



AWS and Verizon team up to deliver 5G edge cloud computing

Verizon first in the world to offer 5G network edge computing with AWS Wavelength

For the first time, developers can innovate and build new applications by accessing AWS compute and storage services at the edge of the Verizon 5G network

Leading video game publisher Bethesda Softworks using AWS Wavelength and Verizon 5G Edge computing to deliver frictionless, ultra-low latency experiences for millions of gamers

The NFL tests AWS Wavelength on Verizon 5G for lower data transmission latency for delivery of new in-stadium enhancements for fans

SEATTLE—BASKING RIDGE, NJ —(BUSINESS WIRE)—December 3, 2019— Today at AWS re:Invent, AWS, an Amazon.com company (NASDAQ:AMZN), and Verizon Communications Inc. (“Verizon”), (NYSE, NASDAQ:VZ) announced a partnership that will bring the power of the world’s leading cloud closer to mobile and connected devices at the edge of Verizon’s 5G Ultra Wideband network. Verizon is the first technology company in the world to offer 5G network edge computing, and will use AWS’s new service, AWS Wavelength [link to release], to provide developers the ability to deploy applications that require ultra-low latency to mobile devices using 5G. The companies are currently piloting AWS Wavelength on Verizon’s edge compute platform, 5G Edge, in Chicago for a select group of customers, including award-winning, worldwide video game publisher Bethesda Softworks and the National Football League (NFL). Additional deployments are planned in other locations across the U.S. in 2020.

By utilizing AWS Wavelength and Verizon 5G Edge, developers will be able to deliver a wide range of transformative, latency-sensitive use cases like machine learning inference at the edge, autonomous industrial equipment, smart cars and cities, Internet of Things (IoT), and augmented and virtual reality. To accomplish this, Verizon 5G Edge provides mobile edge computing and an efficient high-volume connection between users, devices, and applications. AWS Wavelength lets customers deploy the parts of an application that require ultra-low latency to the edge of the network and then seamlessly connect back to the full range of cloud services running in AWS.

Verizon 5G Ultra Wideband technology enables a wide range of new capabilities and diverse use cases with download speeds many times faster than typical 4G networks. 5G will also dramatically increase the number of devices that can be supported within the same geographic areas and greatly reduce network latency to mobile devices. Mobile edge compute (MEC) technology further reduces latency. Currently, application data has to travel from the device, to the mobile network, to networking devices at the mobile edge, and then to the Internet to get to the application servers in remote locations, which can result in longer latency. This prevents developers from realizing the full potential of 5G in addressing lower latency use-cases. For example, game streaming requires less than 20 millisecond latency for a truly immersive experience.

In placing AWS compute and storage services at the edge of Verizon's 5G Ultra Wideband network with AWS Wavelength, AWS and Verizon bring processing power and storage physically closer to 5G mobile users and wireless devices, and enable developers to build applications that can deliver enhanced user experiences like near real-time analytics for instant decision-making, immersive game streaming, and automated robotic systems in manufacturing facilities.

"We are first in the world to launch Mobile Edge Compute -- deeply integrating Verizon's 5G Edge platform with Wavelength to allow developers to build new categories of applications and network cloud experiences built in ways we can't even imagine yet," said Hans Vestberg, CEO and Chairman of Verizon. "Bringing together the full capabilities of Verizon's 5G Ultra Wideband and AWS, the world's leading cloud with the broadest and deepest services portfolio, we unlock the full potential of our 5G services for customers to create applications and solutions with the fastest speeds, improved security, and ultra-low latency."

"We've worked closely with Verizon to deliver a way for AWS customers to easily take advantage of the ubiquitous connectivity and advanced features of 5G," said Andy Jassy, CEO of AWS. "AWS Wavelength provides the same AWS environment -- APIs, management console, and tools -- that they're using today at the edge of the 5G network. Starting with Verizon's 5G network locations in the US, customers will be able to deploy the latency-sensitive portions of an application at the edge to provide single-digit millisecond latency to mobile and connected devices. While some ultra-low latency use cases like smart cars, streaming games, VR, and autonomous industrial equipment are well understood today, we can't wait to see how builders use 5G edge computing to delight their mobile end users and connected device customers."

Bethesda Softworks is an award-winning, worldwide video game publisher best known for iconic franchises like The Elder Scrolls, Fallout, and DOOM. Bethesda, along with its engineering team at subsidiary id Software, has developed new cloud gaming technology, called Orion, that greatly enhances the experience of streaming video games. This new technology is incorporated into a game's engine in order to optimize performance in the cloud. By substantially reducing latency and bandwidth, Orion provides a much better experience for gamers and significantly lowers costs for publishers, developers, and streaming service providers.

"The promise of streaming is great -- play your favorite games anywhere, anytime, without downloads or the need to buy expensive consoles or PCs. But gamers don't have unlimited bandwidth, and they demand an ultra-low latency experience. If you can't provide that, it won't be good enough," said James Altman, Bethesda's Director of Publishing. "Now, by combining Orion with AWS Wavelength and Verizon's 5G network, we will be able to deliver on the promise of streaming: a frictionless, ultra-low latency experience that will enable millions of gamers to play AAA quality games at max settings, wherever they want, whenever they want -- no downloads or consoles required."

The NFL continues to look at technology to grow the sport of football to the millions of fans who engage with the League throughout the year, including how the use of Verizon's 5G Ultra Wideband network and the cloud can help unlock new and exciting ways for NFL fans to view, share, and engage with their favorite teams no matter where they are.

"Fans love the live game-day football experience in stadium, and we constantly strive to deepen engagement on and off the field," said Matt Swensson, Vice President, NFL Emerging Products and Technology. "The Next Gen Stats platform captures player location data in real-time, generates over 200 stats per play, and charts individual movements within inches. The use of AWS's Wavelength and Verizon's 5G Ultra Wideband network has the potential to lower data transmission latency for delivery of new and exciting in-stadium enhancements to fans."

About Amazon Web Services

For 13 years, Amazon Web Services has been the world's most comprehensive and broadly adopted cloud platform. AWS offers over 165 fully featured services for compute, storage, databases, networking, analytics, robotics, machine learning and artificial intelligence (AI), Internet of Things (IoT), mobile, security, hybrid, virtual and augmented reality (VR and AR), media, and application development, deployment, and management from 69 Availability Zones (AZs) within 22 geographic regions, with announced plans for 13 more Availability Zones and four more AWS Regions in Indonesia, Italy, South Africa, and Spain. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—trust AWS to power their infrastructure, become more agile, and lower costs. To learn more about AWS, visit aws.amazon.com.

About Amazon

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About Verizon

Verizon Communications Inc. (NYSE, Nasdaq: VZ), headquartered in New York City, generated revenues of \$130.9 billion in 2018. The company operates America's most awarded network and the nation's premier all-fiber network, and delivers integrated solutions to businesses worldwide. With brands like Yahoo, TechCrunch and HuffPost, the company's media group helps consumers stay informed and entertained, communicate and transact, while creating new ways for advertisers and partners to connect. Verizon's corporate responsibility prioritizes the environmental, social and governance issues most relevant to its business and impact to society.

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AWS Public Relations Inquiries aws-pr@amazon.com

AWS Analyst Relations Inquiries aws-ar@amazon.com

Verizon Media Inquiries:

Kevin King

410-353-3234

kevin.king@verizon.com

Howie Waterman

917-359-5505

howard.waterman@verizon.com