niko | Telstra

Whitepaper

The Key to Making Games Successful: Your Network Infrastructure

Contents

04
Introduction

- Why is Network Infrastructure Important?
- Developing Your Network Infrastructure Roadmap
- The Game Development Lifecycle

08
Market Overview

- The Growth of the Gaming Sector
- China Market
- Southeast Asia + Chinese Taipei Market
- Connecting Asia and North America
- Top Games in Asia, Developed in the U.S.
- Top Games in the U.S., Developed in Asia
- 2019 Market Size (Million $USD)
- The Rise of Mobile and Cloud Gaming
- The Impact of COVID-19

18
Stage 1: Developing a Game, from Conceptualization to Production

- Distributing a Game to Key Markets
- Network Costs, Demands, and Diversity
- Building the Network: Owned vs. Leased vs. Hybrid
- Ensuring Your Development and Design Teams Can Easily Collaborate

22
Stage 2: Launching a Game to the Public

- Games and Networks are Global
- Test, Evaluate, and Plan

26
Stage 3: Expanding Game Availability and Keeping Gamers Engaged

- Navigating Regional Complexity
- Building for Reliability and Scalability
- Example: Why One of the Biggest Gaming Companies in the World Selected Telstra as its Primary Asia-Pacific Network Infrastructure Partner

30
Stage 4: Streaming, Broadcasting, and Watching Individual Gameplay and Esports Tournaments

- Esports as a Driver for Game Growth
- Making Your Game Livestream Ready
- Producing Esports Content
- Example: How Riot Produces and Broadcasts its Esports Content with Telstra

34
Conclusion: The Network Makes the Game Work

Introduction

Whether you're a small gaming startup just beginning your journey in the industry or a well-known developer and publisher, the one thing you strive to do more than anything else is entertain people and make great games. While there are many factors that can make a game successful – engaging gameplay, interesting storylines, social interaction and community, competition, and more – there's one important element that's often less talked about: how the game gets into the hands of consumers and the network on which it's distributed.

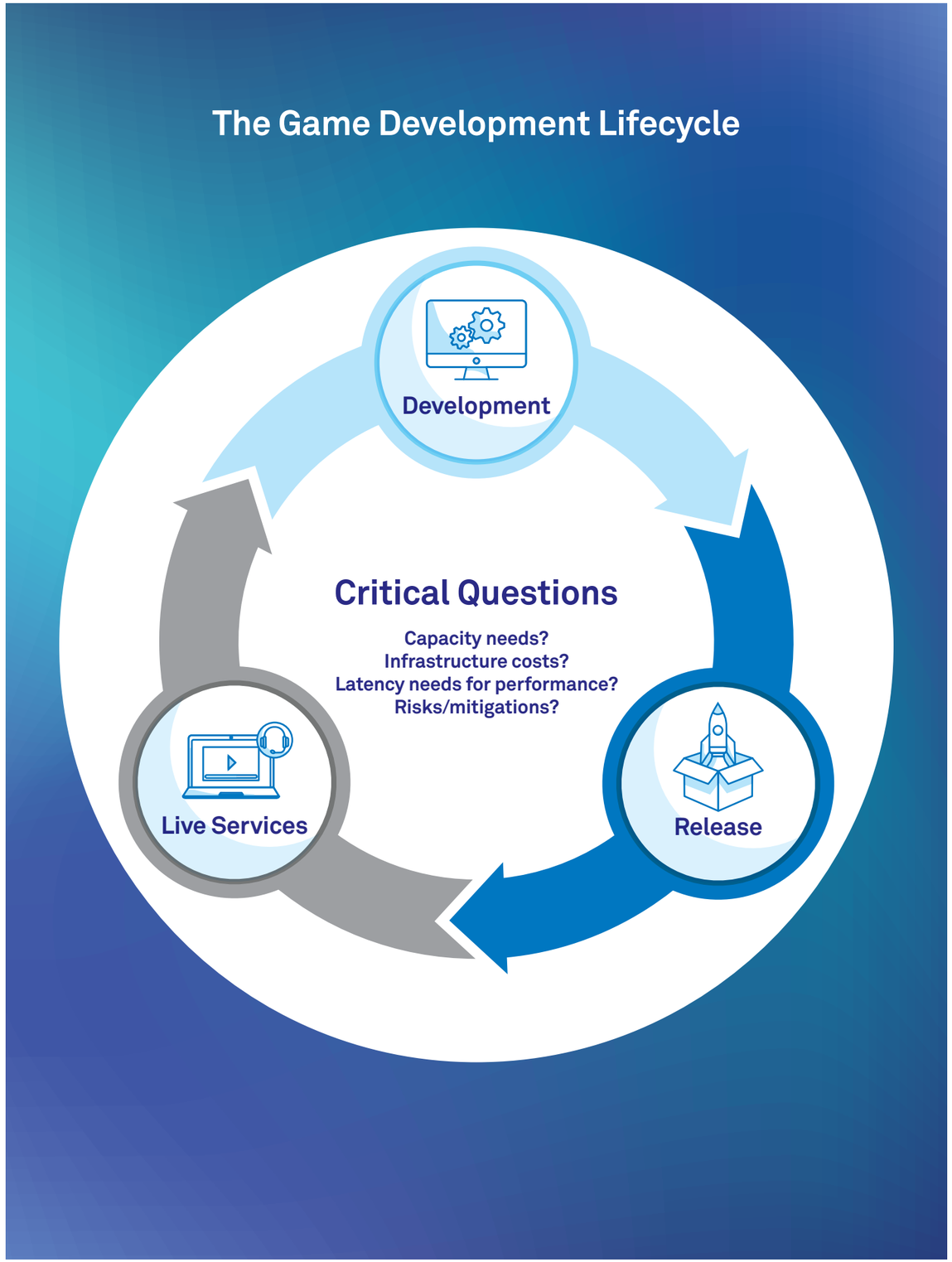
This white paper, developed by **Niko Partners** and **Telstra**, describes the critical role that telecommunications (telecom) companies, providers, or partners play in the lifecycle of a game from conceptualization and production to public release, to live services and updates, to esports. Gaming companies must weigh several key network infrastructure and connectivity considerations in each of these stages, which are influential to a game's success, both in terms of consumer satisfaction and financial performance. Using real-world case studies, interviews, and our analysis, we'll outline network infrastructure best practices for gaming companies and some of the approaches for working with telecom providers.

Why is Network Infrastructure Important?

If the network infrastructure and internet connectivity that form the backbone of your game are subpar, then latency, user experience, and download time may suffer, often resulting in frustrated gamers who may just move on to another game. This is important because, in today's gaming world, console, PC, and mobile gaming are all online, and cloud gaming has just begun. Not only is connectivity crucial when it comes to delivering a game to consumers, it's also a significant factor in the development of the game itself, as well as the other aspects that are associated with gaming such as livestreams and esports. Great network infrastructure may not be the sexiest part of making a great game, but it may just be one of the most vital; and, it's imperative that you work with telecommunications partners to ensure everything you've worked so hard on goes off without a hitch, keeps gamers coming back for more, and sets you up for long-term success. Additionally, by providing a good user experience through a solid network, you're more likely to generate revenue from your game for your business.

