EDGE AND FOG COMPUTING FOR CAVs

Autonomous Vehicles: The Vision
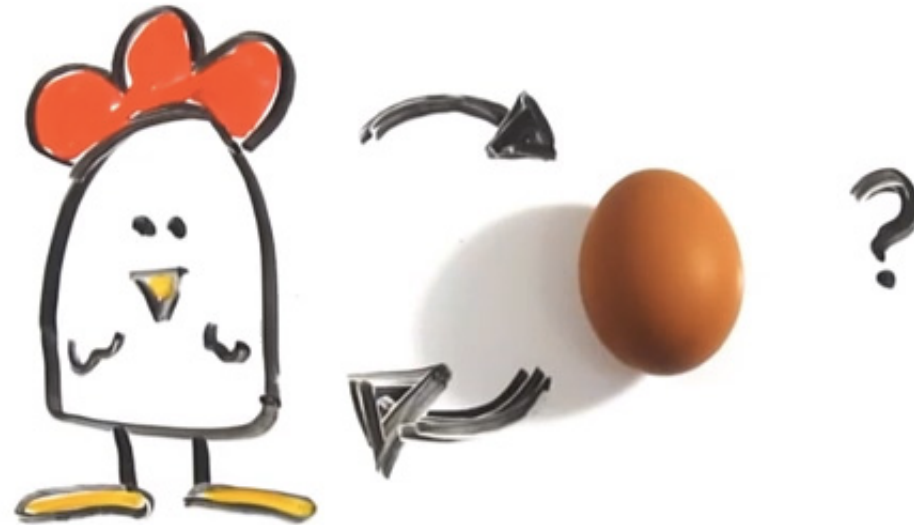
Autonomous Vehicles: The Reality

Edge and Fog Computing:
Solving the Chicken or the Egg Dilemma

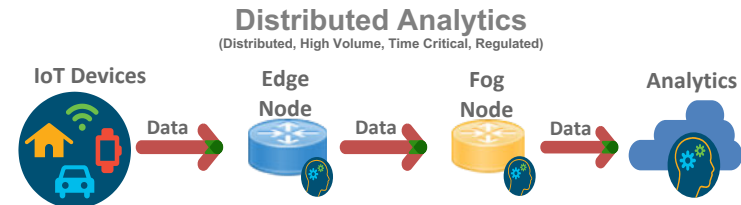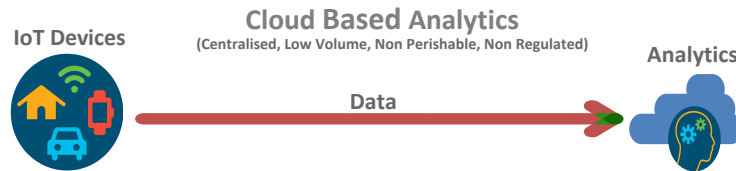# Edge and Fog Computing for CAV's

Challenge

Vehicle-centric Connected Autonomous Vehicle (CAV) applications are challenged in a number of areas:

- sensor fidelity, especially in detecting vulnerable road users
- realising CAV benefits while CAV deployments are low
- scalable data management for CAVs and intelligent transport systems (ITS)

Solution

It is possible to address these issues by using infrastructure-centric CAV applications combined with real-time data from multiple sources and processed as close to the data source as possible (infrastructure such as at intersections) leading to:

- earlier detection of impending events and notification
- better protection for vulnerable roads users
- immediate benefits for early adopters
- efficient data collection and management.

