

Transform your AR/VR experiences.

Solution brief

Verizon 5G Edge with AWS Wavelength opens up possibilities for a broad range of new augmented reality and virtual reality applications.



Verizon 5G Edge with AWS Wavelength work together to help you improve your ability to deliver engaging mobile and immersive augmented reality/virtual reality (AR/VR) entertainment experiences. They make it possible to deploy edge-specific applications with lower on-premises infrastructure requirements, greater mobility than traditional on-premises architectures and leaner compute requirements.

Obstacles to creating great AR/VR experiences

While the media and entertainment industry sees significant market potential and competitive value with AR and VR, several key challenges can frustrate AR/VR success. One of the most difficult challenges is lag time, which can make an AR/VR experience feel unnatural and out of sync to the point that it can even induce nausea in some people. Additionally, the delivery of AR/VR experiences can require significant computing power from an end user's device. Not only can those compute requirements quickly drain battery power, but they often require the use of bulky, expensive headsets. Plus, as consumers constantly and rapidly change their behavior, it makes it hard for businesses and developers to quickly adapt to those changes with new forms of engaging content.

Further hindering AR/VR adoption is the reality that today's consumers prefer to engage with their own devices whether they're in a venue or anywhere else. But seamless, realistic AR/VR requires very low latency to deliver experiences with no noticeable lag. For many businesses and developers, solving the challenges of on-device compute power and low latency connectivity may have seemed out of reach—until now.

Bringing edge computing services to 5G networks

More and more computing happens in the cloud, but even with advances in radio technology and backhaul speeds, latency had remained a problem for advanced applications. Moving computing to the network's edge—closer to the end user—speeds response, enabling the quick relay of seamless movements and inputs from an end-user device. This type of low latency is especially critical for AR/VR applications that seek to provide natural and fluid user experiences.

Combining 5G connectivity with mobile edge computing (MEC) allows applications to now take advantage of increased bandwidth and enhanced mobility. For example, edge computing can be used as a simple content delivery network (CDN) for mobile devices to create more immersive and realistic AR/VR experiences by reducing the lag between movement and rendered scenes. This reduction in lag—or lower latency—can help AR/VR users feel like they're actually inside an experience. So, when overlaying preproduced, high-resolution AR experience content over a user's physical surroundings or when creating full-scene VR experiences, 5G and MEC could help enable the delivery of more realistic experiences due to the lower latency provided.

Thanks to the pay-as-you-go pricing model, elastic compute capabilities and flexible instance pricing models, media and entertainment businesses and developers can also enjoy lower sandbox experimentation costs with the coupling of 5G and MEC. That can help them gain a significant competitive advantage as they try to determine the best ways to engage target audiences with interactive content while AR and VR are still in their early life-cycle stages.

Verizon 5G Edge with AWS Wavelength makes it possible to build and deploy edge-specific applications that enable seamless, scalable AR/VR experiences.

The power of 5G Edge with AWS Wavelength for AR/VR

Verizon and AWS have partnered to provide a MEC infrastructure—Verizon 5G Edge with AWS Wavelength—colocated at the edge of Verizon 5G Ultra Wideband network sites.* Verizon's 5G Ultra Wideband is built with critical spectrum holdings that include millimeter-wave spectrum—which helps deliver gigabit-level data rates and low-latency performance—and will eventually incorporate C-Band spectrum that should enable wide geographic area coverage.

With AWS Wavelength, applications are deployed to Wavelength Zones that embed AWS compute and storage services at the edge of the Verizon 5G network. This allows applications to seamlessly access the breadth of AWS services in the region. AWS Wavelength allows experience creators and administrators to use the familiar and powerful AWS tools to manage, secure and scale applications. You can start small and scale as your needs grow without worrying about managing physical hardware, while benefitting from AWS features like elasticity, availability and low pay-as-you-go pricing.

By bringing cloud infrastructure and cloud-based services closer to where content is generated and consumed, 5G Edge with AWS Wavelength can significantly reduce application latency and improve performance. That allows innovative media companies and independent software vendors to bring new services and experiences to market.

5G Edge brings you right to the edge of Verizon's 5G Ultra Wideband network for low latency and high bandwidth to offer more immersive AR/VR experiences.

