AWS LOCAL ZONES

Multiplayer game server deployment with AWS Local Zones

Local Zones enable single-digit millisecond latencies for a consistent and engaging gaming experience in more locations.

Online multiplayer gaming is a fast growing industry. Global game content revenues have doubled in recent years, and are set to reach $432 billion by 2030.[1] The most popular games tend to be action-oriented, session-based multiplayer experiences. Fortnite (Epic Games) and League of Legends (Riot Games) have each hosted millions of concurrent players from around the globe. Great engaging content is the most important factor that makes a game popular. But in addition to great content, players also want an immersive and fair gaming experience.

The multiplayer gaming experience depends on game servers that coordinate in-game events and transmit data between players. Delivering a rich, real-time experience requires low network latency between the game server and the player. The greater the distance between the server and the player, the longer it takes to transmit data between them. As latency levels increase to where there is a noticeable delay between input and

on-screen action, players abandon games at higher rates.[2] Game server proximity is therefore critical to latency and the gaming experience.

Many gaming companies have on-premises installations around the world to deploy servers closer to players, to offer low latencies for global player communities. But maintaining on-premises installations is costly and technically challenging, pulling focus away from their core business of making great games.

AWS Regions are physical locations around the world where AWS clusters data centers. We call each group of logical data centers an Availability Zone (AZ). Each AWS Region consists of a minimum of three, isolated, and physically separate AZs within a geographic area. Customers can already access single-digit millisecond latencies in AWS Availability Zones. However, for customers who are not close enough to a Region, AWS Local Zones are an alternative infrastructure that places select services close to large population centers and

extend AWS infrastructure to the edge. With Local Zones, game developers can access AWS cloud services in more locations around the world to run game servers closer to their player communities. Local Zones enable customers to access the benefits of the cloud—elasticity, scalability, pay-as-you-go pricing and flexibility—in more locations beyond existing AWS Regions, for workloads that are latency sensitive or have to meet data residency requirements. AWS has more than 15 years experience in supporting leading industry customers such as Epic Games, Riot Games, and Supercell. By delivering game servers at the edge with Local Zones today, you can offer superior performance and experiences for players worldwide.

The latency challenge in session-based online multiplayer gaming

In many online multiplayer titles, low latency is critical for an optimal player experience. Games must respond to player inputs in perceived real-time to create an enjoyable experience.

$432 billion by 2030
The predicted growth of global game revenues.[1]

Competitive PC games such as Valorant (Riot Games) demand maximum frame rates and the lowest end-to-end latency, with sub 25 ms being desirable. Multiplayer mobile games such as Brawl Stars (Supercell) also require low-latency, but can tolerate up to 80 ms an maintain an acceptable player experience. In games involving action like active combat between players, lag can disadvantage a player. This is because the player with higher latency will have a delayed perception of in-game events, giving the other player an advantage. Higher latencies create an unfair experience and can negatively impact player retention.

Latency in online multiplayer games is affected by several factors. Latency is typically higher where the physical distance between the game server and the player is greater. Also, during peak hours gamers can experience delays in getting into a session, particularly where on-premises servers are used which can't handle the scale and bandwidth, something AWS is able to cope with.

To meet these challenges, many gaming companies have maintained multiple on-premises installations around the world. But this approach requires a significant up-front investment in hardware and network infrastructure. Resources may be

wasted during periods of low demand, as the infrastructure sits idle. And scaling out to new locations is slow and costly. When a game gains popularity and the number of players grows exponentially, on-premises installations may not be able to scale as needed.

AWS Local Zones: Enabling fast real-time gaming experiences

With Local Zones, you can deploy game servers and access AWS services in locations outside of AWS Regions, which are closer to your player populations. With game servers deployed in Local Zones, you can offer multiplayer gaming with single-digit millisecond latency to the highest number of customers.

Low latency results in more engaged players, deriving greater enjoyment from games and increased retention. You can focus on developing game content that expands your player base and drives revenues. And by running game servers in the AWS cloud today, you can create a foundation for continued innovation such as game analytics or game streaming services.

With over 35 Local Zones available and more coming soon in the Americas, Europe, Asia-Pacific, and Latin America, moving game servers to the cloud can help you engage and expand global player communities.

See the full list of AWS Local Zones locations ›
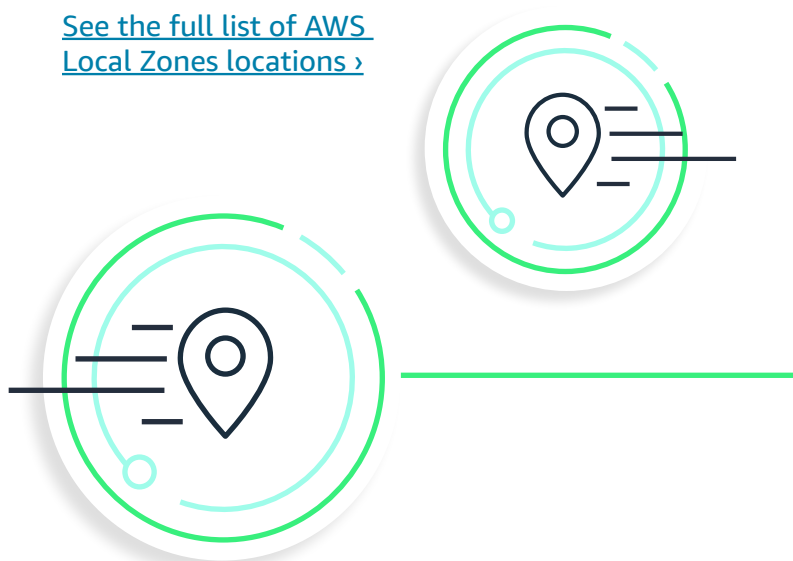
Benefits of Local Zones for multiplayer gaming

How AWS Local Zones can transform the way you run multiplayer game servers.

