Machine Intelligence

Modern Infrastructure

http://mi2.live

Running Apps at the Edge with AWS IoT Greengrass

What is MI2?

MI2 Webinars focus on the convergence of **machine intelligence** and **modern infrastructure**. Every alternate week, I deliver informative and insightful sessions covering cutting-edge technologies. Each webinar is complemented by a tutorial, code snippets, and a video.

MI2 strives to be an independent and neutral platform for exploring emerging technologies.

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Objectives

- Introduction to AWS IoT
- The role of AWS IoT Greengrass
- A closer look at AWS IoT Greengrass
- Demo
- Summary

Waves of Innovation

Cloud

Globally available, unlimited compute resources

IoT

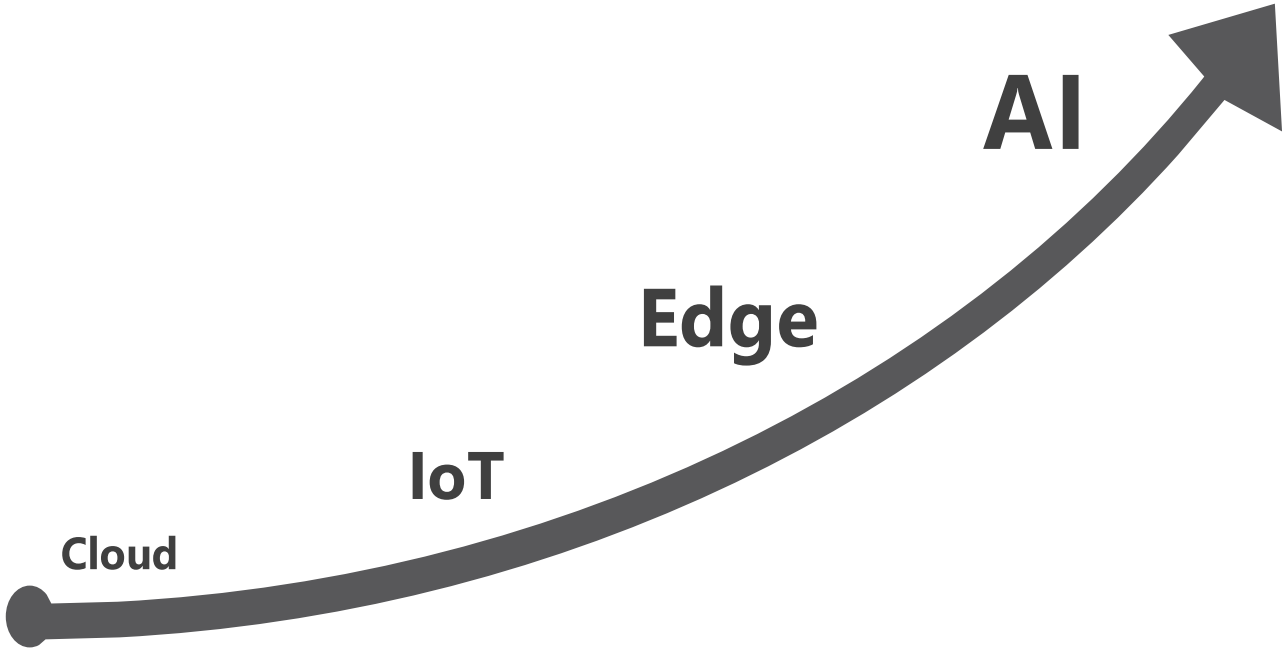
Harnessing signals from sensors and devices, managed centrally by the cloud