Here are some possible use cases:

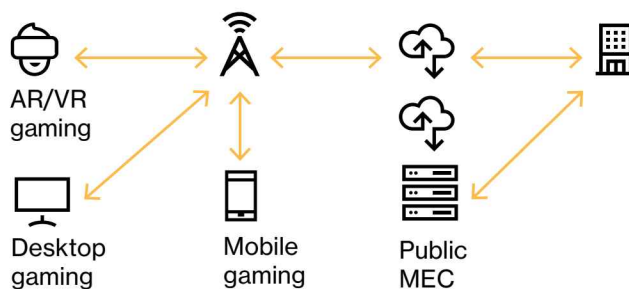
Graphics rendering offload

To achieve near real-time rendering for AR and VR, mobile users need low-latency connectivity and access to powerful computing resources, such as graphics processing units (GPUs). That's what 5G Edge with AWS Wavelength can provide. Mobile edge resources can include GPUs that deliver the added computing power needed for AR/VR content rendering that mobile devices, such as AR/VR headsets and mobile phones, simply don't have. Offloading computing power from a mobile device to the mobile edge can also potentially reduce device costs and improve battery life.

Additionally, when you offload workloads to Verizon 5G Edge with AWS Wavelength, you can reduce the volume of data traffic between mobile devices and your AWS Region or data center. That also decreases the load on your centralized resources since more of your video traffic, encoding and content production will stay locally at the Verizon 5G Edge.

AR/VR gaming

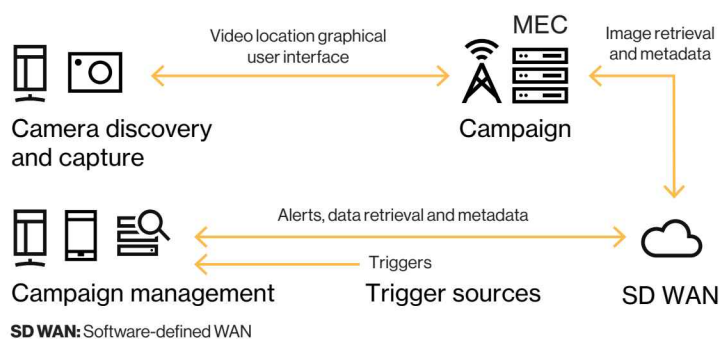
Delivering positive AR/VR gaming experiences requires a tight synchronization of users' activity. 5G Edge with AWS Wavelength can help with that by shifting the workload of storing and processing game software to the mobile edge. Using 5G Edge, rendered frames can be streamed to local hardware and then commands based on users' in-game activity can be sent back to the edge. Leveraging the mobile edge in this way can potentially reduce hardware costs for gamers since it could allow them to run even graphically demanding games on less compute-intensive devices. The mobile edge can also help shorten game load times. Plus, it can allow gamers to play high-end cloud video games on a wide variety of mobile devices from virtually anywhere within a 5G Edge footprint.



Shifting of game software storage and processing to the edge for tight synchronization of user activity

Creation of context-aware digital objects as a marketing tool

5G Edge with AWS Wavelength could possibly provide a platform that marketers could leverage to increase brand connection and engagement with customers and fans through the use of unique digital or smart objects. It's possible that such objects could be policy-controlled in a way that allows them to be traded, shared, collected, combined, nurtured or redeemed. For example, media and entertainment companies could potentially design smart objects for their customers to discover in a virtual map or capture in an AR experience,



Leveraging digital objects with mobile edge computing to increase brand engagement with digital collectibles and media campaigns

allowing them to share the digital objects with others or redeem them.

They should also be able to create digital collectibles using current and historical content. Digital objects could potentially be used in paid media campaigns. These different use cases not only offer the prospect of unique ways to engage customers and fans, but they could likely be used in conjunction with campaign management and analytics to drive object drops and policy, and to gain insights into the number and types of customer interactions.

Get started.

5G Edge with AWS Wavelength can help you deliver the next generation of AR/VR experiences. And since it's supported by industry leaders, you can focus on building the new breed of immersive AR/VR experiences and applications with the network and cloud capabilities you need, as well as enjoy the assistance of professional services to help with the underlying technologies.

Learn more:

verizon.com/5gedgeawscld