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Cloud to Edge Communications
Solutions



The Global Telco 5G Cloud Gaming Opportunity

Research by: SAPIO Research

Foreword

Gaming remains one of the most sought-after entertainment genres, generating significant revenue for all stakeholders. Increasing numbers of users are playing games both inside and outside of the home, largely due to smartphones. This has greatly expanded gaming's appeal beyond the hardcore gamers who typically play with a dedicated gaming machine or console. Despite this, the move towards streaming games via the Internet has been slower than other content genres, most notably music and video. Recent developments show that this is rapidly changing with more and more users now playing games in the cloud. This paper represents primary research undertaken to examine the connectivity needs of gamers and the added value 5G brings to this market for carrier.

While the concept of cloud gaming is not new, it has failed to evolve beyond small scale availability. Over the past decade we have seen a huge shift in technology, changing consumer behavioral patterns and forcing the evolution of business models.

Both fixed and mobile networks are getting faster, paving for new possibilities. Today, users own a slew of connected devices and access a wide range of content across them, including services such as Netflix, Spotify and many others. Gaming will be the next genre to benefit from this multi-screen usage world.



The potential for cloud gaming is huge: all of the building blocks are falling into place with better equipped devices, and faster, more robust networks. The new generation of gaming consoles is beginning to take advantage of these high-speed networks, such as the forthcoming Sony PS5, which includes an all-digital edition. This will help tap into revenue opportunities from online distribution, new ways of playing via streaming, and new subscription-based services.

Carriers are converging, given the need to focus on lowering costs and improving efficiency. Most now own both fixed and mobile assets. The arrival of 5G has reignited unlimited price plans, which removes one of the other key obstacles towards cloud gaming on the move. There are clear opportunities for carriers to bundle cloud gaming services with their own plans, giving them the opportunity to drive subscriptions and revenue, and introducing new audiences to gaming providers.

Of course, challenges remain. This is a nascent market and convincing users to spend on yet another subscription will take time. While the biggest opportunity resides with mobile gamers, core gamers represent a key segment which cannot be ignored, as they currently spend a significant portion of their disposable income on a premium gaming experience. Despite these challenges, there is no doubt that we are in a golden era of connectivity and content which promises to transform the way we interact and engage with devices in the future.

Executive Summary: Carriers could see an increase of \$150 billion per year from 5G Cloud gaming

The global gaming market represents big business to its stakeholders. The ability to offer a compelling playing experience to the world's 2.7 billion¹ gamers requires careful collaboration within a broad ecosystem of companies including game publishers, gaming hardware manufacturers (devices and accessories), IT companies and carriers.

This report focuses on the opportunity that gaming presents to both fixed and mobile carriers and in particular to those operators offering low-latency 5G services.

There is an undeniable link between the quality of playing experience and the speed, latency and resilience of the supporting internet connectivity. Today, many mobile connections offer lower latency than some fixed lines, and 5G will increase and enhance this advantage. Gamers realize this, especially those playing popular but bandwidth-hungry massive multiplayer games online.

Today, as this survey reveals, more than 58% of these enthusiasts pay a premium to their provider to enjoy the best gaming experience possible, and 60% of ardent gamers are willing to pay at least 50% more than their current home and mobile service for mobility and a better experience. Of course, within the mobile market, only 5G services can offer true guaranteed end-to-end quality of service controls.

This willingness to pay more for guaranteed service is significant. The next big wave set to hit this market is cloud gaming, which enables gamers to play across multiple devices, both indoors and outdoors. This format dispenses with the need for data processing via a local device and relies on live streaming from the cloud, straight to the device. To gamers, it will be like having a gaming console hosted in the cloud, with hundreds of available games that they can access, and play, from any device, anytime, anywhere.

Almost all gamers are aware that the arrival of 5G brings higher speeds and greater bandwidth. They are excited about the cloud gaming potential of 5G:

- 79% would consider replacing their home broadband and mobile connectivity with 5G for a better gaming experience
- 95% would pay more for this improved experience
- 60% would pay at least 50% more (average paid today is \$84 per month which would rise to \$126 per month)
- 58% would switch connectivity provider as soon as they could if a competitor offered a high-quality gaming service with a new 5G subscription

Based on the extrapolation of this survey data and publicly available gaming market forecasts from Newzoo, the incremental opportunity to provide the high-performance connectivity, via 5G cloud for gamers, could be worth more than \$150 billion annually to carriers deploying 5G.

