

# AWS RoboMaker

## DevOps for Robotics

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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

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ROS

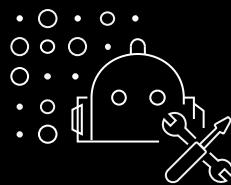
# ROS 2 Technical Steering Committee



# ROS

# ROS Industrial Consortium

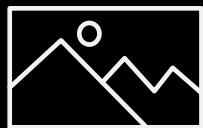
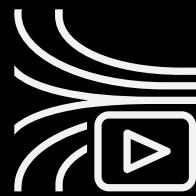




# AWS RoboMaker

# Cloud Extensions for ROS

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



# LEX speech recognition

# POLLY speech generation

# KINESIS VIDEO STREAMS

## video streams

# RECOGNITION

## image and video analysis

# CLOUDWATCH

## logging and monitoring



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

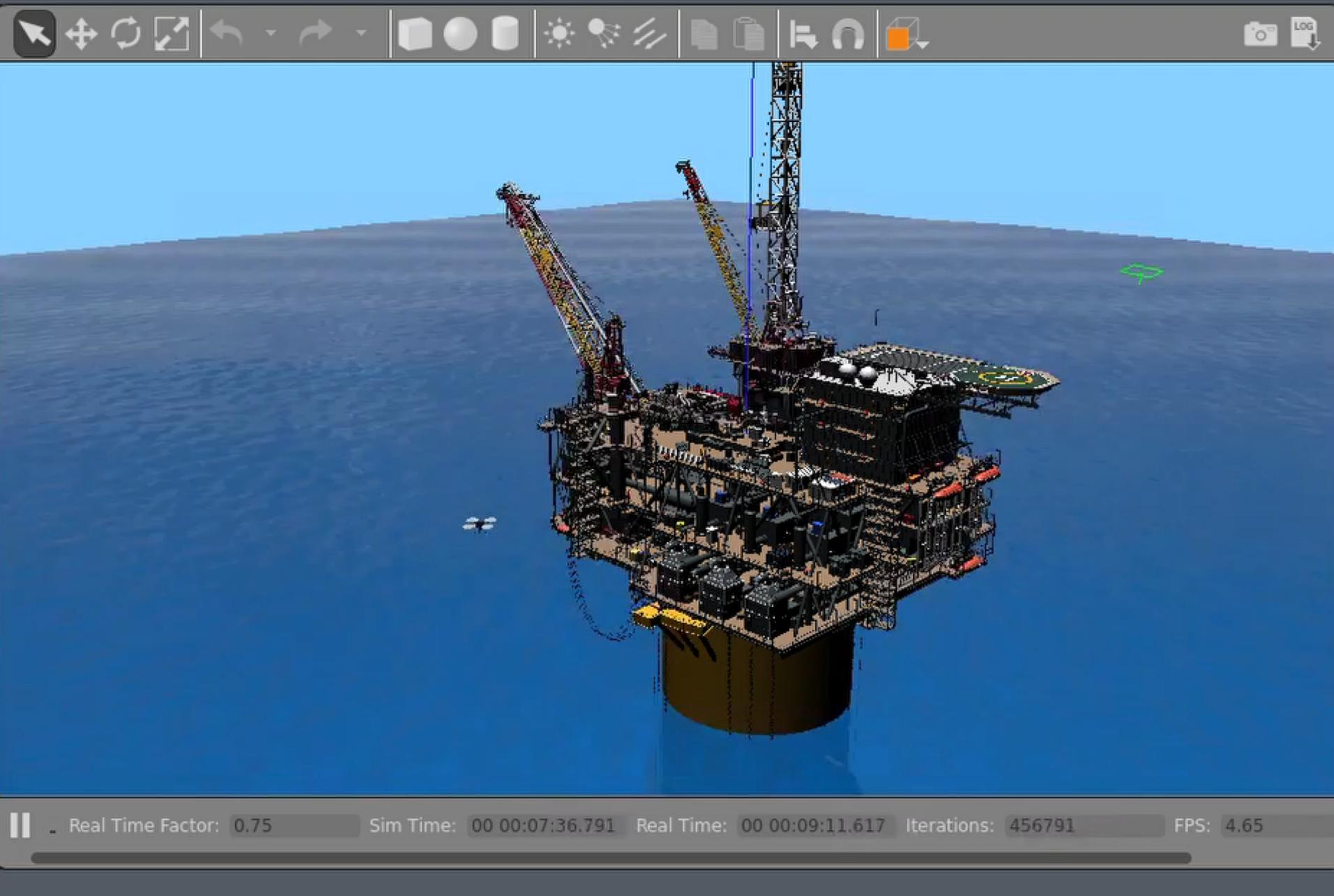
- ❖ Pre-built virtual 3D worlds, bring your own
- ❖ Zero infrastructure to provision, configure or manage.
- ❖ Run multiple simulations in parallel
- ❖ Auto-scale based on simulation complexity



