2022 Special Olympics USA Games App

A Transformational Mobile Fan Engagement Experience
Powered by Solodev and AWS Serverless Cloud Technology

SPECIAL OLYMPICS USA GAMES ORLANDO 2022

CORE SOLUTION

Serverless Cloud Compute on AWS

AWS STACK

- AWS Fargate
- Amazon Virtual Private Cloud (VPC)
- Amazon Relational Database (RDS)
- Application Load Balancer (ALB)
- Amazon Elasticache for Redis
- AWS Certificate Manager
- Amazon Simple Storage Service (S3)
- AWS CloudWatch
- Amazon CloudFormation

KEY RESULTS

- Moved from Azure VMs to AWS Fargate
- Scaled to serve 25,000 concurrent users
- Performed with zero downtime
- Improved security and sustainability
- Reduced costs by up to 82%

CHALLENGE

The Special Olympics – an international beacon of hope for millions with intellectual disabilities – marked its triumphant return to competition at the 2022 USA Games. After more than a year of cancelled events due to Covid-19, nearly 6,000 athletes assembled in Orlando as their families and fans cheered them to victory. It was the largest USA Games in history, with several Caribbean nations invited to participate for the first time, and large-scale sponsors including Jersey Mike's, ESPN, and Disney.

To connect this community throughout the event, the USA Games team envisioned a mobile app that transformed the fan engagement experience, integrating a host of rich features to enhance healthcare, manage competition schedules, improve wayfinding, and more. With over 135,000 attendees, they also needed a scalable cloud infrastructure to power every interaction and ensure seamless performance – all while maintaining or even reducing costs.

One of the key challenges for the Special Olympics was a lack of continuity with previous app development. As part of its vision for digital transformation, the 2022 USA Games wanted a package that could be used by future events at local, regional, and global events. This composable "legacy" app would save thousands in development and allow other Special Olympics organizations to put more athletes on the field while providing access to technology that has never been available before.

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SOLUTION

To power its mobile fan engagement experience, the USA Games turned to Solodev: an AWS Advanced Technology Partner with competencies in Government, Education, Digital Customer Experience, and Public Safety & Disaster Response. Solodev was also awarded the mantle of "Cloud Consulting Partner" to the 2022 USA Games.

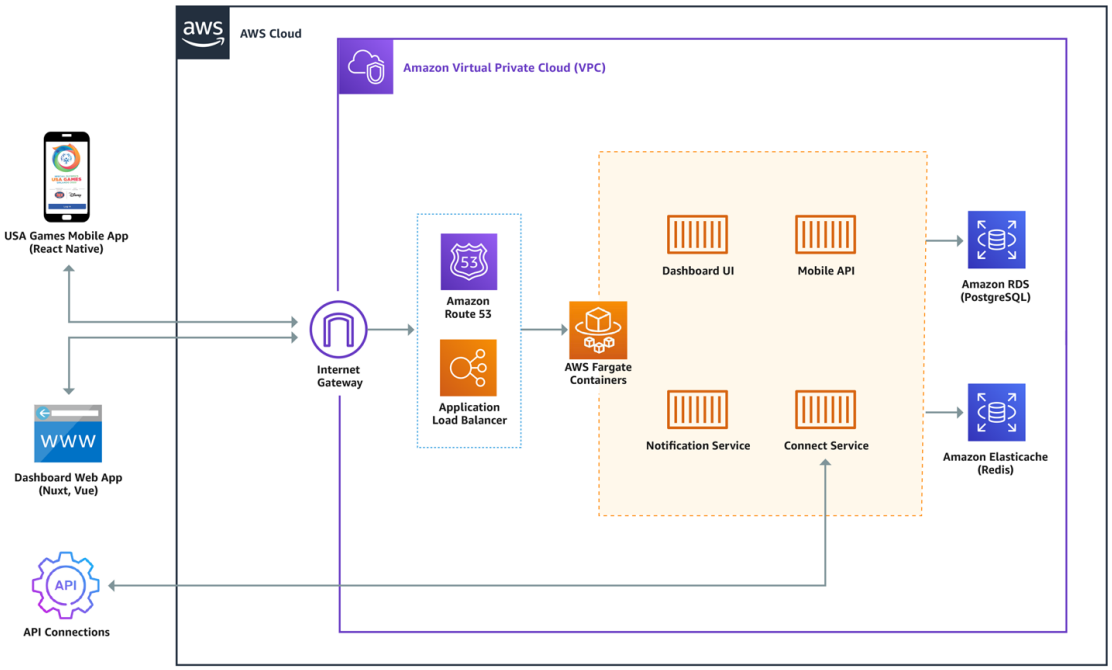
The strategy for the mobile app was nothing short of digital transformation. It would provide a single source of truth for the entire event, delivering a seamless athlete and fan experience that unified schedules, competition results, and more. Available in both iOS and Android stores, some of the marquee features would include:

- **Find and Follow Athletes:** a module for tagging and tracking specific athletes across their competitions
- **Send Cheers:** a unique feature enabling users to send general messages of encouragement to specific athletes
- **Healthy Athletes:** a system for easing wait times for medical screenings at the Healthy Athletes pavilion
- **Scheduling:** a personal calendar for tagging events and competitions across the Games
- **Wayfinding:** an immersive, phone-based mapping and navigation experience

Going Serverless with AWS Fargate

After consulting on both vendor selection and UX design, Solodev worked closely with the development partner for the USA Games app, specifically around the cloud infrastructure. At prior events, Microsoft Azure had been used to power the mobile app, utilizing enterprise virtual machines that were costly to maintain and difficult to scale.

Given its stateless, React-based architecture – and the need to scale significantly over the 7-day event – the new app was a perfect fit for a serverless deployment. Solodev recommended its proven **Solodev Serverless** solution powered by **AWS Fargate**, providing manageable orchestration for the app's containers and eliminating the need for over-provisioning multiple VMS.



The USA Games app consisted of four **Docker** containers: one for the mobile app itself, one for an admin dashboard, one for notification services, and one for a connect service that powered APIs to a range of third-party services. Using Fargate, the production containers were managed behind an application load balancer while **Amazon RDS** provided the database and **Amazon Elasticache** managed in-memory data store caching to improve app performance.

The Solodev Serverless stack was deployed using **AWS CloudFormation**, and included critical services such as **Amazon VPC, AWS Certificate Manager, AWS S3,** and **AWS CloudWatch** for monitoring the ecosystem. Solodev's AWS engineers built the essential DevOps pipelines for **GitHub** and **Bitbucket** to secure and streamline tagging and versioning. The elastic solution also helped minimize development timelines and provide nearly limitless scalability based on sessions, not servers. A load testing strategy was also employed using **Loader.io** to confirm that the app could withstand up to 25,000 concurrent users at any given time – and it performed flawlessly.

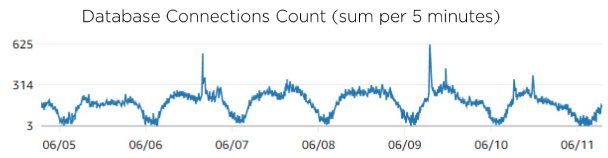
docker | Bitbucket | GitHub | docker Compose

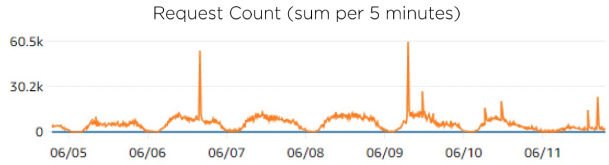
AWS Fargate | Amazon Elasticache | AWS ALB | Amazon RDS

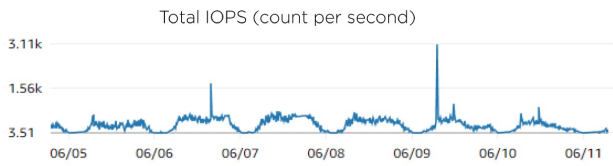
RESULTS

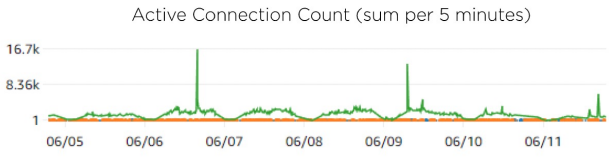
The 2022 USA Games app was a game changer. Not only were athletes, coaches, and fans delighted with the functionality, but the Solodev Serverless solution provided unmatched scalability and zero downtime over the 7 days of the event.

