

# AI & ML Services and Machine Learning Process

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS

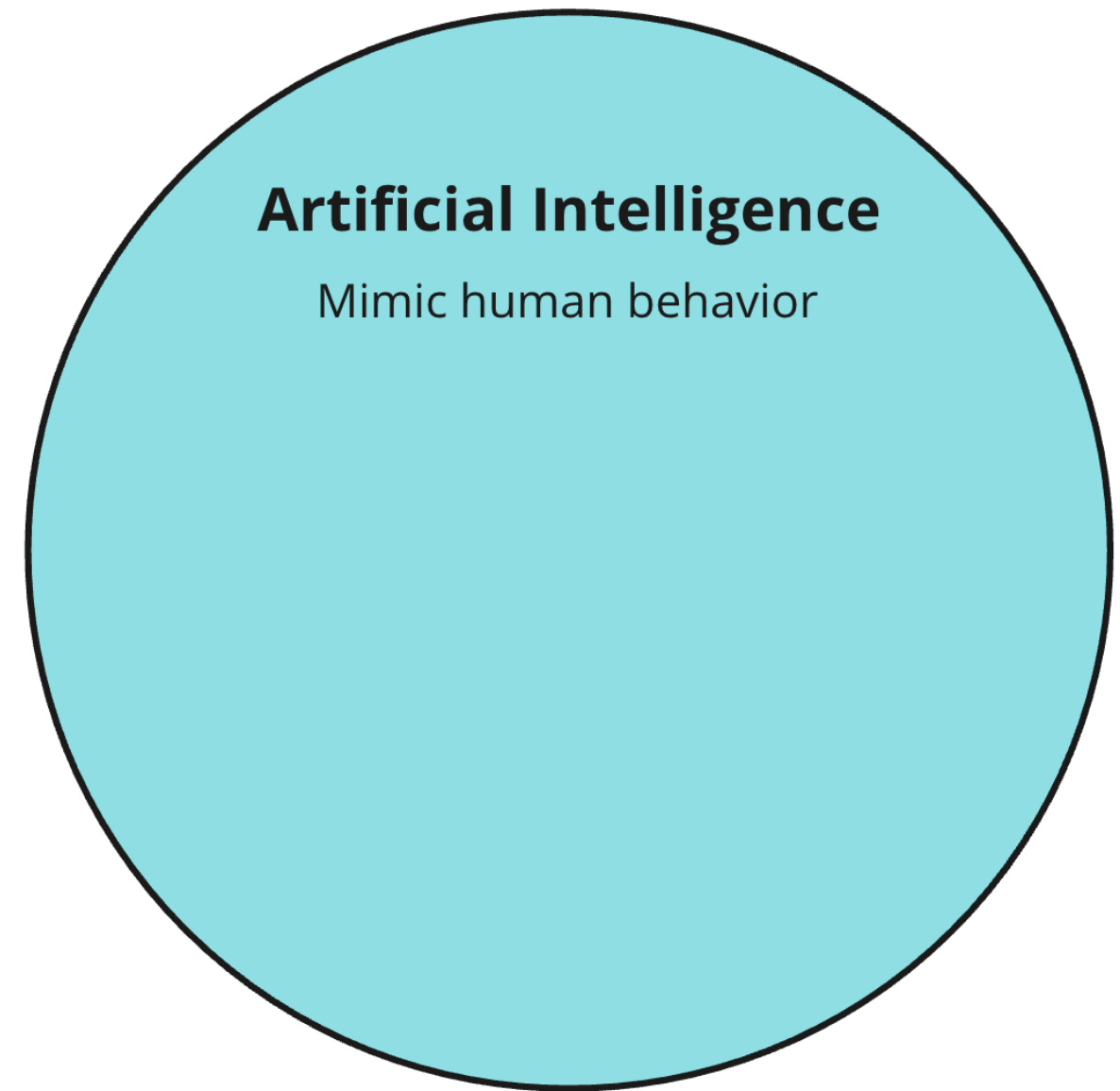


**Rahulraj Singh**  
Technical Product Manager

# What is AI and ML?

## Artificial intelligence

- Simulates human intelligence in machines
- Involves tasks like problem-solving, speech recognition, and learning



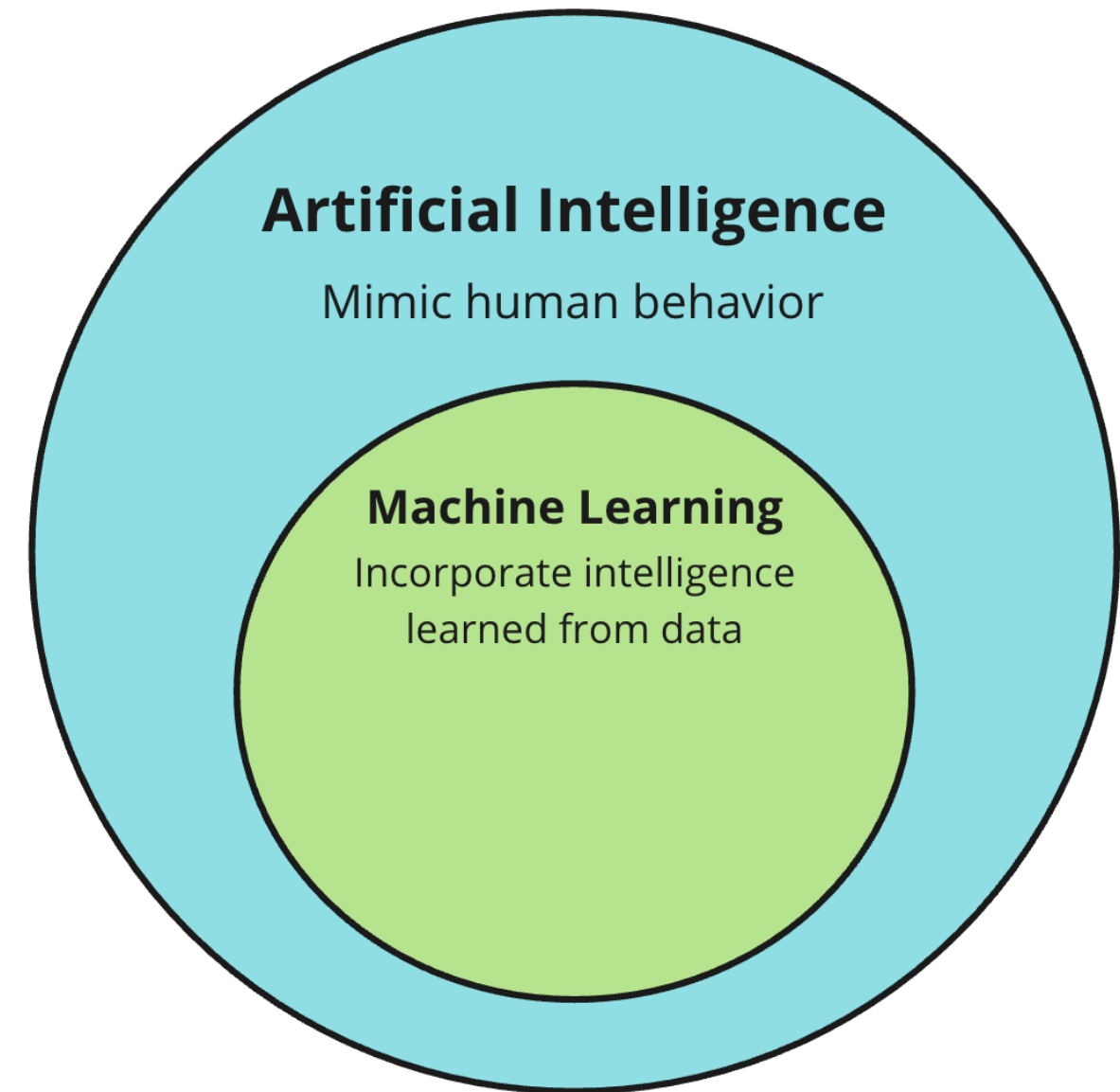
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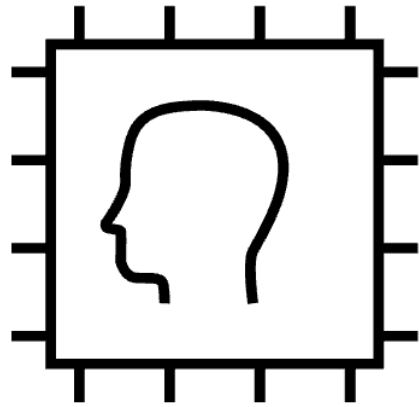
## Machine learning

