THE SECRET LIFE OF STREAMERS:
DEVICES, CONTENT, LOCATION, AND QUALITY

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INTRODUCTION

The popularity of streamed shows like *Luke Cage* and *Transparent* is clear, but how, when and where people watch them most certainly is not. That is the subject of this paper.

Just 10 short years ago the television stood supreme as the sole source of video entertainment in the home. Pay television was the last word in quality delivery. And the big broadcast and television networks were the arbiters of what we could, and could not, watch.

Today, the television is just one among many screens in our lives. The only way for most to see the highest quality ultra HD video is with a Netflix or Amazon subscription over broadband. And viewers can watch the latest eSports tournament from Japan as easily as their home town baseball team.

Such is the popularity of streaming that online originals, such as Netflix' *Luke Cage*, can garner audiences similar to HBO's *Westworld*.[1] With our smartphones, tablets, PCs, and connected TVs, we are all video streamers. The barriers that have held in check our desire to watch at our convenience have been removed. And the viewing habits learned over the decades are irrevocably changing.

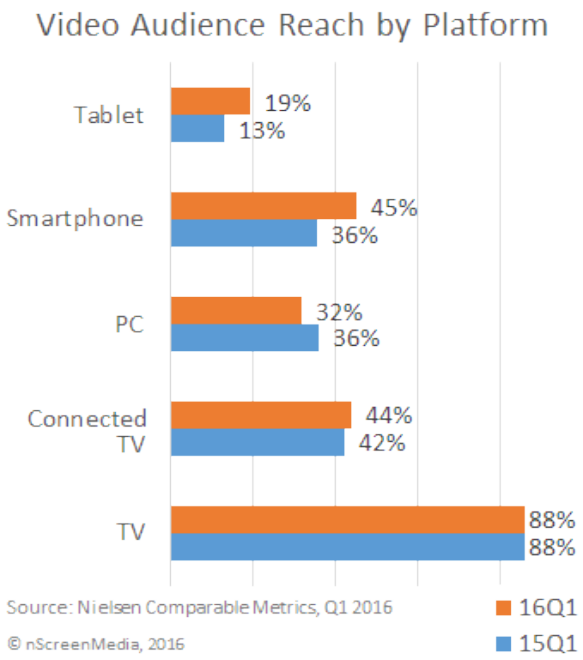
The popularity of streamed shows like *Luke Cage* and *Transparent* is clear, but how, when and where people watch them most certainly is not. That is the subject of this paper.

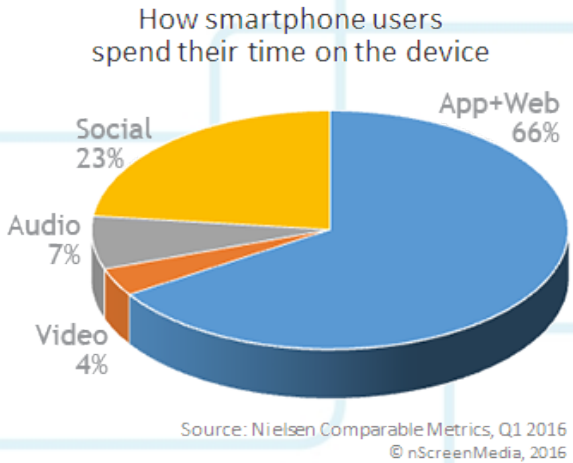
One habit that this paper looks at in some detail is watching video between the hours of 8 and 11PM. The television industry has established prime time as the slot reserved for only the best content.

But shows such as *Comedians in Cars Getting Coffee* aren't governed by linear channel schedules. Do most people still watch it in prime time? Do they prefer to watch it on a connected TV, or are they just as happy to use a smartphone? Mobile networks are fast enough and coverage is good enough that a viewer can watch the show on their smartphone outside the home as easily as in. Is this something they commonly do?

Streaming failures seem to be only too common; even the very best content companies are not immune. Many trying to watch CBS' live stream of the 2016 Super Bowl from an Apple TV had to wait until the second half before they could watch.[2] How common are these failures, and are they worse in-home or when on the go?

Using the latest research, and exclusive data made available specially for this paper, we analyze the role devices, content, location, and quality are taking in shaping our new viewing habits. This data and analysis helps reveal in great detail the secret life of video streamers.





The Television No Longer Dominates Screen Time

For decades, the television has been the screen commanding our entertainment attention. With many consumers turning it on in the morning, and leaving it on all day, it has been our window to the world. That is no longer the case. Conviva data shows that average playtime during prime time on connected TVs is 80 minutes, and through the smartphone over 30 minutes.

The rate at which these new screens have come to dominate our lives is frightening. Between Q1 2015 and Q1 2016, smartphone owners have increased screen time with their device by 44%, to almost 3 and half hours a day.* Of course, unlike the television, the smartphone is a multifunction device. And video is anything but the dominant activity. Two-thirds of smartphone time is occupied with web browsing and apps. A further 23% of time is spent with social media, 7% is spent streaming audio, and video takes up just the remaining 4% of time.

That's not to minimize the importance of the smartphone as a video platform. Both its reach and usage have increased dramatically over the last year. 45% of the population is now counted as smartphone video users, up by 25% in just one year. The smartphone is second only to the television, which reaches 88%. The connected TV is close behind the smartphone, with 44% audience reach, and well ahead of the PC video audience (32%). It should also be noted that the PC is in serious decline as a video platform. Its audience shrank by 13% year-over-year. Bringing up the rear is the tablet, with a video audience reach of 19%.

