



Success story:

5G live streaming creates new fan experiences

Tech and media collaborations
are transforming sports viewing

AT&T teams up with Ericsson, LiveU, Samsung and the NBA to broadcast live video over AT&T 5G+ network at the NBA Summer League 2019.



Whether at the game, at a local sports bar or watching from the comfort of home, fans are now taking photos, shooting video, sharing clips and checking in on highlights from multiple games—often simultaneously. Sports fans have high expectations for always-accessible and immersive sports viewing experience.

5G will likely play an important role at virtually all sports venues in the future to enhance the spectator viewing experience. In some cases such as the NBA Summer League, 5G using millimeter wave spectrum ("5G+") is already demonstrating its potential to enhance the fan experience by changing the way a live sports broadcast is produced.

5G+ provides an efficient and high-performance game-changing experience.

Sporting events have the potential to better serve both the fan attending games in person and the die-hard fan catching the game remotely. The stakes are even higher for organizations like the NBA and live broadcasters that connect the world to professional basketball.

Through live-streaming video, mixed reality experiences and near real-time access to information about the game, the next generation in mobile wireless technology can create an enhanced experience, reinventing how the media and broadcast industry connects with fans and how fans participate in sports.

AT&T 5G+ is fast. Really fast. Reaching 2Gbps in trials. From a theoretical peak speed perspective, 5G+ is 40 times faster than 4G. This means that in the time it takes to download just one piece of content with 4G, over a 5G+ network the same content could be downloaded 40 times. Looking at it another way: you could download close to 20 basketball games before 4G could deliver even the first one! Not only that, but 5G+ also provides lower latency—the time it takes data to be transferred after a request.



Transforming media coverage of sporting events

Today, major sporting events require a large number of cameras within the venue and broadcasting trucks outside the venue, with expensive production technology usually requiring dedicated fiber, satellite links or internet connections to transport captured footage to a main production center.

A temporary and dedicated 5G+ solution can be utilized on an event-by-event basis—allowing for a subset of the number of cameras at major events or as the primary transport technology for cameras at smaller events. 5G+ can be used to connect cameras to production facilities without cables, allowing camera operators and reporters to become more mobile.

5G+-enabled smartphones with seamless integration into the production workflow (e.g., the LiveU smart app) provide sports broadcasters with a new level of flexibility. Without the need for heavy, bulky equipment and cables, camera operators using only a smartphone to capture video can get closer to the action. Additionally, smartphones give roving reporters an opportunity to create “social media” perspectives with short form content that appeals to a generation primarily consuming their media online.

“We are committed to creating entirely new immersive experiences with our 5G+-enabled smartphones by taking advantage of the speed and lower latency benefits 5G+ networks offer,” said Drew Blackard, Head of Product Management, Samsung Electronics America. “We are excited and inspired to see new use cases come to life within sports broadcasting and are proud of our work with AT&T to bring this to life powered by the Galaxy S10 5G.”

With 5G+, a sports broadcaster can mix their video captured from traditional broadcast cameras with video captured on a 5G+-enabled smartphone. According to Steve Hellmuth, EVP, NBA Technology & Operations, “the NBA found that by using Samsung Galaxy S10 5G smartphones

exclusively as cameras at the MGM Resorts NBA Summer League 2019, we had excellent video quality covering the entire field of play giving our fans a cool seat—close to the action with a personalized view—making the game more intimate.”

Ultimately, 5G+ allows for broadcasters to produce content from a variety of camera angles not possible today—whether the platform is linear TV, digital channels or social media!

In the sports venue

The introduction of 5G+ at a sports venue helps broadcasters to create very high-quality video streaming in 4K UHD video, 360-degree or augmented reality and virtual reality (AR/VR) formats. High-quality video helps make detailed analysis possible in near real time.

5G also creates a horizontal platform to serve additional applications. Imagine the moment when fans will be able to monitor and track athletes’ performance during practice and competition in near real time. With 5G technology at events, and the expected market deployment of smart wearables over the coming years, one can only imagine what is possible—for fans, players and officiating teams alike. Intuitive player analytics/interaction, lower latency lag on supported streaming services, near real-time offside calls are in the realm of the possible.

And when a fan cannot be at the game, with 5G the potential exists to eventually create immersive fan experiences remotely with the introduction of 360-degree cameras, virtual and augmented reality. Imagine being able to walk the sideline, see what the players are seeing or join the victory celebration in the locker room—all serving the purpose of bringing fans closer to the action at the venue.

The future of sports and media

These are all things that 5G helps to enable, but the impact of the technology will have ramifications moving forward. Whether it’s watching the game from a new perspective or analyzing plays and stats in near real time, 5G has the potential to increase engagement in a multitude of ways.