The app performed like a champion under demanding conditions. The database received an average of 250 connections every 5 minutes and 500 IOPS every second during competitions, while the infrastructure load received an average of 10,000 requests every 5 minutes and 3,000 active connections every 5 minutes during competitions.









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Improved Performance and Cost Savings from Azure to AWS

Moving from Microsoft to serverless on AWS delivered incredible performance and cost savings. At the previous Special Olympics World Games, CIO Lonnie Snyder was experiencing bills of roughly **$5,000 - $7,000 per month**. Microsoft's enterprise VMs were also limited in their ability to scale, so the DevOps team was forced to over-provision during their development and testing phases.

With Solodev Serverless on AWS, the 2022 USA Games was able to eliminate costly HA servers and clusters, **reducing costs to $1,200 per month – a savings of up to 82%**. During the 7-day event, consumption only increased to $300 per day, and was quickly cycled back down to just $40 per day after the event.

82%
SAVINGS WITH AWS*

*Cost savings and other metrics provided by 2022 Special Olympics USA Games.

Enhanced Security with Serverless

When servers don't exist and auto-scaling is ever-present, it's important to know how and where to deploy cloud and application security measures to help mitigate risk. In addition to the enhanced scalability and cost savings, Solodev Serverless delivered a more secure experience from end to end.

As a Git-powered solution, everything was tightly controlled from the repo, allowing development to tag and release versions with clarity and confidence. A granular "nano service," Solodev Serverless also applied critical security policies with AWS across a myriad of services. Perimeter security was also less challenging, and the ephemeral nature of the stateless app significantly reduced the surface area for hackers.

A Sustainable, Eco-Friendly Footprint

Solodev Serverless also delivered a more sustainable model for powering the USA Games app. By removing servers and eliminating any over-provisioning, the app development team was able to scale with precision during the 12-month beta phase of the project – including load testing. During the 7-day event, demand increased significantly, and the infrastructure scaled in lockstep,; meanwhile, excess capacity was never an issue. The net effect was a reduction in overall consumption, cost, and energy use.

By achieving these remarkable efficiencies, the 2022 USA Games app illustrated the potential of serverless technology to deliver **Environmental, Social, and Corporate Governance (ESG)** – a global initiative for businesses and organizations that focuses on reducing energy consumption and climate impact while making systems more sustainable.

"During the Games, the first app notification we sent was about inclement weather. 16,000 people opened the message within one minute and there were no issues. ***The cloud was the one constant in our event that just worked,*** *no matter what kind of load we threw at it. I never once woke up worrying if the app's infrastructure was going to deliver. AWS and Solodev's serverless environment was a complete game changer."*

Lonnie Snyder CIO, 2022 Special Olympics USA Games

AWS Imagine Grant

Along with PoC credits from the AWS TechSoup program, Solodev leveraged its relationships as an AWS Advanced Technology Partner to help the 2022 USA Games access AWS funding for 501(c) organizations. This included the application for the **AWS Imagine Grant:** a unique public grant for non-profits in the United States who are using cloud technology to solve the world's most pressing challenges. Solodev's assistance in the grant submission helped the USA Games win the award, which provided a combination of cloud credits and unrestricted funding to support its humanitarian efforts. [Learn more]

ABOUT SOLODEV

Solodev Cloud Services is the internet's largest ecosystem of cloud and digital experience technologies – from containers to crypto, content to AI. With Solodev, developers and organizations can build amazing customer experiences, deploy custom cloud and blockchain apps, launch NFT marketplaces, and collaborate on digital transformation. Solodev Cloud Services also provides consulting, training, managed services, and 24/7 human support to help users succeed on their cloud journey. An Amazon Web Services (AWS) Advanced Technology Partner, Solodev has achieved rigorous competencies in Government, Education, Digital Customer Experience, and Public Safety & Disaster Response. Solodev Cloud Services – including CMS, Kubernetes, and Personalize – can be purchased on-demand in the AWS Marketplace, through state/federal contracts, or online at [www.solodev.com]

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