aws PARTNER Advanced Tier Services

binbash®

Serverless Pipeline for Meteorological Forecast Solutions on AWS

Executive Summary

Aprilis, a global leader in meteorological forecasting solutions, faced the challenge of developing a scalable, efficient, and automated infrastructure to support its growing need for real-time, accurate weather predictions. Partnering with Binbash, an AWS Advanced Tier Services Partner, Aprilis embarked on a transformative journey to build a serverless pipeline leveraging AWS services. This collaboration aimed to enhance operational efficiency, optimize resource utilization, and ensure robust data processing capabilities for their advanced weather forecasting models.

Customer Challenge

Aprilis required an advanced, automated infrastructure to handle large volumes of meteorological data efficiently. Their existing setup was not scalable and lacked the automation necessary for continuous deployment and integration. The primary challenges included:

Scalability: Ensuring the infrastructure could handle increasing data volumes.

Automation: Implementing fully automated CI/CD pipelines to streamline deployments.

Cost Optimization: Reducing operational costs while maintaining high performance.

Operational Efficiency: Enhancing the overall efficiency of data processing workflows while adopting Infrastructure as Code.

Solution

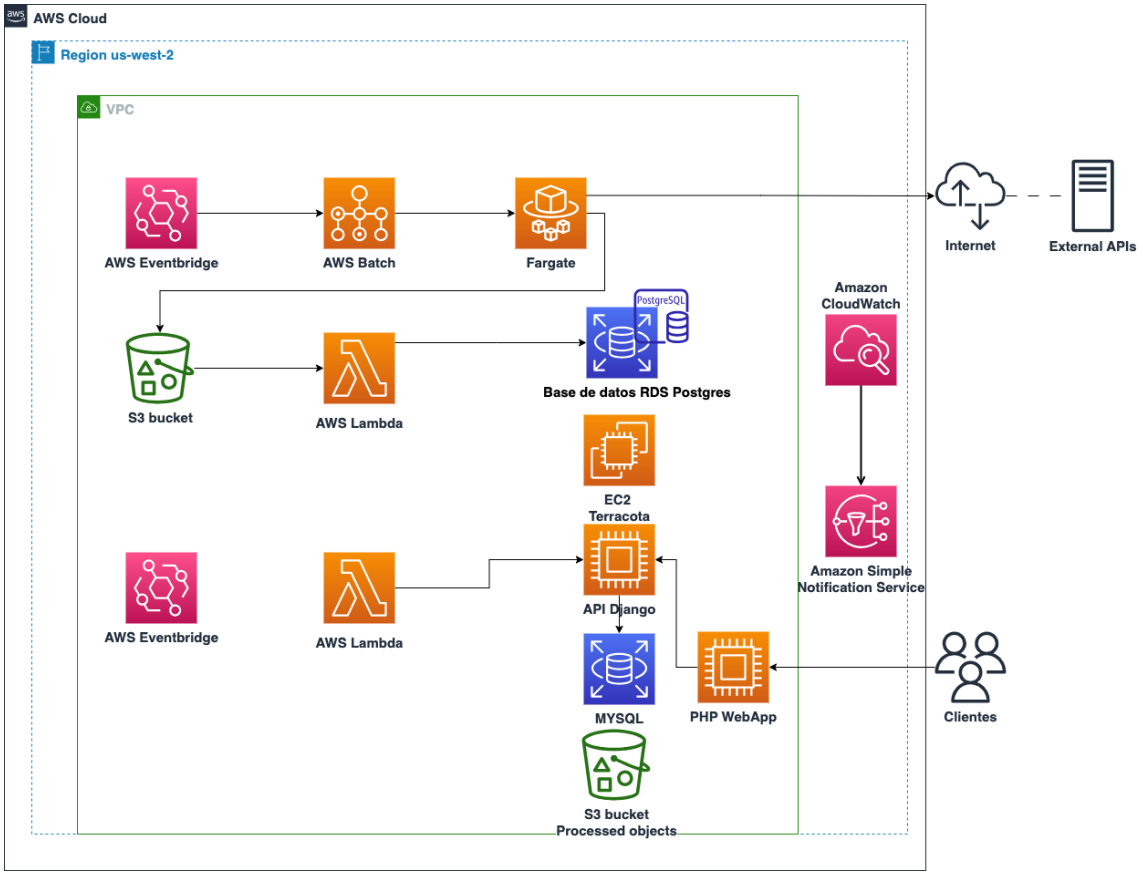
binbash provided a comprehensive serverless solution leveraging various AWS services to address the challenges faced by Aprilis. The solution was designed to be scalable, cost-effective, and fully automated, ensuring seamless data processing and integration.