“The broadcast industry has always required the best technologies because the stakes are high. However, to the surprise of many, they are also very creative, known to experiment and open to change. Because 5G is not just about speed and is positioned to deliver increased reliability and lower latency, this is a great time to collaborate with this industry on the art of the possible.”

— Phillip Coleman, AT&T Director of 5G Mobile Solutions

Live video streaming, with wireless video transport over a deployable 5G+ network that is private, dedicated and specifically designed for broadcasting live events, will ultimately transform broadcast productions. It will also introduce completely new categories of connected camera use. With creativity—and a network that can support it all—we have the capacity to bring an entirely new sporting experience to fans all over the world.

“5G enables new and innovative use cases across a variety of industries and experiences, including sporting events where broadcasters are looking for unique ways to deliver more live content. 5G+ makes it possible to set up and deliver near real-time broadcast-quality video, wirelessly, benefitting both the broadcaster and the fans,” said Jeanette Irekvis, VP Enterprise Solutions and Emerging Business, Global Customer Unit AT&T, Ericsson.

5G technology in action

At the MGM Resorts NBA Summer League 2019, AT&T showcased the power of 5G technology. AT&T and the NBA presented fans with new and interesting ways to get involved with all the action the event has to offer. Technological advancements with 5G and fan expectations are evolving the sports entertainment landscape, driving leaders like the NBA, AT&T and ESPN to create new and exciting opportunities on and off the court, and for fans everywhere.

During select games played on July 10–11, 2019, AT&T provided the 5G mmWave spectrum, with Ericsson as the network infrastructure supplier, to allow the NBA to stream live video from Samsung Galaxy S10 5G mmWave devices. Live action video was streamed, using the LiveU Smart mobile app, from devices in the stands directly to the NBA production truck. From the truck, AT&T Global Video Services transferred the footage to ESPN's network broadcast offices. The live



5G prototype kit and radio

footage from the devices was used to broadcast live coverage of the games on NBA and ESPN platforms and on social media channels. This solution is opening new ways for fans to engage with the games and their broadcasts and represents another example of AT&T working to build the future of 5G applications.

"We see 5G, particularly using mmWave spectrum, as a critical advancement for the broadcast industry eventually disrupting the way breaking news, live sports and other live events are produced. We anticipate the technology will bring more capabilities to our customers such as multiple channels of audio, multicamera productions from a single portable transmission solution, 4K UHD streaming and high-quality video return," said Avi Cohen, Chief Operations Officer and Co-founder, LiveU.

Benefits of AT&T 5G+ for events and broadcasters

AT&T's innovative approach to supporting live event broadcasting using 5G+ technology addresses the evolving need to have high-resolution video content available quickly for distribution to multiple outlets and viewers. The solution deployed at the NBA Summer League provided benefits not otherwise realized by traditionally tethered broadcast cameras including:

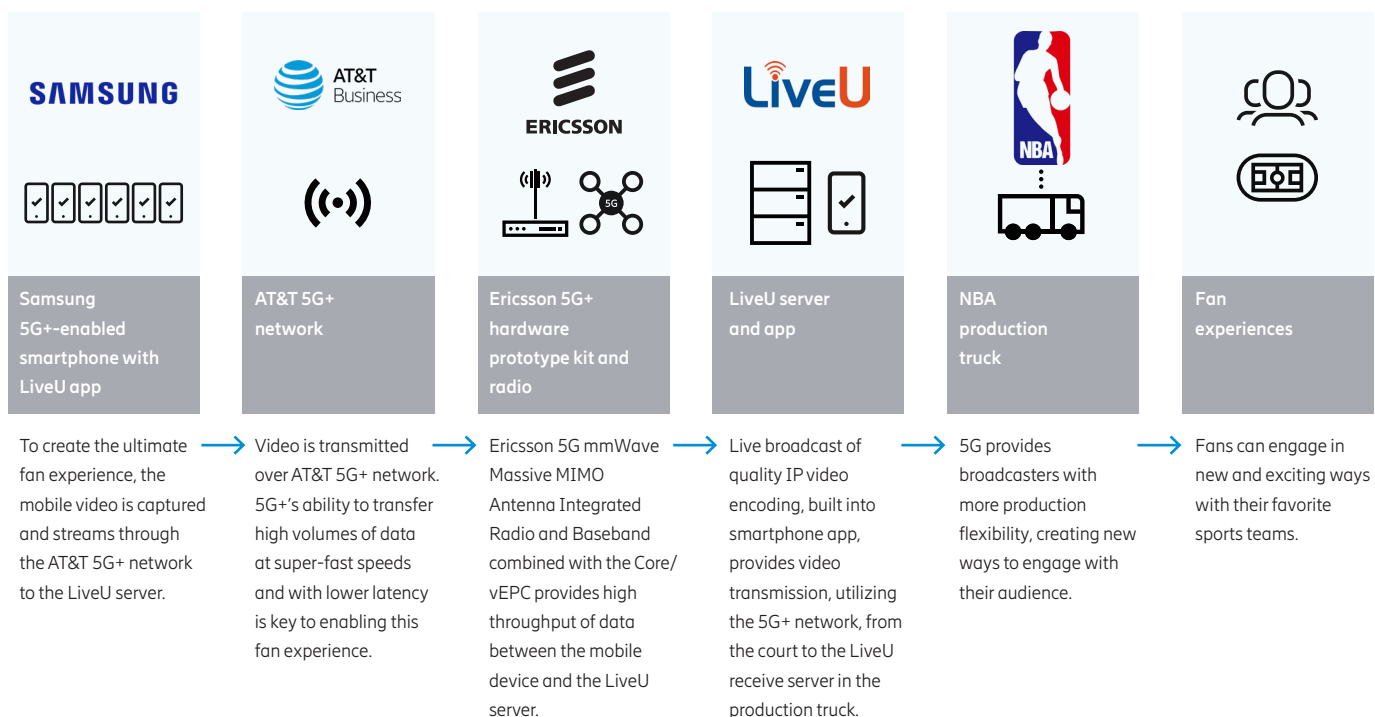
- Flexibility—High-speed bandwidth without wires gives access to new and different camera angles

