

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

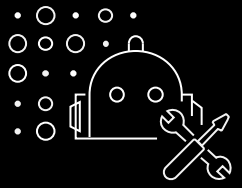
ROS 2 Technical Steering Committee



ROS

ROS Industrial Consortium





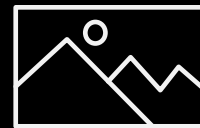
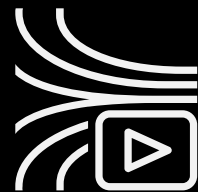
AWS RoboMaker

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

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LEX
speech
recognition

POLLY
speech
generation

KINESIS VIDEO
STREAMS
video streams

REKOGNITION
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

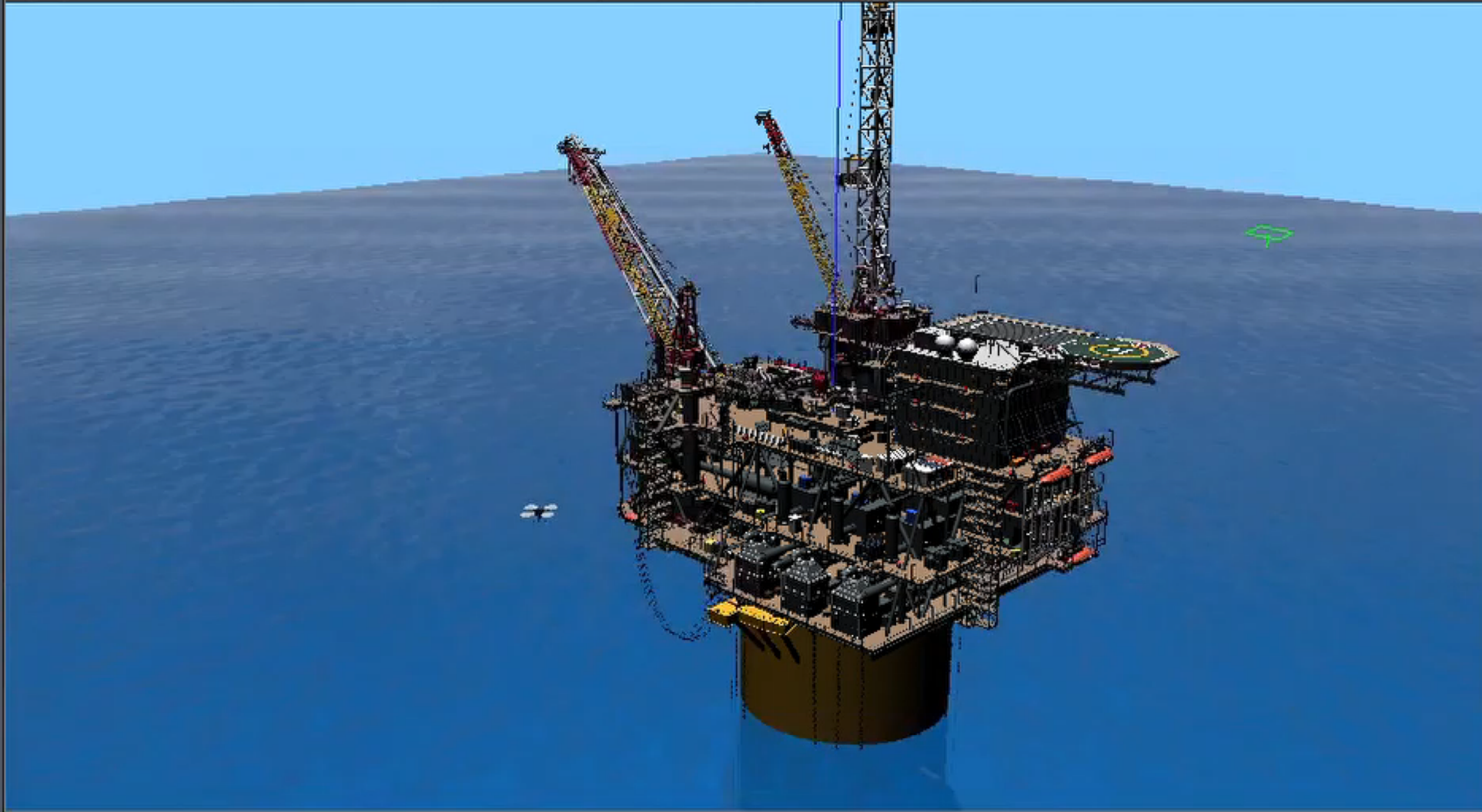
- ❖ Pre-built virtual 3D worlds, bring your own
- ❖ Zero infrastructure to provision, configure or manage.
- ❖ Run multiple simulations in parallel
- ❖ Auto-scale based on simulation complexity



