



2017 VIDEO STREAMING PERCEPTIONS REPORT

How do consumers feel about the quality of video streaming today?

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INTRODUCTION AND METHODOLOGY

In Q1 of 2017, Mux commissioned an independent survey that asked 1,035 U.S. consumers about their viewing experience with online video. The survey explored frustrations and satisfaction levels around the core attributes that affect a viewer's quality of experience: playback failures, buffering, picture quality, and startup time.

Our core question:

How do consumers feel about the quality of their video streaming experience today?

The survey focused on video streaming services watched on a television such as Netflix, Hulu, YouTube, or WatchESPN. Respondents indicated that they watched at least 1 hour of streaming video each month.

As this survey demonstrates, most consumers will abandon streaming video when quality suffers. Improving streaming video quality is an important hurdle that must be crossed as TV moves online.

CONSUMERS SURVEYED

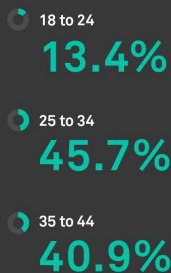
1,035

STATES REPRESENTED

50



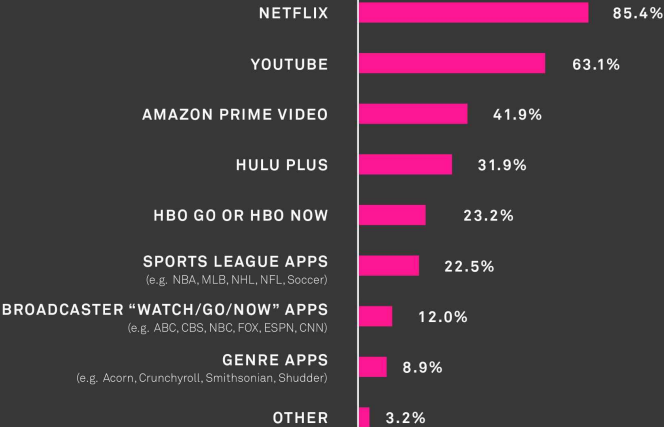
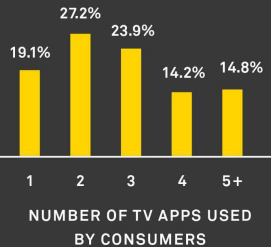
AGE DISTRIBUTION



MOST POPULAR STREAMING SERVICES

Users were asked to select all video streaming services they use through their TV (via Roku, Chromecast, Firestick or Smart TV Apps).

These results show that Netflix (85.4%) dominates video broadcast publishers, followed by Amazon Prime (41.9%), Hulu Plus (31.9%) and HBO GO / HBO Now (23.2%)



FRUSTRATION VS. FREQUENCY

Users were asked which problems that they experienced were the most frustrating, and which were the most frequent.

This was followed by asking users how important "reliability and quality" was to their video streaming experience.

95.5%

of people said that "reliability and quality" was very important to their video streaming experience.

MOST FRUSTRATING PROBLEMS

1	The video stalls and rebuffers	47.0%
2	Video playback fails and shows an error message	19.9%
3	The video is slow to load up and start	18.8%
4	The picture quality of the video is low	14.3%

MOST FREQUENT PROBLEMS

1	The video stalls and rebuffers	41.4%
2	The video is slow to load up and start	26.0%
3	Video playback fails and shows an error message	17.5%
4	The picture quality of the video is low	15.2%

WHY CONSUMERS STOP WATCHING

Users were asked if they have ever stopped watching a video due to streaming issues.

Slow load times (85.1%) and rebuffering (85.0%) are not tolerated by viewers and lead to video abandonment.

While poor picture quality (57.3%) is the least likely to cause video abandonment, over half of respondents have still abandoned a video due to this issue.

92.9%

of our respondents have abandoned a video due to one of these four reasons

85.1%

Have stopped watching because **load time** took too long.

21.5% Frequently 63.6% Occasionally

57.3%

Have stopped watching because **picture quality** was too poor.

12.7% Frequently 44.6% Occasionally

85.0%

Have stopped watching because of **stalling and rebuffering**.

18.2% Frequently 66.9% Occasionally

67.5%

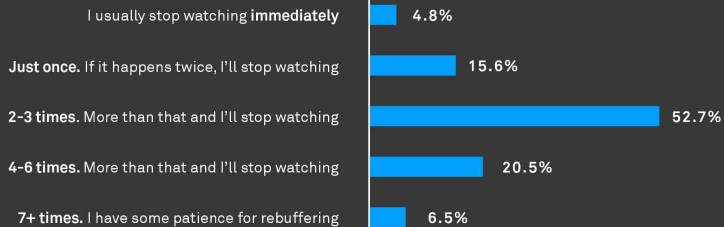
Have stopped watching because of repeated **playback errors**.