Developing Your Network Infrastructure Roadmap

Before we discuss each stage of game development in more detail, let's take a high-level view of some of the decisions you'll need to make in developing your network infrastructure roadmap. A game depends on a robust network to function. To reach a global audience, gaming companies must build fast, reliable, and sustainable network infrastructure to deliver game content to players in their key markets (such as Asia and North America) and to connect players to online features. The decisions you make about how you build your network, even in the early phases of development, can have a dramatic impact on the success and profitability of a title. Poor network experiences or technical issues are demonstrated to reduce player engagement, spending, and ultimately to cause player attrition. Therefore, you'll need to plan early for executing and maintaining network infrastructure by building a roadmap that coincides with your game development timeline, which will allow you to successfully develop and launch your game, grow with your audience, and account for variations in bandwidth demand and prepare for potential gameplay disruptions.



Decisions involved in developing your network infrastructure roadmap include:

- Building your own network, paying to use a network from an existing platform (Amazon, Google, etc.), or creating a hybrid solution that combines both. The correct approach depends on factors such as scale, market, audience, and growth projections for a title.
- Identifying key markets and developing roll-out strategies that consider existing infrastructure, partnerships with local providers, IP transit, and the content delivery networks that will get the game in the hands of consumers.
- Preparing for and understanding the peaks and valleys in network demands due to seasonality, new content, events, and other variables as well as planning contingencies to meet these demands, when they occur.
- Understanding the required network infrastructure to ensure peak performance for your game. This includes identifying bandwidth and IP transit needs to achieve the level of latency and resiliency essential for a positive user experience, and then mapping out the IP peering and transit relationships needed across a country or region and the specific subsea cable routes and data center locations that will get the game in the hands of your audience. Once you understand these factors, you can better forecast and budget network related costs and determine preliminary ROI, which are big factors in your game's overall development and production budget.
- Planning appropriately for the potential streaming and broadcasting of your game (if and when your game becomes a massive hit) with players. Many publishers, big and small, see huge value in esports and have begun to create, produce and stream their own esports content. Having a network capable of delivering that content globally is extremely important, especially as remote production becomes more mainstream.

Your brand is intrinsically tied to your network and your network partners. Network implementation, while separate from game design, is a foundation of the player experience. Learning these lessons as a game launches to the public risks alienating early adopters in key markets essential to your game's growth and return on investment.

Many foundational decisions will be made early in the development process, well before a company engages a telecom to build their network. However, remember that a telecom company can be an invaluable consulting resource that can help you further define and refine your go-to-market strategy, cost estimates, and more.

In the following sections, we'll examine when these decisions should be made in a game's lifecycle, and the best practices from the perspective of network design and implementation. While this is not exhaustive, it provides guidance to publishers and developers when building a game-specific network, whether you're a startup doing this for the first time, an established business entering a new market, or a veteran gaming company looking to refine and evolve your existing network infrastructure.

Market Overview

Before we get into the best practices, let's first explore some of the gaming market realities that may affect how you build your network infrastructure and with which provider or providers you choose to build it.

The Growth of the Gaming Sector

Over the last decade, gaming has grown to represent one of the largest consumer media markets in the world, with global revenue of $146 billion in 2019 (Niko Partners). Gaming is a truly international industry bringing together game development, design and production teams often located in multiple regions around the world, distributing games globally to audiences in dozens of countries, livestreaming gameplay on platforms like Twitch that almost anyone anywhere can watch, and broadcasting esports competitions (i.e., League of Legends) that reach millions of spectators worldwide. It's the global nature of the gaming industry that has enabled its growth.

However, some regions have grown and are expected to grow more than others. More specifically, Asia and North America have the most robust gaming industries and neither region is showing any signs of slowing down.

There are over 2.5 billion gamers globally, forecast to reach 2.7 billion in the next two years, with about 60 percent in Asia where 2019 revenue hit $69 billion (Niko Partners). North America will generate over $40 billion in games revenue this year, with the majority of revenue concentrated in the U.S. where 165 million gamers play on consoles, PCs, and mobile phones. The U.S. is also home to over 2,700 game company locations and there are over 220,000 U.S. jobs in the gaming sector. (ESA)

It's no wonder these regions are often the two most sought after markets for game developers, publishers, broadcasters, esports organizations, and other gaming service providers. That's where the gamers are, and, quite frankly, it's where the revenue is. Not only do gaming companies in Asia and North America produce content for their own regions, if and when they're looking to expand a game's reach or audience, many times they look to each other.

China Market

PC Games

Game Revenue ($ Billion)

14.6 (2019) 14.7 (2024)

Gamers (Million)

321 (2019) 351 (2024)

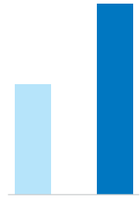
Gamers spending more on PC games during COVID-19

94.6% Time

76.3% Money

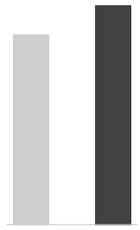
Mobile Games

Game Revenue ($ Billion)



18.5 (2019) 32 (2024)

Gamers (Million)



637.1 (2019) 737 (2024)

Gamers spending more on mobile games during COVID-19

97.2% Time

81.6% Money

Southeast Asia + Chinese Taipei Market

Niko's data covers Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

PC Games

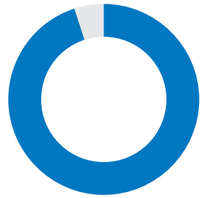
Game Revenue ($ Billion)

2.19 (2019) 3.14 (2023)

Gamers (Million)

154.3 (2019) 186.8 (2023)

Gamers playing esports games or competing in esports



95%

Internet User Penetration

77% 2019

99+% 2023

Mobile Games

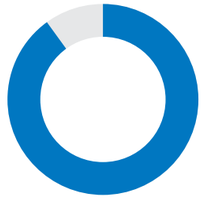
Game Revenue ($ Billion)

2.89 (2019) 5.2 (2023)

Gamers (Million)

227 (2019) 290.2 (2023)

Gamers playing esports games or competing in esports



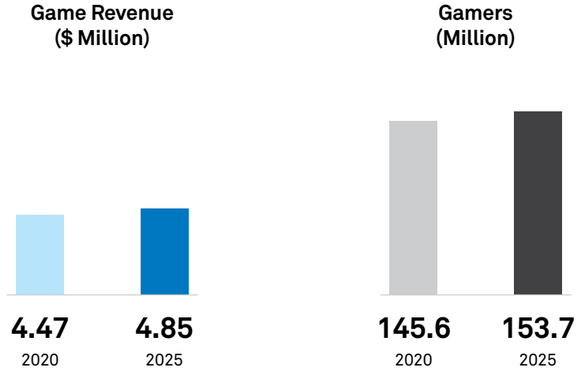
90%

Smartphone Users (Million)