- Traffic Management—Enables data aggregation over a dedicated, highly secure 5G+ network
- Live Experience—Supports innovation through local capture and consumption of content
- Portable—Brings a temporary customer network solution to an event
- Revenue—Creates potential revenue streams with new 360-degree or 4K UHD video content

Through collaboration with Ericsson, LiveU, Samsung, ESPN and the NBA, AT&T has reached another first in the 5G innovation race: live-streaming a professional sports event over 5G+ smartphones using a deployable 5G+ platform.

"It's fair to say that AT&T delivered triple-double results across innovation, partnership and execution by enabling the NBA to achieve their #SMARTPHONEVIEW vision," observed Jill Reardon, Vice President East, Sports & Entertainment, AT&T.

AT&T and its solution providers are creating new ways to capture content, providing options for new camera angles and coverage opportunities all delivered via a deployable, highly secure and dedicated 5G+ wireless network solution. The future is here for sports broadcasting, raising the bar for what a premium sports experience means to broadcasters and fans made possible with 5G.



About AT&T

AT&T Inc. (NYSE: T) is a modern media company that brings together premium content, direct to consumer relationships, advertising technology and high-speed networks to deliver a unique customer experience. AT&T has recorded 34 consecutive years of quarterly dividend growth and is a Fortune 10 company.
<https://www.business.att.com/learn/5G.html>

About Ericsson

Ericsson enables communications service providers to capture the full value of connectivity. The company's portfolio spans Networks, Digital Services, Managed Services and Emerging Business and is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's investments in innovation have delivered the benefits of telephony and mobile broadband to billions of people around the world. The Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York. www.ericsson.com

About LiveU

LiveU is driving the live video revolution, providing live video streaming for TV, mobile, online and social media. Let your audience become part of your story with high-quality and flawless live video, transmitted from anywhere in the world, through the use of our patented bonding and video transport technology. LiveU creates a consistent bandwidth and a reliable connection so you can acquire, manage and distribute high-quality remote live broadcasts over IP. Our broad portfolio of products sets the industry standard for live video production. From backpacks to smartphones, LiveU offers a complete range of devices for live video coverage anytime, anywhere. For more information, visit www.liveu.tv, or follow us on Twitter, Facebook, YouTube, or Instagram.

About Samsung Electronics America, Inc.

Headquartered in Ridgefield Park, N.J., Samsung Electronics America, Inc. (SEA) is a recognized innovative leader in consumer electronics, mobile devices and enterprise solutions. A wholly owned subsidiary of Samsung Electronics Co., Ltd., SEA is pushing beyond the limits of today's technology and providing consumers and organizations with a portfolio of groundbreaking products in appliances, home entertainment, Internet of Things, mobile computing, smartphones, virtual reality, wireless infrastructure and wearables, in addition to offering leading content and services related to mobile payments, 360-degree VR video, customer support and more. Samsung is a pioneering leader in smartphones and HDTVs in the US and one of America's fastest growing home appliance brands. To discover more about Samsung, please visit www.samsung.com. For the latest Samsung news, please visit news.samsung.com/us and follow us @SamsungNewsUS.

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