- Subset of AI
- Focuses on systems that learn from data



# AWS AI and ML offerings

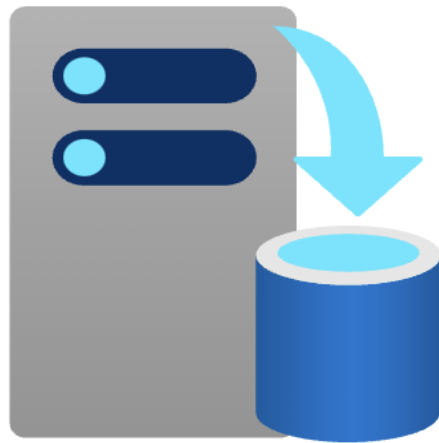
AI services



ML services



ML frameworks



ML workflow



# AI & ML services

## Artificial Intelligence services



Amazon Translate



Amazon Polly



Amazon Lex



Amazon Comprehend



Amazon Forecast



Amazon Rekognition



Amazon CodeGuru

## Machine Learning services



Amazon SageMaker



Amazon CodeWhisperer

# Introducing AWS AI services

- Pre-trained, auto-trained models
- No machine learning background needed

## Artificial Intelligence services



Amazon Translate



Amazon Polly



Amazon Lex



Amazon Comprehend



Amazon Forecast



Amazon Rekognition

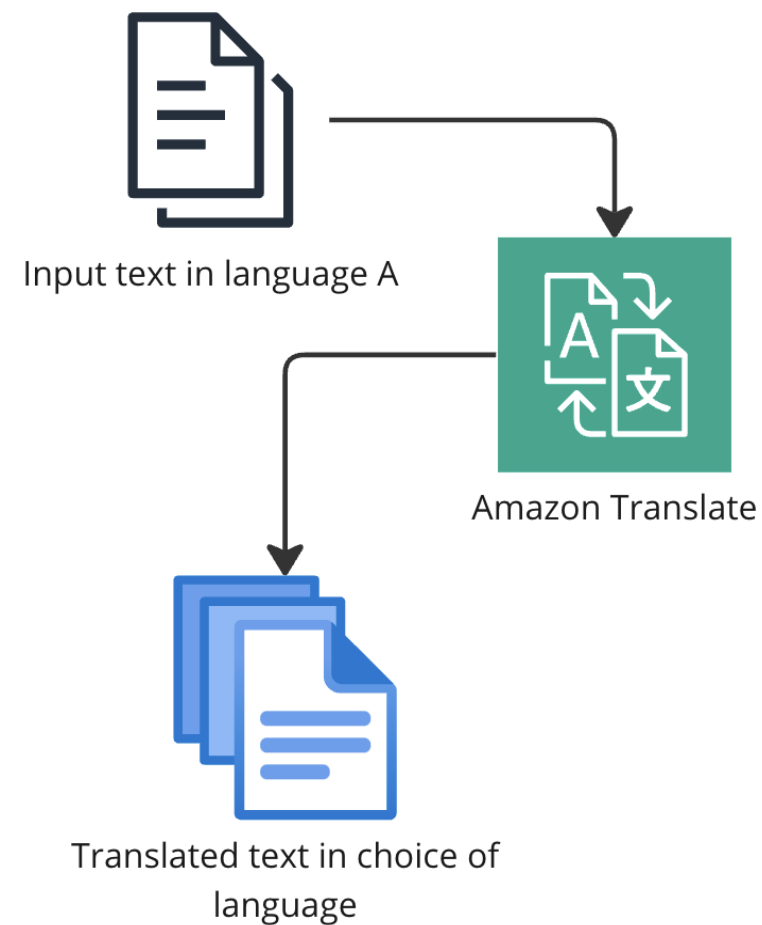


Amazon CodeGuru

# AWS AI services

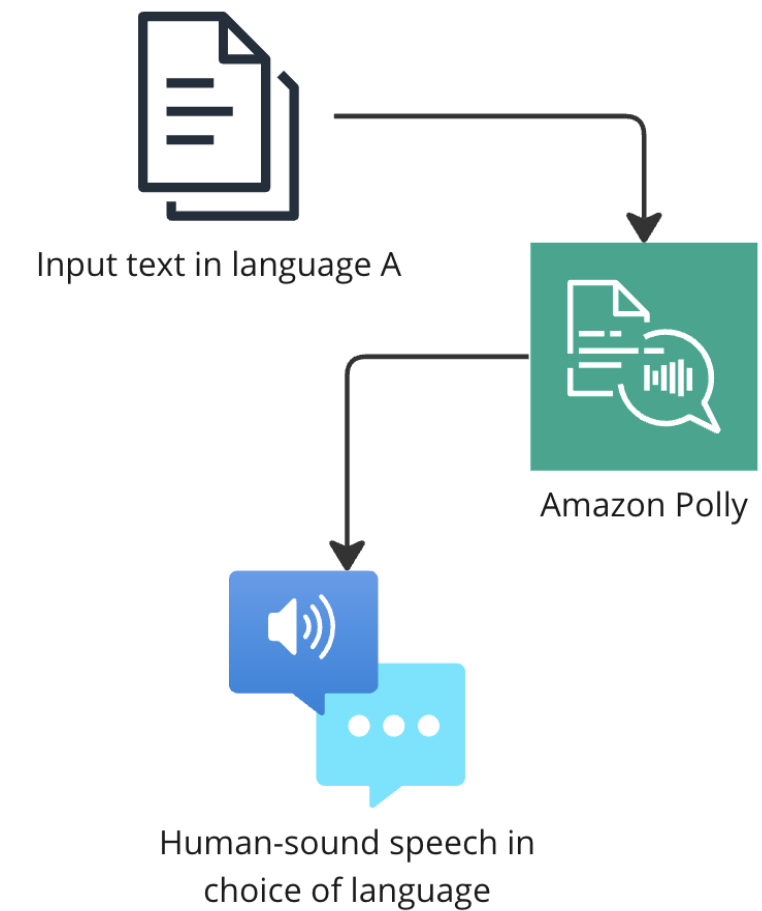
## Amazon Translate

- Translate text between languages



## Amazon Polly

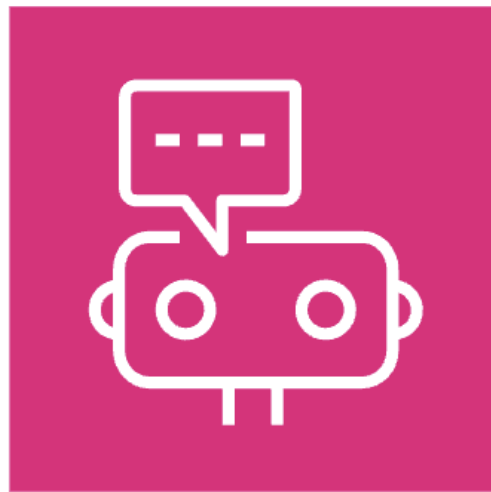
- Convert text into lifelike, natural-sounding speech