But it doesn't end there: the revenue potential for carriers goes beyond improved connectivity. Cloud and mobile gaming present an opportunity for them to partner with games publishers or cloud gaming platforms to offer bundled services under a revenue sharing model. Such bundled packages may also help to surmount any net neutrality concerns.

These offers would undoubtedly be attractive to committed gamers. In addition to being willing to pay more, almost 3 in 5 of all gamers (58%) would switch connectivity provider as soon as they could if a competitor offered a high-quality gaming service with a new 5G subscription. This suggests that there are many potential early adopters eager to enjoy the improved capabilities that 5G will bring to their gaming experience.

¹Newzoo: <https://newzoo.com/insights/articles/newzoo-games-market-numbers-revenues-and-audience-2020-2023/>

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This primary research, undertaken to examine the connectivity needs of gamers and the added value 5G brings to those deploying it, proves the value of cloud gaming as a lucrative use case. With so much revenue to fight for, carriers that act decisively and press ahead with their 5G investments will be the first to capitalize on this market opportunity and start making healthy returns.

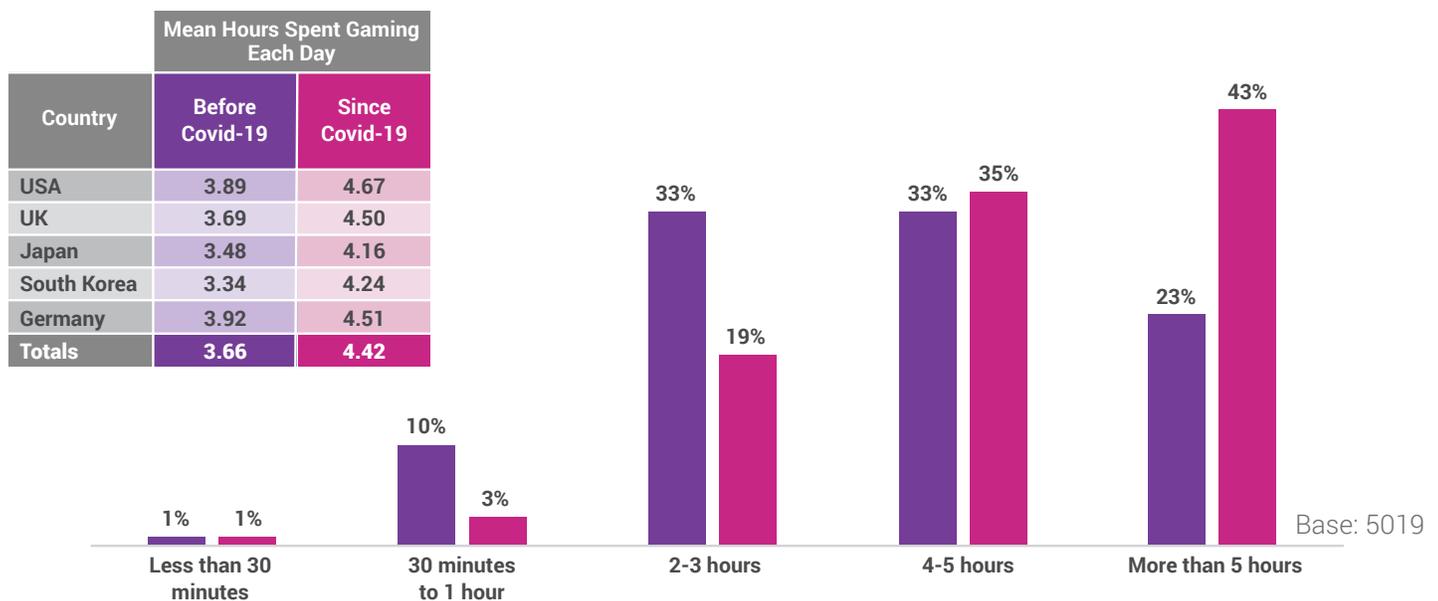
The research demonstrates that ardent gamers present the most addressable audience for carriers to target. They are very aware of the internet speeds they have and understand the detrimental impact of latency on their gaming experience. They are also prepared to spend what it takes to negate these issues. Carriers that invest in and build standalone 5G networks will be the first to offer these capabilities and dominate the gaming connectivity sector accordingly.