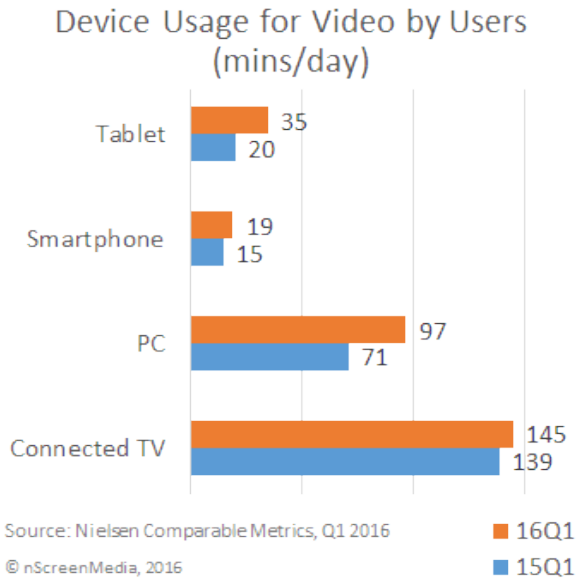
When it comes to video engagement, screen size is the determining factor. Of all the connected screens, the connected television commands the longest viewing times by far. Users of Internet set-top boxes†, game consoles, connected Blu-ray players and smart TVs spend 2 hours and 15 minutes a day watching video on their devices.

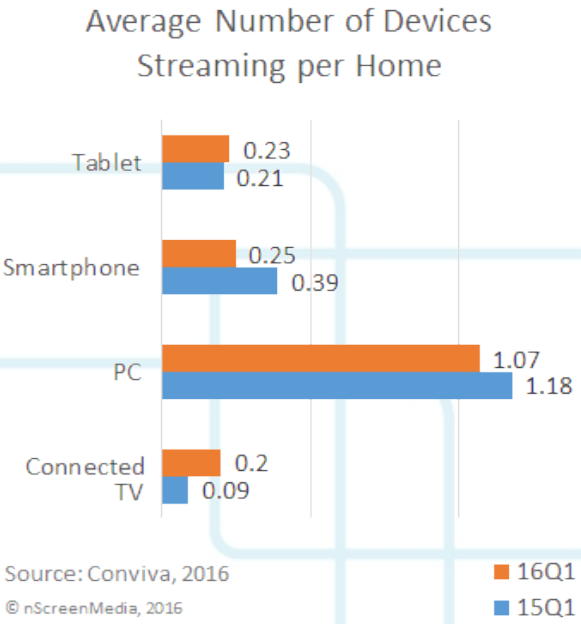
Though the PC may be losing audience reach, those that do use it are watching more. PC video viewers watched 1 hour and 37 minutes a day, up by 37% on the previous year. Tablet video viewers are also watching a lot more than before. They spend 35 minutes a day with their device, up by 75% year-over-year. Finally, smartphone video viewers watched 27% more, consuming 19 minutes a day.

The small amount of time spent viewing on the smartphone may have you thinking short YouTube videos rule the mobile world. As we shall see later in the report, this is not necessarily the case. Neither is it true that long form video rules the world of the connected television, even though the time spent watching is much longer than the smartphone.

* Much of the data on this page is drawn from the Q1 2016 Comparable Metrics report from Nielsen

† The industry also refers to iSTBs as streaming media players and multimedia devices





How Many Screens Are Used In the Home?

To understand more clearly how these different devices are used within the home (we will look more closely at out-of-home usage later), we turn to a different data set. In particular, we will focus on the streaming video audience. This is a little different from the Nielsen data discussed previously which is focused on device usage among the broader population.

Conviva plumbed its streaming data to help us gain insights into the behavior of the millions of online video streamers.‡ The data reveals the use of multiple devices in streaming video homes is the new norm. The average home has 1.7 devices streaming sometime during the day. The PC is used by every home that streams, though is used in slightly fewer households this year than last. This confirms the Nielsen data showing the decline in audience reach for the PC.

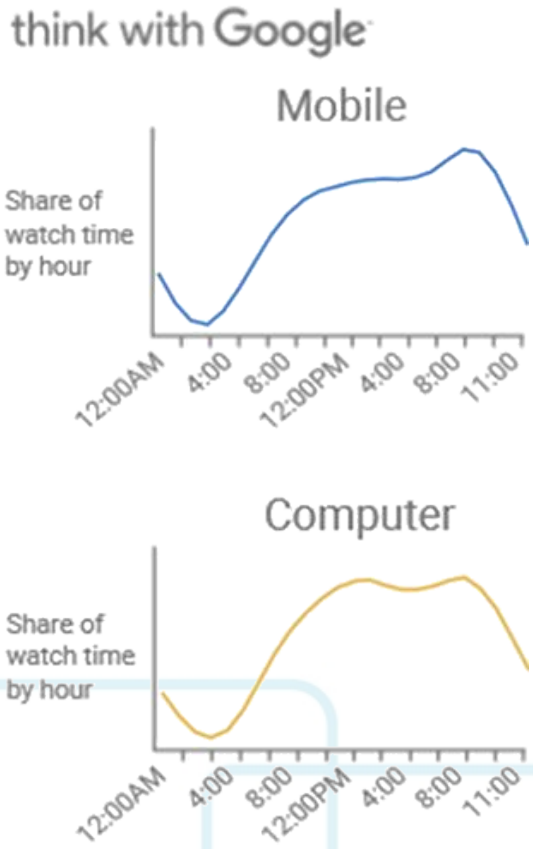
The connected TV has grown in use spectacularly over the last year. In 2015, 1 in 10 homes used one or more of the many connected TV devices. This year, that increased to 1 in 5 homes. This growth in use is also seen in markets like the UK. The BBC reports that online requests to iPlayer for video from connected TVs increased by 70% in the last year. Connected TV devices now account for 12% of all online iPlayer video requests.[3]

