



Winning in Cloud Gaming with 5G

The New Monetization Opportunities and the Strategy for Success



The key to 5G cloud gaming success is a good strategy 'that brings out the right gaming titles to the addressable market with the right infrastructure and coverage, and ensures a business case that brings out the growth and expected ROI

The advent of cloud gaming, especially when combined with the rollout of technologies such as 5G, creates a strategic imperative for communication service providers (CSPs) and technology players to create a new service, a new market, a new revenue stream, and above all, a game changing opportunity that will set them apart from the competition. Apart from CSPs and technology providers, all consumer-driven industries like retailers, education etc. are also exploring cloud gaming as a new proposition to connect, engage, monetize and create a differentiation in the changing digital world.

Today, we see many cloud gaming players who are positioning themselves as niche cloud gaming providers and addressing a specific market segment in terms of titles and target consumers. We also see that players like Google, Microsoft have embarked on the cloud gaming journey. Large gaming publishers have been gearing up for cloud gaming with their own strong titles and market credibility. So, it's quite a complex market with many players sharing the belief that cloud based gaming services with 5G will have a large audience and will become the premier way to play games.

Cloud gaming market forecasts have shown tremendous growth opportunity, according to some of the analysts and industry leaders viz.

- IHS Markit expects the cloud gaming content and services markets to grow from \$387 million in 2018 to \$2.5 billion in 2023, with 5G driving much of that growth¹.
- Newzoo's Analytics Platform forecast that 2020's global games market will generate revenues of \$159.3 billion, a healthy year-on-year growth of +9.3%².
- According to Mordor Intelligence, the Cloud Gaming Market was valued at USD 1.15 billion in 2019 and is expected to reach USD 2.70 billion by 2025, at a CAGR of 15.3% over the forecast period 2020 - 2025³.

- Mobile Video Industry Council revealed that mobile operators expect 25–50% of their 5G data traffic to come from cloud gaming by 2022⁴.

Cloud gaming providers expect to reduce the cost and technology barriers and attract all game genres across geographies. Also, they are looking at having the ability to create a new engagement model with gamers by providing "gaming as a service", thereby users can access gaming at any time, on any device, and in any location.

5G will be critical for cloud gaming landscape to evolve, and especially, CSPs or technology providers will require to understand the business and technology implications. 5G cloud gaming will enable gamers globally to enjoy games anywhere on any connected device; replace consoles with smart phones and television, and further create new experience that will reduce friction and enable deeper engagement.

Cloud gaming is getting redefined with 5G as it will provide better gaming experience and consumers are open to pay more or switch connectivity provider for the new gaming experience.

5G imperatives for cloud gaming

The 5G imperatives for cloud gaming is required to be understood from two perspectives viz. from the gamers point of view, and from the mobile operators and enterprises (gaming providers) point of view.

Gamer's expectation from 5G is a new experience whereby global gamers can compete with other gamers across the globe without delays and in high resolution; further, they are able to immerse and interact through the game. As games become immersive and the devices become powerful with 5G enablement and with high GPUs, the challenge to be addressed is high speed, low latency and reliability of the network. As per research reports, gamers are ready to pay more or change their mobile connectivity with 5G for best high-quality gaming experience.

Technology providers and mobile operators' expectation and focus from 5G is monetization, creating new revenue streams, upsell and cross-sell with product bundling and further expand and strengthen the consumer base.



Understand the region and focus on building a strong cloud gaming brand and increased market share



Get the right business case that provides the expected return on investments (ROI)



Create right engagement and commercial model to address every type of gamers with right gaming titles



Ensure high quality seamless gaming experience through high speed reliable network, low latency and streaming platform



Ability of streaming platform to support all game genres from hyper casual to AAA, and single player to multiplayer



Identification and classification of encrypted traffic and ensure trust and safety providing the right security and data privacy compliance

As challenges and trends push mobile operators and technology providers to reinvent their position and cloud gaming strategy, the key will be to put forth a good strategy that brings out the right gaming titles to the addressable market with the right infrastructure and coverage, and ensure a business case that brings out the growth and expected ROI.

Guiding principles of cloud gaming strategy with 5G

Communication service providers, technology providers and other enterprises offering gaming services and embarking on the cloud gaming initiative will require a two-fold strategy that will include run-up to 5G cloud gaming and further implementation with 5G connectivity. Mobile operators and other enterprises will require the following guiding principles as tenets to the cloud gaming strategy with 5G:

1. Business viability and validation

Building the right business case that delivers the expected ROI is key to the success of cloud gaming with 5G. This will require mobile operators and enterprises in cloud gaming to understand the market, gamers segment, gaming categories and titles, and above all, new cloud gaming products and service innovations that 5G will enable for business viability. The business case will require striking the right balance w.r.t costs, gaming titles and technology and as a result, understanding the business and technology implications is critical to the success of 5G cloud gaming. The operators and enterprises will require to clearly articulate the monetization models: merely a subscription model approach may not be viable for business. It will require continuous collaboration to bring new 5G gaming experiences and address multiple revenue streams that could include Ad monetization, data monetization, eSports⁵, immersive gaming etc. Thus, an advisory approach is required with mobile operators and other enterprises to put a strategy that will focus on outcomes of the 5G gaming products and services to deliver desired results. To design a comprehensive 5G strategy, operators and enterprises must define the roadmap based on the three dimensions viz. Engineering, Intelligence and Monetization.