Survey Methodology

The survey was conducted among 5019 gamers from the following five countries:

- US (1013)
- UK (1003)
- Japan (1001)
- South Korea (1000)
- Germany (1002)

The survey was focused on ardent gamers who played for at least three hours per day prior to the COVID-19 pandemic outbreak (though the impact of the pandemic on gaming time was also captured).



■ On average, how much time did you spend gaming each day before the outbreak of COVID-19?

■ On average, how much time do you spend gaming each day now that social distancing restrictions are in place?

The survey was undertaken to better understand the habits and pain points of ardent gamers when it comes to creating the optimal gaming experience both indoors and on the move. It also considers attitudes towards cloud gaming. This includes measuring the current appetite for the gaming format, future intentions to play cloud games in multiple environments and the general willingness to increase gaming spend for an optimal cloud gaming experience.

At an overall level results are accurate to $\pm 1.4\%$ at 95% confidence limits assuming a result of 50%.

The interviews were conducted online by Sapio Research in April & May 2020 using an email invitation and an online survey.

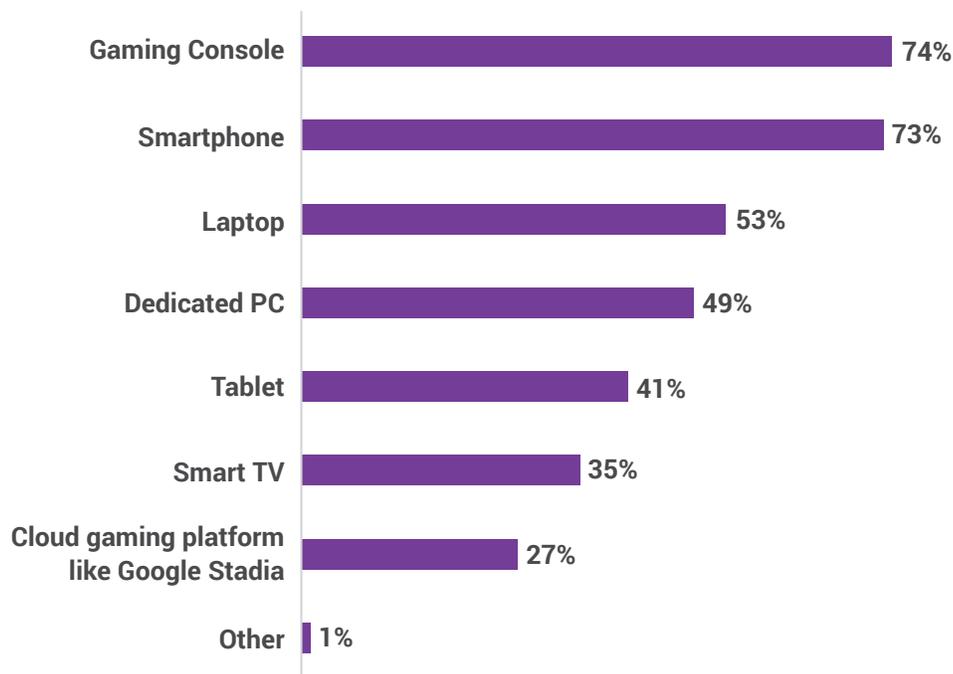
1. The Global Gaming Market Today

The global gaming market is thriving. According to gaming market insights company [Newzoo](#), there are currently 2.7 billion gamers around the world who will spend more than \$159 billion on games alone in 2020. This number is forecast to exceed \$200 billion within the next three years. The gaming market, of course, is much larger than games alone.

Today, ardent gamers spend more than 3.5 hours playing each day. During the COVID-19 pandemic, this increased to nearly 4.5 (4.42 hours) hours per day across all ages and genders. The vast majority (75%) play at home. With so much playing time, it is not surprising that these gamers also spend a lot of money to create the best possible gaming experience.

According to this research, on average, the ardent gamers surveyed spend more than \$260 per month (more than \$3,000 per year) on their hobby. This includes money spent on games, accessories, gaming subscriptions, gaming tournaments and internet connectivity (fixed and mobile broadband).

What devices do you use for gaming? Select all that apply



Base: 5019

Ardent gamers also use up to seven different types of devices when gaming. Which equates to an average of three different devices per user. The gaming console and the smartphone are the most popular.

2. Assessing perfect gaming connectivity

The quality of internet connectivity is instrumental in creating the perfect gaming experience. Just less than half (45%) of all gamers currently livestream games on-demand, and a further 43% play games through websites.

