AWS re:Invent

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IOT302-R2

Build intelligent IoT devices faster with AWS IoT Greengrass

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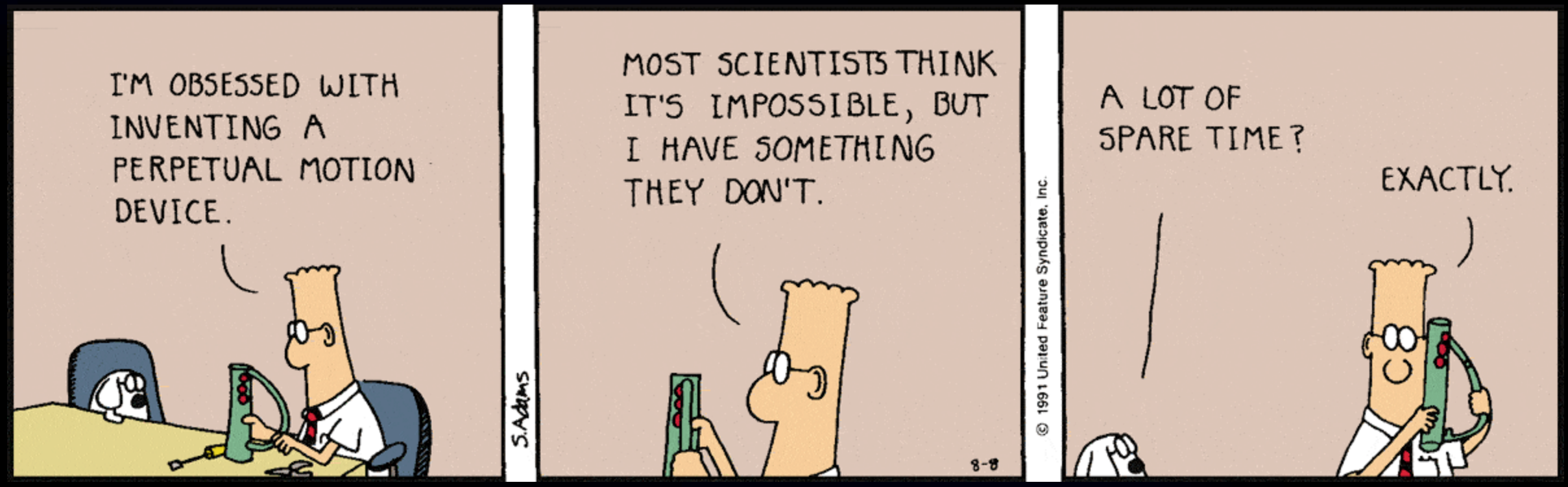
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Agenda

- AWS IoT Greengrass overview
- How to start
- Pet Feeder in action: Design overview and demo
- Common application examples
- Q&A