# AWS AI services

## Amazon Lex

- Create conversational interfaces
- Design and deploy chatbots



Create and deploy  
conversational systems

## Amazon Comprehend

- Extract insights from text
- Identify sentiments, entities, and language



Extract sentiments and  
insights from text



# AWS AI services

## Amazon Forecast

- Build accurate time-series predictions



Time series predictions

## Amazon CodeGuru

- Automate code reviews
- Improve code quality with intelligent recommendations

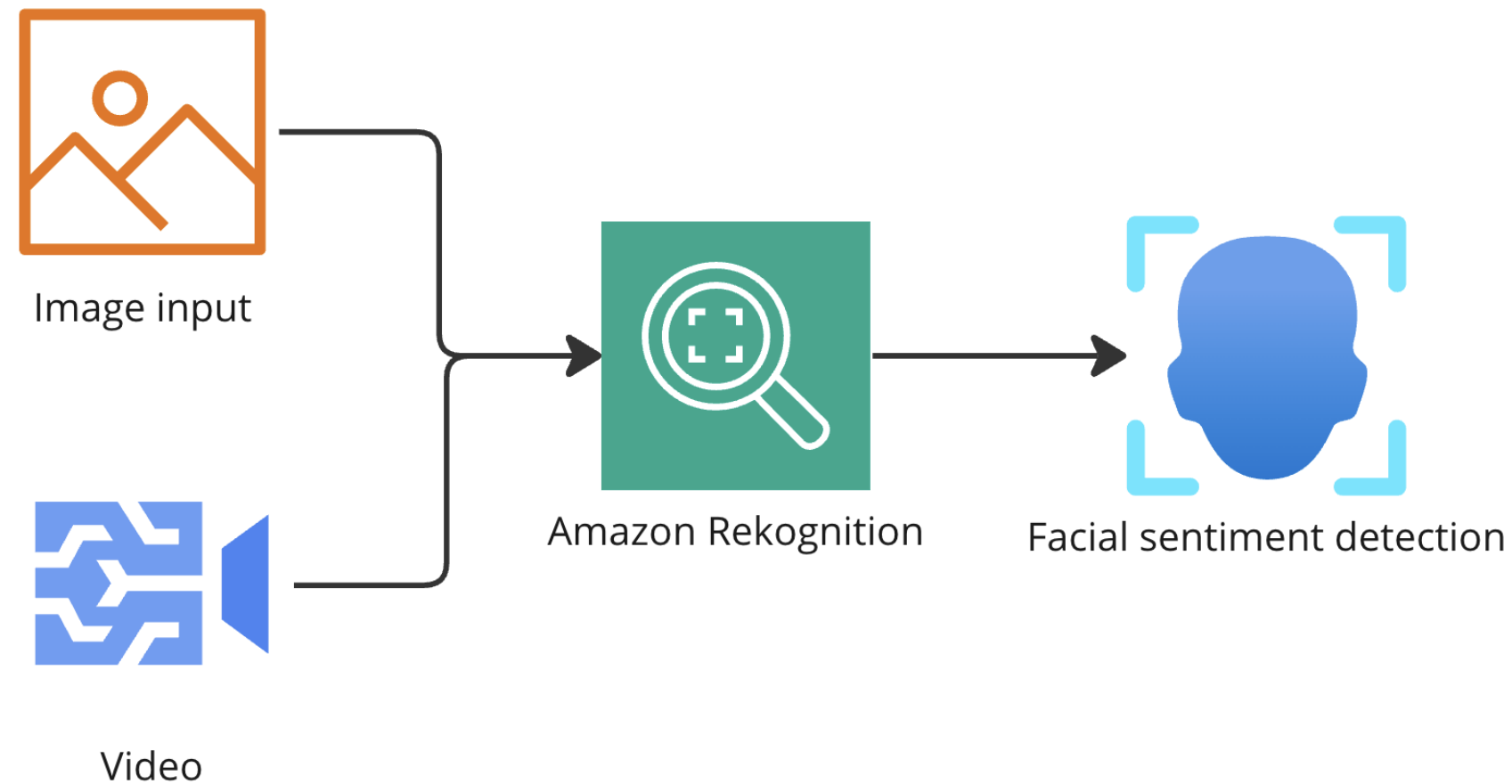


Intelligent code reviews

# AWS AI services

## Amazon Rekognition

- Analyze and recognize objects in images
- Perform facial analysis and sentiment detection in videos



# ML services in AWS

- Enable developers to build custom ML models
- Tailored for those with ML expertise and specific use cases

## Machine Learning services



Amazon SageMaker



Amazon CodeWhisperer

# Amazon SageMaker

## Key features

- Fully managed service for end-to-end ML lifecycle
- Integrated Jupyter notebooks for model development
- One-click training and deployment



Predictive analytics

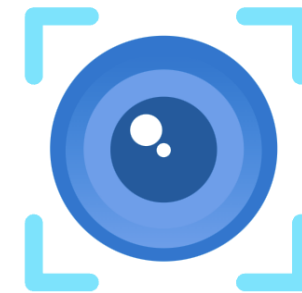
# Amazon SageMaker

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Predictive analytics



Computer Vision

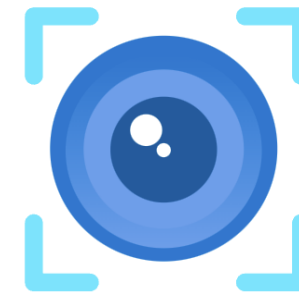
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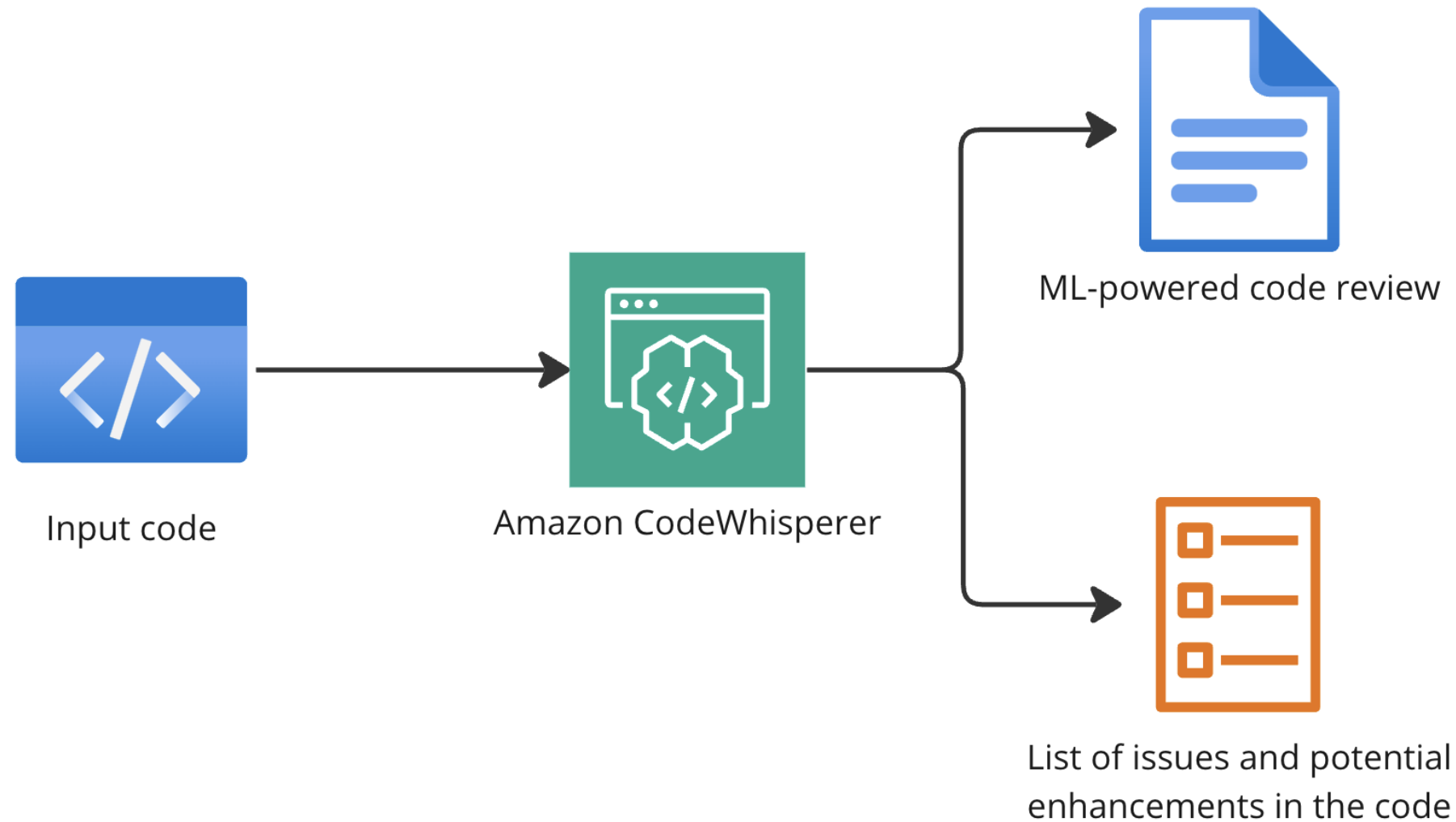
Computer Vision



Natural language processing

# Amazon CodeWhisperer

- Automated ML-powered and streamlined code review
- Enhances code quality and identifies issues



