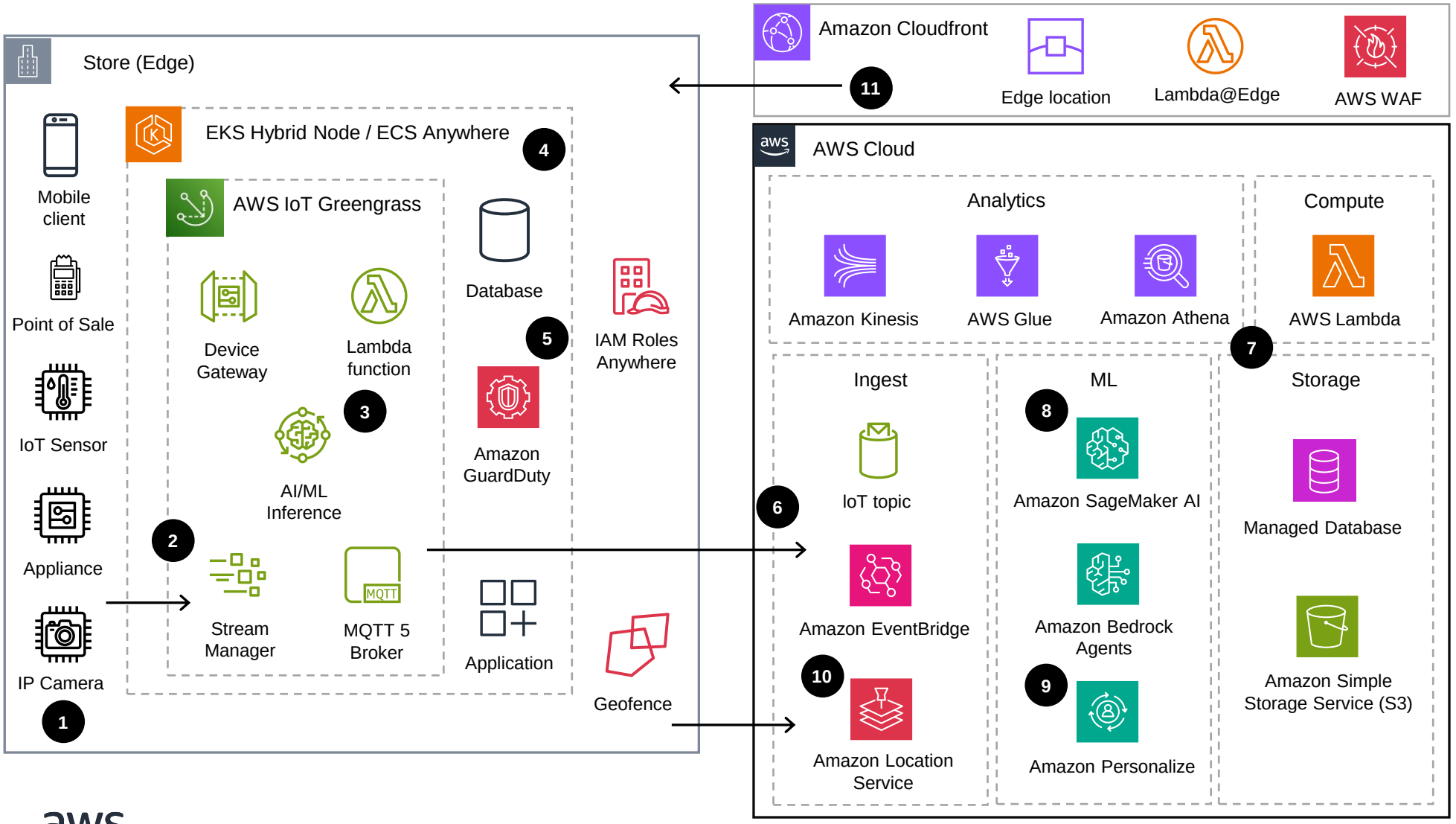
Guidance for Edge Computing in Retail on AWS

This architecture diagram shows how retailers can deploy edge computing to collect in-store data, run applications and ML inference locally for immediate insights, while connecting to cloud services for advanced analytics and personalized experiences.



AWS Reference Architecture

1. IoT sensors, IP cameras, point-of-sale systems, mobile clients, and appliances collect raw data in-store
2. **AWS IoT Greengrass** streams data via Device Gateway and Stream Manager
3. Data is initially processed by edge components using **Lambda function** and AI/ML Inference for quick analysis
4. **Amazon EKS Hybrid Node/Amazon ECS Anywhere** runs Applications & Databases that support Point of Sale and Retail Applications
5. **Amazon GuardDuty** provides threat detection at the edge
6. App data, logs, and metrics are sent to **Amazon Kinesis**, **Amazon EventBridge**, or IoT Topic via MQTT, HTTP, or WebRTC protocols
7. Data is stored in **Amazon Kinesis**, **Amazon S3** or managed database where transformation is conducted with **AWS Glue** or **AWS Lambda**. Store Analytics surfaced using **Amazon Athena**.
8. Machine Learning is conducted and edge models optimized using **Amazon SageMaker AI**
9. **Amazon Bedrock Agents** & **Amazon Personalize** optimize customer journeys and personalized recommendations
10. **Amazon Location Service** kicks off business logic when customer enters/exits store Geofence
11. Content is updated and distributed globally with **Amazon Cloudfront** to closest Edge location. **Lambda@Edge** allows auth logic to be added & **AWS WAF** provides protection from exploits

Reviewed for technical accuracy August 12, 2025