Edge

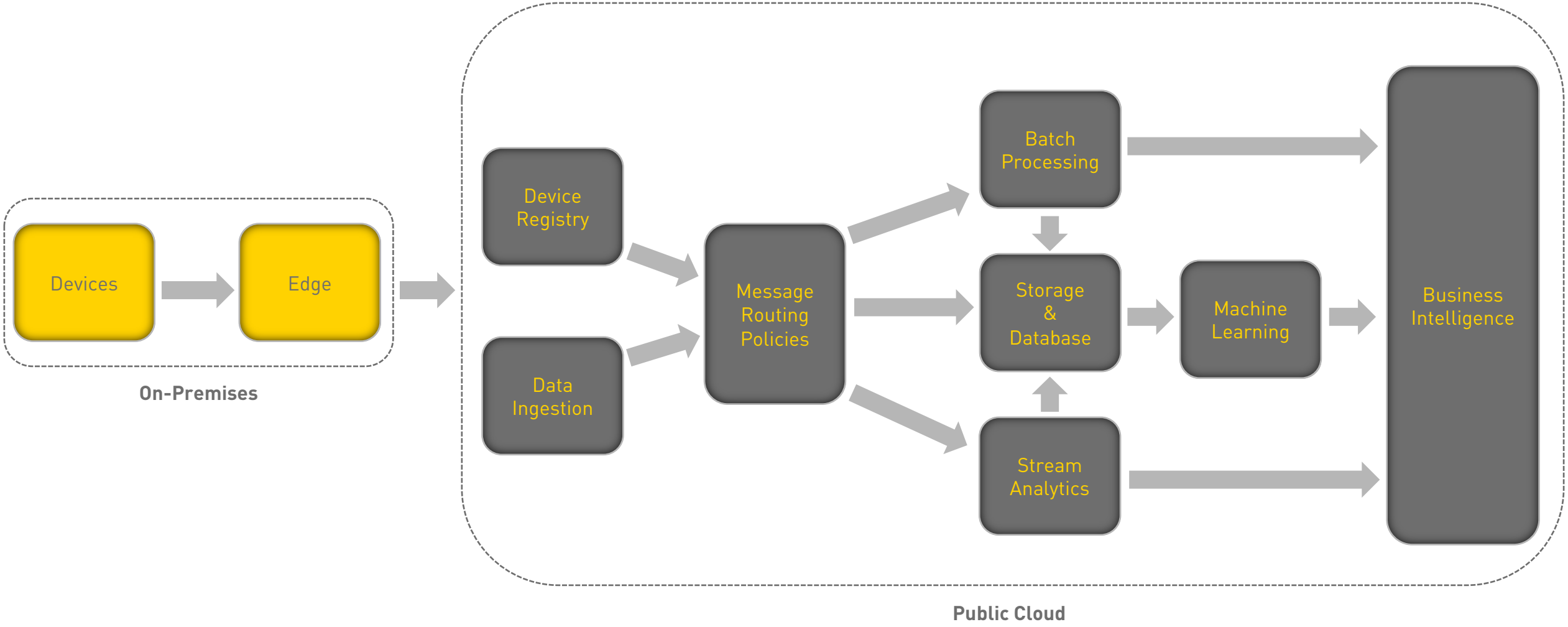
Intelligence offloaded from the cloud to IoT devices

AI

Breakthrough intelligence capabilities



The Big Picture of IoT Platforms



AWS IoT Services Suite

Things

Sense & Act

Cloud

Storage & Compute & Learn

Intelligence

Business Logic & Analytics

Secure local triggers, actions, and data sync

Endpoints

Amazon FreeRTOS

Gateway

AWS Greengrass

Secure device connectivity and messaging

AWS IoT Core

Fleet onboarding, management and SW updates

AWS IoT Device Management

Fleet audit and protection

AWS IoT Device Defender

IoT data analytics and intelligence

AWS IoT Analytics

AWS IoT 1-Click

AWS IoT Core

Connect Devices at Scale

AWS IoT Core is a managed cloud that lets connected devices easily and securely interact with cloud applications and other devices.