1 in 4 streaming households use a tablet and the same number use a smartphone to stream video during the day. The tablet shows a minor increase from last year, though the smartphone shows a decrease in usage from 2015. This decline could be caused by consumers shifting some of the viewing time to the bigger screen of the connected TV.

Most of these streaming homes also watch regular television. That means in the average streaming home, 2.7 screens are used to watch video during the day. Of course, some people use more than one screen to watch video, but it illustrates how the audience is fragmenting across many screens. The average US home has 2.5 people living in it, and each of them uses a separate set of screens. Gone are the days when people had to agree on something to watch. Now they just watch what they want on their own device.

For advertisers, this is particularly challenging, as traditional TV can no longer be relied upon to deliver the target audience. Little wonder that advertisers are pouring money into online properties. The US digital advertising market is forecast to reach $70B in 2016, roughly equal to the TV advertising market.[4]

‡ See the note in the Conclusions regarding the use of Conviva data



YouTube share of watch time, trended by screen type

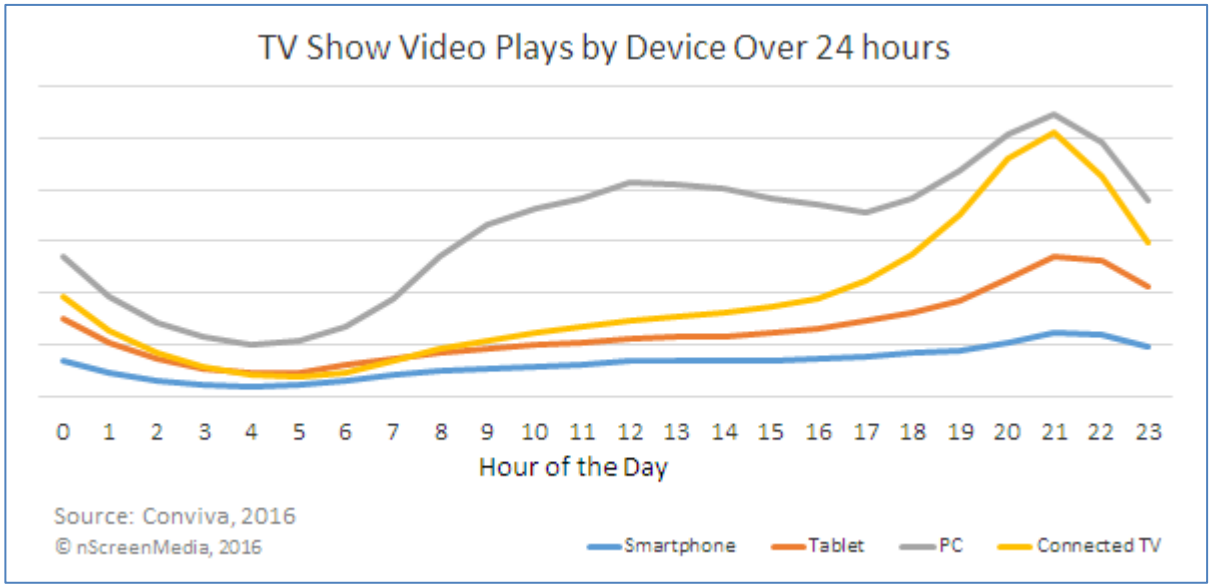
Source: Google internal data, July 2016, U.S. base, calculated as watch timeshare per hour by device

Which Devices Matter For TV Shows?

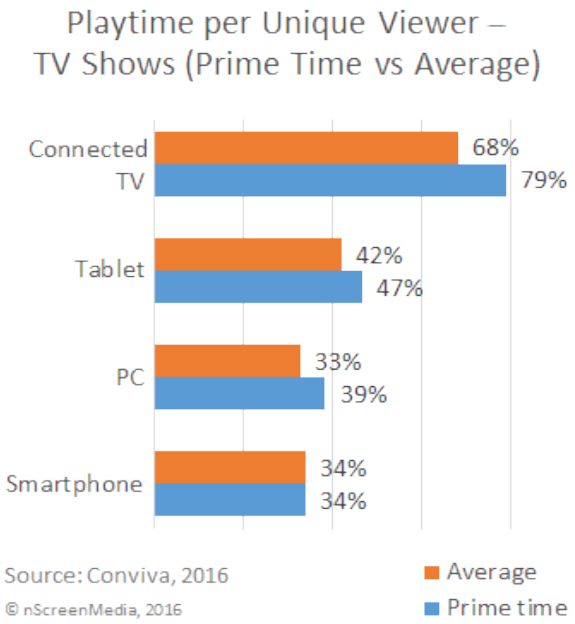
The importance to the online video market of TV-show-length content is now clear. SVOD services such as Netflix, which started life focusing on movies, now focus primarily on episodic series like *NCIS* and *Downton Abbey*. Even premium original content made exclusively for the web, such as *House of Cards* and *Transparent*, stick with traditional TV show lengths.