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Building smart devices



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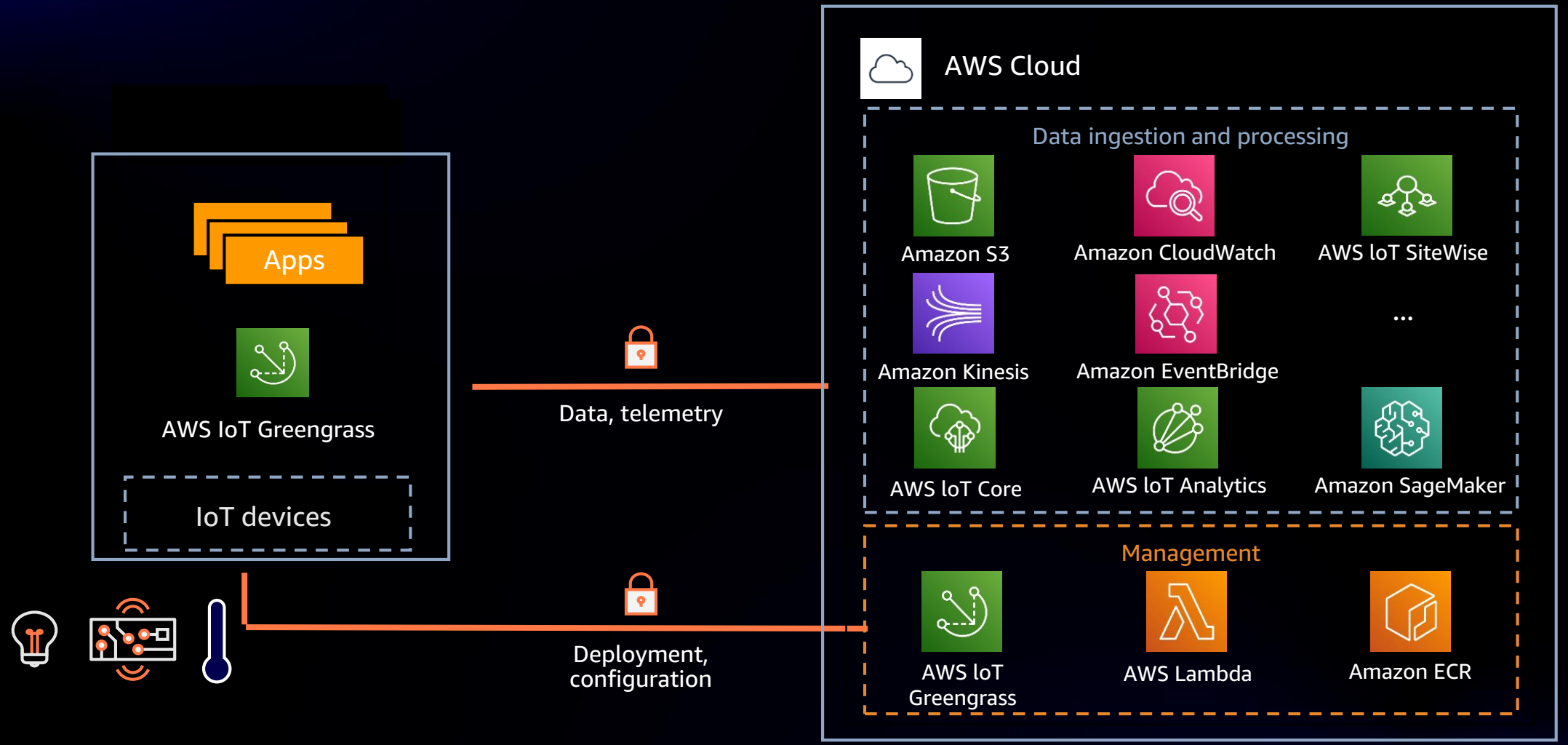
How can I build and operate intelligent device software with AWS IoT?



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AWS IoT Greengrass



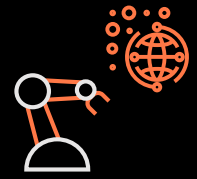
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Why AWS IoT Greengrass?

Open source runtime 

Modular building blocks 

Local development tools 

Remote fleet management 

Integration with AWS services 

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How do I start?

1. Work backwards from capability and device functionality
2. Check which functionalities are addressed by existing Greengrass components
3. Design components for new functionality
4. Develop components on a local test device
5. Test and troubleshoot the application on a test device
6. Upload application to the cloud
7. Deploy to device fleet via the AWS IoT Greengrass console

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Introducing Pet Feeder

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Reinvented:

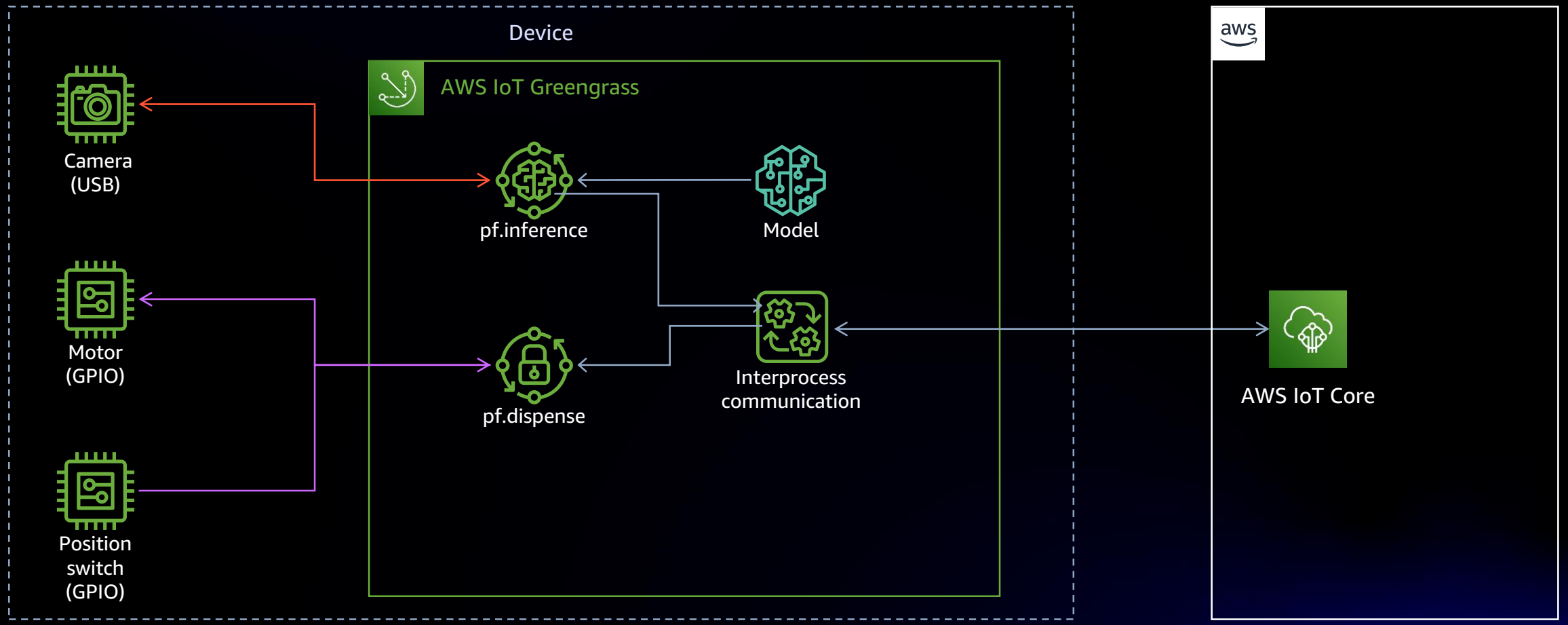
Pet Feeder 2021



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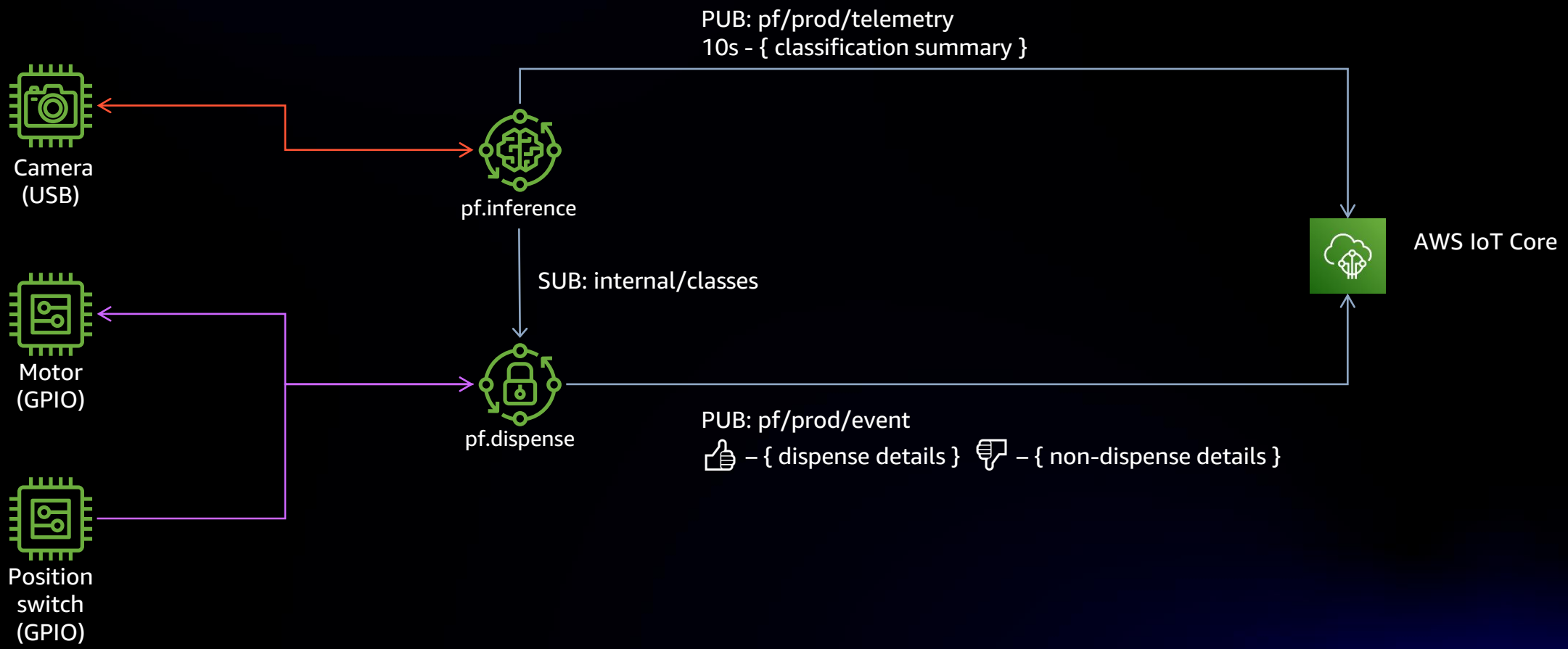
Pet feeder reference architecture