# ML frameworks

- Open-source frameworks for diverse ML workflows



Open-source frameworks

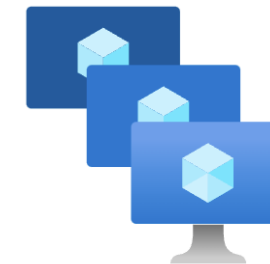


# ML frameworks

- Open-source frameworks for diverse ML workflows
- Enables robust, scalable, and seamless deployment



Open-source frameworks



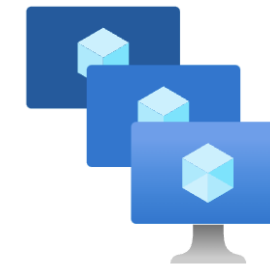
Durability and scalability

# ML frameworks

- Open-source frameworks for diverse ML workflows
- Enables robust, scalable, and seamless deployment
- Caters to a wide range of uses



Open-source frameworks



Durability and scalability



Flexibility and versatility

# AWS services enabling ML frameworks



TensorFlow

Development and deployment of scalable ML models on AWS

# AWS services enabling ML frameworks



TensorFlow

Development and deployment of scalable ML models on AWS



PyTorch

Execute machine learning and computational graph-based systems on-the-fly

# AWS services enabling ML frameworks



TensorFlow

Development and deployment of scalable ML models on AWS



PyTorch