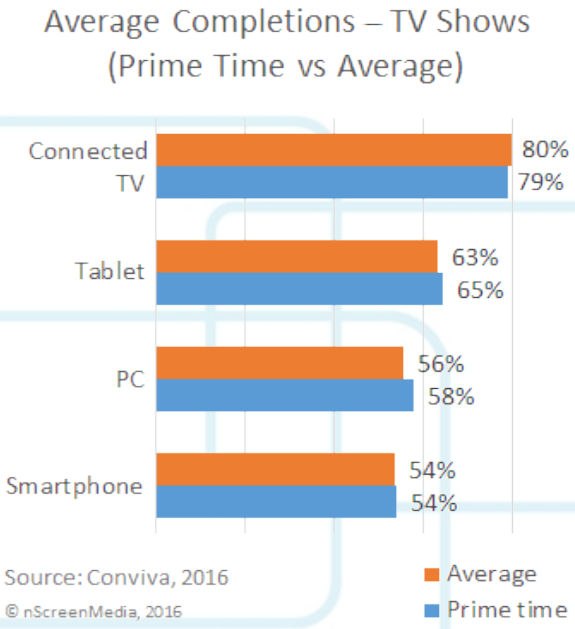
Which device is best for TV-show-length video? Looking at video plays for this type of content across the 4 main screens, it's clear the PC still rules. On average, it attracts 40% more plays per hour than the connected TV, 60% more than the tablet, and 80% more than the smartphone.

However, during prime time, the rate of use shifts dramatically. Between 8 and 11 PM the connected TV and PC attract about the same number of video plays. The tablet and smartphone also see pronounced spikes in usage at prime time. Both see the number of video plays double from the average in the 9 o'clock hour.



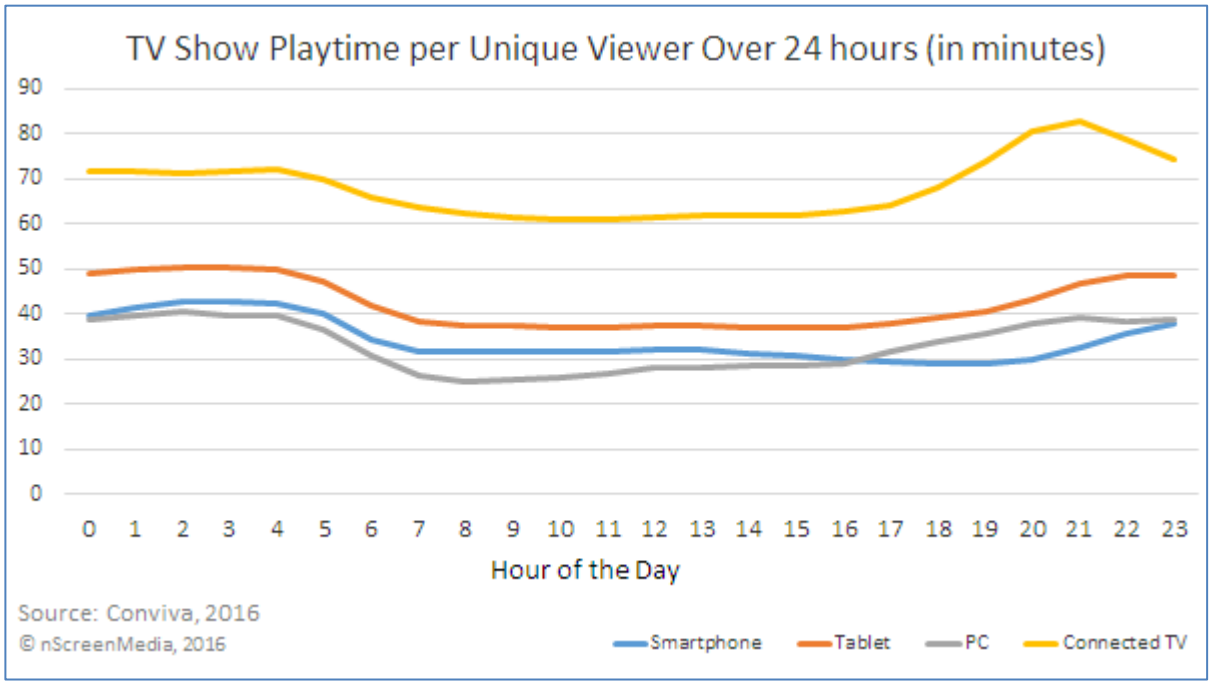
One remarkable fact to consider about PC use for TV shows is the bump in usage at lunchtime. This data strongly suggests people are catching up with their favorite shows on their PC while they eat their lunch.





All the other devices see steady, but relatively low usage for TV show content throughout the day. The PCs increased use for video over lunchtime is confirmed by Google data from YouTube. The company also sees a pronounced bump in usage at lunchtime. The share of watch time then is roughly equivalent to the prime time peak.

Though the PC still rules in terms of video plays, for engagement the TV is dominant. Average playtime minutes (length of a viewing session) for the connected TV are 40% more than the tablet, and double that for the PC and smartphone. It is also interesting to note that people seem to watch for about the same time on the tablet, smartphone, and PC. Since they are watching for between 40 and 50 minutes, they seem very comfortable watching a complete episode of their favorite show. However, the extended time on the connected television illustrates how they are watching several episodes in a viewing session.