Custom Authentication & Credentials Provider

Device Gateway

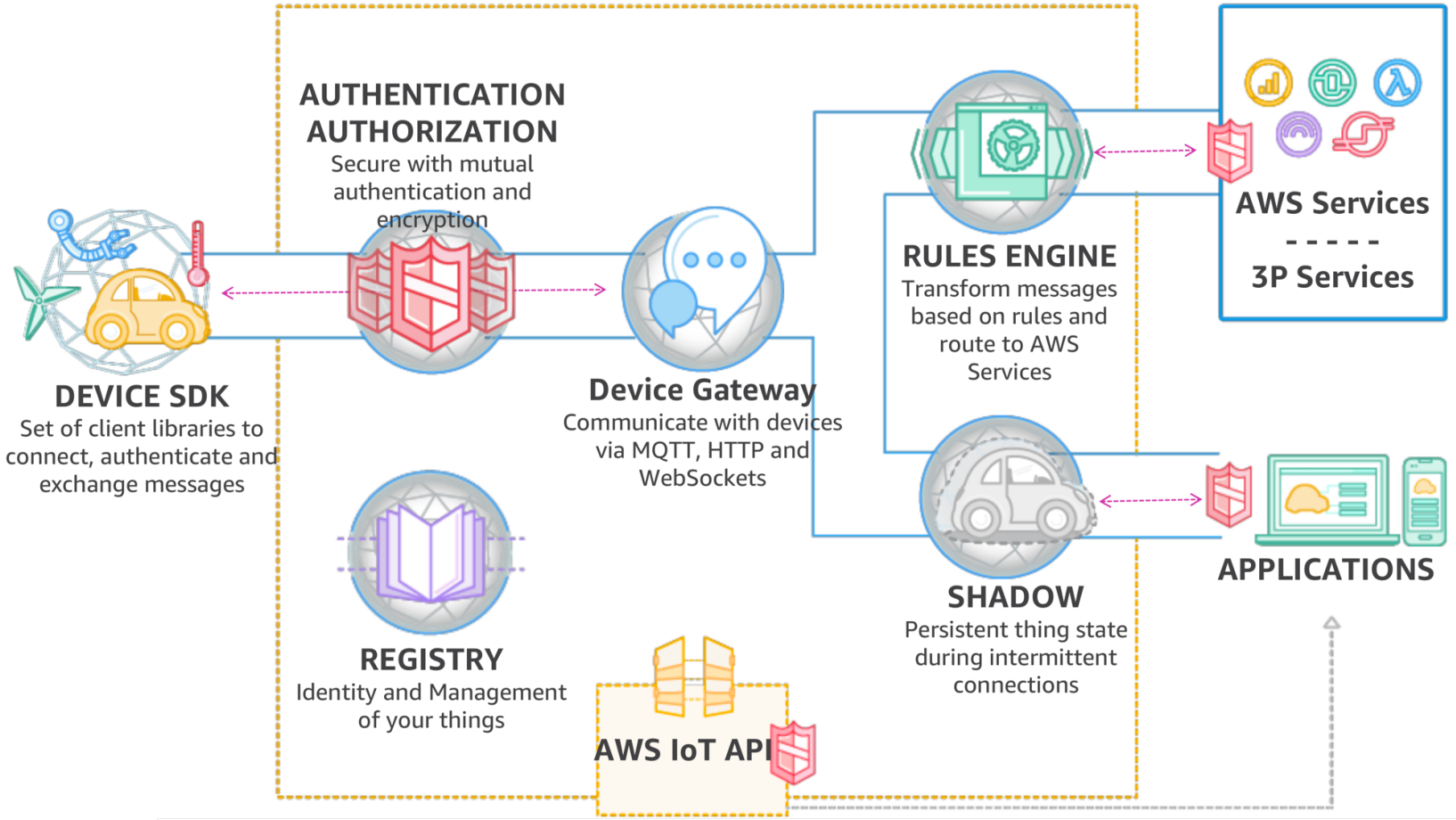
Message Broker

Rules Engine

Device Shadow

Device Registry

A Closer Look at AWS IoT Core



What is Edge Computing?

- Edge computing makes the cloud truly distributed
- Moves core cloud services closer to the origin of data
- Mimics public cloud platform capabilities
- Delivers local storage, compute, and network services
- Reduces the latency by avoiding the roundtrip to the cloud

AWS Greengrass

Extend AWS IoT to the edge

AWS Greengrass extends AWS IoT onto your devices, so that they can act locally on the data they generate, while still taking advantage of the cloud