I want my device to detect a pet and dispense food



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Component messaging flow

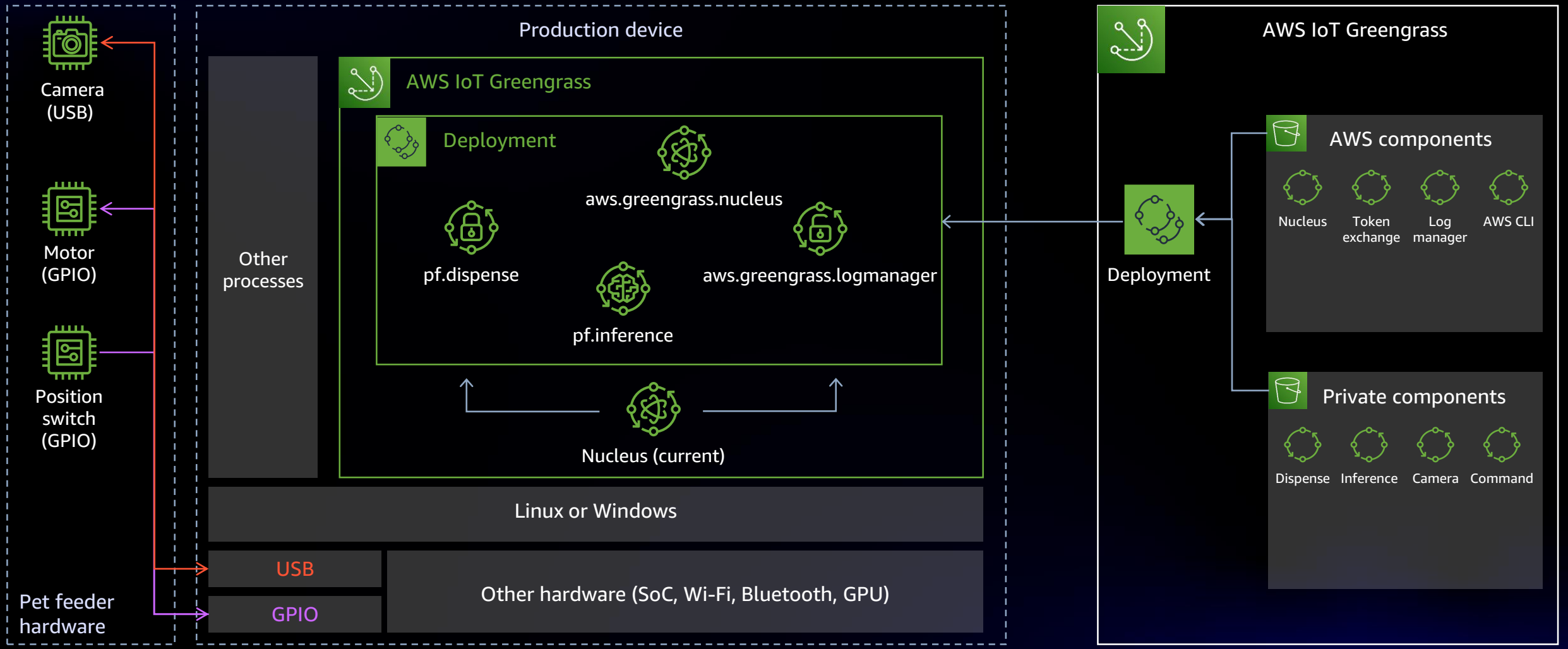