Over prime time (between the hours of 8 and 11PM), average viewing sessions increase by 16% over the average hour viewing time for connected TV and PC, and by 10% for the tablet. However, the smartphone sees no increase in viewing session length at all. In the peak viewing hour, between 8 and 9PM, the increase over the average hour viewing is even more pronounced: 20% for the connected TV and PC, 10% for the tablet, with the smartphone still showing no increase at all.

The data suggests that the connected TV is the platform consumers use for their binge viewing sessions. The long viewing times indicate viewers are commonly watching multiple episodes. The other screens appear to be used to watch individual show episodes. The data also illustrates that prime time remains important, particularly for providers reliant on advertising. With the exception of the smartphone, more ads will be delivered to each viewer during prime time hours.

One interesting thing to note is that completion rates, the percentage of people who watch a show to the end, do not vary between the average viewing hour and prime time. Again, the connected TV delivers the highest completion rates (80%), the tablet is second best (64%), and the PC and smartphone are once again tied (55%).

Should we have expected completion rates to increase during prime time? It's difficult to say for sure. However, the following factors are certainly involved:

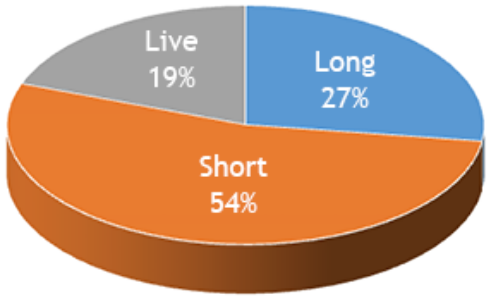
- The length of time a video viewer has available to watch
- The amount of attention the viewer is paying to the video
- The quality of content being watched

As we have seen, viewers are clearly taking time during the day (lunchtime for example) to watch video. If viewers don't really have enough time to watch a full TV show, we would expect completion rates to fall during the day. However, we don't see this. Conviva data shows that viewing sessions throughout the day are typically long enough to watch full episodes of TV shows on each of the primary connected screens. In other words, people don't start watching a TV show unless they have enough time to finish it.

All other things being equal, if viewers are watching in situations where they can't pay full attention, we would expect to see completion rates fall. Again, we do not see this.

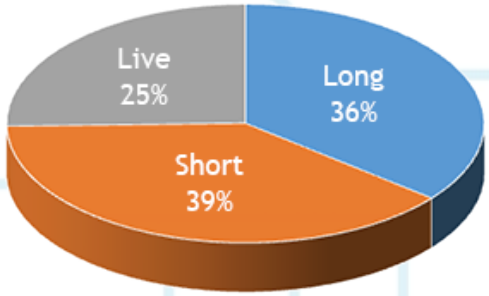
So, it seems whenever a viewer decides to watch a video, they mostly have enough time to complete it and can pay it the appropriate amount of attention. In this situation, the quality of the content determines how much of it a viewer will watch. And that doesn't change between prime time and any other time. In other words, when we watch doesn't matter, what we watch does!