Local actions

Local triggers

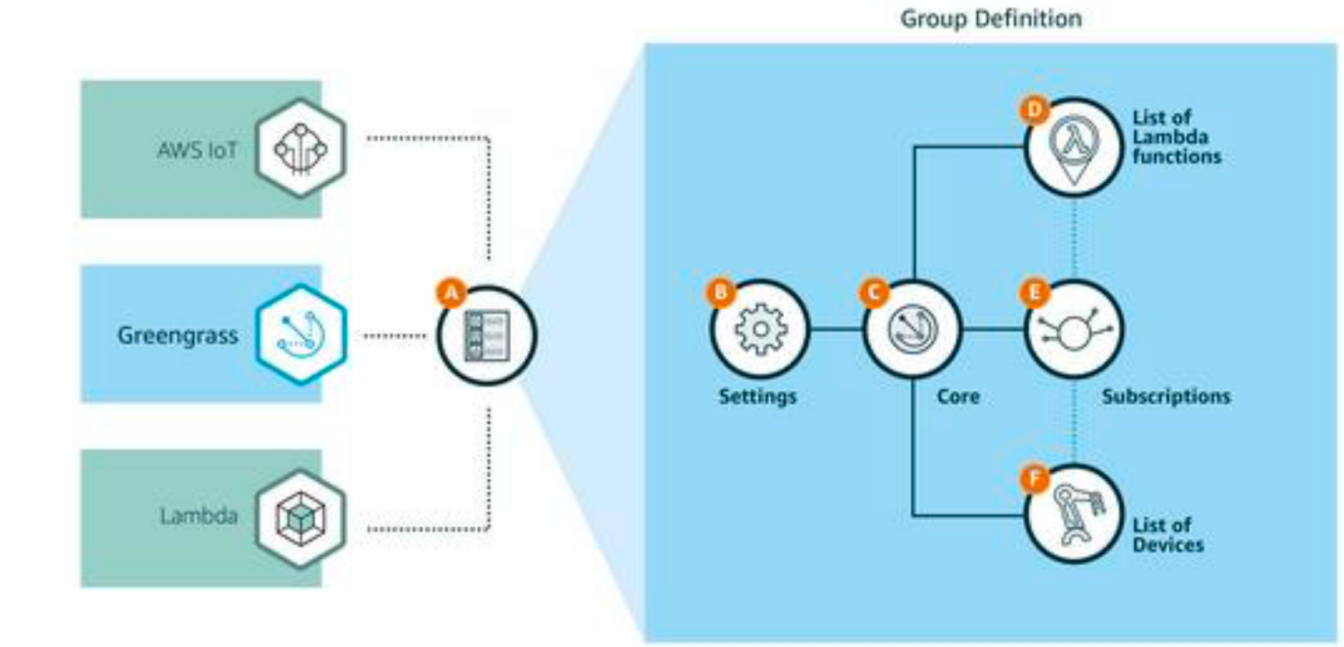
Data and state sync. Over the air updates

Security. Protocol adapter for OPC-UA

Local resource access

Local ML inferencing
New!

Core Elements of AWS IoT Greengrass



A: AWS Greengrass group definition
B: AWS Greengrass group settings
C: AWS Greengrass core
D: Lambda function definition.
E: Subscription definition (Routing rules)
F: Device definition

What are we building?

- A smart camera that detects objects including vehicle types
- A smart bulb that changes the color based on the vehicle type
- Greengrass Core running on a Raspberry Pi 3 Model B+
- Camera and bulb are connected to a Raspberry Pi Zero W
- A Lambda function to control the color of the bulb
- Subscriptions to enable flow of messages

Demo Scenario

DEMO

Managing a Smart Camera and Bulb with Greengrass

Summary

- **Low-latency access**
  - Edge computing exposes compute, storage, and networking locally.
- **Reduced bandwidth consumption**
  - Edge layer aggregates and filters data by only ingesting what's needed to the public cloud.
- **Offline availability**
  - Applications that have intermittent access to the Internet and cloud can rely on local resources exposed by the edge computing layer.
- **Local ML inference**
  - Machine learning models that are trained in the public cloud are deployed at the edge for faster inferencing.

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Next Webinar

Using Linkerd as a Service Mesh for your Microservices

Linkerd is a service mesh for Kubernetes and other frameworks. It makes running services easier and safer by giving you runtime debugging, observability, reliability, and security—all without requiring any changes to your code. Attend this session to get started with Linkerd service mesh.

Thursday, May 30th, 2019
9:00 AM PST / 9:30 PM IST

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