1 Simplify infrastructure

By deploying game servers on Local Zones you can minimize time spent on building and managing game server infrastructure. Local Zones can remove the need to establish data centers, co-locations, and low-latency connections to telco networks. If you run game servers in AWS Regions, you'll find using Local Zones a familiar experience.

2 Scale easily to serve greater numbers of daily active users

When you have a hit multiplayer game on your hands, you can rapidly expand infrastructure and deploy game servers in locations where player density is highest.

3 Optimize costs

Ramp up during peak gaming hours and ramp down at quieter times. You only pay for the exact compute resources you need, when you need them.

> Up to
> **70%** reduction in game server compute costs with AWS, compared to on-premises deployments.[3]

4 Improve matchmaking

Match players based across Regions and Local Zones based on their latency, skill level, and location. You can also use Amazon GameLift FlexMatch in select Local Zones, a customizable matchmaking service for multiplayer games, to set matchmaking priorities and cross-platform play.

5 Provide a consistent experience

Through the same APIs and toolsets as AWS Regions, we provide a consistent experience with Local Zones, offering dedicated server management for session-based multiplayer games. Reduce dependence on peer-to-peer hosting, which can give the game host an unfair advantage in latency and ability to run custom code.

6 Build in resiliency

Deploy game servers across Local Zones and AWS Regions for high availability and fault tolerance.

Learn more about AWS for Games on the AWS website ›

AWS services in Local Zones

Compute

You can host game servers directly on virtual machines on a variety of Amazon Elastic Compute Cloud (EC2) instance types. Leverage Amazon EC2 Auto Scaling to match the game servers with demand.

Access to AWS services including managed game servers

Seamlessly connect to the full range of services available in your Local Zone's AWS parent Region through the same APIs, toolsets, and private, high-bandwidth AWS network.

Services include Amazon GameLift (in select Local Zones), which deploys and manages dedicated game servers hosted in the cloud, on-premises, or through hybrid deployments. Amazon GameLift provides a low-latency and low-cost solution that scales with fluctuating player demand.

Containers

Run your containerized game servers in the most secure, reliable and scalable environment. Select from either Amazon Elastic Container Service (ECS) or Amazon Elastic Kubernetes Service (EKS) to run your containers.

Networking

Extend your existing Amazon Virtual Private Cloud (VPC) to span across Availability Zones and Local Zones. Create a subnet in your regional VPC and associate it with a Local Zone to extend VPC features, including Security Groups, Network ACLs, and Route Tables to a Local Zone. You can do this similarly to how you associate subnets with an Availability Zone in an AWS Region.

Internet access

Local Zones have local internet ingress and egress to reduce latency.

See the full range and request additional services

Explore the full offering on the AWS Local Zones features page. If your organization needs services that aren't currently available in a particular Local Zone, you can contact AWS teams for more information.

Customer success stories

Some of the biggest names in global gaming use AWS Local Zones to deliver consistently great multiplayer experiences.

How Epic Games uses AWS Local Zones to provide lower latency for players

Epic Games is the interactive entertainment company behind Fortnite, one of the world's most popular online games with over 400 million players. The company needed to provide a low-latency experience for players in Mexico and the Central United States, which would be similar to those of players in its East United States and West United States server regions. The company worked with AWS to deliver a new matchmaking server region located in Dallas, Texas with Local Zones. This new Local Zones-based region enabled Epic Games to run all of its North American competitive events in one central region, and create tournaments with a single North American champion for the first time.

Read the full Epic Games case study ›

Mobile game developer Supercell improves the player experience with AWS Local Zones

Supercell is also using AWS edge services to enhance the gaming experience for players of Brawl Stars, which launched globally in 2018. "Brawl Stars is a near-real-time multiplayer game, so delivering a low-latency experience is crucial," says Supercell's Juho Mäkinen. Over the past 4 years, Brawl Stars has surpassed $1 billion in gross sales, making it Supercell's highest-performing game. To reduce latency for Brawl Stars players, Supercell is adopting new AWS Regions and AWS Local Zones so that it can run servers closer to players. By using Local Zones to support deployment, Supercell has reduced latencies and facilitated a more seamless user experience.

Read the full Supercell case study ›

Get started with AWS Local Zones for gaming

Creators of online multiplayer games need to provide low-latency game servers to achieve high levels of player engagement. With global player communities, significantly higher activity during peak times, and the potential to reach millions of customers, a highly flexible edge infrastructure is essential. AWS Local Zones offer high-performance game server deployments in more locations around the world, so players can enjoy a consistently engaging game experience.

aws.amazon.com/about-aws/global-infrastructure/localzones ›

[1] "Online Gaming Market Global Forecast to 2030", Meticulous Research, 2023
[2] "The Effects of Network Latency on Player Gaming Experience", Zha, M. X., & Zhang, Y, 2019
[3] "Using Amazon GameLift, Spot Instances, and Autoscaling compared to servers in a colocation", AWS