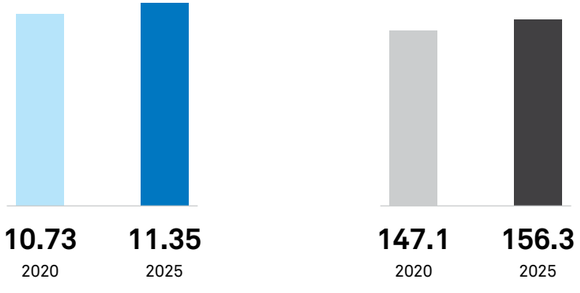
527 (2019) 679 (2023)

U.S. Market

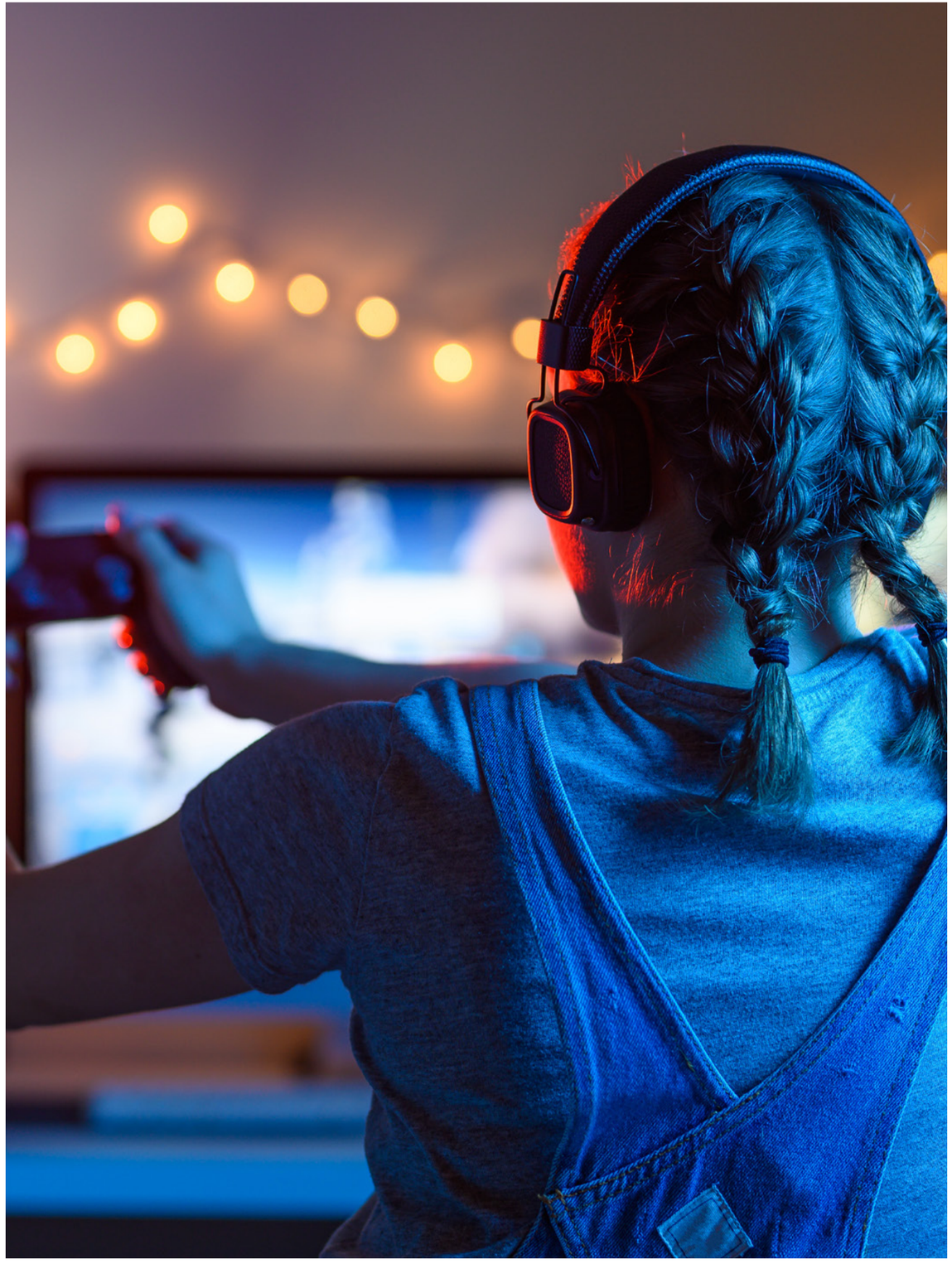
PC Games



Mobile Games

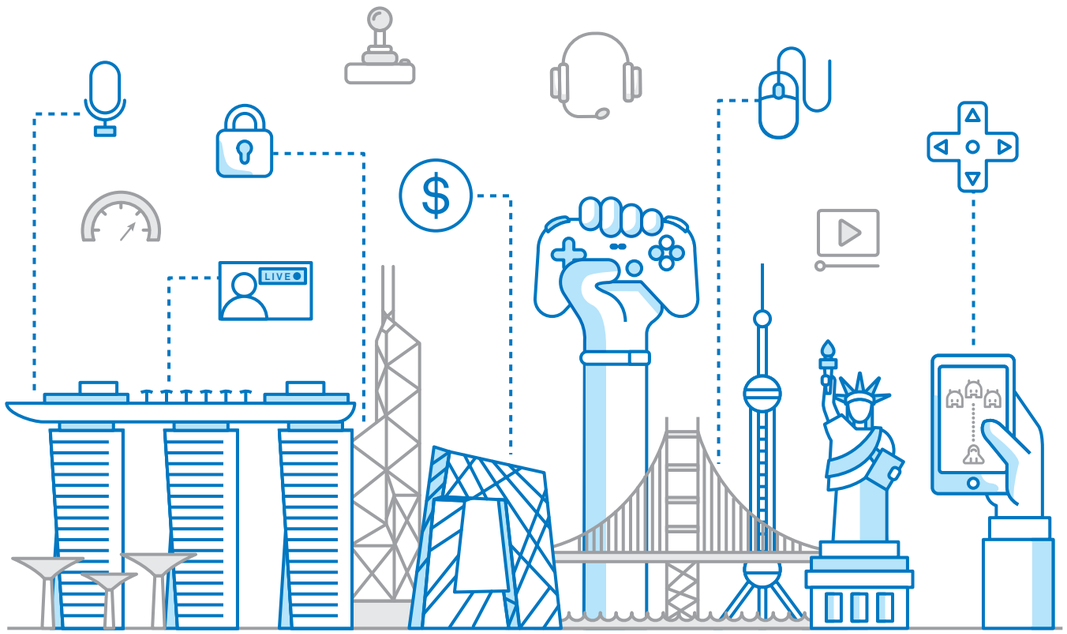


Source: Statista



Connecting Asia and North America

Asia and North America are at the forefront of the gaming industry, so many games are developed in one region and distributed to the other (and vice versa) to much success. Just look at several of the top games over the last decade that have done just this.



Top Games in Asia, Developed in the U.S.