The ardent gamer spends, on average, \$84 per month on fixed and mobile broadband connectivity and the vast majority (88%) know whether they receive the speeds they pay their providers for. This is not surprising given more than half (58%) of gamers pay a premium for a high-quality fixed line broadband connection to optimise their gaming experience.

Average download, upload and ping scores received by gamers today

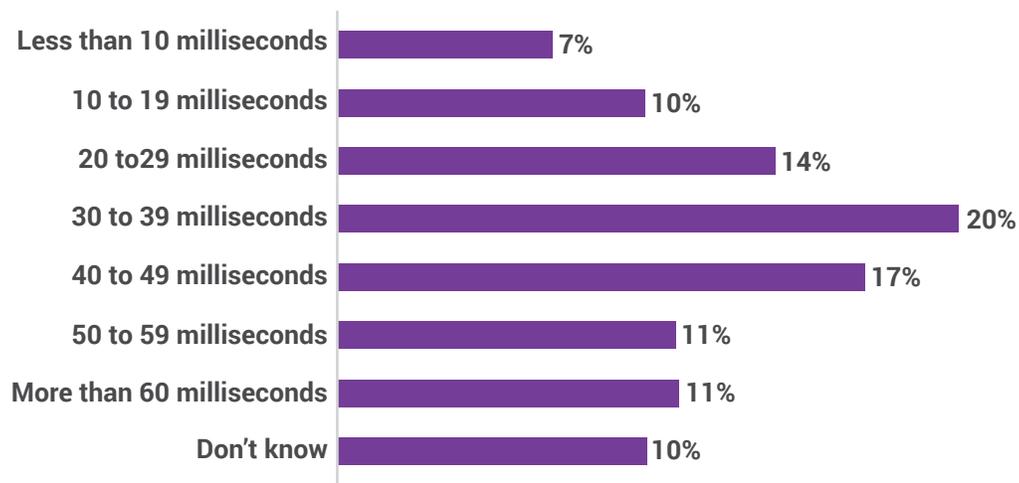
Since the majority of gamers pay for premium fixed line connectivity, there is little surprise that most of them receive high internet download and upload speeds. In gaming, download speeds describe how fast data is pulled from central gaming servers and upload speeds reflect how fast gamers are able to send data to other gamers. The average download speed global gamers receive is around 600 Mbit/s, compared to 16 Mbit/s for upload. On the face of it, these speeds would be considered sufficient to deliver a very good gaming experience.

However, there is a third measure – the ‘ping rate.’ This refers to how fast gamers get a response from their internet connection once they make a request or command. It actually describes the time it takes to project the action taking place in the game to the gamer’s screen. It is a measure of latency, and the shorter the timeframe, the better the gaming experience.

More than half of global gamers (55%) play multiplayer (like Call of Duty, Destiny or Pay Day) or massive multiplayer (World of Warcraft, Final Fantasy) games the most. In addition, the majority (74%) of gamers prefer to use a console as their main device. In this instance, the ‘ping rate’ refers to the time it takes for a console to connect to the game server. The higher the rate, the higher the likelihood for gamers to experience issues like lag and buffering.

In most gaming environments therefore, global gamers are competing against the respective ping scores their opponents are achieving – especially in competitive, fast-paced, and highly interactive massive multiplayer games. These games often involve vast servers that connect gamers from all over the world – in these instances ping rates of less than 10 milliseconds are seen as optimal, as it is possible for gamers to experience lag with ping rates above 30 milliseconds.