AWS RoboMaker

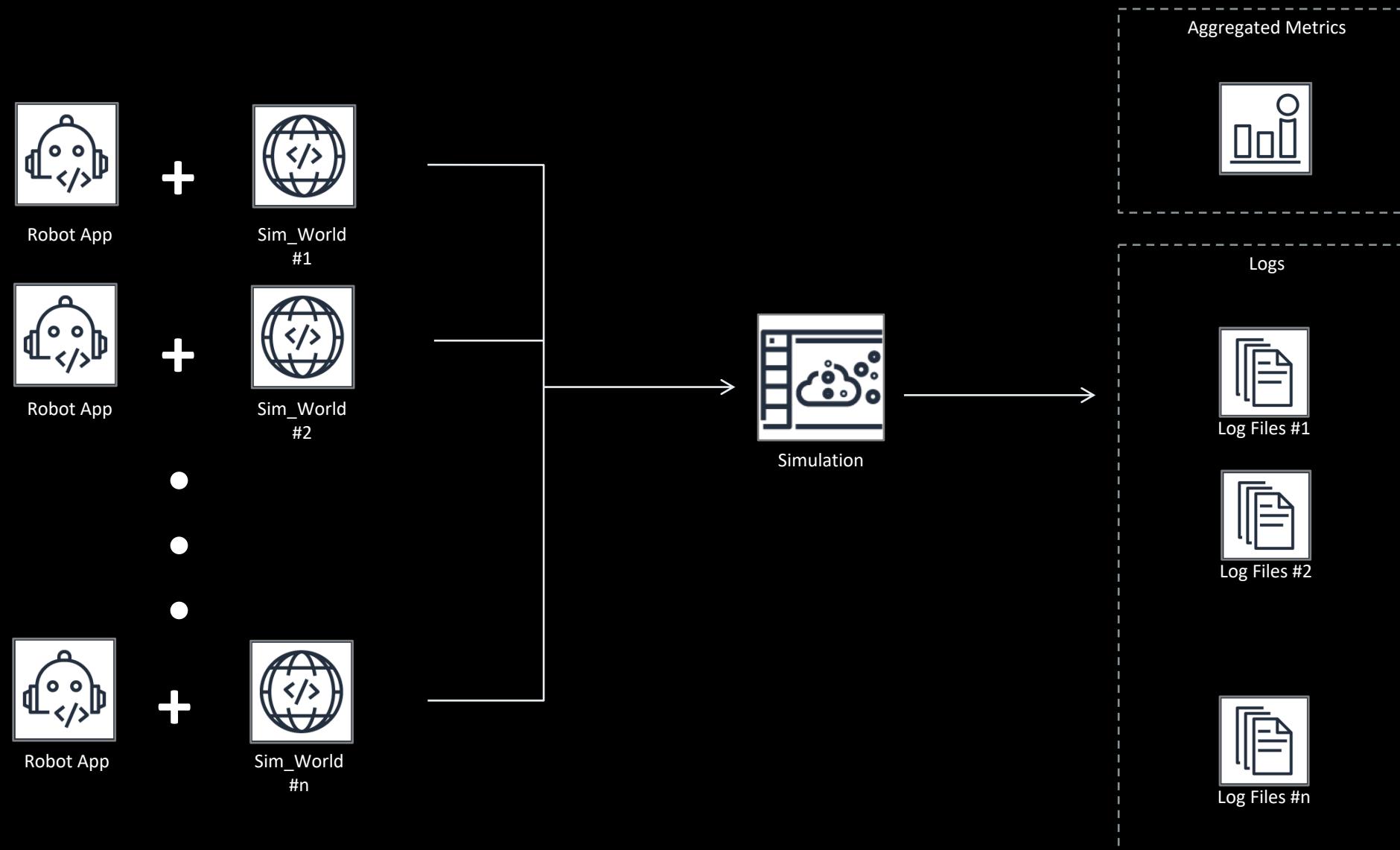
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Action ▾