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Demo:
Pet Feeder in action

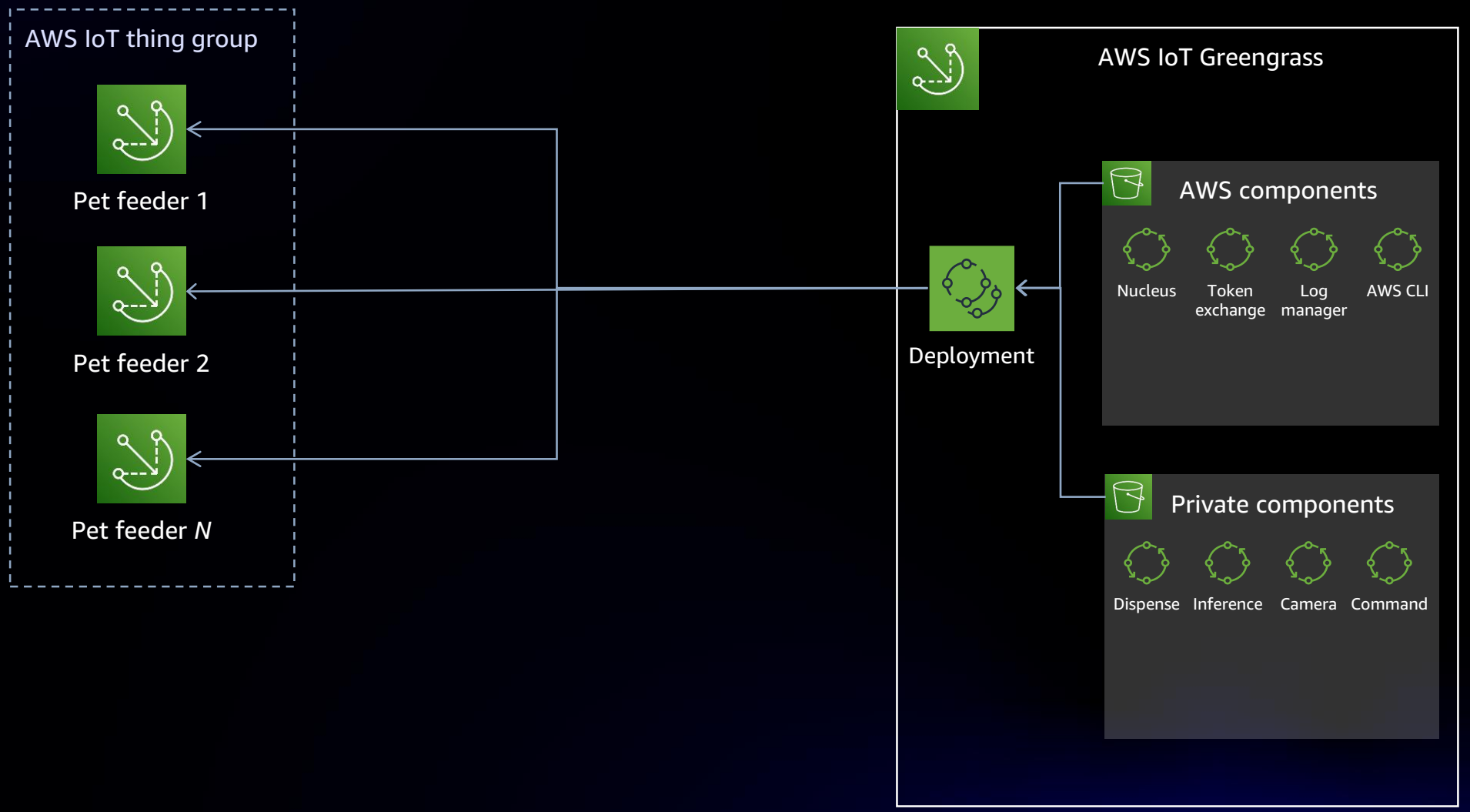
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Workload deployment