13.1% Frequently 54.4% Occasionally

HOW MANY REBUFFERING EVENTS ARE ACCEPTABLE?

Users were asked how many times they would tolerate video rebuffering before they abandoned the video.

20.4% viewers said they stopped watching after just one instance of rebuffering, while the majority of viewers (52.7%) accept 2-3 rebuffering events before abandoning








WHO DO CONSUMERS BLAME?

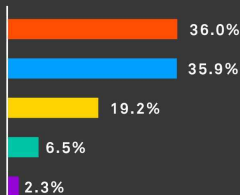
For slow video start times, poor picture quality, rebuffering and playback failures, users were asked who they blamed for causing the problem.

Users mostly blame their ISP or their WiFi connection for long video load times and rebuffering. However, the publisher is never entirely free from blame.

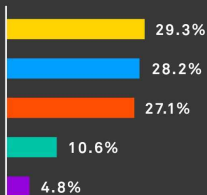
In the event of poor picture quality and playback failures, users blamed the video publisher the most (29.3% and 32.7% respectively).

-  The smart TV (e.g. Samsung, LG) or the streaming box (e.g. Roku, Apple TV)
-  The app publisher providing the stream (e.g. Hulu, HBO GO)
-  My internet service provider (e.g. Comcast, Verizon)
-  My home WiFi network
-  None of the above

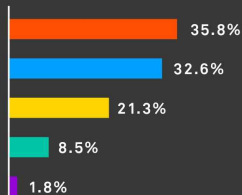
SLOW LOAD TIMES



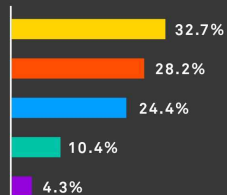
PICTURE QUALITY



REBUFFERING



PLAYBACK FAILURES



ARE CONSUMERS SATISFIED?

Users were asked how they felt about each problem: the loading times of videos streamed to their TVs, the picture quality they received, the amount of stalling and rebuffering they experienced, and how frequently they felt they encountered playback failures or errors.

60.3%

Feel that video **load times** could be improved.

53.4% Could be better 6.9% Too slow

46.3%

Feel that there is room for **picture quality** to be better.

36.8% Tolerant 9.5% Frustrated

72.2%

Feel the amount of **rebuffering** they experienced could be improved.

51.1% Tolerant 21.1% Frustrated

79.7%

Have frequently or occasionally experienced video **playback errors**.

70.2% Occasionally 20.3% Frequently

ANALYSIS

Based on our analysis, publishers should take away three key conclusions from this survey.

First, video streaming performance is extremely important. 95.5% agree that it is "very important" when considering streaming services (including 65.5% who "strongly agree"). The vast majority of consumers have abandoned playback due to performance problems at some point.

Second, for video streamed on a television, rebuffering is the most frequent and most frustrating problem. Video quality, playback failures, and startup time all matter, but rebuffering is perceived to be a bigger problem. That said, the gap isn't huge, and even the least frequent and frustrating performance dimension, video quality, has caused 57% of viewers to abandon a video. It is clear that Viewers want improvement across all four dimensions of video.

Finally, viewer experience is a competitive differentiator. If over 80% of viewers use more than one streaming service, but 93% of viewers have abandoned a video stream over quality problems, then providing a seamless video streaming experience is critical. Publishers who focus on quality of experience may attract more users, and publishers who ignore performance might fall behind.

At Mux, we believe strongly that good video performance starts with data. "If you can't measure something, you can't manage it," as the old axiom goes. There are a number of ways of improving a viewer's quality of experience, this might include changes to streaming formats, player technology, encoding settings, or CDN strategy. However, without detailed and accurate QoE metrics, it would be impossible to know if video performance is getting better or getting worse.

IN SUMMARY

From this survey we have been able to garner a greater understanding of how users perceive their quality of experience with video streaming to their TVs.

We have seen that users highly value the reliability and quality of their video streaming experience, but that overall they consider there to be significant room for improvement in the areas of load times, picture quality, rebuffering and playback errors.

While ISPs and personal WiFi connections are often blamed for rebuffering and slow load times, almost a quarter of users still blame their video publisher for these issues. Publishers are also most likely to be blamed for poor picture quality and playback errors.

ABOUT MUX

Mux offers real-time performance monitoring and analytics for video streaming, helping publishers deliver better quality of experience to their viewers.

By working with Mux, you are working with the experts. We know video: we're the creators of the biggest open-source video player on the web, the largest transcoding service in the cloud, and the best community for engineers working on video technology.

Build better video.