PC Games (2019)	Publisher	Year
League of Legends	Riot Games	2010
DOTA 2	Valve Corp.	2013
Fortnite	Epic Games	2017
APEX	EA	2019

Mobile Games (April 2020)	Publisher	Year
Candy Crush Saga	King	2012
Fortnite Mobile	Epic Games	2017
Red Alert Mobile	EA / Tencent	2018
FIFA OL4	EA	2018
Call of Duty Mobile	Activision / Blizzard / Tencent	2019

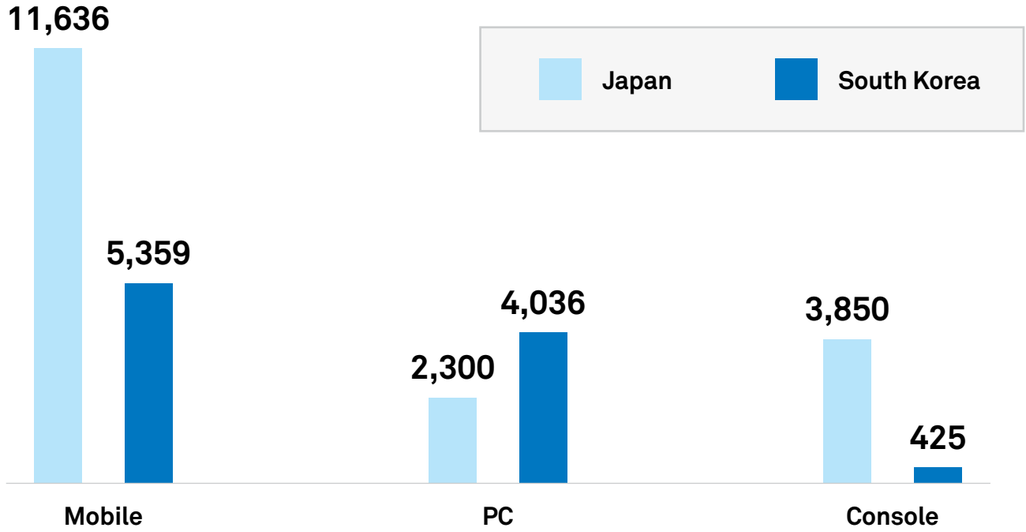
Top Games in the U.S., Developed in Asia

Console Games (2019)	Publisher	Year
Mario Kart 8 Deluxe	Nintendo	2014
Super Smash Bros. Ultimate	Nintendo	2019
Kingdom Hearts 3	Square-Enix	2019
Pokemon Sword/Shield	Nintendo / Game Freak	2019
Resident Evil 2	Capcom	2019

Mobile Games (April 2020)	Publisher	Year
Dragon Ball Z: Dokkan Battle	Bandai Namco	2015
Guns of Glory: Empires	FunPlus	2017
PUBG Mobile	Tencent	2018
Rise of Kingdoms	Lillith	2018
Last Shelter: Survival	Long Tech	2020

Source: Niko Partners and Sensor Tower

2019 Market Size ($ Million)



Distributing games online in either Asia or North America requires not only game localization and culturalization, but, just as importantly, highly reliable telecom services from a provider that has infrastructure spanning both regions.

Global game developers looking to distribute their content to Asia's 1.5 billion gamers (720 million of whom are in China alone) should be aware that gaming is much more than an idle activity to gamers in the region, it is a primary form of entertainment. Gamers in Asia are savvy and they demand high-quality games that don't crash, that push the boundaries of the game design medium, and are best in class for their genres. They want to play the best games, no matter where they were developed. They want to play them with their friends, and to know that the games have high reliability online so that competition is fair and fun. Yes there are government policies that restrict access to certain titles, but that is a supply issue not a demand or telecom issue.

Asia is a major consumer of games developed in North America and is increasingly a major exporter of games to North America. Five of the top 10 mobile games by download in Southeast Asia in the first half of 2020 were developed outside of Asia. In both Japan and South Korea the number is six out of 10. In China, 60 percent of all PC gaming revenue comes from foreign developed titles. But, this isn't a one-way pipeline, China's game exports are growing at a faster rate than domestic games revenue. This is driven in part by a temporary game approval freeze in 2018, when many Chinese developers increased their focus on the global market. This has increased trans-Pacific game revenue.

Chinese developers have not only exported self-developed titles, they have also partnered with overseas publishers to license IP and create new titles for a global audience. Companies like Tencent and NetEase are currently staffing up development studios in North America to infuse global elements into their titles. In 2019, Sony and Nintendo opened facilities in Southeast Asia, signaling the ongoing growth of the region's development industry. The Asian developer global expansion continues through and beyond 2020 in earnest.

The Rise of Mobile and Cloud Gaming

Mobile gaming is the fastest growing and most popular segment throughout Asia, as measured by the number of mobile gamers and the revenue and growth rate of mobile games. Already there are over 900 million mobile gamers in Asia, but by 2023 there will be 150 million more. All of this will mean a steady increase of gaming revenue across the region. Southeast Asia and India will experience the majority of this growth, but even established markets, such as South Korea and Japan, continue to add gamers and game revenue annually.

Additionally, cloud gaming or gaming as a service (GAAS) is an emerging technology that will have a significant impact on the industry by both lowering barriers to entry and moving product models towards subscription services. Tencent's Start, Google Stadia, PlayStation Now, Microsoft's Project xCloud, GeForce Now, and others will all change the way consumers access games. In Asian markets where access to gaming technology has been a limiting factor for growth, cloud gaming will allow more players to experience top titles. While cloud gaming will make games more accessible to consumers, it will also make network speed and availability even more important to the companies that want to reach these gamers.

The Impact of COVID-19

Across the games industry COVID-19 has had a significant impact. Asia was the first region to navigate these hurdles as well as the first region to plot a post-COVID course. Shutdowns during the pandemic slowed development, delayed hardware production, and forced esports and gaming events to move online-only. But the pandemic also generated new opportunities in the industry. Niko Partners found that 50-75 percent of Asian gamers reported spending more time playing games and that streaming viewership increased by 75-100 percent over the same period a year prior. This signaled better visibility and revenue for game publishers, but also increased network demands.

Stage 1

Developing a Game, from Conceptualization to Production

In the first stage of a game's development, you're likely focused on creating a concept, designing the gameplay and features, and producing the content. It's imperative that you plan for the cost of production, establish a timeline for development milestones, and think strategically about your go-to-market strategies and the pending release of the game to the public. While the content of the game is paramount, much of the planning in this stage must also be grounded in the game platform(s) (PC, mobile, console), the markets in which the game will be released, the estimated return on investment, and more. Network infrastructure costs are a huge factor to be considered when planning as well. By doing this and thinking strategically about how to maximize network investments in the early life of a game, it will enable it to be profitable sooner.

The top considerations in this stage

- How can I ensure the best end user experience (easy to download, low latency/ smooth gameplay, the game loads fast and at high quality)?
- How do I access and distribute a game to the key markets I've identified?
- Should I build my own network, partner with an existing platform (Amazon, Google, etc.), or create a hybrid solution?
- How do I determine my network infrastructure needs and costs?
- How can I ensure optimal collaboration between development teams who may be located in several different places around the world?

A telecom company can be an invaluable consultant when considering these questions and can offer invaluable insights. Let's look at these a little bit deeper.