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Deploying at scale



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Demo:
Production deployment

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Aggregate data from wireless temperature and flow sensors, and point-of-sale systems

Problem

WeissBeerger develops an IoT system designed to put the world of data analytics at the food and beverage industry's fingertips. Acquired by Anheuser-Busch InBev, WeissBeerger serves as an analytics arm of the largest brewing company in the world. WeissBeerger's homegrown IoT architecture and hardware were limiting the company's ability to scale and the effectiveness of its system due to time-consuming installations, inconsistent results, and a complicated user process.

Solution

WeissBeerger replaced its cumbersome framework with a sophisticated IoT architecture by placing a gateway running AWS IoT Greengrass inside bars. AWS IoT Greengrass extends AWS to edge devices in order to analyze edge data and take local actions while still using the cloud for management, analytics, and durable storage. WeissBeerger sensors send pub data (e.g., beer volume, temp.) to the gateway, which aggregates and filters data before sending it to AWS.

Impact

Bars are deriving value from WeissBeerger and AWS IoT. By tracking beer usage and waste data, a bar in Tel Aviv reduced waste by 45% and saved $3,000 in one month. AWS IoT gives WeissBeerger the headspace to focus on applications and analytics most valuable to customers, worrying less about the nuts and bolts of their underlying IoT system.

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Local command and control for smart farming

Challenge

30MHz provides real-time remote crop monitoring solutions for optimizing irrigation and ventilation, preventing disease or sun scald, improving pest management, or predicting shelf life. As 30MHz expanded, provisioning edge devices and dealing with intermittent connectivity in rural and remote areas was a challenge.

Solution

30MHz leveraged FreeRTOS and AWS IoT Greengrass to build a serverless architecture to maintain data and protect against intermittent connectivity. Bulk deployment of IoT devices, management, and edge data enrichment enable elasticity and scaling.

Benefits

30MHz was able to integrate these new functionalities with their ZENSIE application on AWS. 30MHz can collect and buffer data on the devices even when the internet connection is temporarily down, so they don't lose data.

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Trusted broker and ML inference at the edge

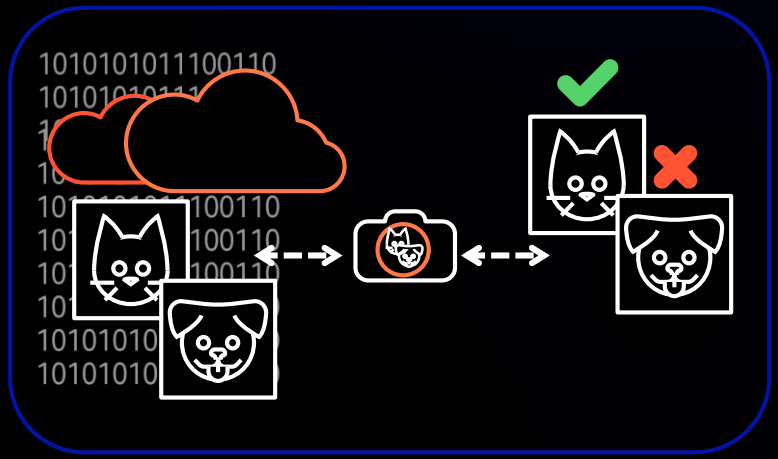
Problem
Arthrex is a global medical device company and leader specializing in orthopedics. Arthrex has pioneered the field of arthroscopy and develops more than 1,000 innovative products and procedures each year. An arthroscopy, or “keyhole surgery,” is a minimally invasive surgical procedure on a joint in which an examination and sometimes treatment of damage is performed.