SURVEY QUESTIONS

- Which of the following streaming video services have you watched on your television in the past three months using a TV App on a Smart TV, Roku, Fire TV, Apple TV, Chromecast or similar? Select all that apply.**
Netflix
Amazon Prime Video
Hulu Plus
Sports League
Broadcaster "Watch/Go/Now" Apps: e.g. ABC, CBS, NBC, FOX, ESPN, CNN
Genre Apps: e.g. Acorn, Crunchyroll, Smithsonian, Shudder
YouTube
HBO GO or HBO Now
Other
- Which of the following streaming video problems is the most frustrating for you when it occurs?**
The video is slow to load up and start
The video stalls and rebuffers
The picture quality of the video is low
Video playback fails and shows an error message
- Which of the Following Streaming video problems occurs most frequently?**
The video is slow to load up and start
The video stalls and rebuffers
The picture quality of the video is low
Video playback fails and shows an error message
- To what extent do you agree or disagree with the following statement: When considering streaming video services, the reliability and quality of the video streaming experience is very important to me.**
Strongly Agree
Agree
Disagree
Strongly Disagree
- Have you ever stopped watching a streaming video on your TV because it took too long to load?**
Yes, frequently
Yes, occasionally
No, I have not
- When a video takes too long to load, who do you usually assume is responsible?**
The smart TV (e.g. Samsung, LG) or the streaming box (e.g. Roku, Apple TV)
The app publisher providing the stream (e.g. Hulu, HBO GO)
My internet service provider (e.g. Comcast, Verizon)
My home wi-fi network
None of the above
- Select the statement below that best reflects your experience about how quickly streaming videos load.**
Streaming video startup time is usually FAST ENOUGH
Streaming video startup time is OK, BUT COULD BE BETTER
Streaming video startup time is usually TOO SLOW
- Have you ever stopped watching a streaming video on your TV because it kept stalling and rebuffering?**
Yes, frequently
Yes, occasionally,
No, I have not
- When you experience stalls and rebuffering while watching streaming video on your TV, how many times can the video rebuffer before you decide to stop watching the video?**
I usually stop watching immediately
Just once. If it happens twice, I'll stop watching
2-3 times. More than that and I'll stop watching
4-6 times. More than that and I'll stop watching
7+ times. I have some patience for rebuffering
- When a video freezes and rebuffers, who do you usually assume is responsible?**
The smart TV (e.g. Samsung, LG) or the streaming box (e.g. Roku, Apple TV)
The app publisher providing the stream (e.g. Hulu, HBO GO)
My internet service provider (e.g. Comcast, Verizon)
My home wi-fi network
None of the above

SURVEY QUESTIONS

11. **Select the statement below that best reflects your feelings about the amount of stalling and rebuffering you experience when watching streaming video services.**
I'm SATISFIED with the amount of rebuffering
I'm TOLERANT of the amount of rebuffering
I'm FRUSTRATED with the amount of rebuffering
12. **Have you ever stopped watching a streaming video on your TV because the picture quality was too poor?**
Yes, frequently
Yes, occasionally,
No, I have not
13. **When streaming picture quality is poor on your TV, who do you usually assume is responsible?**
The smart TV (e.g. Samsung, LG) or the streaming box (e.g. Roku, Apple TV)
The app publisher providing the stream (e.g. Hulu, HBO GO)
My internet service provider (e.g. Comcast, Verizon)
My home wi-fi network
None of the above
14. **Select the statement below that best reflects your feelings about the picture quality you usually receive when watching streaming video?**
The picture quality on streaming video is usually SATISFACTORY
The picture quality on streaming video is usually TOLERABLE
The picture quality on streaming video is usually FRUSTRATING
15. **Have you ever stopped watching a streaming video on your TV because you experienced repeated playback failure errors?**
Yes, frequently
Yes, occasionally,
No, I have not
16. **When you get playback failure errors while watching streaming video on your TV, how many times will you retry the video before you give up?**
I usually stop watching immediately
Just once. If it happens twice, I'll stop watching
2-3 times. More than that and I'll stop watching
4-6 times. More than that and I'll stop watching
7+ times. I have some patience for playback failure and errors
17. **When playback fails and shows an error while streaming video to your TV, who do you usually assume is responsible?**
The smart TV (e.g. Samsung, LG) or the streaming box (e.g. Roku, Apple TV)
The app publisher providing the stream (e.g. Hulu, HBO GO)
My internet service provider (e.g. Comcast, Verizon)
My home wi-fi network
None of the above
18. **Select the statement below that best reflects how frequently you experience playback failure errors?**
My videos experience playback errors FREQUENTLY
My videos experience playback errors OCCASIONALLY
My videos experience playback errors NEVER