Distributing a Game to Key Markets

Once you've identified the key markets in which you'll launch your game, you'll need to figure out how the content will actually get distributed to consumers in those regions. Some markets are more difficult to enter than others.

China has high regulatory hurdles to overcome, but once your game successfully obtains a publishing license there are also network limitations that need to be considered. In order to distribute a game to consumers, you must work with a state-approved distribution partner such as Tencent or NetEase.

Some Southeast Asian (SEA) countries such as the Philippines also have excessive barriers to entry due to high backhaul costs, which also results in one of the worst consumer experiences for internet connectivity in Asia. Indonesia is similar to the Philippines. In contrast, Singapore, which is close to both of these countries, is far more open and is considered the telecom hub for SEA allowing better network choice, quality, and diversity.

In North Asia, Japan and South Korea have high spending gamers and they, like discerning gamers everywhere, will demand low latency and high uptime, for uninterrupted gaming.

To put it briefly, Asia is complex. With all of these different regulations and potential obstacles to network accessibility, it's key that you work with a telecom company that has a robust regional and global infrastructure, local teams and expertise in each country, and well-established partnerships and peering relationships with in-country ISPs. This will enable you to get your game into the hands of consumers in your key markets much more easily and efficiently, allowing for better return on investment over the long-term.

Network Costs, Demands, and Diversity

Partnering with the wrong telecom provider can mean that content moves inefficiently to your users, adversely affecting their gaming experience. Worse still, a failure to account for network redundancy and diversity may leave your game susceptible to outages. While all users may access content through peering arrangements between telecom operators, more layers and hand offs lead to network delays and introduce new potential points of failure. Most telecom companies will be able to help you navigate these roadblocks, but it is important that you also understand the demands of the game you are building. These include the latency necessary for optimum game performance (a first-person shooter game needs much lower latency than a turn-based strategy game), network diversity and resiliency, the number of points-of-presence (PoPs) you will need for your anticipated audience, etc. A baseline understanding of your network needs can help you as you begin to have conversations with a telecom to map costs and network design.

Safeguarding against network outages is critical for a game's success, and safeguarding against outages is one aspect of the importance of securing carrier diversity. Developing relationships with multiple carriers early in the process in each market will allow a team to evaluate networking costs and factor these into their budget. It is important to ensure that these carriers' networks do not overlap too much, or you may be paying twice for the same infrastructure.

Carrier diversity is also important to enable access to as many consumers as possible. While your primary partner will give you access to a majority of consumers in a market, secondary partners will expand the reach of your game and fill in the gaps in your primary network, crucial if you want to go viral.

The complexity of the Asian region in terms of the number of networks, local operators, and mobile carriers can be daunting to companies unfamiliar with the landscape. For this reason, many western companies rely on local game publishers and distributors to manage their games in Asia. Top game publishers in Asia include Tencent, NetEase, and Garena.

It's important to have a telecom company help you map this out and ensure you do this right. This is particularly imperative in Asia where network access, IP transit costs, and IP routing is more complex than in many open Western markets. While the U.S. and North America have a less complicated geography of telecoms providers and networks, compared to Asia, building a network and network partnerships is still a key to success in this market.

Building the Network: Owned vs. Leased vs. Hybrid

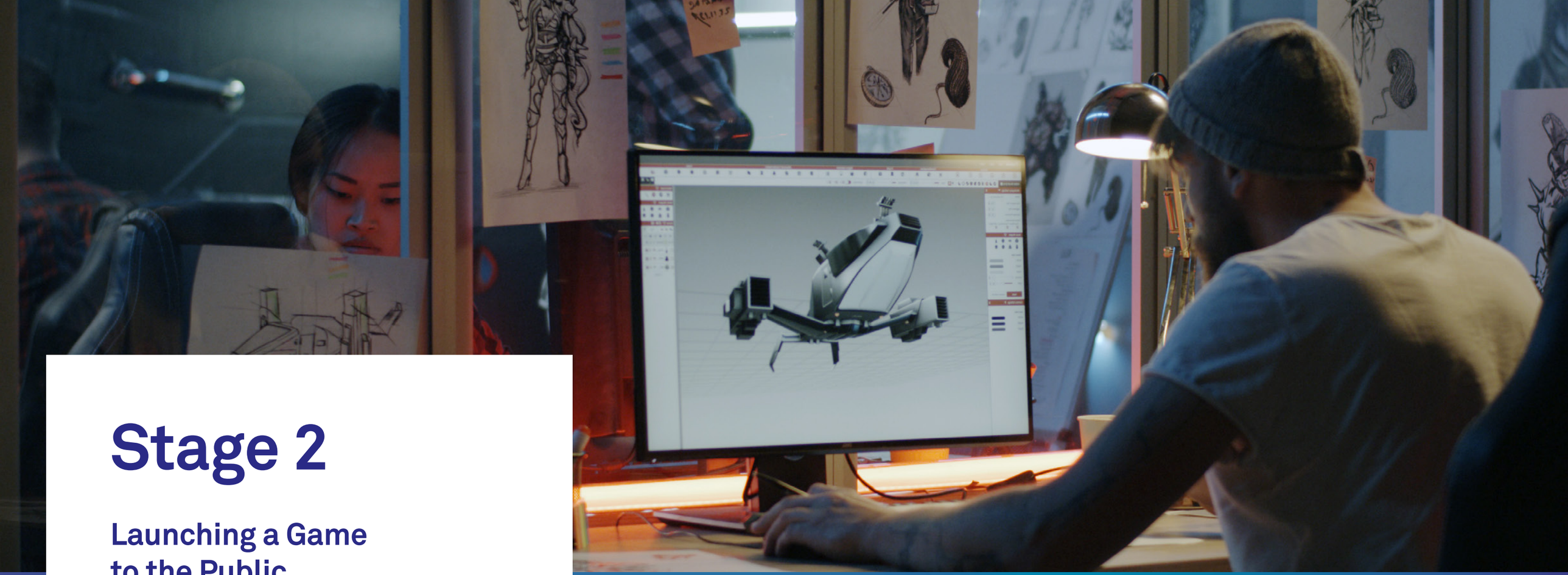
Owning the network infrastructure backbone on which your game is developed and eventually released can be time and cost-intensive, but it may make sense for mass market games with the potential for long lifespans. In some cases, it can be less flexible than a leased or shared services network, but has the advantage of being highly customizable to your company's needs. For example, Riot Games has built its own network which it can tailor to the needs of its players.

If you're a gaming company just starting out, it may make sense to build your network infrastructure using a shared networking service or a hybrid networking solution, which can be mapped out with the help of your telecom partner(s). As a game and its audience grows, you may decide to start building out your own network infrastructure, and, again, a telecom company can assist you in evaluating the most cost-effective approach. The route you choose depends on your goals and how you will balance up-front capital investment versus operational costs, so having a road map that covers both the short and long term growth of your game can save headache and maximize value as you grow.