IoT Devices

Cloud Based Analytics
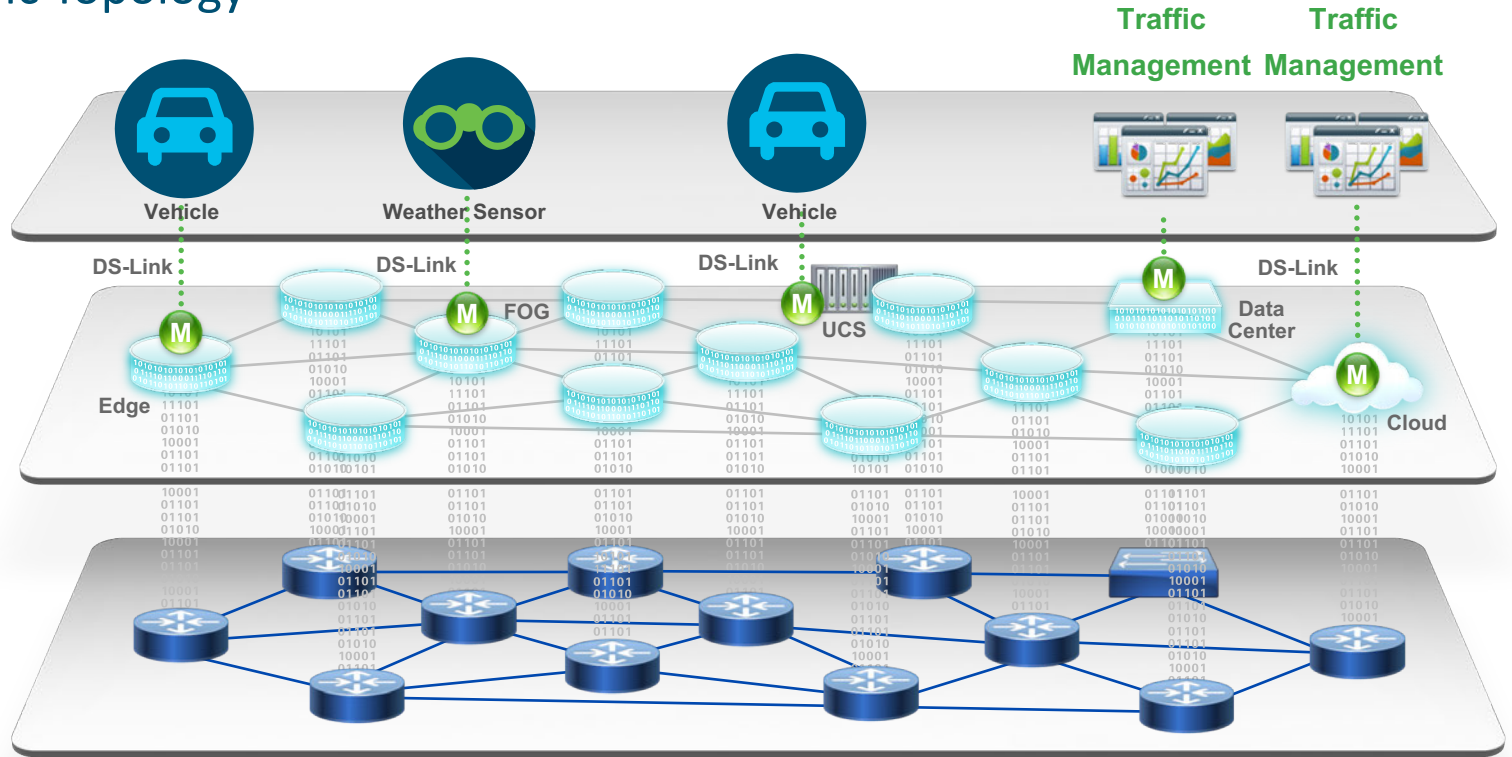(Centralised, Low Volume, Non Perishable, Non Regulated)

Analytics

Data

IoT Devices

Distributed Analytics
(Distributed, High Volume, Time Critical, Regulated)

Data — **Edge Node** — Data — **Fog Node** — Data — **Analytics**

Edge and Fog Computing for CAV's

Data Fabric Topology

Enabling Applications & Microservices

- Vehicle
- Weather Sensor
- Vehicle
- Traffic Management
- Traffic Management

IoT Data Fabric

- DS-Link
- DS-Link
- DS-Link
- DS-Link
- Edge
- FOG
- UCS
- Data Center
- Cloud

IoT Network Fabric
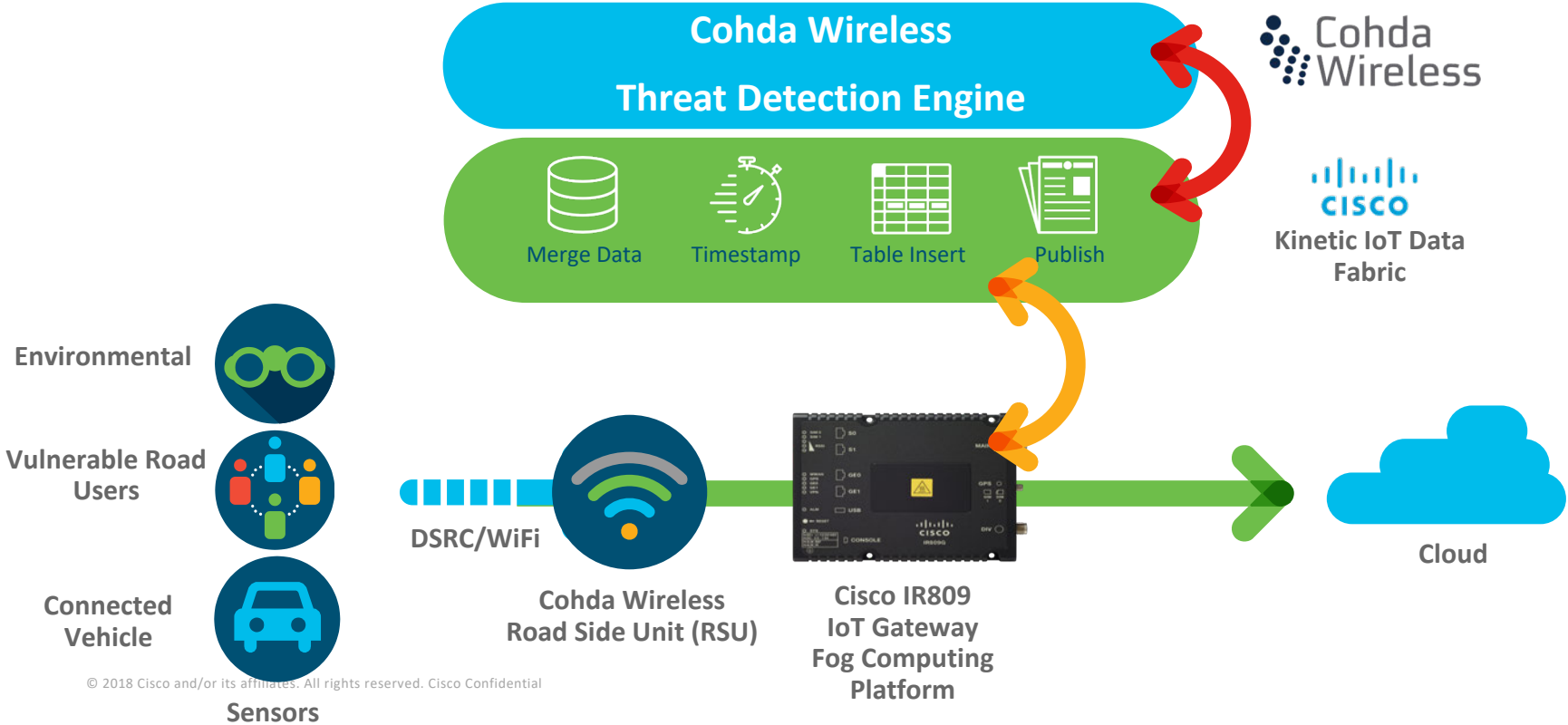
Microservices Run in Software Routers, Switches, UCS, Data Center, Cloud