Execute machine learning and computational graph-based systems on-the-fly



MxNet

Large-scale, distributed training of deep neural networks

# Sample ML pipeline

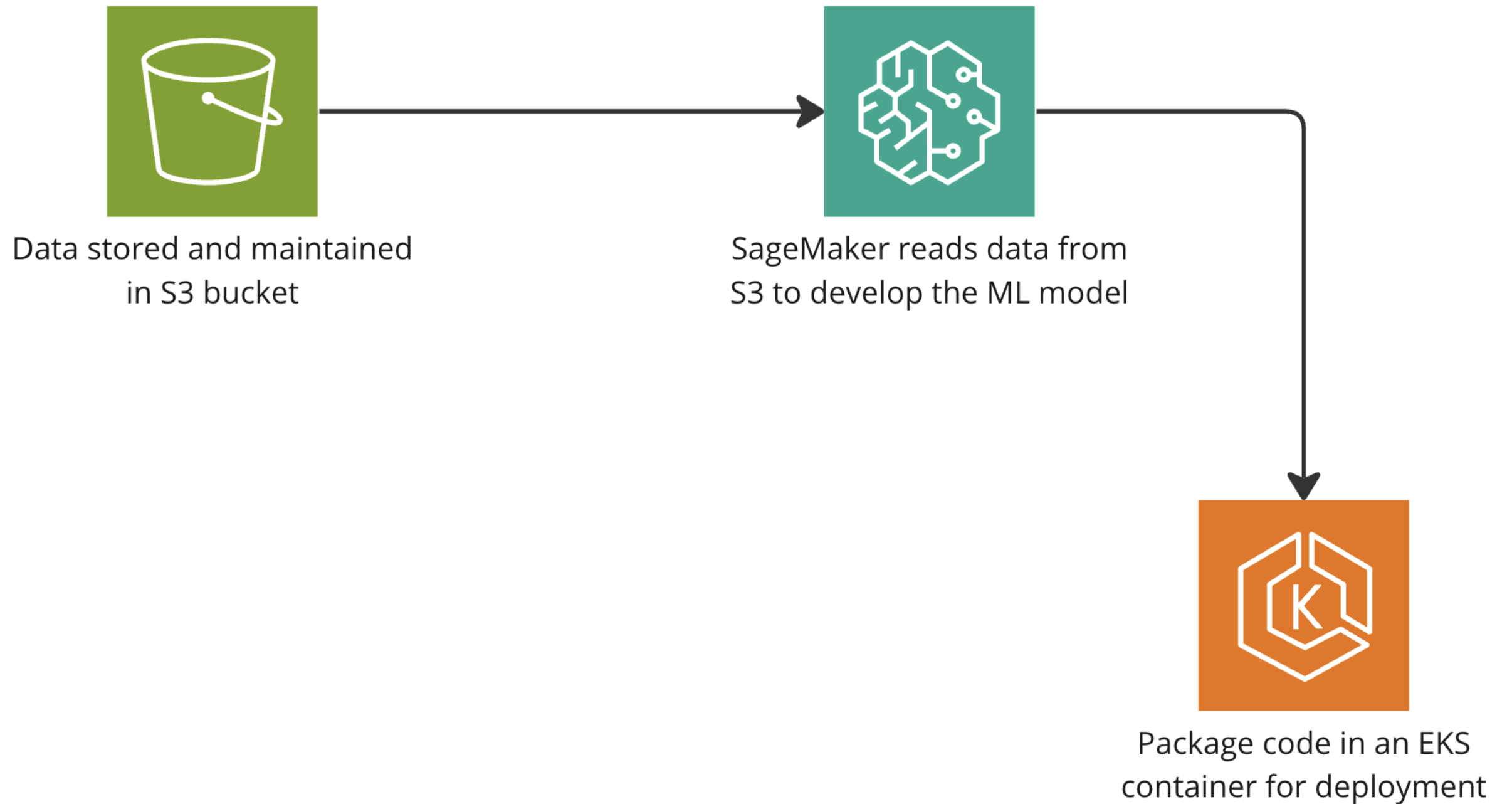


Data stored and maintained  
in S3 bucket

# Sample ML pipeline

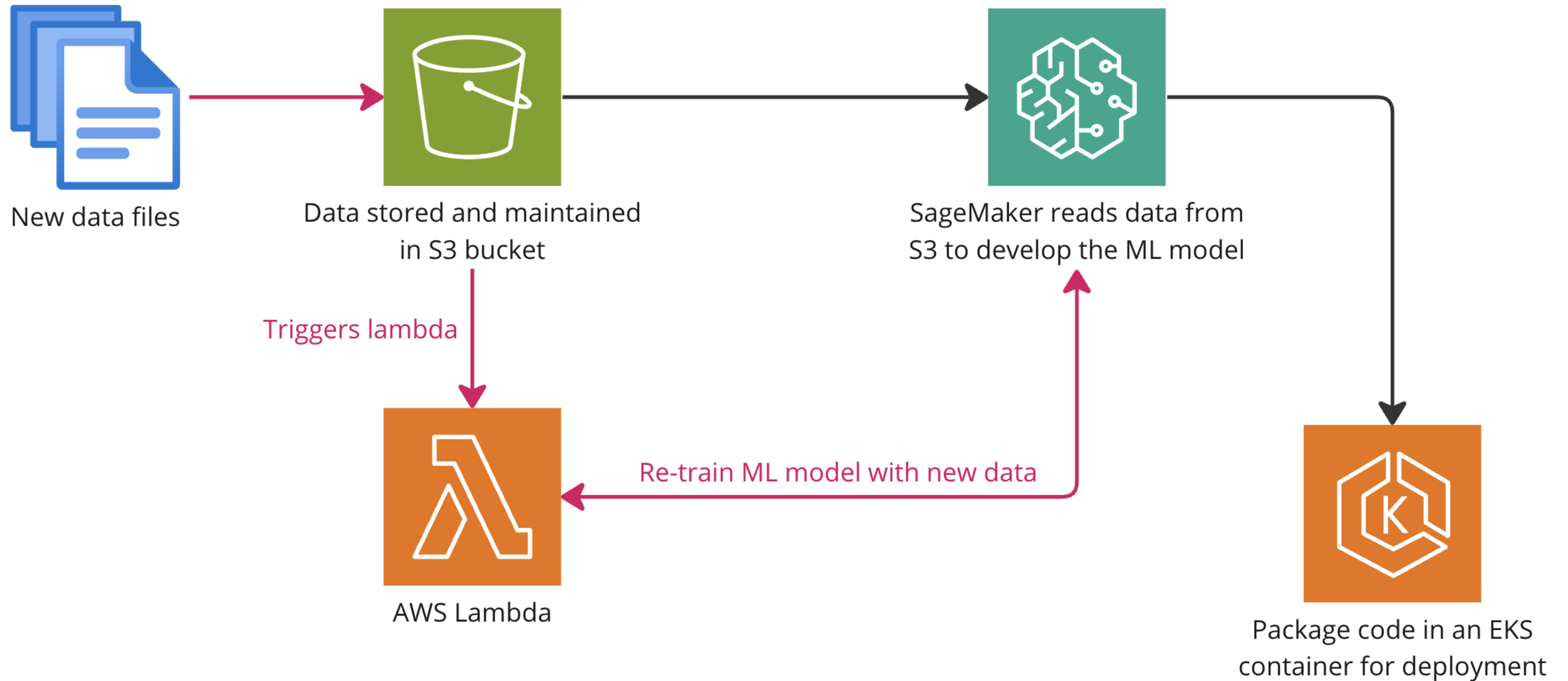


# Sample ML pipeline





# Sample ML pipeline



# Let's practice!

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS

# Analytics & BI Services

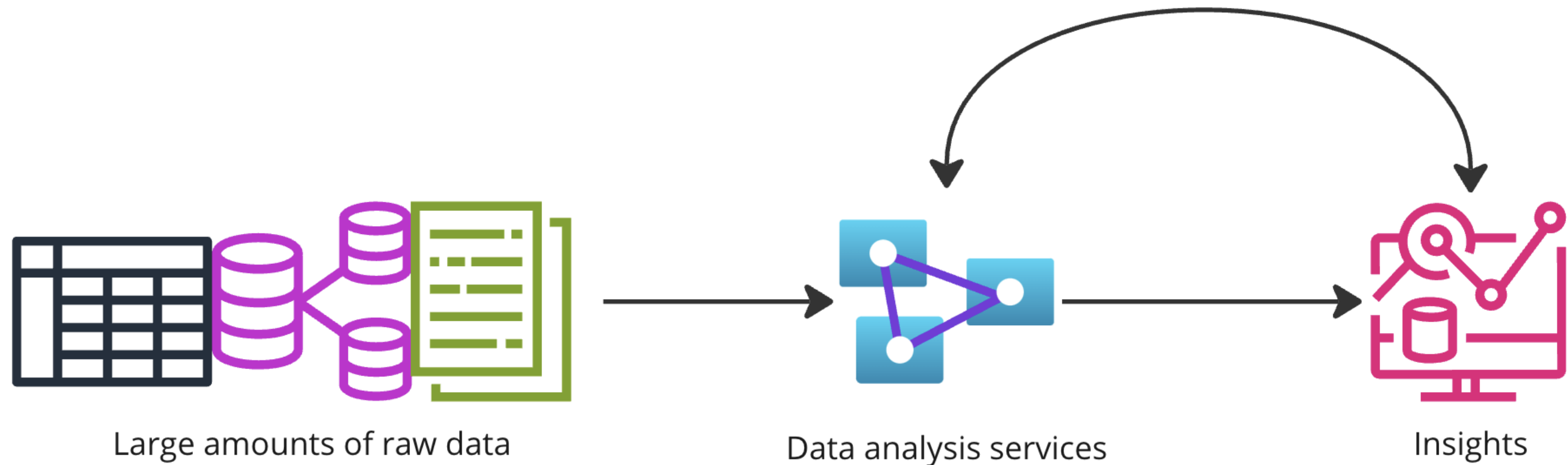
AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS



**Alex Kuntz**

Head of Cloud Curriculum, DataCamp

# Introduction to data analytics



- Turning raw data into actionable insights
- Iterative process

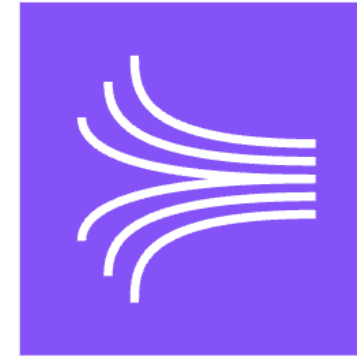
# Data analytics in AWS



Amazon Athena



Amazon QuickSight



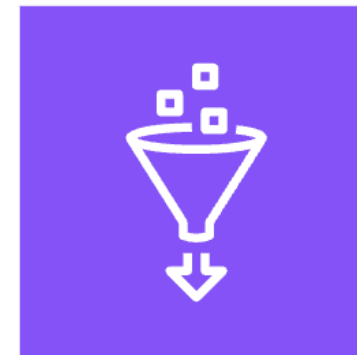
Amazon Kinesis



Amazon Redshift



Amazon Macie



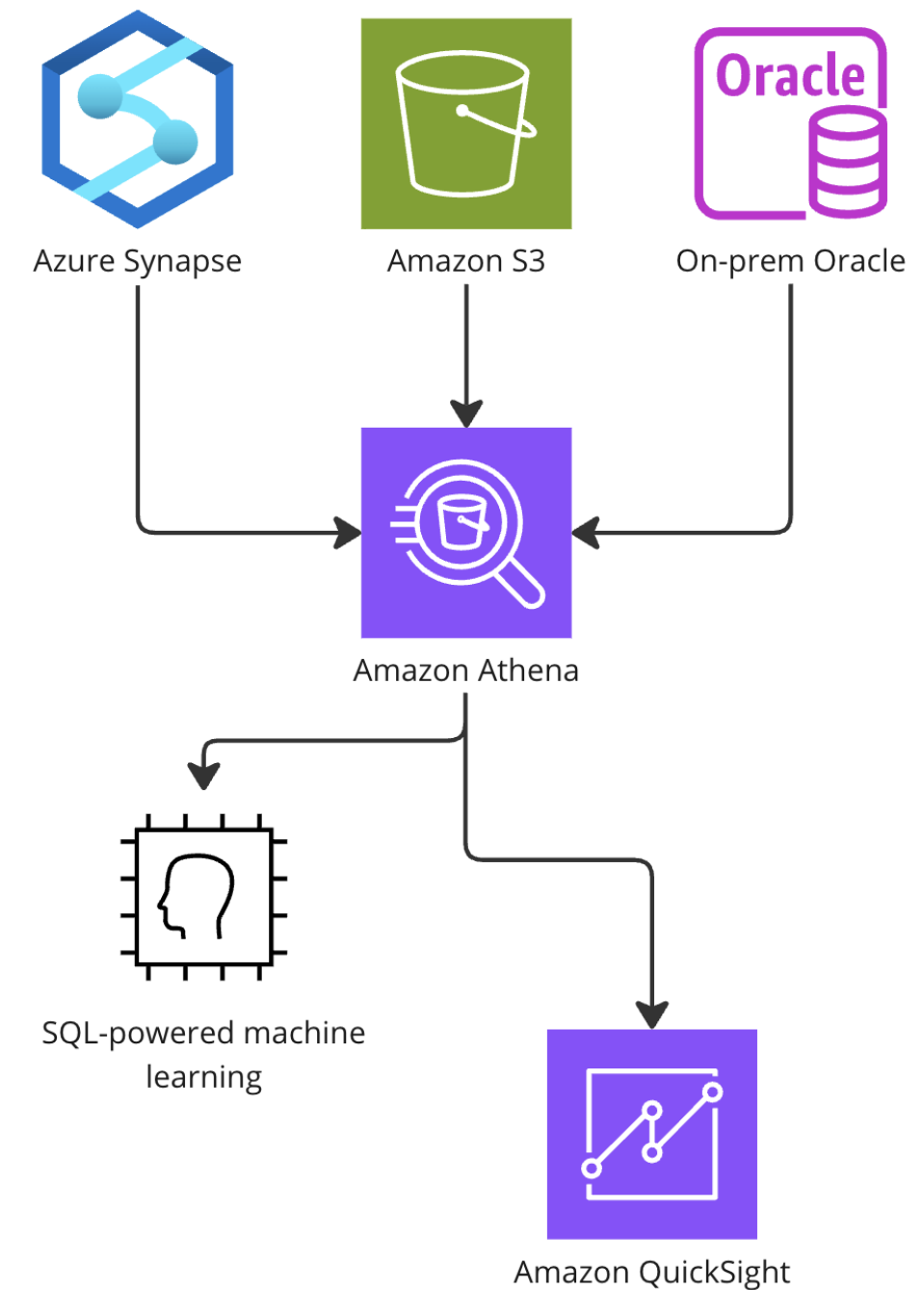
AWS Glue

# Amazon Athena

Serverless, interactive analytics service for analyzing petabyte-scale data at source