Non-Mobile Device Video Starts In the Home



Source: Conviva, 2016

Mobile Device Video Starts Outside the Home

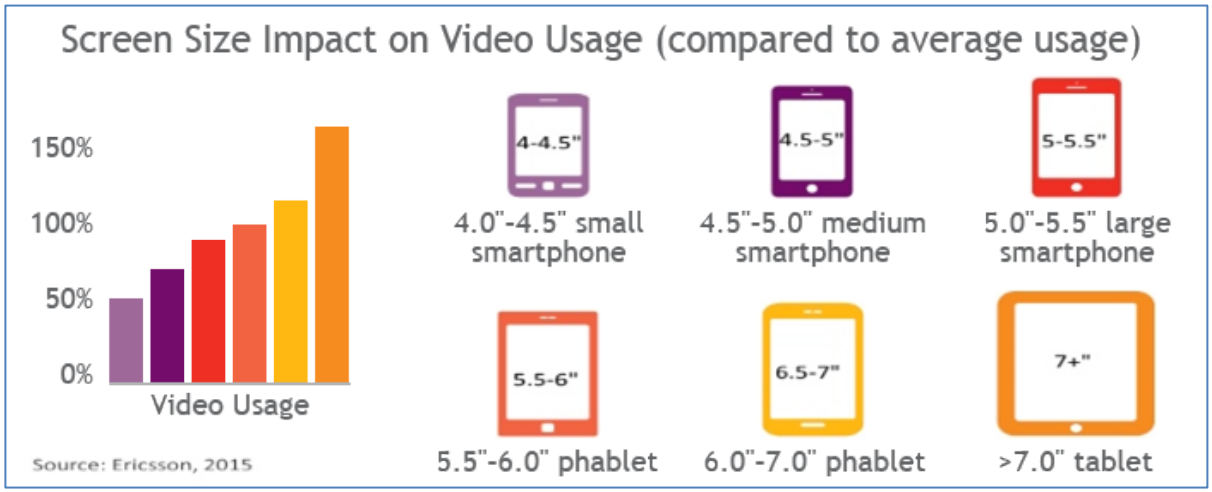


Source: Conviva, 2016

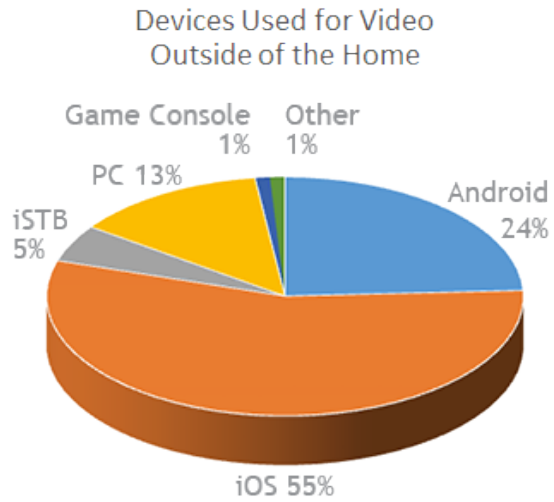
Big Differences Between In-Home and Out-of-Home Viewing

The common belief is that out-of-home viewing is dominated by short-form video, and in-home viewing by long form. From the perspective of connected device viewing, the truth is a lot more nuanced than that.

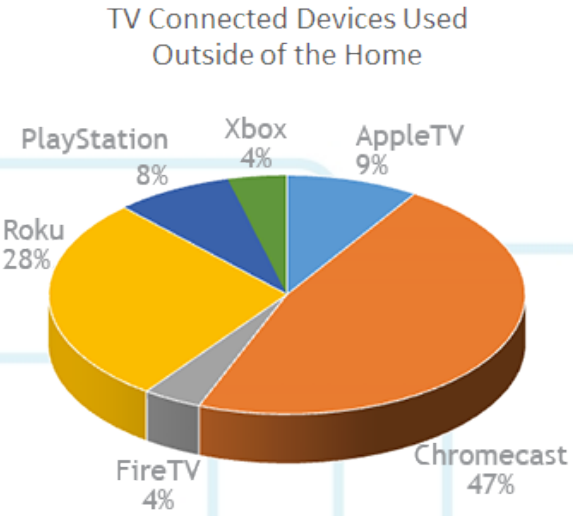
Conviva data shows that in-home viewing through connected devices is dominated by short-form, not long-form content. 53.5% of video starts in the home are for short content, 27% for long, and 19.5% for live. Out-of-home viewing tends to be more balanced between short, long, and live video. Short content share of mobile video starts is 39%, long form drives 36% of starts, and a quarter of video starts are for live content.



One explanation for the dominance of short-form content on connected devices in-home could simply be because of the television. As we saw earlier, consumers tend to prefer the largest screen available to them, particularly for longer content. This is confirmed by Ericsson, which found an almost linear relationship: the bigger the screen the more frequently it was used.[5] Since the occupants of 113M homes in the US still watch 4+ hours of broadcast or cable television a day, they simply don't need to use their connected devices to watch long form content as much.[6]



Source: Conviva, 2016



Source: Conviva, 2016

That changes once a consumer steps outside the home. Without access to the television, when the consumer wants to watch something they reach for the only screen available to them. That is typically the smartphone. Hence, out-of-home viewing tends to be more balanced, reflecting the varied video consumption habits of the typical consumer.

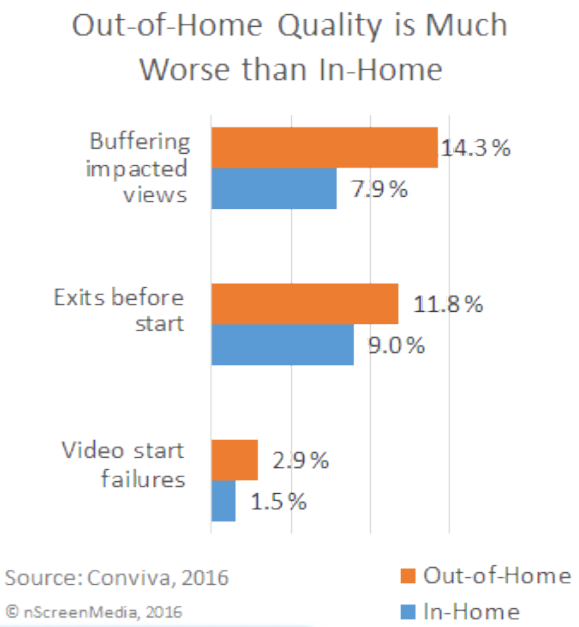
Consumers still watch far more video in-home than out-of-home on their connected devices. Cisco says that fixed networks will deliver ten times more video than mobile networks in 2016.[7] That said, it is interesting to look at which devices they take with them to watch out of home. Of course, the smartphone dominates, but it is surprising which devices consumers are prepared to take with them!

According to Conviva, 79% of all out-of-home video requests came from smartphones and tablets. iOS tablets and smartphones are by far the most used devices for video outside of the home. 55% of mobile video starts came from iPhones and iPads. Android tablets drove a quarter of mobile video start requests. Mobile enabled laptops were the third most popular devices, commanding 13% of out-of-home video starts. It's quite surprising to see that television connected devices, which many would consider to be "fixed" devices, are thought of as portable by a small but significant group. 6% of the out-of-home start requests came from Internet set-top boxes (iSTBs) and game consoles.