AWS RoboMaker

sim-h8yd7dj8z

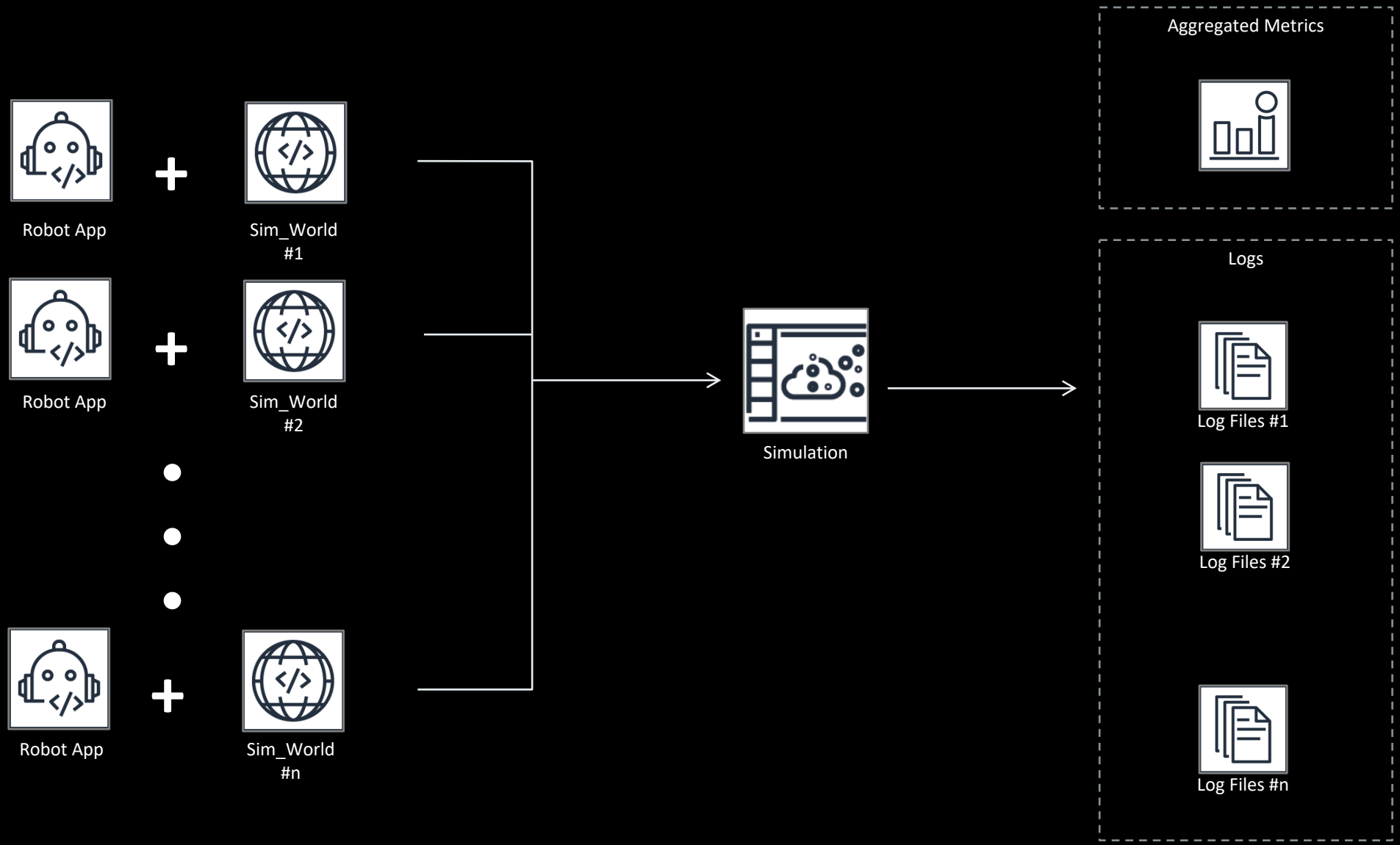
Action ▾



|| Real Time Factor: 0.75 Sim Time: 00 00:07:36.791 Real Time: 00 00:09:11.617 Iterations: 456791 FPS: 4.65



