

# Continuous Integration drives Operational Readiness

## **Case Study**

# SUNPOWER®



partner network

SaaS Architecture Competency Resilient data supply chain enables machine learning to expose event anomalies across global energy grid Discover how SunPower leveraged continuous integration to achieve operational readiness for their global solar power infrastructure. Learn how they processed billions of data points, utilized machine learning, and improved equipment anomaly detection.

## SUNPOWER<sup>®</sup>

## **INDUSTRY**

Solar Power and Energy Grid

## SOLUTION

DevOps, SaaS, Real-time analytics, Machine Learning

## CLIENT

SunPower



## SunPower

SunPower is the leader in solar power innovation, operating over 3 gigawatts of commercial and utility-scale solar power plants. Panels and equipment situated in over 700 sites around the planet are all managed from a central Command Center in Austin, TX. Avoiding costly downtime in this large-scale equipment infrastructure depends on SunPower's Remote Operations team, and how well it can work with data-intensive alert streams.

#### **The Challenge**

SunPower's global Remote Ops teams needed to process billions of data points per hour. Inputs varied widely. There are hundreds of equipment types from different manufacturers. Managers had to make sense of report data in incompatible formats from legacy systems, such as Data Historian, EAM, SCADA and more. Operators needed to see unified health status for each plant, using AI to diagnose the state of each piece of machinery. Field technicians needed proactive notifications about possible failures, minimizing false positives.

### **The Solution**

CloudGeometry chose the AWS cloud platform for its global reach. Another key benefit was using Amazon Kinesis, for signal collection and parallel processing across geographies. Processed data flows to Amazon RDS, and is then replicated into central storage, using Amazon Aurora DB for SQL data and DynamoDB for nonSQL data sets. Signal data also feeds into Machine Learning (ML) models, each trained for specific equipment types. ML helps check device health data, discover anomalies and flag them to operators and technicians. Signal data is also aggregated every 15 seconds via with Spark data processing, which creates datasets for a web-based unified analytics dashboard showing health status for the whole network.

CloudGeometry's CI/CD solution enables frequent updates to production systems with no downtime. It also speeds up on-boarding of new equipment types, as well as releasing new business process and reporting features.

#### Easily add new equipment

Reliable integration with logging via Kinesis streaming, and API data feeds. Flexible framework for tuning data cleansing and transformation rules.

Machine Learning models ML models helped cut 50% of false alarms, and continue to drive improvements as the models process new anomalies and incorporate feedback from field technicians.

24/7 Monitoring and compliance CloudGeometry Monitoring tracks the health of all system components 24/7, ensuring operational integrity at all locations worldwide.



## SunPower

#### **The Benefits**

Thanks to the new scalable cloud-native system, SunPower operators have the visibility they need to discover equipment anomalies sooner, and at far less cost. Always getting better data faster also cuts downtime and reduces the number of on-site technicians dispatched.

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## **Technology Solutions & Services** to build, optimize and run your cloud software and operations.

## **TECHNOLOGY SOLUTIONS**

**APPLICATION MODERNIZATION** 

Transform Legacy Systems for Future-Ready Innovation

**CLOUD COST MANAGEMENT** Optimize Cloud Spending for Maximum ROI and Efficiency

## FOUNDATION SERVICES

#### **CLOUD INFRA & OPS**

Robust Infrastructure Solutions for Seamless Operations

- DevOps as a Service
- Managed Cloud Operations
- Cloud Spend Optimization
- Resilience, Continuity & Backup
- AWS Well-Architected

#### AI & DATA

Achieve breakthrough automation and analytic insights via cutting-edge data strategies

#### SECURITY AND COMPLIANCE

Reinforce your cloud infra, workload, operations, and development end-to-end

#### **MODERNIZATION & MIGRATION**

Smooth Transitions to Modern Architectures with Minimal Disruption

- Application Modernization
- Kubernetes Adoption
- AWS Database Migration
- Data Engineering Operations
- Data Integration
- Data Migration
- Cloud Migration & Adoption

## ADVANCED SERVICES

#### **CLOUD-NATIVE DEVELOPMENT**

Build Scalable, Resilient Applications with Cloud-Native Technologies

- CI/CD
- Multi- Platform App Design & Development
- Cloud-Ready Teams
- Enterprise SaaS Modernization
- Multi-Tenancy SaaS
- B2B Customer Success Engineering

## AI/ML & DATA SERVICES

#### AI/ML & DATA

Leverage Advanced Analytics and Machine Learning to achieve exponential acceleration in the ROI of your data assets

#### **CLOUD-NATIVE OPERATIONS**

Streamline Operations with Advanced Cloud-Native Practices

- Platform Engineering
- Workload Management
- Monitoring & Observability
- Infrastructure Management

- AI/ML Engineering for Data Analytics
- Generative AI
- Traditional ML for Data Analytics
- AI/ML Development and and Data Science
- Data Engineering for MLOps



## CloudGeometry

San Francisco

**CloudGeometry** delivers expert technical services, helping our clients unlock the full potential of cloud-native open source tooling and commercial platform technologies.

New York

With roots in Silicon Valley, we've seen firsthand what works (and what doesn't). Count on CloudGeometry to accelerate application modernization, Kubernetes adoption, developer enablement, secure multi-tenancy, AI/MLOps, DevOps automation and more.

- As AWS Advanced Consulting partners, our certified solution architects and platform engineers help address the range of challenges facing enterprise innovators and venture funded startups alike.
- The Cloud Native Computing Foundation has accredited us as a Kubernetes Certified Service Provider.
- We serve as charter contributors to the Linux Foundation Data & AI Commons (LF Data & AI), supporting a diverse, sustainable ecosystem for open source data and AI technologies.

Over the last decade, we've built and deployed hundreds of big, fast full-stack apps with well-engineered cloud infrastructure across industries: Financial Services, Industrial Automation, Healthcare, AdTech, Consumer-grade Mobile, smart devices, and more.

From enterprise upgrades to data engineering to cloud-native scale-out, CloudGeometry helps you plot the shortest path across all dimensions of modern cloud software engineering.



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## Advanced Consulting Partner

SaaS Amazon Kinesis AWS Lambda Amazon Redshift AWS Database Migration Service







# CloudGeometry

Expert Platform Engineering & DevOps

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