Ensuring Your Development and Design Teams Can Easily Collaborate

You may also engage a telecom company or cloud provider to build a private network for development purposes. In order to facilitate reliable, secure, large-scale collaboration companies may build a dedicated private network to connect servers in several locations or between international teams. This can be used to connect servers in several locations or between international teams. These kinds of networks are generally reserved for larger projects generating significant revenue, as smaller productions can rely on leased servers. Private networks are built solely for the purpose of internal networking.

While these networks are not the ones your players will use, they are an important part of the game development process. They allow your team to work on a project from various locations as if they were in the same office, sending giant packets of proprietary information quickly and safely. Most of your investment in a game is put into the development process, making leaks especially damaging, and a secure proprietary network essential. Moreover, this may be the first time you engage a telecom to support your work. As such, this is an opportunity to evaluate your telecom partner and to begin asking questions about costs, strategy, and your network road map.



Stage 2

Launching a Game to the Public

As you're getting ready to launch your game to the public, you're likely going through the finaling stage of production and multiple rounds of private or public beta testing. Throughout this process, you'll need to identify the network infrastructure requirements necessary to deliver a positive user experience and you can do this by assessing the network with your beta testers, which can then be extrapolated to the requirements needed for a larger global audience. While no launch is ever flawless, planning for this by consulting with your telecom provider(s) in this stage can help mitigate potential disruptions, generate contingencies, and predict unforeseen network demands.

The top considerations in this stage

- How and/or where should I beta test or soft launch the game?
- How much bandwidth will be needed for each user and what does that mean at scale?
- How much will my network infrastructure cost when we launch to the masses?
- What backup plan is in place to deal with network outages or unexpected demand? Am I prepared to meet demand or adjust accordingly based on data from beta testing?
- What steps can be taken to adjust performance if it is not meeting benchmarks?

Games and Networks are Global

Designing a plan for where you will roll-out with your network partners can keep costs low and your players satisfied.

However, as your game grows, you will need to develop a global network infrastructure. Using the lessons you learned from your game's launch, you can create your own global network. You will need to start with a strong network backbone, which is essentially a system of subsea cables that connect data centers in key regions across the world.

By partnering with global content delivery networks and global telecom providers from the outset, you can ensure that the content will reach your targeted end users when the game is finally released. Additionally, building out the edge of a network and caching game data locally in your major markets allows you to make the content more easily accessible to users to minimize network latency. This means placing infrastructure and servers closer to your users, especially in key markets where you hope to grow your game's footprint.

Test, Evaluate, and Plan

As a network is put to work in the beta testing phase, the ability to monitor network demands generates data that will be essential to planning for full release. Where this testing takes place is also crucial, as a publisher needs to understand how a game will perform in key markets. This is the last opportunity to catch network flaws before a game goes live, so the ability to test and scale quickly, and the ability to monitor game performance as it passes to regional peers is vital to launch-day success. For each key market, you must be able to test and understand the performance of network components and points of connection.

This will also help you to understand what developments need to take place as the game moves into live services and updates. Using network partners to evaluate performance can build a roadmap for subsequent game releases.

Although testing can help to plan for launch day demands, this process is not foolproof. Publishers must develop strategies with network partners to scale-up as demands arise. The number of markets a game enters at launch will complicate this planning. The complexity of the Asian telecoms marketplace creates an imperative to work with a telecom like Telstra that has a network that operates across Asia at scale, has unique IP and backbone strength, and has experience partnering with gaming companies. That kind of telecom partner can help you navigate and evaluate network implementation and planning on the fly.

Assigning resources to each market in the region can be costly, and this is compounded by administrative, industrial, regulatory, and cultural differences on a country-by-country basis. Regional expertise with local teams can mitigate greater unforeseen costs.

Likewise, developing peering relationships and diverse, network redundant partnerships can insulate a network from spikes in demand or local network outages. While it is impossible to anticipate all contingencies, diligent testing and communication with your telecom partners can help you launch with a network that is ready to meet your players' demands.

Stage 3

Expanding Game Availability and Keeping Gamers Engaged

Following a release, you'll turn to providing live services and game updates. The network is stable and launch-day network issues have, hopefully, been resolved. The focus shifts from building a network and finalizing a game, toward service expansion, updates, expanding to new markets, quality-of-life improvements, and more.

Niko Partners analysis shows that 25 percent of Chinese mobile gamers surveyed in 2020 reported abandoning a title either due to poor content or technical issues, meaning the live services that improve the experience, mitigate latency and game errors, and keep a game fresh are a crucial part of the long-term success of a title.

The top considerations in this stage

- How do I keep the audience engaged, keep them playing, spending, and not moving on to the next game?
- How do I ensure the best user experience in the face of potential network outages, and/or low network capacity or availability?
- How do I make sure the network can withstand a variety of issues such as network outages or increased latency due to spikes in demand, physical disruptions to network infrastructure, etc.?

Navigating Regional Complexity

The gaming market in Asia is the largest in the world, as we mentioned before, and for this reason many Western gaming companies will seek to gain a foothold there. However, the market is also highly competitive. An understanding of gamer motivations, market characteristics, and successful go-to-market strategies are crucial to a game's profitability and longevity in this market.

Part of this requires identifying elements that differentiate the subregions in Asia from each other, and collectively from the West. Niko Partners has written numerous reports and analysis on this topic for nearly two decades. For instance, PC gaming is driven by a robust Internet café industry in key markets such as China, Korea, and across Southeast Asia (SEA). Mobile gaming in the region is driven by rising smartphone penetration rates in China, India, and SEA.

Network geography is also an important factor for this market. The number of countries and operators in the region can make navigating network design and implementation especially complicated.

Regional gamer profiles are key to understanding how to successfully expand services in the region. Niko finds that Asian gamers are motivated by what we call "The 4 Cs: Competition, Community, Completion, and Challenge." Gamers like to be social, compete, and be challenged by games. If a game has such features, gamers are more likely to be attracted to it. However, we find that the largest driver of player attrition is poorly implemented monetization, followed importantly by poor content and technical issues.

In order to compete in this market, developers and publishers need to ensure that their game meets gamers' expectations from day one.

Building for Reliability and Scalability

The Asia-Pacific region is a challenging region for telecom providers for two key reasons: it's the most challenging region in the world for subsea cable cuts (due to a high concentration of shipping routes, natural disasters, etc.), and many countries do not have fully open/competitive telecommunications industries.

Network disruptions can cut off players from their communities or end a stream early, and these experiences can have serious impacts on the longevity, profitability, and the legacy of a title. An experienced telecom partner – with both regional scale to provide network diversity and redundancy as well as Asia-Pacific expertise to provide unique access and lower costs – can identify areas of the network that are susceptible to failure or where connections can be made more efficiently. Locating single points of failure and designing solutions for congestion can improve the player experience as well as prevent major outages.

Network outages caused by damage to telecommunications infrastructure are inherently unpredictable, but building resilience and eliminating single points of failure can mitigate this for your game when they do occur. Natural disasters, fiber optic cable damage caused by shipping traffic, and other events can produce outages that congest global networks affecting your players and it is important to be prepared for these events. Although the data that passes along them is digital, networks themselves are physical, and this opens them up to all kinds of disruptions or failures. A network with a high degree of resiliency can react to the outages before your players are impacted.