Solution
They developed Synergy, the fastest-growing video and integration solution in operating rooms worldwide. The Synergy product portfolio is a comprehensive set of interconnected surgical tools and technology for the operating room. Arthrex interest in AWS IoT Greengrass is for offline data processing, for mission-critical device communication during operations and surgeries. You don’t want this to go dark during a procedure because of loss of internet connectivity.

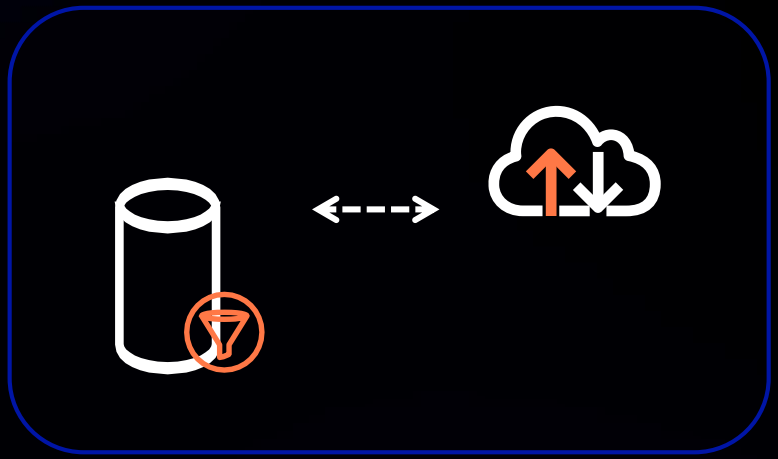
Impact
With AWS IoT Greengrass, Arthrex expects to have improved visibility into procedures and better patient outcomes.

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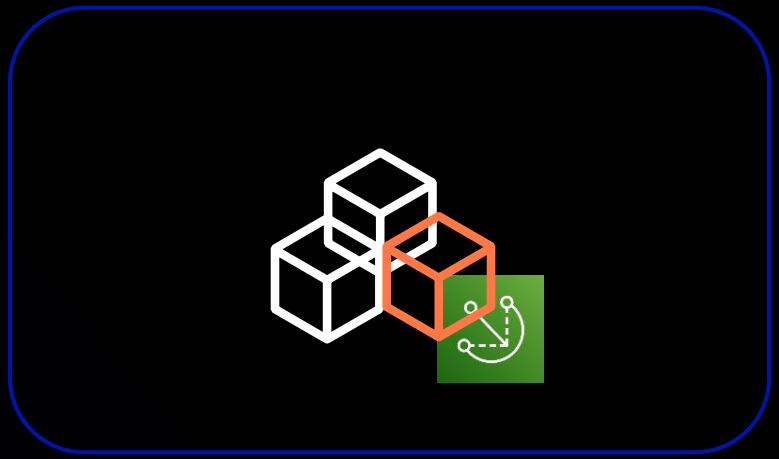
What do you want to build?



ML at edge



Data filtering and
streaming to the cloud

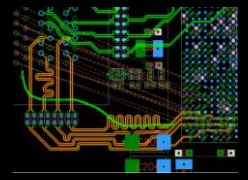


AWS IoT Greengrass
in containers

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Greengrass application continuum

- Applications can be developed and deployed across a variety of devices
- Applications Local Resource Access: GPU, GPIO, and File System
- Running mode: On Linux or as Docker container (any OS)
- Min Resources: 1 GHz ARM or x86, 96MB RAM



Build your own



Raspberry PI



Third-party certified



AWS Snowcone



AWS Snowball



AWS Outposts

Always or partially connected — *Always connected*

Build or buy — *Pay x Use*

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Re:Invent 2021 launches

- Greengrass Software Catalog, a collection of AWS IoT Greengrass components on GitHub to help kickstart IoT projects. It includes several new components with capabilities such as data streaming to Amazon Kinesis Video Streams, Modbus TCP protocol support, local InfluxDB time-series database, and Grafana visualization.

- Integration with AWS Systems Manager to enable remote patching of device OS and execution of system commands on IoT devices at scale

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One more thing ...