Although the volume of usage through these TV connected devices is relatively small, it's interesting to look at exactly which devices consumer are using. Simply put the smaller the device, the more portable consumers consider it to be. The most popular iSTB by far is the svelte and cheap Chromecast. Almost half of all out-of-home TV connected device video requests came from Google's device. It is the smallest and lightest of all the iSTBs, and it is also very easy to hook up to an open HDMI connected on a friend's television. It can also be powered by a USB connector, which many TVs now have.

The second most popular portable TV connected device is Roku. 28% of mobile video requests came from this device. Though Conviva data does not indicate the exact Roku device, it's likely the company's streaming stick is the one people are carrying with them. It shares many of the same advantages as Google's Chromecast.

12% of out-of-home video requests came from game consoles. PlayStation was preferred 2 to 1 over Xbox for out-of-home video viewing. Least used of the mainstream devices are the Apple TV (9%) and Fire TV (4%). Both of these devices are the heaviest and most expensive of the Internet STBs.



In-Home Quality Needs Improvement

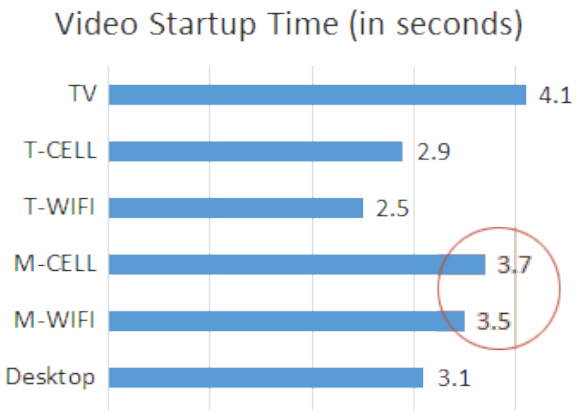
Quality is critical to the success of any video streaming business. Though nothing can derail a video service faster than poor video quality, the occurrence of in-home streaming problems is still remarkably common. The length of time it takes for a video to start is still unacceptably high. 9% of video requests take so long that the viewer clicks away to something else before the video starts. Buffering impacted views are also very common. 8% of viewing sessions stall at least once during playback.[§] Situations where the video just doesn't start when requested are less common (1.5% of video requests fail to start), but can be very damaging. Consider what happened to Sky toward the end of the 2014 premiere league season.

Sky makes all of its live sports channels available to Sky subscribers through Sky Go, the company's TV Everywhere offering, and to non-subscribers through the standalone OTT services called Now TV.[8] Sky also owns the broadcast rights to many of the premiere league games. On the last weekend of the 2014 Premiere League season the ultimate champion and those headed for relegation hung in the balance. This proved to be too good to miss for English football fans, and created a surge in demand for the live sports channels, which Sky was simply unprepared for.

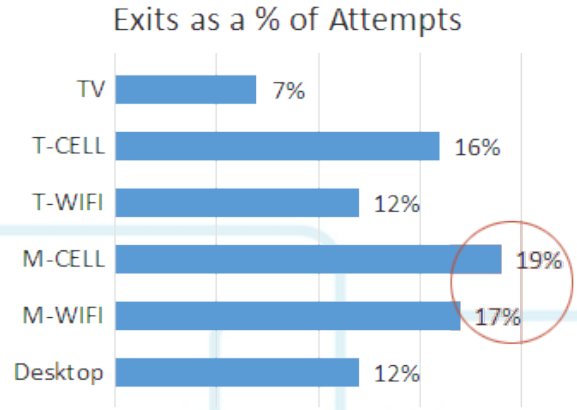
The service went down at exactly the moment that the eventual champions, Manchester City, were kicking off the final regular season game against West Ham United.[9] For 60–90 minutes, people trying to watch the games through Sky Go and Now TV were greeted with the message "Please Come Back Later, this area is temporarily unavailable."

Sky has since acted to correct the problems that caused so much trouble in 2014. The exciting finish to the 2015 season, which saw Leicester City win the league after finishing bottom in the previous season, was handled by Sky Go and Now TV without a hitch.

[§] Devices maintain a small buffer of the video being watched to help provide smooth playback. If there is a problem with the Internet connection and the buffer empties, video playback freezes. This is called a rebuffering event.



Source: Conviva, 2016



Source: Conviva, 2016

Out-of-Home Quality Much Worse Than In-Home

The quality of experience for out-of-home streamers is much worse than in-home. All three quality metrics discussed degrade as soon as the viewer steps outside of their house. Buffering impacted views balloon to 14%, exits before starts increase to 12%, and video start failures double to 3%.

What's more, cellular networks consistently underperform WIFI access. Buffering ratio is 24% worse on cellular than WIFI, and video startup time is 6% slower. The result of this poor performance is frequently, though not always, lower engagement. Stream exits as a percentage of start attempts on mobile increases by 12%, and average completion rate decreases by 6%.[10]

One interesting anomaly uncovered by Conviva is that average video startup time for the connected TV is actually longer than on any other device. Why doesn't this adversely impact engagement? Perhaps the fact that the television is a single use device acts in its favor, making the viewer more tolerant of the slower performance. On a smartphone, 4 seconds can feel like eternity. Particularly when one touch can take you to another app or piece of content.