Another kind of network disruption, network spikes, can have a similar effect. Network spikes are tied to major holidays as well as media releases. The two largest events on Telstra's Australian network in 2019 were the release of Fortnite 11.0 Season 2 and the launch of Disney+ hit The Mandalorian. Similarly, COVID-19 caused a 50 percent uptick in international traffic virtually overnight as businesses moved to teleconferencing and consumers turned to streaming video and increased online gaming for their entertainment (Telstra, 2020). These spikes can slow down your network, making your game unplayable or cutting off key features like in-game stores and transactions. Nothing can take away from the excitement of a new patch or update, like long download times or overcrowded queues. While spikes are sometimes more predictable than outages, being able to respond to both must be part of your game plan.

A network must be designed to account for shifting demands without adversely affecting players. Publishers should choose a company that is continually investing in more infrastructure to meet surging demands. Building diversity into your network through PoPs, carriers, routes, and through your own IP network can give your network redundancy and eliminate or at least minimize how vulnerable you are to unexpected outages. Likewise, ensuring your network partners are able to scale up to meet new demand and minimize network spikes, ensures your game is always playable.

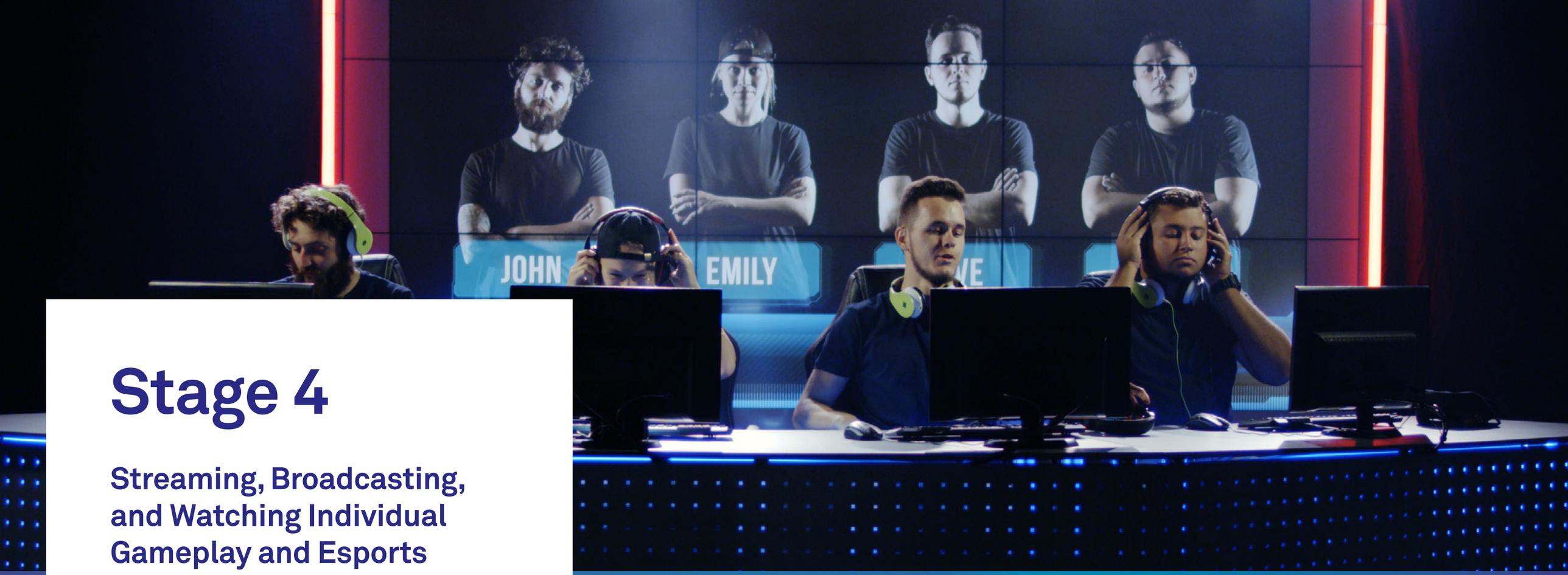
Example: Why One of the Biggest Gaming Companies in the World Selected Telstra as its Primary Asia-Pacific Network Infrastructure Partner

In 2017, one of the biggest gaming companies in the world engaged with Telstra with the goal of building up its network in Asia. Telstra was selected because it owns one of the largest IP networks in the region (up to 33 percent of all internet traffic in Asia moves through Telstra), and because of Telstra's unique offerings, which provide access to countries such as China, Korea and Taiwan. Other telecom providers in Asia do not have this level of connectivity across the region.

In 2019, this gaming company reorganized its network to use Telstra as its primary gateway into and within Asia. This was in response to a major outage caused by the 2018 tsunami that ravaged Japan. As a result of the tsunami, most gaming companies were nearly cut-off from Asia, but Telstra was as one of the only networks keeping the region's servers online and the only subsea network that remained online in Japan. These kinds of events can cause a company to re-evaluate their network design, to safeguard against future outages, and that's exactly what this gaming company decided to do.

Prior to this natural disaster, this company had been partnering with multiple telecom providers in Asia (and it still does to some extent), but after that event, its network engineers needed to take a hard look at the business' network infrastructure to prevent something like this from happening again. Through that review process, the network engineers found that by expanding the company's partnership with Telstra, not only could they mitigate natural disasters, but they could also save 35 percent on their costs, and streamline the company's partners in the region. This had a positive impact on the people that play the company's games, as costs came down and it would be less likely gameplay would be interrupted.

Telstra now carries 80 percent of that publisher's backbone traffic between the U.S. and Asia, and 60 percent of its transit network traffic in the Asia-Pacific region. The scope of Telstra's network helps tis gaming company to identify and eliminate single points of failure, preventing network outages. Additionally, Telstra's presence in the region makes them a one-stop-shop for managing ISP partnerships across Asia. Rather than manage individual partnerships with ISPs across Asia, the business counts on Telstra to support its operations in the region and to make its servers accessible to its players.



Stage 4

Streaming, Broadcasting, and Watching Individual Gameplay and Esports Tournaments

Streaming and esports help your game reach new audiences, provide new monetization options, and increase the longevity of your work. While these elements may seem far removed from the game development process, they can do wonders for the success of a title. Extending the lifespan of your game, building awareness among a community of fans, and introducing new ways for your players to see and use your game translates directly to long term ROI. While much of this can happen organically, there are active measures you can take to make your game easier to stream and reliable enough to support serious competitions.

The top considerations in this stage

- How can you make it easier for people to stream your games and watch esports competitions?
- With esports events moving online, how can you ensure the experience that pro players and esports teams need for fair game play? (low latency, reliability, security, etc.)
- Can you produce top-tier events remotely, from anywhere in the world, without having to set aside a massive esports budget?
- With top TV sports networks becoming more interested in this space and acquiring rights to broadcast esports events, how can you reliably deliver the live content they paid for?
- How can you best connect the two biggest esports markets in the world, US and China, to reach the biggest audiences and better monetize your content?