The average PING score received by global gamers



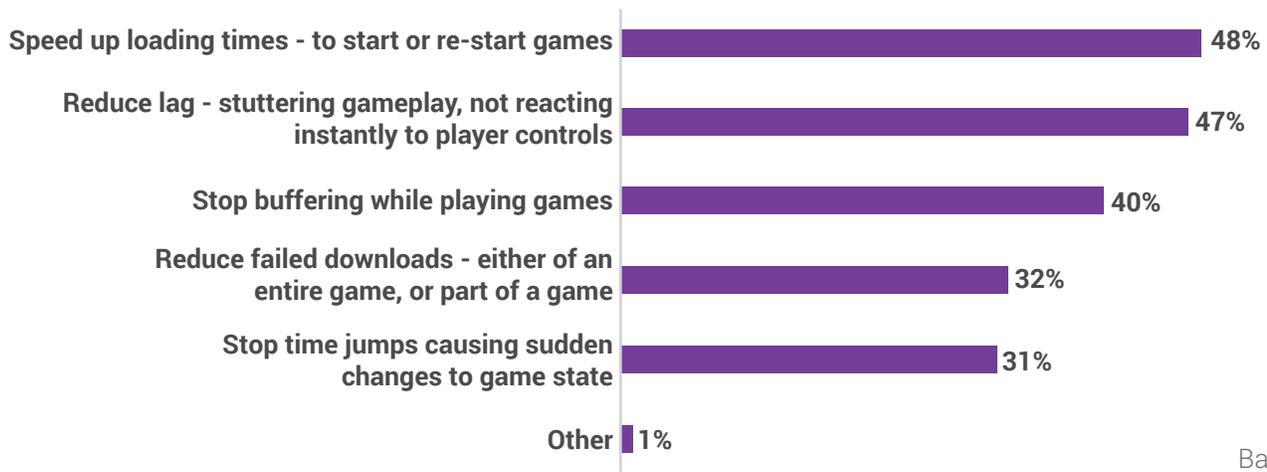
Base: 4398

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More than half of all gamers (59%) receive ping rates above 30 milliseconds, while only 7% currently receive optimal latency of less than 10 milliseconds.

Almost one in five gamers (19%) feels some level of disappointment when it comes to the quality of their existing connectivity for gaming. These gamers cited experiencing issues with slow loading times, lag, buffering, failed downloads and time jumps to varying degrees.

How could your current connectivity service be improved to give you a better gaming experience?



Base: 2826

3. 5G and the Cloud Gaming Carrier Opportunity

Growing popularity of cloud gaming

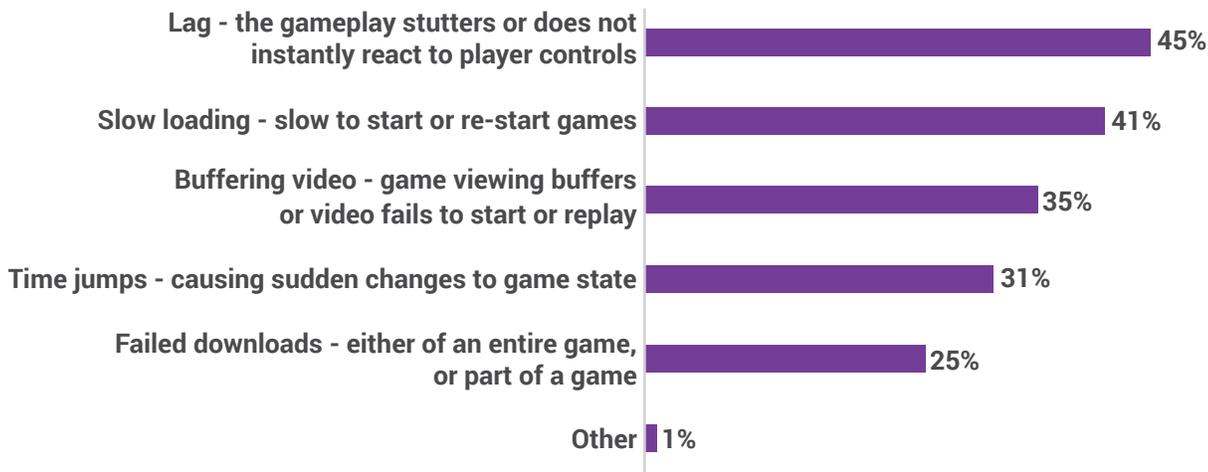
Cloud gaming is a way of playing video games via remote servers. Rather than downloading or installing a game and playing it locally, cloud gaming relies on internet streaming to deliver games to any connected device. It therefore relies on a consistent internet connection to operate seamlessly. Current examples include Google Stadia, Blacknut and Microsoft xCloud.

The concept of cloud gaming is extremely familiar to ardent gamers. We already know that on average, these gamers play with three different types of connected devices. More than 78% of those surveyed regularly play cloud games and more than half (53%) have an active subscription to a cloud gaming service. Of those gamers who have not yet played cloud games, half expect to do so in the next year. There is significant global momentum behind this gaming format.

As with regular games, most cloud games (81%) are played indoors and currently more than 4 in 5 gamers, (83%) believe that the playing experience of cloud games meets their expectations at least most of the time.