2. Gaming titles and customer journey

The value of 5G in cloud gaming will be driven with gamers behavior and engagement. Gaming titles will require a lot of focus to clearly understand the segment of the gamers to which a product is targeted. For example, gaming providers like Hatch have gaming titles to address kids and family⁶. Similarly, there are players who focus on gaming titles for Gen Y and Gen Z. Another aspect to address will be the ownership issue where people want to pay for a game once and play it forever rather than pay a subscription. Looking at one segment of game genres will limit the gamer market segment or focusing only on AAA complex MMORPG (massive multiplayer online role-playing games) games may not lead to desirable business viability in terms of high costs related to title licenses and technology infrastructure. Thus, understanding the gamer's community and aligning the gaming titles for different type of gamers is critical to the success of the 5G cloud gaming strategy.

Mobile operators and cloud gaming providers will require to define and position their 5G gaming products and services aligned to the customer journey and offer them a seamless experience across locations and connected devices. Thus, having the right gaming titles that demand 5G connectivity and understanding the customer journey is critical to address all game genres from hyper casual to AAA and single player to multiplayer.

3. Experience driven solution design

5G cloud gaming is expected to deliver new experiences to the gamers globally with games available anytime on many devices. The architecture for cloud gaming is very critical given that any challenges on gaming experience can impact the business and gamer loyalty. Some of the key tenets to focus include:

a. Network strategy

In run up to 5G, network design is critical in having the game genres to be able to play games on 4G / LTE advanced and further transition smoothly to the 5G network. Cloud gaming requires consistent connectivity, fast speeds and low latency especially with AAA complex MMORPG games. 5G will provide the experience of streaming precision-based, graphics-heavy MMORPG games seamlessly on smart phones. The bandwidth needed can

vary based on streaming service, game titles, region and resolution. In many cases, bandwidth typically required varies w.r.t 15 mbps for 720p at 60fps; 25 mbps for 1080 at 60 fps and if we are streaming at higher than 1080p, then can go to 50 mbps. To ensure less bandwidth and latency, the command streaming form of cloud gaming can be explored whereby the game logic and graphics command is processed

b. Build to scale streaming service

The cloud gaming architecture should be built to scale and ease of operations. Cloud gaming architecture tenets should include highly portable cross-platform with optimized high performance technology and caching of assets. The right sized infrastructure and coverage for game genres is a critical element and for mobile operators or cloud gaming enterprises, it is important to have presence and coverage across geographical locations with their own data centers or cost-efficient providers and hardware available in each region. The streaming service architecture needs to be designed in the context of the game genres, titles and accordingly, explore options of deciding the streaming options based on the video streaming or file streaming. Further, the platform and infrastructure will need to be scalable to handle new products and services in future