Poor Quality Is Bad For Your Health

Aside from the obvious impact on the online video service provider bottom line, there is another downside to poor video streaming quality. It certainly makes us mad, and could be making us sick. According to a recent Ericsson study, start delays and buffering are a toxic mix for people watching online video.[11] The study found stress levels were 13% with no delays or video buffering problems. A two second start delay caused stress to go up to 16%, and a two second buffering delay pushed it up to 34%. If the viewer encountered a 6 second start delay stress went up to 19%, and a 6 second buffer delay pushed it up to 34%. Little wonder the industry is calling this effect "buffer rage."[12]

Not only should this quality data worry subscription video on demand (VOD) providers, it should give advertising supported VOD (AVOD) providers pause for thought, too. The Ericsson study found that with higher delays, users began to transfer some of the blame from the service provider to the content provider.[13] That means that in AVOD services, the poor performance of a video service can rub off on to the show and ad brands!

CONCLUSION

> "The secret life of streamers shows the way people watch is changing. Consumers are embracing new habits, new devices, and new services. Their viewing has broken the shackles of the home, occurring wherever the inclination strikes."
>
> ***Colin Dixon***
> *Founder and Chief Analyst, nScreenMedia*

The data reviewed in this paper shows that we are well into the transition from broadcast to Internet delivery of TV. The average US home uses 2.7 screens to watch video throughout the day. Viewing times on connected TVs are rapidly approaching regular broadcast TV levels. This data, and much more, demonstrate the growing importance of connected experiences.

The PC remains important for the delivery of TV entertainment, but the connected TV is catching up fast. Even the smallest screen, the smartphone, is used to watch full episodes, delivering over 30 minutes per viewing session. And when a viewer wants to catch a football game or the latest antics of Kim Kardashian when they are out and about, it is to the smartphone that they turn.

It is now clear that the video experience at every screen is important to video service providers.

The secret life of streamers shows the way people watch is changing. Consumers are embracing new habits, new devices, and new services. Their viewing has broken the shackles of the home, occurring wherever the inclination strikes. However, while old viewing habits may be going by the wayside, watching TV shows during prime time hours still matters. Even as the very definition of what prime time is changes beyond recognition.

Feeding these new habits with excellent quality of service remains challenging. Far too many streaming sessions are impacted by performance problems. In the home, nearly 1 in 10 attempts to stream a video result in the viewer leaving before the video starts. And 8% of video streams are impacted by buffering. Mobile performance is even worse. 12% of viewers exit before the video starts, and 14% of streams are impacted by buffering.

Unaddressed, these challenges threaten the reputation of not only the video service provider, but also the content and brands associated with it. Never has it been more important to fix poor streaming performance.

About the Conviva Data Used In This Paper

Conviva monitors over 20 billion video streams per month from over 2 billion video viewing screens across the globe. The data used in this research study was pulled from nearly 2 billion streaming sessions in North America from April 2015 to April 2016. The streaming sessions were analyzed from connected TVs, gaming consoles, smartphones, tablets and many other streaming devices. Findings in this research paper represent just a small set of global OTT video consumption data that Conviva collects and analyzes on behalf of some of the world's leading OTT video providers.

Conviva worked with nScreenMedia to mine the data to reveal insights into consumers' streaming video behavior. nScreenMedia believes this data to have been impartially rendered, and we have reached our own conclusions as to its applicability and meaning. For more details, expanded data coverage and methodology used in this research, please contact nScreenMedia or Conviva.

References

1 Parrot Analytics, *Top Ten Most In-Demand Shows in the US (October 2–8, 2016)*, Parrot Analytics, Oct 10, 2016, www.parrotanalytics.com/news/top-10-most-in-demand-shows-in-the-us-october-2-8-2016/ (accessed on 10/17/16)

2 Colin Dixon, *CandW discuss the online Super Bowl*, nScreenMedia, Feb 11, 2016, www.nscreenmedia.com/2016-online-super-bowl/ (accessed on 10/28/16)

3 nScreenMedia, *Trackers->BBC iPlayer*, nScreenMedia, July 2016, www.nscreenmedia.com/bbc-iplayer/ (accessed on 1014/16)

4 Colin Dixon, *Connected device screen time exceeds TV viewing time*, nScreenMedia, Oct 9, 2016, www.nscreenmedia.com/connected-device-screen-time-exceeds-tv-viewing-time/ (accessed on 10/18/16)

5 Ericsson, *Mobility Report — on the pulse of the networked society*, Ericsson, June 2015, p26

6 Nielsen, *The Nielsen Total Audience Report Q2 2016*, Nielsen, Aug 2016

7 Visual Networking Index, *White paper: Cisco VNI Forecast and Methodology, 2015-2020*, Cisco, June 1, 2016

8 Now TV, *Learn about Now TV*, Now TV website, www.nowtv.com/about (accessed on 4/8/15)

9 David Puddicombe, *Now TV viewers to get refunds after Premier League glitch*, MoneySavingExpert.com, May 12, 2015, www.moneysavingexpert.com/news/phones/2014/05/now-tv-viewers-to-get-refunds-after-premier-league-glitch (accessed on 3/9/15)

10 Conviva, *Industry data portal*, Conviva, www.conviva.com/industry-data-portal/ (accessed on 10/18/16)

11 Ericsson, *The Stress of Streaming Delays*, Ericsson Consumer Lab, Feb 2016, p3

12 Ineoquest, *Tech's Newest Epidemic: Are you suffering from buffer rage?,* Ineoquest, www.ineoquest.com/techs-newest-epidemic-buffer-rage (accessed on 10/16/16)

13 Ericsson, *The Stress of Streaming Delays*, Ericsson Consumer Lab, Feb 2016, p4

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