



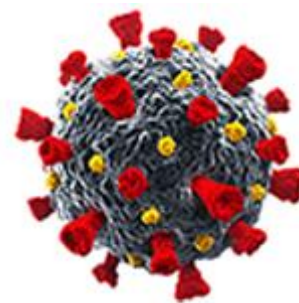
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# The COVID Effect on Internet Quality of Experience

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Since the beginning of the coronavirus pandemic, a flood of news sources has testified to the rise in the use of video conferencing, online gaming, movie streaming and other Internet services in the home. The use of these technologies has affected the quality of experience of home Internet. A recent survey of Veego software agents residing in home routers provides data to analyze the trends in problems that users are facing as they consume more and more Internet services at home.



Recognizing the sudden uptick in home Internet usage, the Federal Communications Commission (FCC) issued [home network tips](#) for the coronavirus pandemic. According to them, "Public health guidelines regarding social distancing have suddenly made staying at home the new normal for tens of millions of Americans. With kids home from school, parents teleworking full-time, and everyone needing Internet access, it's important to optimize the performance of your home network...The majority of households with home Internet service use the WiFi (wireless) service on their home router. When multiple wireless devices are using the same WiFi network, it can impact performance and create lag, or slower responses."

The sudden demand for streaming services—movies, live events, and so on—slowed down the Internet for everyone. In the early days of worldwide shutdowns, the [Financial Post](#) reported that content providers such as Netflix, YouTube, and Amazon Prime Video were reducing the quality of their videos in certain countries in response to a global surge in traffic. During the same time period, YouTube lowered the lowered the default resolution for videos worldwide—an indication that service quality was definitely impacted.

## Survey says: user experience problems abounded

Using data drawn from two European countries and Israel, Veego compared user-experience trends from just before these countries entered into wide-scale lockdowns with usage data garnered through the middle of April. The insights revealed that the uptick in Internet usage was accompanied by a surge in user-experience problems such as unacceptable lags in gaming, freezing of screens during video conferencing, and slow loading of movies. The main reasons behind these problems included network congestion, reduced quality of service that occurs when a network node is called on to carry more data than it can handle, and latency higher than 100 milliseconds—which is especially noticeable by gamers and users of other low-latency applications.

Game companies began working to counter these realities. At the start of the pandemic, Akamai began working with the world's largest distributors of gaming software, such as [Microsoft](#) and [Sony](#), to help manage congestion during peak usage periods. This effort was especially focused on gaming software downloads, which create Internet traffic when a gaming update is released to gamers.

This trend in gaming, especially in the isolation we are experiencing in the time of COVID-19, is expected to continue pushing the boundaries of Internet performance and quality, especially as new games and gaming updates go live to millions of users globally. Let's look at how this plays out in more detail with two examples. In the first, "Call of Duty: Warzone," an 80-gigabyte download that is the size equivalent of dozens of movies on Netflix, was likely downloaded at the maximum bandwidth home connections provided upon its release, saturating Internet infrastructure. In the second, computer game provider Steam published a record 20 million concurrent players with [some analytics](#) showing a 400 percent increase in gaming traffic during the initial weeks of shutdowns in the spring.

Streaming video can also have an impact on Internet usage in the home. Consider that several family members may access a growing volume of 4K video content through streaming media applications such as YouTube, Amazon Prime, Netflix and Hulu across a broad range of video devices, including smart TVs, tablets, smartphones, etc—all simultaneously. In recognition of the complications posed by these traffic demands, YouTube elected to make lower-quality video its streaming standard early in the pandemic. At the time, users would have to manually select a higher-definition video if preferred.

## Insights from the survey

The actual impact of streaming video on Internet infrastructure was captured in the survey, conducted in April 2020. To collect the data for this survey, an intelligent agent located in select home routers was tapped to gain insights. Internet-connected services such as video streaming, online gaming, video conferencing, web browsing, and other software and services used by connected devices in the home were reviewed and the data analyzed. Among the many problems that were identified, two stood out in terms of frequency.

- **A 52 percent increase in general WiFi problems** caused bad streaming and gaming experiences.
- **A 42 percent increase in intermittent connectivity failures** were responsible for slow downloads and other conditions that could cause annoyance for home Internet users.

Many of the connectivity failures were the result of bad WiFi link quality caused by improper configuration of extenders.

In terms of WiFi problems, neighbor interference was particularly noticeable, as it more than doubled during the study's timeframe. This is no doubt due to the increased overlapping in times of Internet usage between households in close proximity. Connectivity failures occurred primarily because people in pandemic-induced isolation within the home are trying to reach their Internet router from remote rooms where they have not used connected devices before. Sometimes, these rooms do not receive a good, consistent WiFi signal.

## Addressing home connectivity problems

There can be many reasons that WiFi signals lack reach in a home. However, there are many ways to improve connectivity in the home. Start by selecting a central location for the router and make sure the router has been updated with the latest software. Acquire a more powerful antenna for the current routers and reduce unnecessary high-bandwidth devices from draining bandwidth. Consider purchasing a WiFi repeater, booster or extender to extend reach. Switch the router to a different WiFi channel where there may be less traffic and congestion. Use the most up-to-date WiFi technologies to ensure maximum connectivity and performance. Check the router to determine which system may operate better with 5 GHz connectivity. Lastly, reboot a poorly performing router for a fresh start, which may clear the system for better throughput.

Without a reliable way to specifically diagnose WiFi problems, a longstanding traditional move (albeit often inconvenient) is to plug devices directly into LAN ports in the home router. While for some, using a directly connected Ethernet cable is a reasonable workaround, there can be many factors beyond the immediate user's home environment that negatively impact Internet performance, such as overall high bandwidth usage by the local population.

Because many new devices do not have an Ethernet port, and most people presumably don't have Ethernet cables (which also have their own speed limits) laying around, there are adapters you can buy if you need to bypass the WiFi and go the direct-connect route.

Even direct connection from device to router doesn't necessarily inoculate against Internet sluggishness. Internet problems emanating from infrastructure deficiencies along with cloud-service hiccups also contributed to downgraded user experience. Our research also noted that some legacy devices can be WiFi hogs, as they have a noticeable, deleterious effect on home networks as the number of simultaneously engaged devices increases.

Overall, the conducted analysis revealed that the number of devices participating in video conferencing services increased 2.5 times while each device is spending much more time consuming those services. In fact, according to our analysis, since the beginning of the COVID-19 pandemic, total consumption time per home has more than tripled during a typical 24-hour period.

There are other factors at play. According to an analysis of video conferencing by [Research and Markets](#), "Social-distancing has also meant that people have had to move their social lives online. Video conferencing software and video chat applications have seen a huge surge in demand as a

result of the COVID-19 pandemic. In March, video conferencing apps saw a record 62 million downloads. Much of the growth is due to increasing adoption of platforms like Google Hangouts Meet, Microsoft Teams and Zoom as businesses switched to remote working to limit the spread of the virus. Zoom was the most downloaded video conferencing app globally in February and March and it continues to see a high number of downloads across the US, EU and UK."

## Conclusion

In this new era where the Internet-connected device count is higher than ever before, it is understandable how such usage spikes by nearly everyone may result in bad user experiences for many. Fortunately, solutions are available to help to address these challenges. The latest AI-based solutions, in fact, are able to resolve many connected home malfunctions autonomously keeping all the services humming along. As these solutions make their way to market, we can expect that bandwidth-related issues will be addressed by Internet service providers (ISPs) so that people at home won't feel any degradation in their Internet services.