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Why PARSEC?



Edge

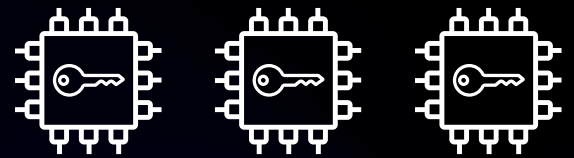
- Rich workloads
- Multi-tenant
- Cloud-native development



Docker Kubernetes

Endpoint

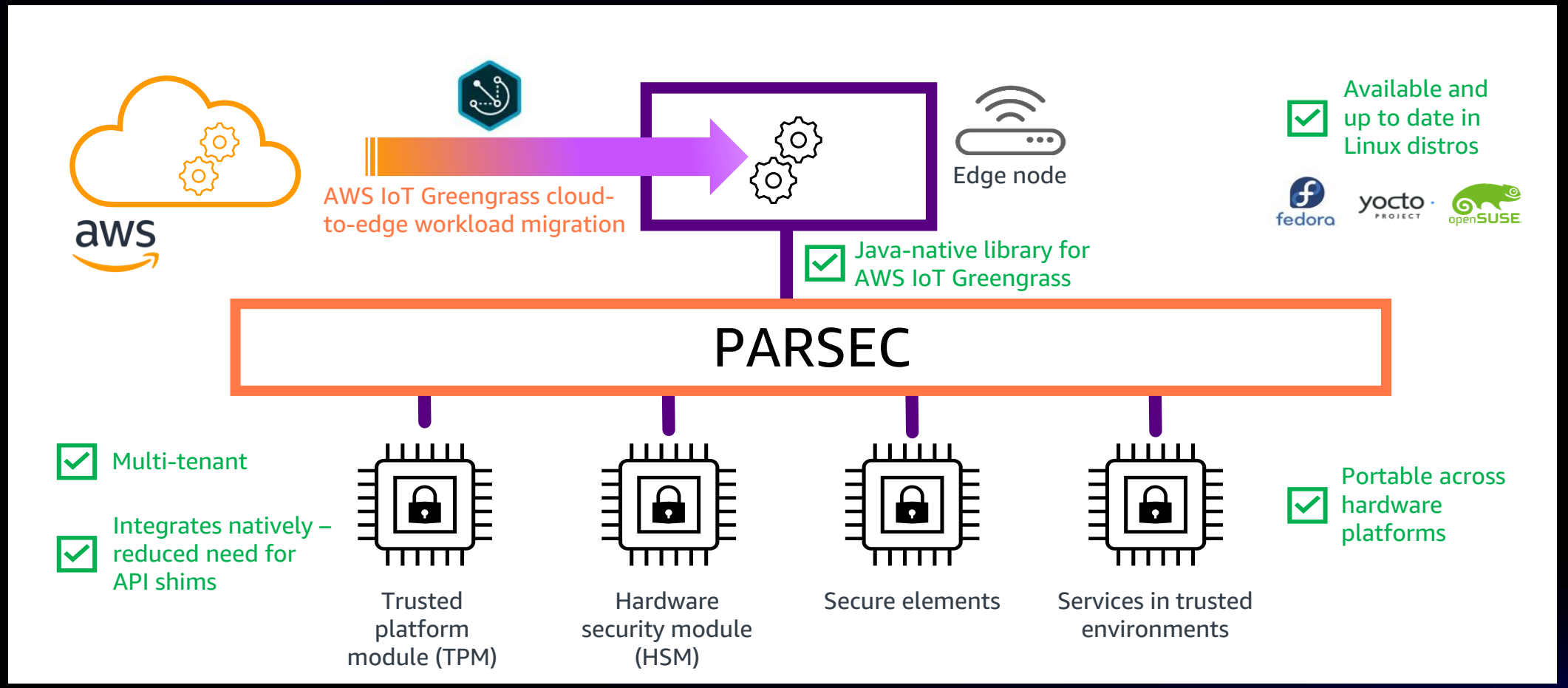
- Threat landscape
- Variety of platforms
- Device-specific RoT



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PARSEC: A modern, open, portable security standard



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Thank you!

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