ʔ Fantasmo

Fantasmo provides a camera-based positioning software that functions as an alternative to GPS. Founded in 2014 in Venice California, Fantasmo currently operates in the US and Germany.

Their primary offering is hyper-accurate positioning solution for location-based services such as shared mobility, last mile logistics, autonomous systems, accessibility, with applications in robotics, mobile phones, augmented reality, and car navigations systems. One of Fantasmo's fastest growing market segments is the work they do in urban areas with electric scooter organizations, which is a quick and clean way to get around, but managing a fleet of shared scooters, from where they are picked up, and where they are dropped off, can create lots of complexity.

Positioning from satellites (GPS) is a common utility for many location-based software applications, but the problem in cities is that buildings, trees, and other objects can block the view of the street, hindering the accuracy of the device's location. Fantasmo's camera vision-based positioning systems help solve this problem by building 3D maps of cities at the ground level, collected using cameras and sensors like those found in electric vehicles. Once a city is mapped, Fantasmo can determine a device's position by pinning camera footage to that digital map using its Camera Positioning System (CPS), an alternative to traditional GPS technology. Fantasmo's proprietary technology not only functions well indoors and in dense urban areas, but does not require infrastructure such as satellites, beacons, or radios.

Fantasmo initially built their cutting-edge software applications on the Microsoft Azure platform, but like many start up organizations, as they grew, they were having a difficult time scaling their overall cloud footprint to keep up with the needs of their business. Furthermore, running manually managed Docker hosts and containers with no orchestration layer, while lacking the additional toolsets needed to better optimize their application performance, was slowing down their software innovation.

By moving to AWS, Fantasmo was able to solve some key business challenges:

- Implement a container orchestration platform to better manage overall application performance and availability using Amazon Elastic Container Service (ECS)

- Scale front-end and back-end services independently to align with application performance needs

- Deploy applications across multiple Availability Zones and Regions, including the US and Europe, to meet demands of their local clients

- Optimize the application's underlying compute resources based on separate GPU, compute, memory, and storage needs

- Leverage AWS FSx Managed Service for Lustre file system to achieve high throughput and low latency access to their repository of map data

- Leverage AWS Aurora Postgres as a managed database platform to reduce administrative overhead and gain performance

- Better flexibility for application updates, deployments, and overall architecture management

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Fantasmo uses a feature extraction application that leverages machine learning (ML) to pull out specific elements of a camera image that is submitted by a client device, and another client positioning application that takes those features and analyzes them against established mapping data to then identify the precise location down to a few inches. Combining these two utilities provides the end user an extremely accurate location of the client devices, but these applications require very specific underlying resources to work effectively.

Fantasmo was struggling with GPU availability for their location-based positioning service applications through Microsoft's Azure, with the chip shortage delaying the availability of additional resources needed to maintain consistent application performance. Based on the set of challenges, AWS recommended that Fantasmo engage with Uturn Data Solutions (Uturn), an Advanced Tier AWS Consulting Partner with significant experience in migrating workloads to AWS. As an AWS DevOps Competency Partner, Uturn has a track record of helping organizations design and implement robust compute strategies for varying application workloads, while helping AWS customers establish a consistent and repeatable platform for consuming new services.

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>
> - **Ryan Measel**, CEO/Co-founder at Fantasmo

Fantasmo engaged Uturn for an initial project to help them design an AWS compute strategy that would help mitigate their design and compute challenges. To streamline the migration to AWS, Uturn leveraged its **Rocketry Rapid Launch** program to accelerate the time to value. **Uturn's Rocketry framework** is a proven and enterprise-ready set of Terraform modules created to reduced time-to-implementation for clients that have a need and desire to implement Infrastructure as Code and Modern DevOps practices within their environments, while staying true to AWS Well-Architected design principles and best practices.

Uturn's solution architecture team worked quickly with the Fantasmo team to assess the current environment, and recommended moving their front-end applications to AWS Fargate, a serverless compute environment, and the other location-based positioning service applications to higher compute instances, and available GPU resources more readily available on AWS. Through the Rocketry framework, Uturn was able to quickly create the landing zones, set up the (CI/CD) pipelines, and establish separate networking and security accounts from the production and development modules, while designing the environments to support multi-region interconnectivity.

The initial engagement was completed successfully in under three months, with Fantasmo's environments fully migrated and established on a best practices AWS framework. "Uturn's excellent team of cloud engineers drastically improved the way we were leveraging public cloud resources, and they have truly become an extension of our organization" said Ryan Measel, Fantasmo CEO and Co-founder.   "The expertise and professionalism they brought to this engagement really made this migration process a success, and we look forward to working with them as we continue to grow our overall cloud strategy".

Fantasmo has since contracted with Uturn for additional advisory services to best leverage the AWS platform for other areas of their business. **Uturn's Architect-in-Residence (AiR) program** incorporates dedicated Senior AWS Architects alongside clients to create a foundation for success, helping increase cloud adoption through teaching Well-Architected design practices, detailed cost analysis, cloud governance, and much more.

About Uturn

Uturn is an Amazon Web Services Advanced Tier Consulting Partner specializing in Enterprise Cloud Enablement and Application Modernization. We help our clients adopt and optimize cloud services to remove technical debt, prepare for growth, eliminate uncertainty, foster innovation, accelerate critical business initiatives, and become more efficient with their technology investments.

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