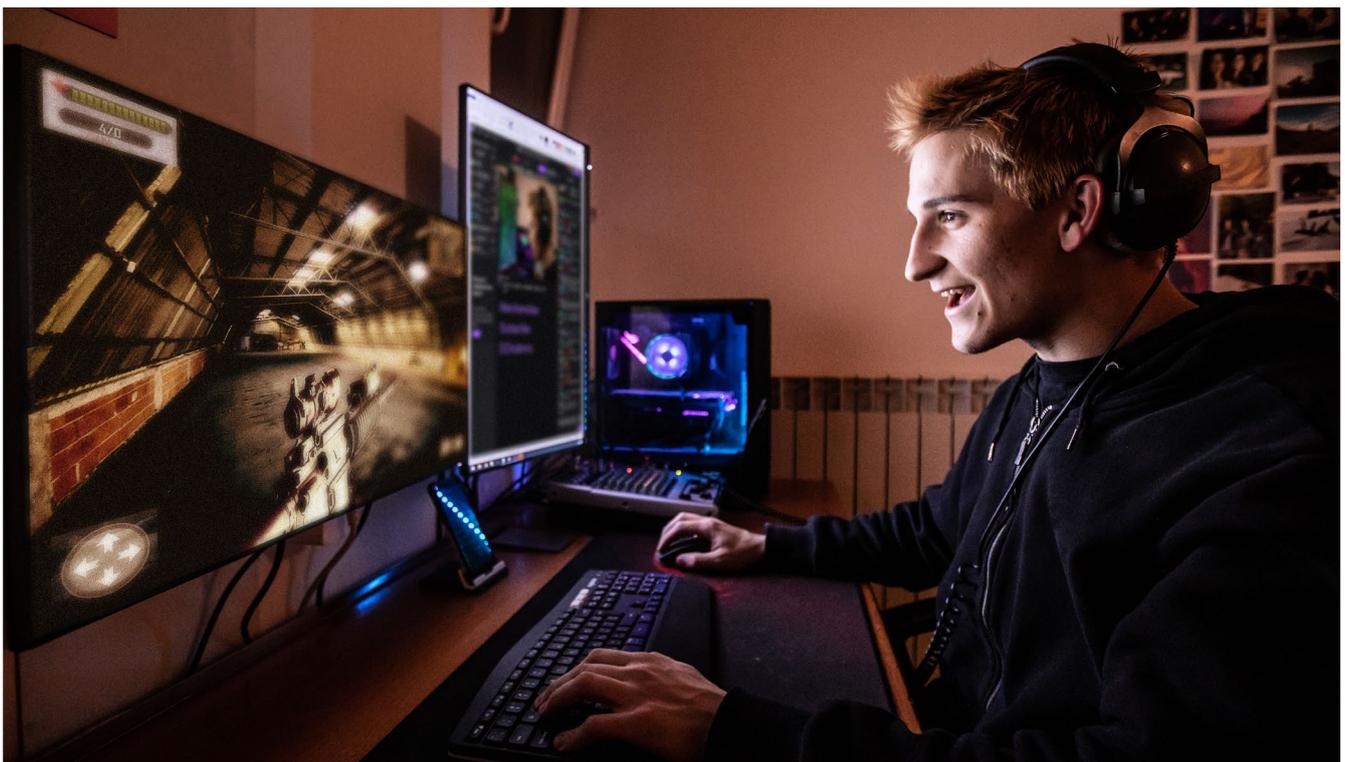
c. **Guarantee performance**

QoS (Quality of Service) and QoE (Quality of Experience) is critical in 5G gaming and requires consideration for higher bandwidth, low latency and resolution requirements. Latency is very important requirement in 5G gaming where lag measured in milliseconds can disrupt the whole gaming experience. The metrics related to display, framerate to depict high frames-per-second (fps), latency of the game played in millisecond to depict the high responsiveness and noticeable ultra-low latency are critical to monitor and notify users and administrators on the performance. It is important that the framerate is greater than 60 fps (Frames-per-second) and in some case of high-end games will require to be greater than 100 fps to ensure right resolution and experience. Also, latency requirements have to be addressed and measured, typically target in the range of 10-50 ms or even sub-10ms to ensure seamless experience especially for serious gamers and competitive multi-player gamers. The performance w.r.t low latency for every title needs to be captured and monitored from the cloud game server to the processing and rendering on edge device, the ultra-low levels of latency can only be guaranteed with 5G networks.

Mobile operators where 4G and 5G will co-exist will need to deal with handovers and gamers will expect similar experience across different access technologies. The 5G connectivity will be adaptive to understand the gaming scenario and accordingly ensure right bandwidth to guarantee performance.

d. **Edge based analytics**

As low latency is so critical in gaming, Edge computing will play an important role in the delivery and distribution of cloud gaming, both at the access network and at the device edge, where the GPU rendering on (say) 5G smart phones can provide a great experience to the gamers. Advanced analytics and AI on Edge will process data and in real time, provide insights to the consumer in a location. It will create extreme personalization through insights and recommendations to the gamers, and for the operators / enterprises, provide ability to understand the consumers and contextually provide dynamic Ads or offers to enhance user experience and create new monetization models.



e. **Security and data privacy**

As cloud gaming matures, trust and safety for gamers and enterprises, becomes one of the most important considerations, given that games have been the most vulnerable areas in terms of data theft and malware attacks. The gamer's identity management and protecting of personal data will be key areas of focus in 5G gaming experience. It will require proactive approach to address end-to-end security and identify the vulnerabilities and areas related to hacking, malware, piracy etc. It will be important to reassess the regulatory requirements in the context of cloud gaming, understand areas related to gaming rights and usage globally, looking into the data privacy laws in a region, for example GDPR compliance in EU even if the gaming servers are located outside the EU⁷. Thus, security and data privacy compliance strategy need to be holistically assessed and 5G cloud gaming audit and remediation plan will need to ensure compliance to the country-specific security and data privacy laws.