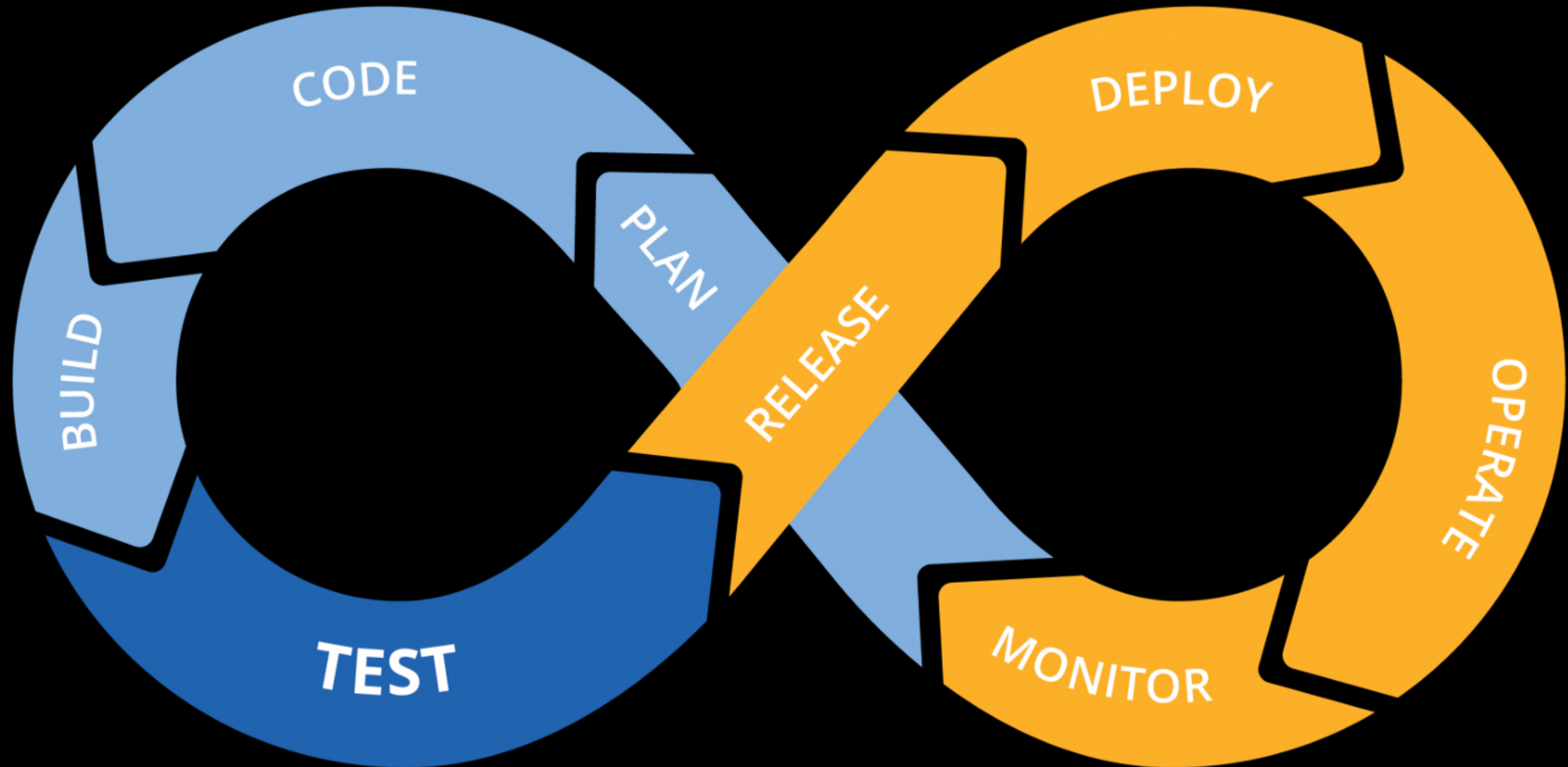
AWS RoboMaker Simulation





AWS RoboMaker

Simulation for CI/CD





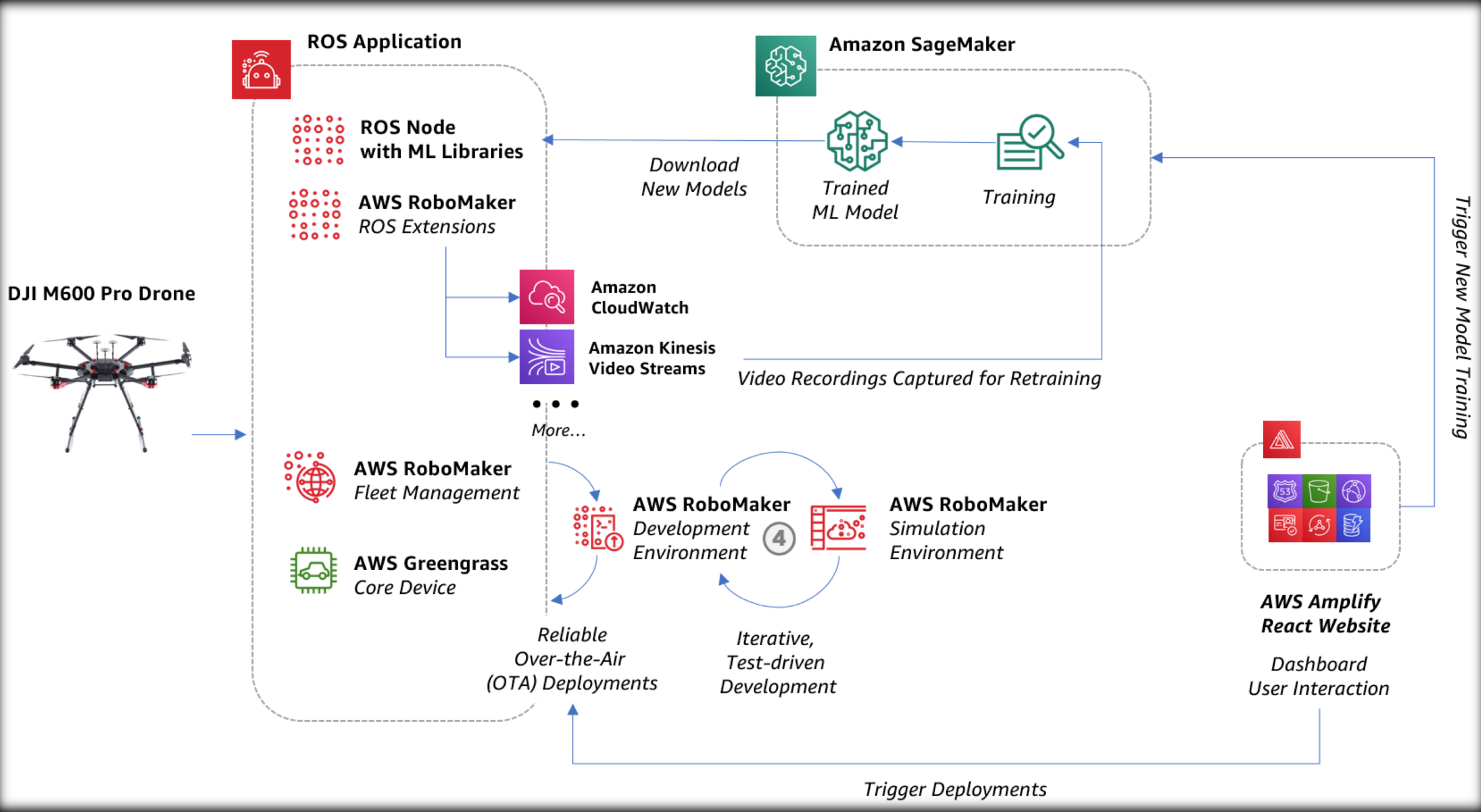
AWS RoboMaker

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



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.