However, a fair proportion of gamers (17%) feel that improvements can be made to the cloud gaming playing experience. The degradation issues experienced with cloud gaming today are similar to those experienced with other streamed games.

What were the issues you experienced when playing cloud games? Select all that apply



Base: 1864

Mobile cloud gaming: 5G adds further potential

Global gamers overwhelmingly prefer to play indoors. Having said this, the vast majority (80%) have played cloud games on their mobile while out and about, and most of them (82%) were satisfied with the playing experience. In addition, the smartphone now rivals the gaming console as one of the most popular gaming devices. Despite this, cloud gaming playing time is limited. Today, just 1% of gamers play cloud games more than other formats.

Gamers have high expectations when it comes to the mobile cloud gaming experience. More than two thirds (67%) expect mobile cloud games to be as good as playing a game indoors on a Wi-Fi or fixed line connection. As many as 80% of ardent gamers would play mobile cloud games if carriers could guarantee this level of connectivity outside.

This has exciting potential considering 5G mobility. Almost all global gamers (95%) are aware of 5G and 83% think it will make mobile cloud games more compelling and enjoyable than they are today. A growing number of ardent gamers (40%) are already 5G customers.

5G remains in its infancy and the technology has yet to achieve its full potential. The vast majority of global carriers have initially focused on a non-standalone version of 5G. While these advancements are being warmly received by global mobile subscribers, this form of 5G only scratches the surface in terms of its true capabilities.

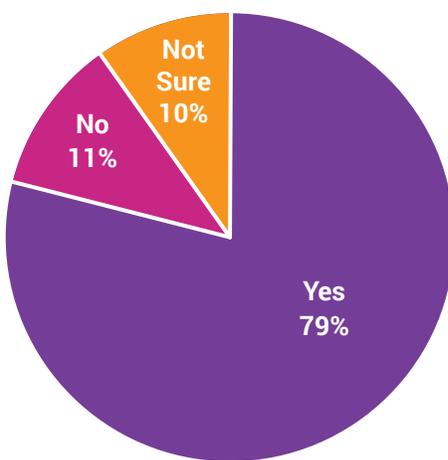
True standalone 5G is capable of achieving download speeds of between 10 Gbit/s and 50 Gbit/s and latency of just 1 millisecond. This is significantly faster than current fixed line fibre connectivity offered today and would comfortably meet the expectations of global gamers in terms of offering an instant and immersive gaming experience, both in the home and on the move.

A highly lucrative opportunity for carriers

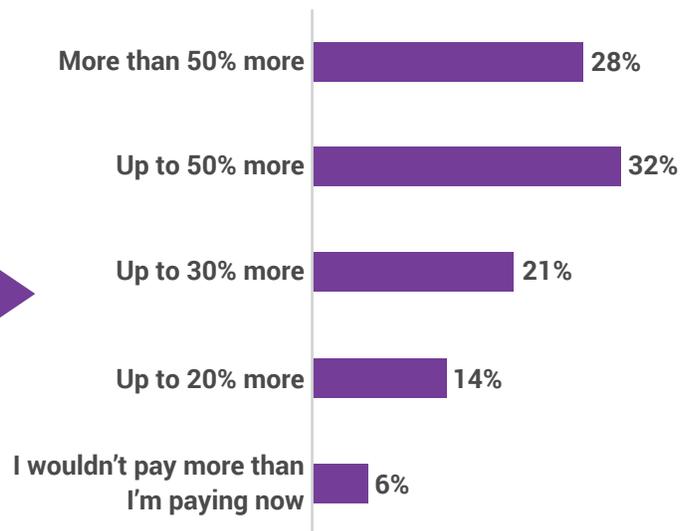
Regardless of how satisfied gamers are with their existing levels of connectivity, there is still significant appetite for a better service, and a stated willingness to pay more for a better service.

If 5G does provide a better experience, would you consider replacing your home broadband, as well as your mobile connectivity for 5G? How much more per month would you pay for 5G connectivity, above what you pay for home and mobile connectivity today?

Would you consider replacing home broadband & mobile for 5G?



How much more would you pay per month?