4. **Collaborative partner ecosystem**

Winning in cloud gaming with 5G requires collaboration and co-operation between mobile operators, gaming companies, IT services and technology players. It is a model where gaming

titles, technology capabilities, and delivery and distribution channels with a reliable and resilient connectivity are all important to make it a mutually beneficial business with 5G cloud gaming. While there are many players in the market, little success is seen due to lack of collaboration or limited focus in partnership. As a result, there have been challenges in creating right engagement and commercial partnerships in terms of reaching the gaming community globally, reliable connectivity, having the right gaming products and titles, and having the right technology architecture, platform and infrastructure, etc.

Thus, 5G cloud gaming success and win-win proposition requires network partnership with operators, commercial partnerships with gaming companies, technology partnership with IT service providers and technology platform and cloud providers. You further need to explore and encourage yours gamers as business partners to create new games, publish in your marketplace, and incentivize them. Building a strong partner ecosystem will enable the right solution and experience for the gamers and collectively, all partners will focus to adopt areas like edge computing, 5G network exposure capabilities, common APIs and interfaces, shared data assets etc. to build a mutually beneficial business.



The right approach to new monetization opportunities

In the turbulent and changing digital world post COVID-19, the advent of 5G is creating a new opportunity and key differentiator for mobile operators and enterprises with cloud gaming. 5G with cloud gaming experience will overcome many of the current challenges and bring benefits that include

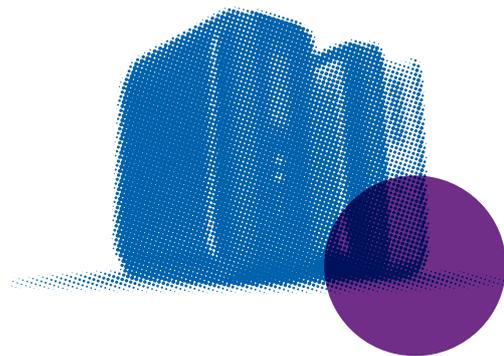
- New revenue streams and monetization models from B2C and B2B segments
- 5G cloud gaming experience will provide ease in gaming experience with instant play with no downloads or installations; storage on cloud, faster and low cost deployments with connected devices support
- High bandwidth and low latency will significantly improve the gaming experience
- Improve quality of games, ability to feel a new experience with high end titles, building immersiveness and interactivity, high resolution and overall smoother gaming experience
- Rise in cloud gaming with development of AR/VR will enable higher realism and a new game world
- Extreme personalization with edge-based analytics, social playing will turn spectators to active gamers
- Trust and safety to ensure personal data protection and cybersecurity.

5G in cloud gaming is evolving: it is a journey, and mobile operators and gaming providers need to test waters to get the business strategy right with multiple proof of concepts, continuous assessment of the success of the strategy, and above all, have a strong partner ecosystem to create a win-win

proposition. The 5G cloud gaming approach will need to support all game genres from high-end to hyper-casual even when streamed over mobile networks. The architecture and technology will need to be scalable, future-proof and low cost to ensure ROI without compromising on the gamers' experience.

References

1. RootMetrics Gaming Report: (<https://rootmetrics.com/en-US/content/us-LA-gaming-report-2020>)
2. Newzoo: <https://newzoo.com/insights/articles/newzoo-games-market-numbers-revenues-and-audience-2020-2023/>
3. <https://mordorintelligence.com/industry-reports/cloud-gaming-market>
4. [https://www.analysismason.com/research/content/comments/cloud-gaming-qoe-rma04/-](https://www.analysismason.com/research/content/comments/cloud-gaming-qoe-rma04/)
5. <https://playhatch.com/news/elisa-5g-global-games-take-main-stage-at-arctic-invitational-with-hatch-and-oneplus/>
6. <https://kidsplayhatch.com/>
7. <https://www.lexology.com/library/detail.aspx?g=a5d1b4f8-c709-47ec-8258-4404cc82530b>



About the Author



L. Ganeshkumar
Consulting Partner
Wipro Limited

Ganesh leads the 5G Industry Solutions at Wipro. He has 25 years of work experience in Information Technology. His experience spans the areas of Communications and Consumer Business with a focus on digital transformation and customer experience. He also brings in rich experience in Media and Entertainment, with a special focus on sports and broadcasting.



Wipro Limited

Doddakannelli,
Sarjapur Road,
Bangalore-560 035,
India
Tel: +91 (80) 2844 0011
Fax: +91 (80) 2844 0256
wipro.com

Wipro Limited (NYSE: WIT, BSE: 507685, NSE: WIPRO) is a leading global information technology, consulting and business process services company. We harness the power of cognitive computing, hyper-automation, robotics, cloud, analytics and emerging technologies to help our clients adapt to the digital world and make them successful. A company recognized globally for its comprehensive portfolio of services,

strong commitment to sustainability and good corporate citizenship, we have over 180,000 dedicated employees serving clients across six continents. Together, we discover ideas and connect the dots to build a better and a bold new future.

For more information,
please write to us at **info@wipro.com**