Esports as a Driver for Game Growth

The network and partnerships you have built to support your game can be the foothold you use to develop a livestreaming or esports production pipeline to grow your audience.

The top grossing games in Asia, across both mobile and PC are esports titles. Esports and live streaming are demonstrated drivers of engagement and growth for the games industry for the region. There are over 350 million esports fans in China alone, and 60 percent of Asian gamers report being drawn to esports titles. These numbers translate directly to higher rates of in-game spending, stronger engagement, and longer usage of the games.

During the COVID-19 pandemic induced quarantine, esports and livestreaming viewership was up between 75 to 100 percent over the same period a year before (Niko Partners 2020). This reflects the growing importance of esports and streaming as a cultural phenomenon.

While esports fandom is growing organically, it takes thoughtful positioning and investment to transform your game into an esports title for the global stage, but the network behind your game can help with this. Working with your network partners, it is possible to leverage IP transit networks, as well as more traditional broadcast networks and production infrastructure to create a cost-effective esports solution.

Making Your Game Livestream Ready

Streamers depend on networks to share their content with an audience. Esports depend on uptime during the tournament for pure competition, as well as robust network and broadcast infrastructure to share it with the world. Games are cultural objects, and once your game is in the hands of players, it begins to develop a life of its own.

With your operation in full gear, your attention turns to improving players' experience, growing your audience, and developing the culture around your game. This means establishing new PoPs to improve the gaming experience and to efficiently bring your game to new regions. Your networks must be able to grow to meet shifting demands. You will work with your network partners to build this, and their experience serving the gaming and media industries can alleviate some of the stress of navigating demands a growing player-base will put on your network.

Producing Esports Content

Esports can put your game in front of millions of viewers. This is your opportunity to showcase your work and generate exposure, but technical failures at this stage can be catastrophic for the perception of your game.

2020 has seen a hiatus on in-person esports events in favor of online-only competitions. At the same time, esports viewership has increased substantially. This makes connectivity and network capacity incredibly important for the success of an esports production, particularly if competitors are also connecting remotely. Low latency is crucial to the legitimacy of these online esports competitions and to the experience of professional players.

If you are testing the waters by building online-only competitions or small-scale esports events, these can be produced using minimal broadcast infrastructure, relying primarily on live streaming platforms and your existing IP infrastructure to stream your content to the world. The gaming networks you build in key markets can accelerate the distribution of esports content to streaming platforms like Twitch, Huya.or Douyu. However, large scale esports productions, especially those using multiple video feeds or employing a production team to edit content, demand more infrastructure and bandwidth. For these kinds of productions, you will want partner with a telecom provider for support.

Major aspects of broadcasting that a telecom can provide:

- Extensive live broadcast media knowledge and experience
- Remote production infrastructure
- Global field services and special events teams
- Direct connectivity between venues, studios, and broadcast partners
- Integrated global satellite, fiber, and IP network to deliver low latency, resilient connectivity

As your esports scale up, rather than reaching players across a region, one-off esports require huge data connectivity to venues, usually for only a few days at a time. When you are ready to build this kind of esports event your network partner will work with local networks to pin up temporary connections and rely on international fiber optic networks or satellite feeds to send esports video across the world.

While esports aren't right for every game, if this is part of your plan, your network design can help lay the groundwork for your esports ambitions. Esports broadcasts are demanding with video packets from multiple feeds sent all over the world. Thinking of how you will produce esports tournaments, where they will be held and where they will be watched, and then partnering with a telecom network provider allows you to design the kind of network that esports events demand and build this into your games network.

Example: How Telstra Helps Riot Games Produce and Distribute its Esports Broadcasts

As the popularity of League of Legends and esports has skyrocketed in recent years, the number of people needed to produce a top-notch esports event and broadcast it to millions of fans around the world has similarly increased. However, a couple of years ago in 2018, Riot Games launched its second generation remote production transmission kit, which enabled Riot to use a tenth of the bandwidth originally needed and allowed most of its production crew to stay home without sacrificing broadcast quality (Riot Games, 2019).

Before the launch of the remote production transmission kit, major esports events like the League of Legends World Championship or the League of Legends Mid-Season Invitational would be produced using a massive onsite production team, loads of video and audio equipment and servers, and production trucks the size of tractor trailers. These trucks incorporate multiple video and audio feeds from onsite cameras and microphones that are then compiled into a single high-quality broadcast. This broadcast would then be sent to production teams in dozens of countries around the world that localize the content (with appropriate language and commentary) for the audience. Riot produces the main feed, and they also manage hundreds of video and audio channels that produce the localized content, which is then routed to the appropriate countries. The custom channels enable the remote production of the event without the added cost and logistics of flying regional staff and partners onsite, and the new transmission kit allows for all of those various feeds to be assembled remotely out of Riot HQ in Los Angeles (Riot Games, 2019).

Here's how it worked for the 2019 League of Legends Mid-Season Invitational. For that event, Riot used its studio in Los Angeles to manage its remote production of the event taking place in Chinese Taipei and Vietnam. Multiple high-definition video and audio feeds from the venue were transported to Riot Direct – the company's global Internet backbone – via local telecom providers. Once the feeds were uplinked to Riot Direct, which is supported by a network of subsea cables owned by Telstra, they then traveled thousands of miles to Riot's studio in LA. There, the feeds would be edited and finalized for broadcast and then sent back out to the many streaming and broadcast partners across Asia, again using Riot Direct and Telstra's subsea cables, to get the feeds to consumers. All of this takes place in a matter of moments, eliminating the need for mobile production studios and standardizing the look and quality of Riot's esports broadcasts. The Mid-Season Invitational was a huge success and Riot now handles all production from its Los Angeles headquarters thanks in large part to Riot Direct and Telstra's underlying network. Riot relies on Telstra's high-speed, trans-Pacific fiber optic network to make this cutting-edge remote production framework possible.

Conclusion: The Network Makes the Game Work

When it's operating as it should, your network is invisible to gamers, and this often makes network infrastructure considerations secondary to game development and production. Producers, designers, and developers are all hard at work realizing the vision for the game via compelling storylines, game mechanics, and exciting visuals, but network engineers and telecom providers play integral roles in ensuring the game's success, too. Developing a network infrastructure strategy and planning for its execution may seem tedious, but it can have a significant impact on whether or not a game becomes a hit. Working with a global telecommunications partner to develop a network strategy at each stage of the game development lifecycle ensures all the sleepless nights weren't for nothing. Even simply understanding the kinds of decisions you will need to make at each stage can help you build a roadmap for network design and budget for these costs.

The North America and Asia are the most important, largest, and continually growing games markets driven by massive audiences and equally massive game development and publishing industries. As you build a game that can move between these markets, network strategy will be crucial to your success. Understanding the institutional and infrastructural complexities of these markets and navigating the telecommunications complexities of the region will be an advantage that allows your game to thrive.

So, if there's one thing you take away from this white paper, it's this: work closely with your telecom providers because when it comes down to it, the network makes the game work.

Contact your Telstra account representative for more details.

tg_sales@team.telstra.com

telstra.com/americas

2020.10.09 v221 CCoE