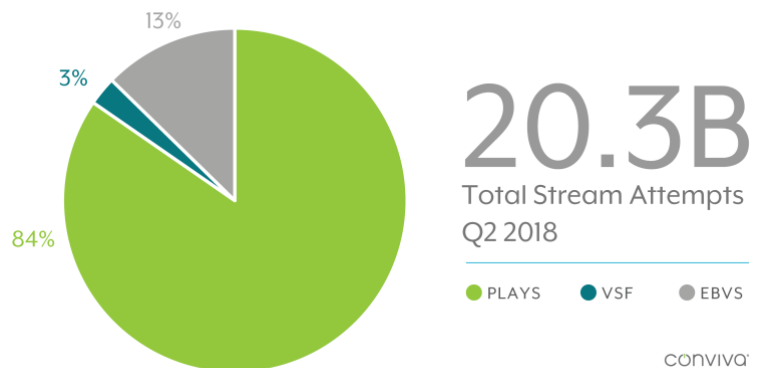
In Q2 2018, **all five QoE metrics improved versus Q2 2017**, indicating that publishers and the video delivery ecosystem continue to improve both their viewers' quality of experience as well as their ability to stream video over the internet. Improvement continues to be a trend Conviva has seen, but there is certainly room for improvement.

How long the viewer will stay engaged is largely determined by the content's streaming quality, with rebuffering as a key factor. Important to note is this quarter's improved **average rebuffering ratio at 0.78%** – in Conviva's end of year 2017 report, the average rebuffering showed 0.95% which had decreased to 0.88% in Q1 2018 indicating a strong trend for improvement. As the average rebuffering ratio across the board improves, the streaming TV industry is well on the way to improving streaming TV quality around the globe.

As seen in the graph below, **with the rebuffering ratio of 0.78%, average engagement was about 27 minutes per stream**. While this is good, it can and should definitely get better! Conviva's data shows that if the average **rebuffering ratio was under 0.4%, engagement could increase by almost 18 minutes per stream (up to 45 minutes)! With the 17.2 billion plays seen in Q2 2018, that results in an astounding 5.1 billion viewing hours lost due to rebuffering**. This illustrates the lack of tolerance today's viewers have when it comes to rebuffering and quantifies its direct impact on publisher revenue.



In Q2 2018, **Conviva saw 20.3 billion streaming attempts total**, a definite increase when compared to just last quarter (Q1 2018) at 16.9 billion. Of this quarter's 20.3 billion streaming attempts, **16% of them were lost** due to videos failing to start and exits before the video started. This resulted in a staggering **3.1 billion lost plays and translates to nearly 1 billion lost viewing hours** that a publisher's content could have realized. While 3.1 billion lost plays is a large number, overall North America and Europe were able to improve their video start failure rate by 44% and 16%, respectively. And while Asia's video start failure rate worsened by 18%, the region saw a 31% improvement in exits before video starts.



CONTINENTS	VIDEO START FAILURES (VSF)		EXITS BEFORE VIDEO STARTS (EBVS)	
	Q2 2018	% IMPROVEMENT	Q2 2018	% IMPROVEMENT
North America	1.4%	44%	12.3%	2%
Asia	5.8%	-18%	13.5%	31%
Europe	2.1%	16%	11.7%	-27%

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The other three key QoE metrics, video start time, rebuffering ratio, and bit rate trended up but showed varied improvements by region. Bit rate is directly related to picture quality – a higher bit rate will accommodate higher image quality, thus leading to a better user experience and higher engagement. Video start time **improved significantly by 34% in Asia**, while the rebuffering ratio and average bit rate **significantly worsened by 39% and 31%**, respectively (see tables



below). North America and Europe saw improvements across the board in their overall video start time, rebuffering ratio, and average bit rate, as seen in the charts below. Across Conviva's publisher base, as streaming traffic has seen massive growth, there has been a focus on improving streaming TV quality YoY, great for the industry and a sign that streaming is only getting bigger and better.

CONTINENTS	VIDEO START TIME (SEC)		
	Q2 2017	Q2 2018	% IMPROVEMENT
North America	5.00	4.42	12%
Asia	4.46	2.96	34%
Europe	4.78	4.44	7%

CONTINENTS	REBUFFERING RATIO		
	Q2 2017	Q2 2018	% IMPROVEMENT
North America	0.95%	0.59%	38%
Asia	1.32%	1.84%	-39%
Europe	0.70%	0.60%	14%

CONTINENTS	AVERAGE BIT RATE (Mbps)		
	Q2 2017	Q2 2018	% IMPROVEMENT
North America	3.82	4.62	17%
Asia	2.02	1.54	-31%
Europe	3.14	3.61	13%

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Overall, the streaming TV market continues to enjoy a very healthy growth rate while the quality of experience delivered continues to improve each quarter. Conviva's continuous measurement, all-screen census confirmed three important trends in Q2 2018:

1. **Content consumption more than doubled over the last 12 months.** Growth across all key KPI's proved a very healthy appetite among consumers for streaming TV.
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