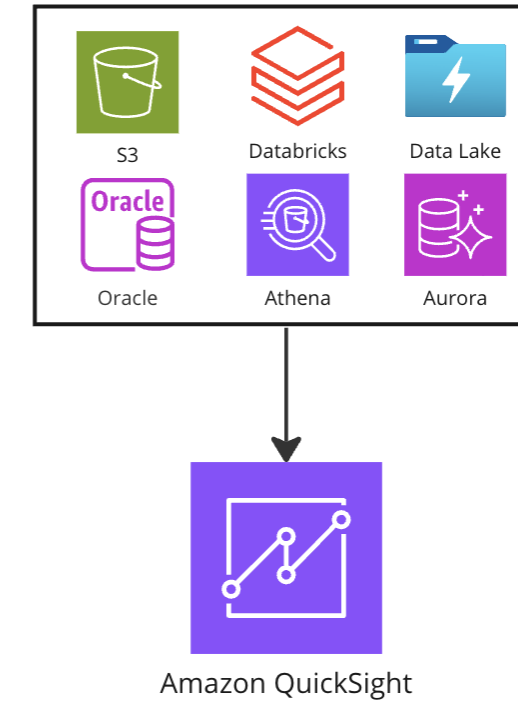
## Key features

- Versatile data integration
- Simplified pricing of paying per query



# Amazon QuickSight

Unified business intelligence service  
supporting interactive dashboards

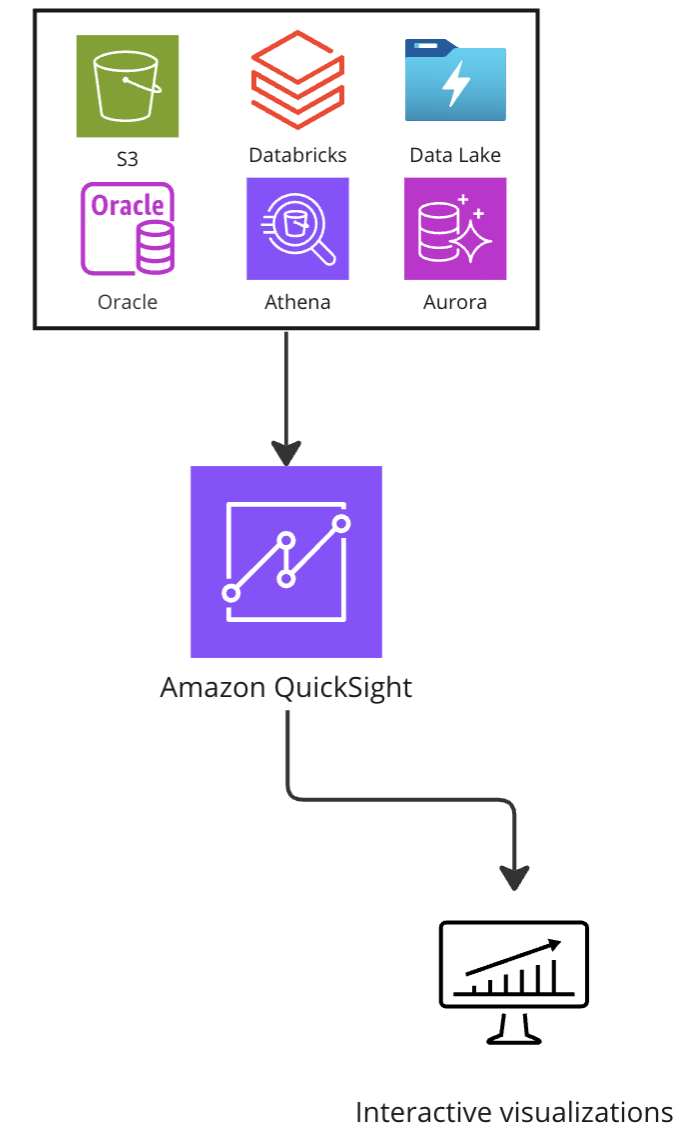


# Amazon QuickSight

Unified business intelligence service supporting interactive dashboards

## Key features

- Automatic scaling without server setup



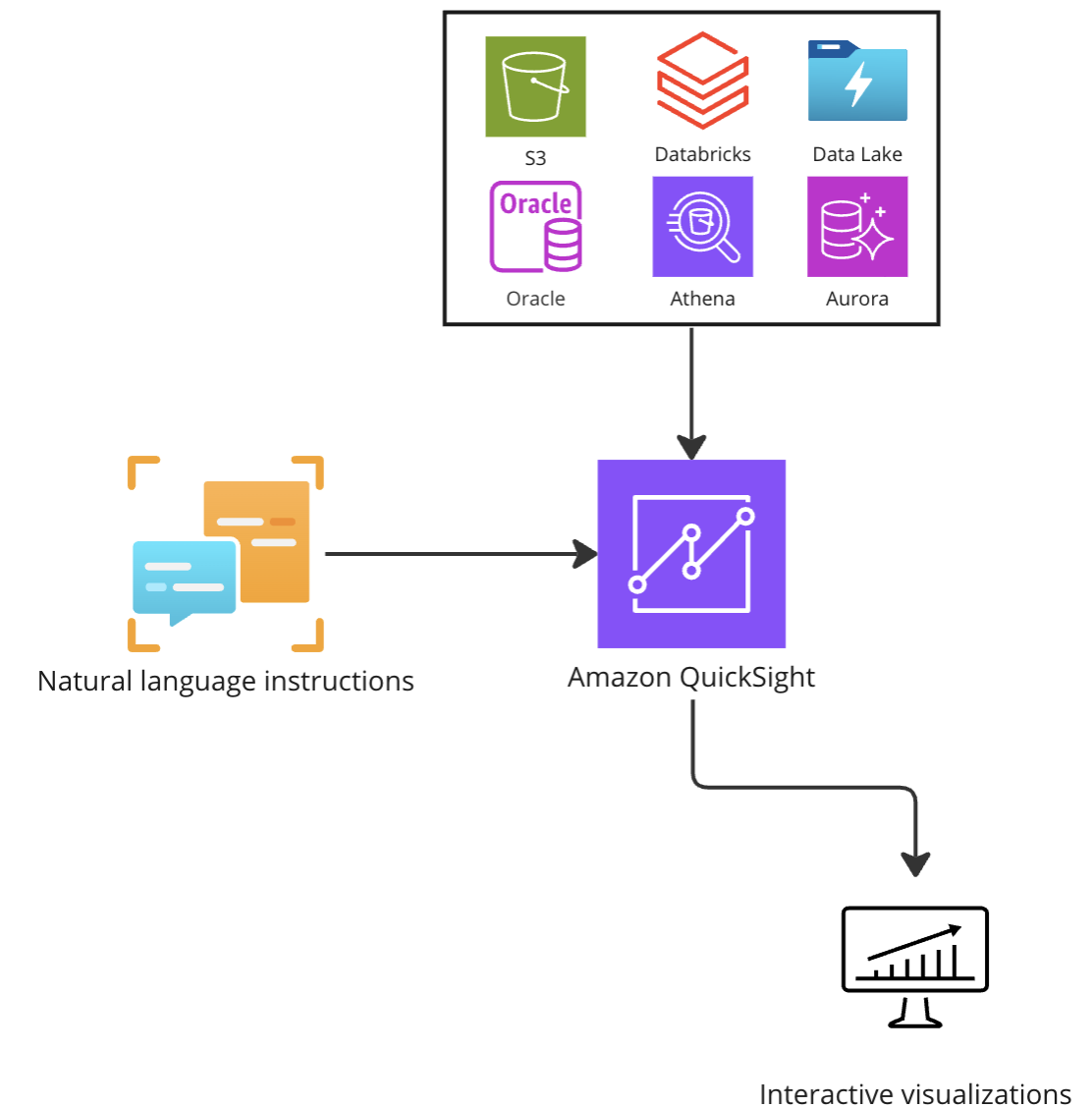


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Unified business intelligence service supporting interactive dashboards

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- Automatic scaling without server setup
- Generative BI capabilities