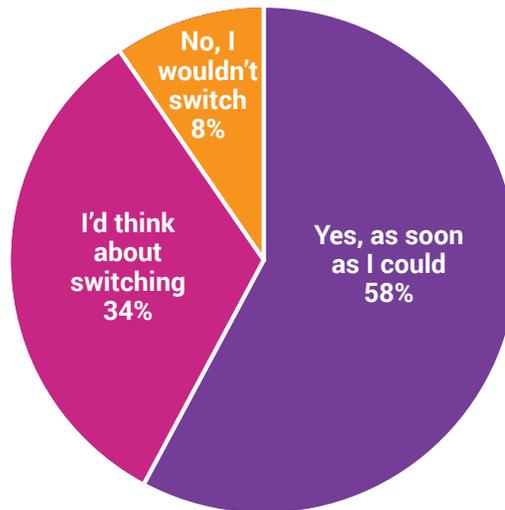
Base: 5019; 3963

Overall, 79% of gamers would consider upgrading their home and mobile broadband connection to 5G if it provided a better gaming experience. More than half of these gamers (60%) would pay at least 50% more than they are paying today.

What does this mean in real terms? Well, according to this survey, ardent gamers already spend \$84 per month, on average, on fixed and mobile connectivity. Newzoo estimates that there are approximately 2.7 billion gamers in the world. By correlating [Newzoo's own gamer profile segmentation](#) with the characteristics of the respondents of this global survey, we estimate that 500 million (18%) of these gamers represent ardent gamers. If 60% of these gamers are prepared to pay at least 50% more for their connectivity, we have 300 million ardent gamers who are each prepared to spend \$126 per month on connectivity. This increase presents an annual market to the global carriers deploying 5G of more than \$150 billion.

There is also increased revenue potential for carriers beyond improved connectivity. Almost 3 in 5 of all gamers (58%) would switch providers as soon as they could if a competitor offered a high-quality gaming service with a new 5G subscription. This suggests that a large number of potential early adopters are eager to enjoy the improved capabilities that 5G will bring to their gaming experience. It also presents an opportunity for carriers to partner with game publishers or wider cloud gaming services for bundled offers under a revenue share model. Carriers have been keen to forge relationships with other music and TV providers such as Spotify and Netflix in order to acquire new subscribers and drive deeper usage. Cloud gaming offers an excellent opportunity for wider collaboration.

If another mobile operator offered high quality cloud gaming services, bundled with a new 5G subscription would you switch providers in order to get them?



Base: 5019

4. What the research shows

While cloud gaming remains in its infancy, the gaming industry is booming. [Newzoo](#) forecasts that the global games market will generate revenues of \$159.3 billion in 2020, a healthy year-on-year growth of +9.3%. The reliance of cloud gaming on ultra reliable low latency connectivity makes it an ideal use case for 5G. Global gamers are aware of the new format, and the majority have active subscriptions to cloud gaming services. Twenty percent of ardent gamers are currently unhappy with their in-home connectivity. Most gamers are aware of the capabilities of 5G and would pay a premium for it, if it guaranteed a better gaming experience than their current one.

To most gamers, a better gaming experience means improving on the capabilities of wireless connectivity, whether in the home or elsewhere. This is what the majority of gamers expect, and they would be prepared to switch providers immediately to get it.

5G can meet these consumer expectations by providing the low latency connectivity needed to deliver fast, reliable and responsive gameplay. If carriers are to make these 5G guarantees to global gamers, however, they must invest in the network infrastructure that will deliver them. Carriers can only seize this global 5G cloud gaming opportunity with standalone 5G networks, and their network slicing capabilities to assure ultra-low latency services.

Carriers who make this investment can compete for \$150 billion in connectivity revenue every year from a market of 300 million ardent gamers. Additional revenue opportunities will follow from partnerships and cloud gaming service bundles, helping to accelerate returns on 5G CAPEX investments. The longer they wait, the greater the chances of ceding their advantage to competitors.

About Ribbon

Ribbon Communications (Nasdaq: RBBN), which recently merged with ECI Telecom Group, delivers global communications software and network solutions to service providers, enterprises and critical infrastructure sectors. We engage deeply with our customers, helping them modernize their networks for improved competitive positioning and business outcomes in today's smart, always-on and data-hungry world. Our innovative, end-to-end solutions portfolio delivers unparalleled scale, performance, and agility, including core to edge IP solutions, UCaaS/ CPaaS cloud offers, leading-edge software security and analytics tools, as well as packet and optical networking leveraging ECI's Elastic Network technology. To learn more about Ribbon visit rbbn.com and for more information about our packet and optical networking portfolio visit ecitele.com.