aprilis

Aprilis offers global meteorological forecasts using advanced models. Services include frost intensity, duration, probability, long-term trends, and daily rain forecasts, utilizing CMC and GFS models for accurate and comprehensive weather predictions.

The quality of service offered was phenomenal, no new technologies were shown that do not allow us to expand our horizon since we are in the process of optimizing our data processing. The predisposition and commitment they had with us to achieve the objective was exceptional, and they were also very clear when passing on the development and implementation of the new technologies to us.

Matías Armanini - Co-Founder



Key Components of the solution

1. **Infrastructure and Tools Setup:**

- AWS Account and Repositories: Kickoff project and creation of access in AWS and repositories.
- Infrastructure Repository: Configuration of a 100% as Code approach with Terraform-based infrastructure repository and Docker optimization for extraction scripts.

2. **Integration and Automation:**

- CI/CD Workflow: Development of CI/CD pipelines using GitHub Actions for building and deploying Docker images.
- Serverless Pipeline: Creation of a serverless pipeline involving AWS EventBridge, AWS Batch (Fargate), and S3 for automated data processing.

3. **Resource and Cost Optimization:**

- VPC Endpoints: Configuration of VPC endpoints for S3 to reduce data transfer costs.
- Fargate Resource Tuning: Fine-tuning Fargate resources to ensure efficient and cost-effective operations.

4. **Enhanced Data Processing:**
- Lambda Integration: Implementation of AWS Lambda for event-driven data processing triggered by S3 write events.
5. **Documentation and Knowledge Transfer:**
- Detailed Documentation: Creation of comprehensive documentation covering operations and application specifications.
- Knowledge Transfer Sessions: Conducting knowledge transfer and demonstration sessions to ensure Aprilis' team could manage the deployed AWS resources effectively.

Results

The implementation of the serverless pipeline brought significant benefits to Aprilis, including:
Enhanced Scalability: The new infrastructure can handle increasing data volumes seamlessly.
Operational Efficiency: Fully automated CI/CD pipelines streamline deployments and reduce manual intervention. Moreover the infra deployment was fully as code using Terraform and binbash leverage (https://leverage.binbash.co)
Cost Optimization: Efficient resource utilization and reduced data transfer costs.
Robust Data Processing: Improved data processing capabilities with event-driven automation.

Key Milestones

Infrastructure As Code: Establishment of Terraform-based infrastructure and Docker optimization.
CI/CD Pipeline Development: Implementation of automated CI/CD workflows.
Serverless Pipeline Creation: Deployment of EventBridge, AWS Batch, and S3 for data processing.
Lambda Integration: Event-driven data processing with AWS Lambda.
Documentation and Knowledge Transfer: Detailed documentation and transfer sessions.

Conclusion

The collaboration between Aprilis and Binbash resulted in a modern, scalable, and efficient serverless infrastructure on AWS. This transformation has positioned Aprilis to handle its growing data needs effectively while optimizing costs and enhancing operational efficiency. Binbash's expertise in AWS services and serverless architectures played a crucial role in the success of this project, setting a strong foundation for Aprilis' future growth and innovation.