AWS RoboMaker
DevOps for Robotics

A service that makes it easy for developers to develop, test, and deploy robotics applications, as well as build intelligent robotics functions using cloud services.
ROS

ROS 2 Technical Steering Committee

logos of various companies
Cloud extensions written as ROS packages automatically create connections and make API calls to AWS services, such as Amazon Lex, Amazon Polly, Amazon Kinesis Video Streams, Amazon Rekognition, and Amazon CloudWatch.
72 Sensors
Low-end CPU
Cloud support
Redundancy & Safety
Open source ROS & ROL
End-to-End custom design
Cloud Powered Future

RoboMaker: Simulations and parameter tuning
RoboMaker-Kinesis: Real-time data streaming
RoboMaker-Lex-Polly: Enhanced interactivity
EC2/S3: Remote portal and Deployment

Analysis: Walking gait of patient
Prediction: Recovery progression
AWS RoboMaker Simulation

- Pre-built virtual 3D worlds, bring your own
- Zero infrastructure to provision, configure or manage.
- Run multiple simulations in parallel
- Auto-scale based on simulation complexity
AWS RoboMaker
Simulation for CI/CD

Code -> Plan -> Release -> Deploy
Build -> Test -> Monitor -> Operate

Infinite Cycle
AWS RoboMaker

Fleet Management

- Install AWS IoT Greengrass on robot;
- Secure container for code that is running on the robot
- Encrypted connection to cloud;
- Over-the-air application update
AWS RoboMaker

Emergency Monitoring Drones built on AWS RoboMaker

ROS Application

ROS Node with ML Libraries

AWS RoboMaker ROS Extensions

Amazon SageMaker

Download New Models

Trained ML Model

Training

Video Recordings Captured for Retraining

Amazon CloudWatch

Amazon Kinesis Video Streams

Video Streams

DJI M600 Pro Drone

AWS RoboMaker Fleet Management

AWS Greengrass Core Device

AWS RoboMaker Development Environment

AWS RoboMaker Simulation Environment

Reliable Over-the-Air (OTA) Deployments

Iterative, Test-driven Development

Trigger Deployments

AWS Amplify React Website

Dashboard User Interaction

Trigger New Model Training
Role of the Cloud in the Future of Robotics

1. DEVOPS for Robotics: code, test, deploy, monitor.

2. Intelligent cloud services can enhance local processing on the robot and can improve performance over time.

3. Simulation, combined with imitation and reinforcement learning can be used to program robot actuation.

4. Cloud services enable fleet management, coordination and remote processing for digital transformation.