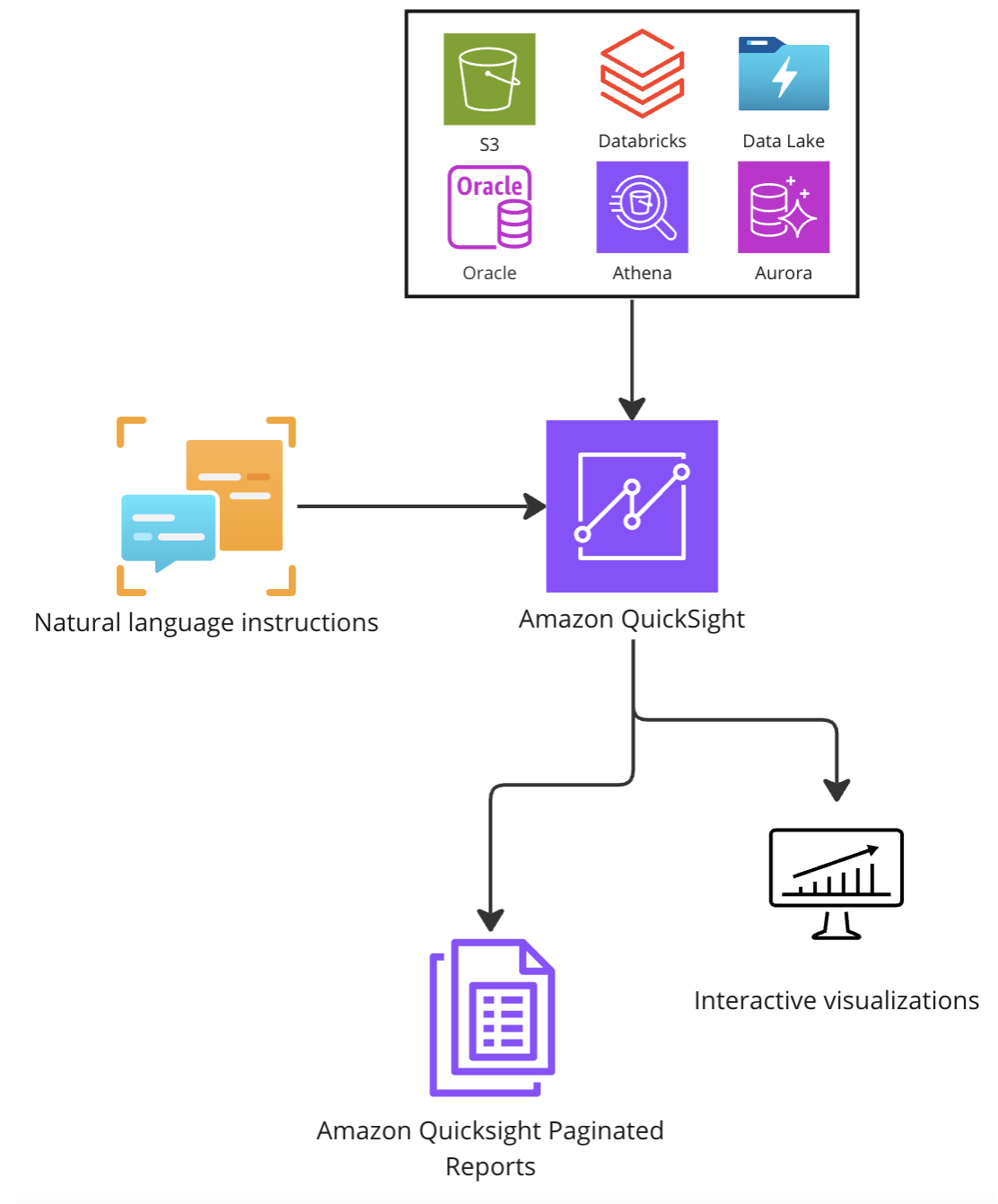


# Amazon QuickSight

Unified business intelligence service supporting interactive dashboards

## Key features

- Automatic scaling without server setup
- Generative BI capabilities
- Paginated reports



# Amazon Kinesis

Enables the collection, processing, and analysis of data streams at scale

## Key features

- Real-time processing
- Serverless infrastructure
- Scalability



Real-time live leaderboards

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Real-time live leaderboards



IoT sensor data processing

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IoT sensor data processing



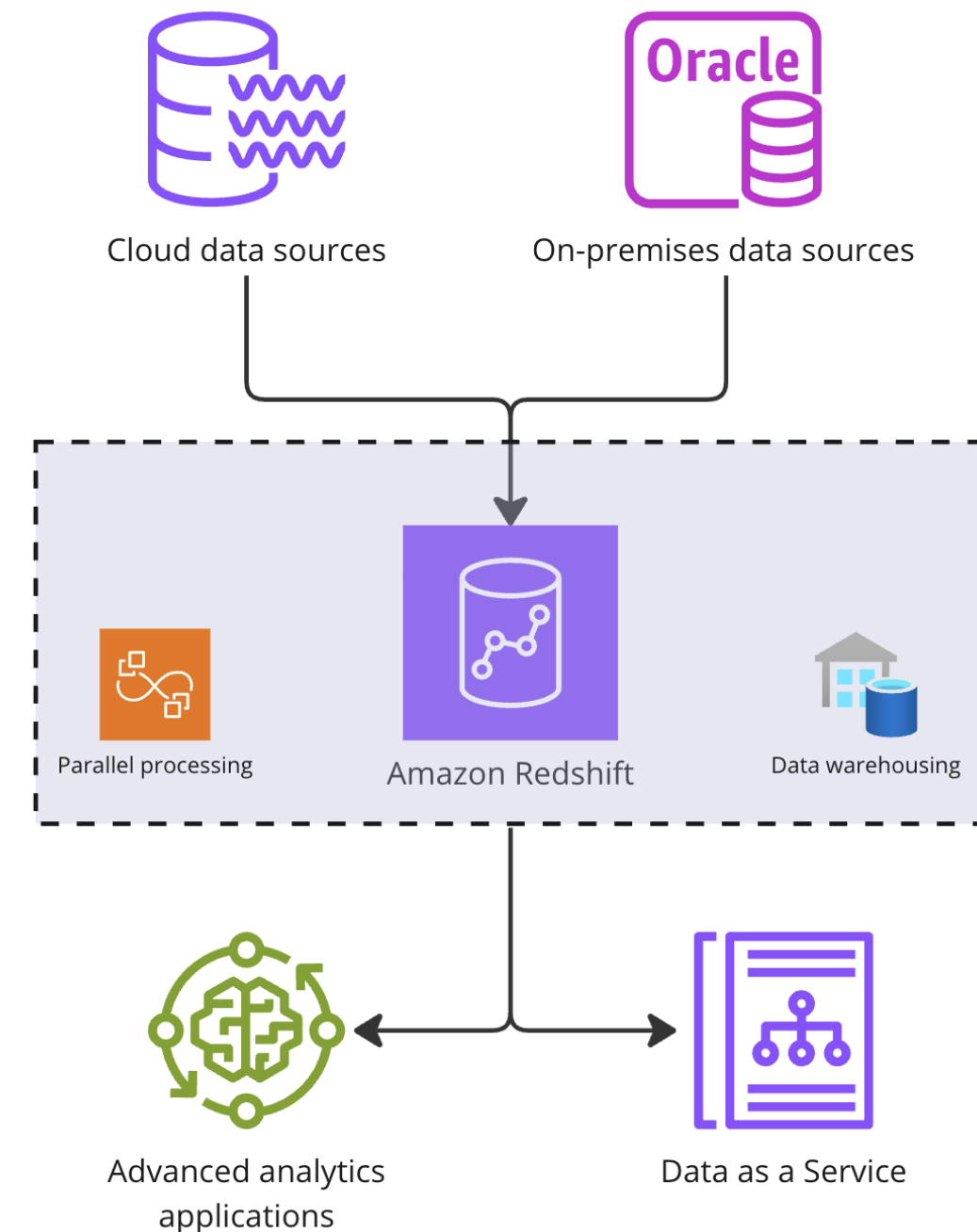
Improve data transfer speeds

# Amazon Redshift

AI-powered, Massively Parallel Processing (MPP) cloud data warehouse for analytics

## Key features

- Achieve up to 6x better price performance
- Zero-ETL approach
- Secure collaboration and governance



# Securing data with Amazon Macie

ML-driven data security service to enable sensitive data<sup>1</sup> discovery and protection

## Key features

- Automated discovery
- Cost-efficient visibility
- Reduce triage time with actionable reporting on sensitive data



Store PII data confidently

<sup>1</sup> PII: Personal Identifiable Information

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Stay compliant

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Store PII data confidently



Stay compliant



Identify risks before migrating data to the cloud

# AWS Glue

Serverless data integration service allowing the discovery, preparation and integration of data