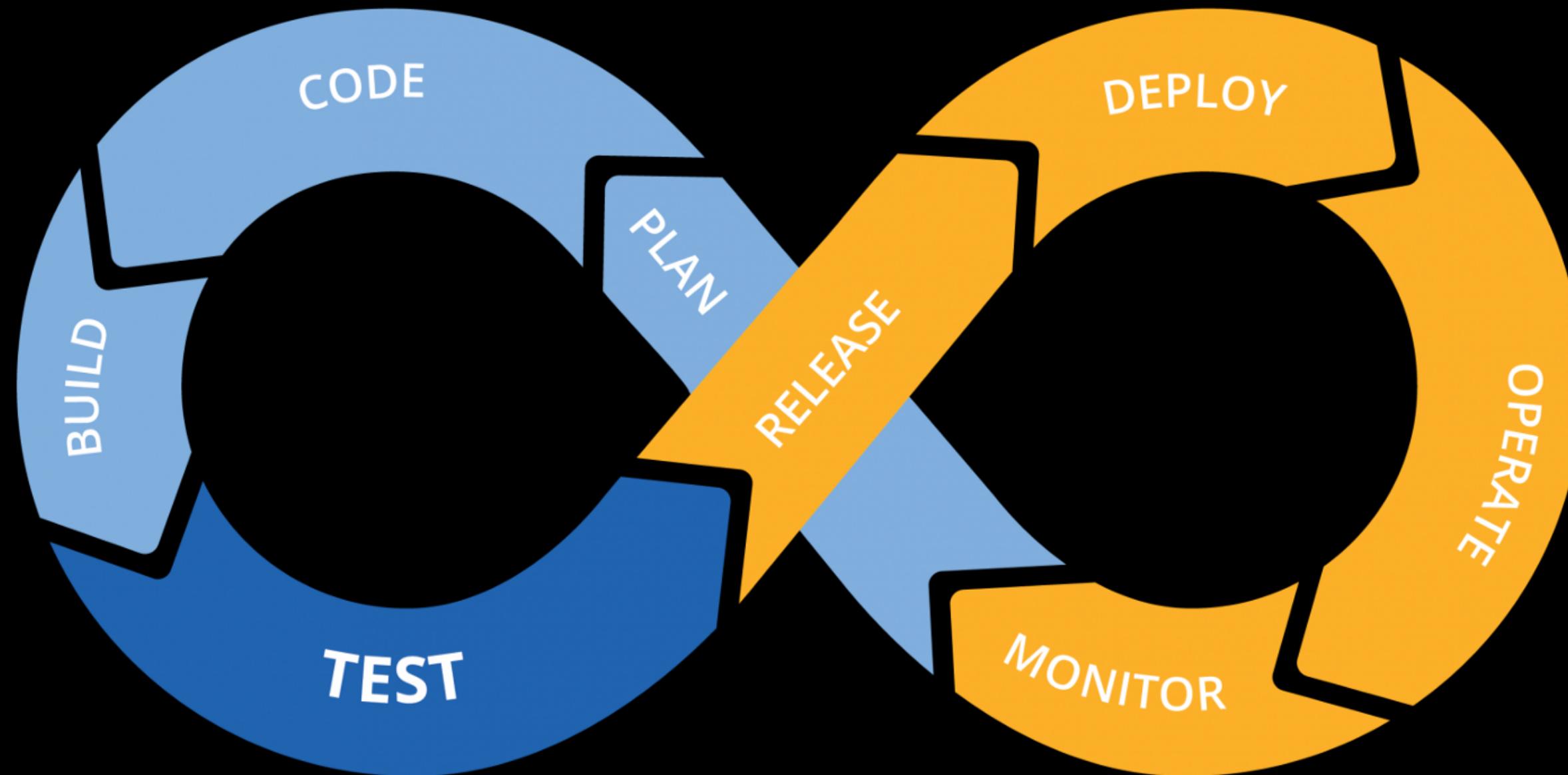
# AWS RoboMaker Simulation





# AWS RoboMaker

## Simulation for CI/CD





AWS RoboMaker

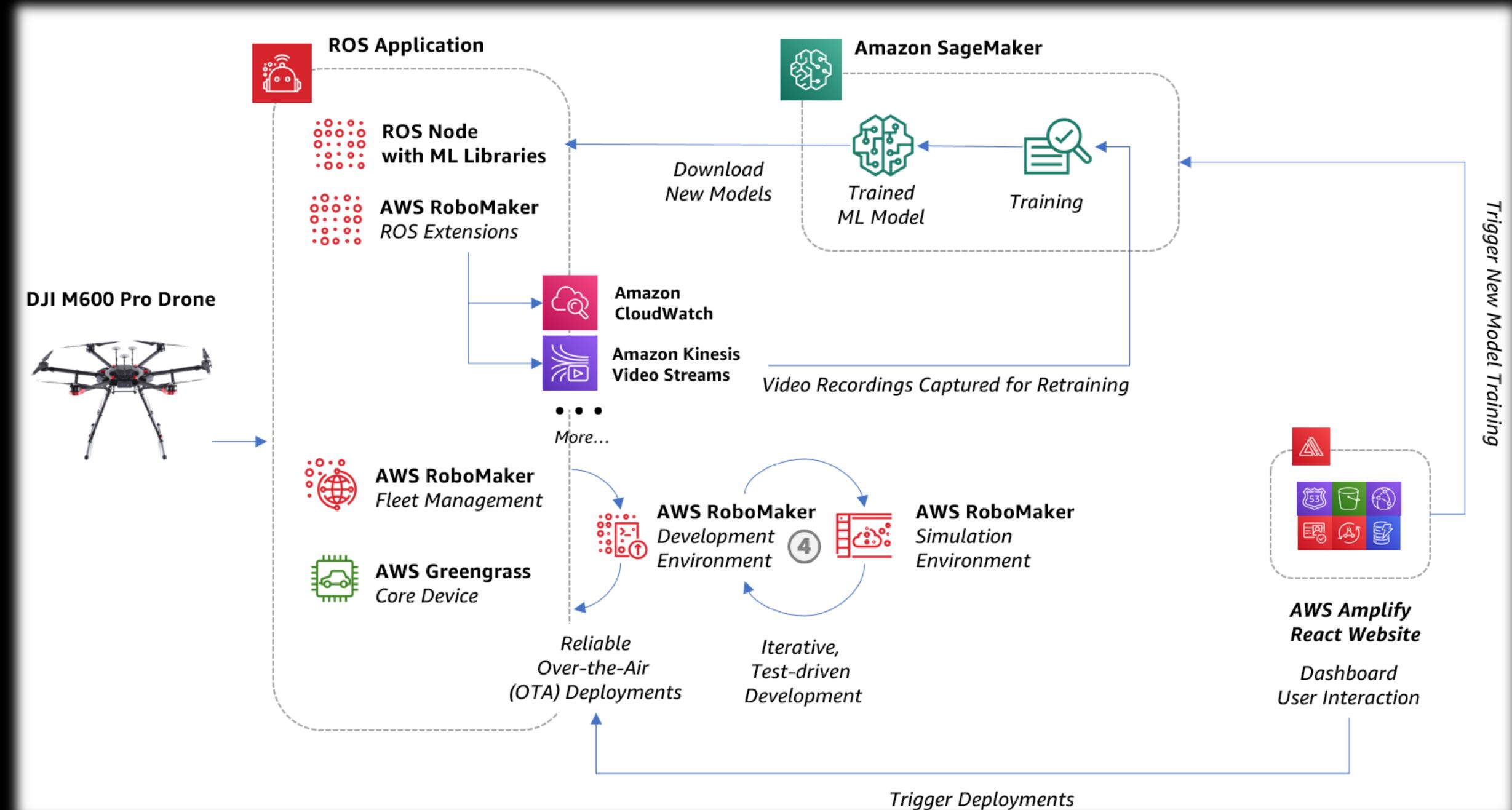
# Fleet Management

- ❖ 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



# 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.