Edge and Fog Computing for CAV's

Intersection Topology

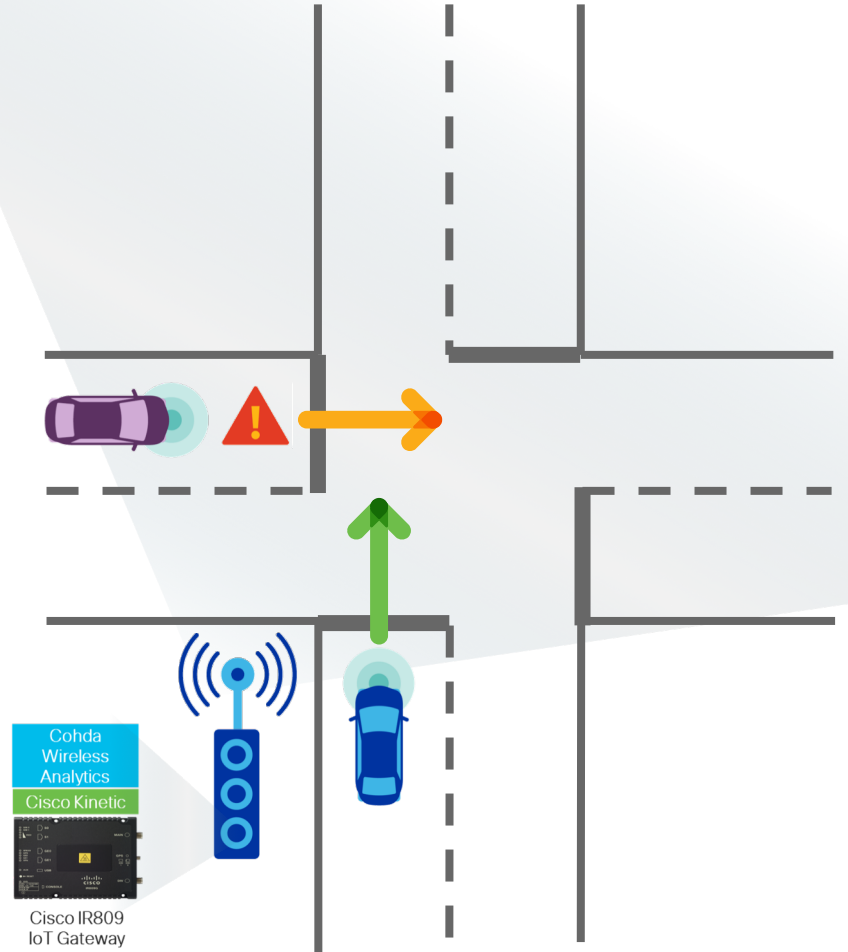# Deploying Edge & Fog Computing

Use Case 1: Dynamic Speed Management

Deploying Edge & Fog Computing

Use Case 2: Vulnerable Road User Protection

Cohda Wireless Analytics
Cisco Kinetic

Cisco IR809 IoT Gateway

Deploying Edge & Fog Computing

Use Case 3: Intersection Collision Avoidance

Cohda Wireless Analytics
Cisco Kinetic

Cisco IR809 IoT Gateway

Reduces Latency for Time-Sensitive Applications

Enables New Data Insights

Accelerates Safety Benefits Including Protecting Vulnerable Road Users

CISCO

Cohda Wireless

Edge & Fog Computing For CAVs