## Key features

- Support both batch and streaming data



Batch and streaming  
data integration

# AWS Glue

Serverless data integration service allowing the discovery, preparation and integration of data

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- Prepare data for machine learning and deep learning



Batch and streaming  
data integration



Prepare data for  
ML and DL tasks

# AWS Glue

Serverless data integration service allowing the discovery, preparation and integration of data

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- Serverless petabyte-scale capacity



Batch and streaming  
data integration



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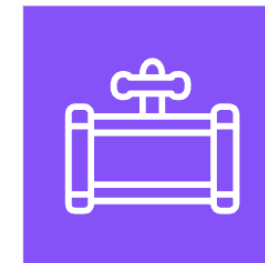
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Batch and streaming  
data integration



Prepare data for  
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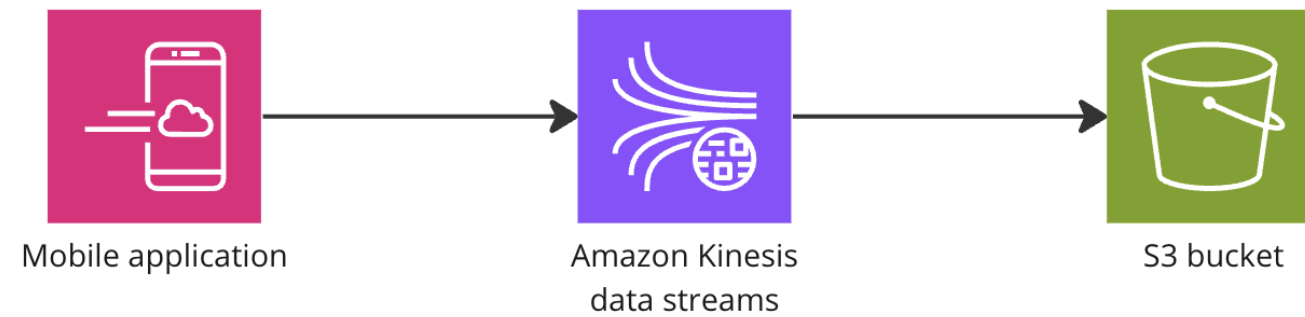
Simplify ETL workflows

# Creating an end-to-end data workflow

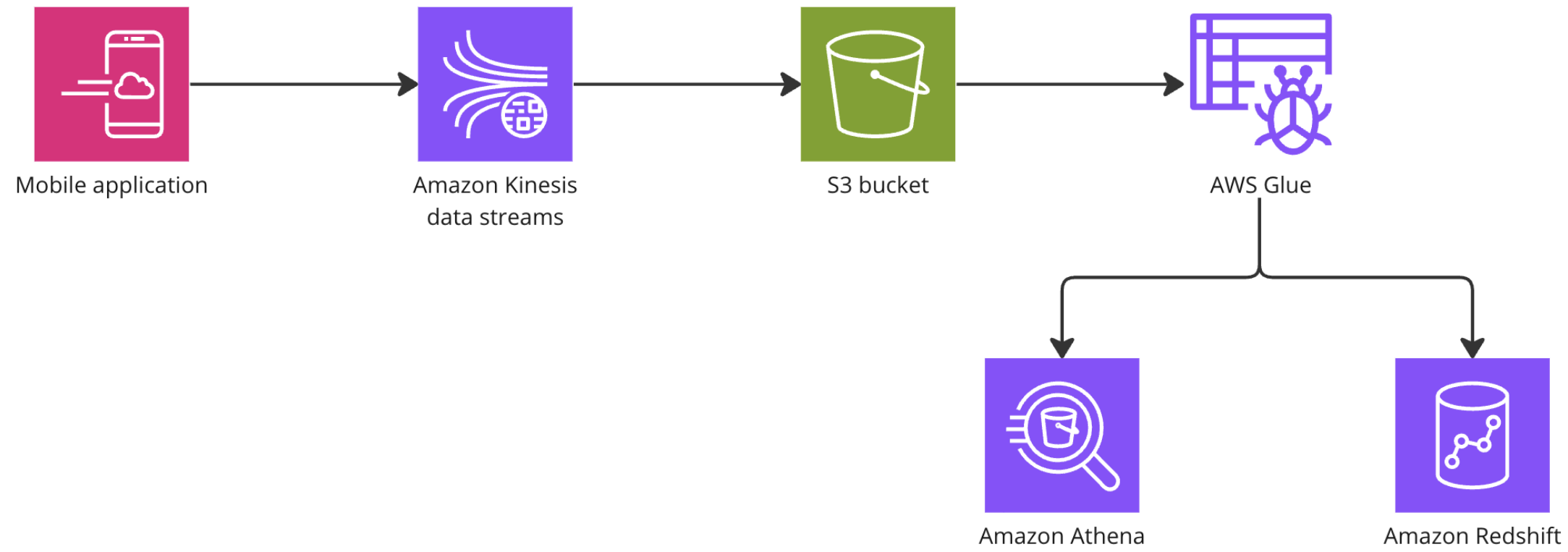


Mobile application

# Creating an end-to-end data workflow

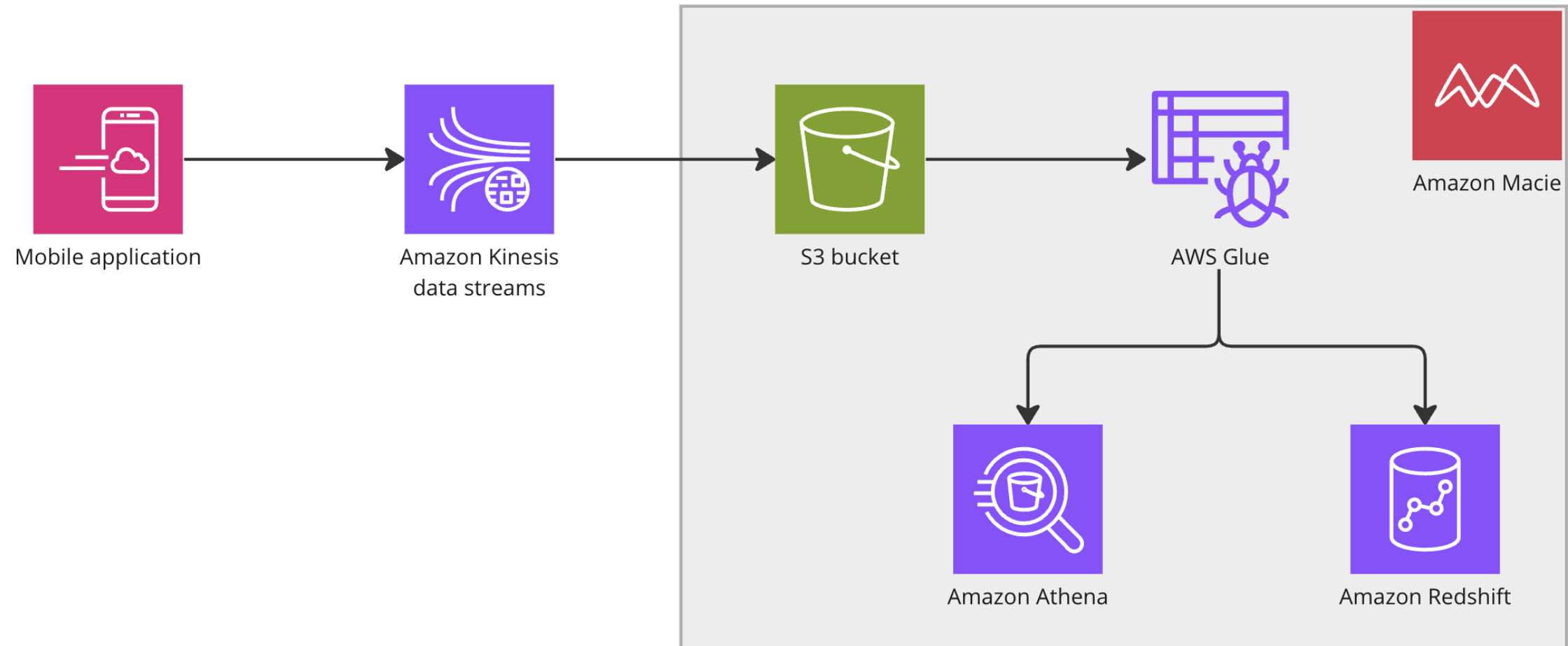


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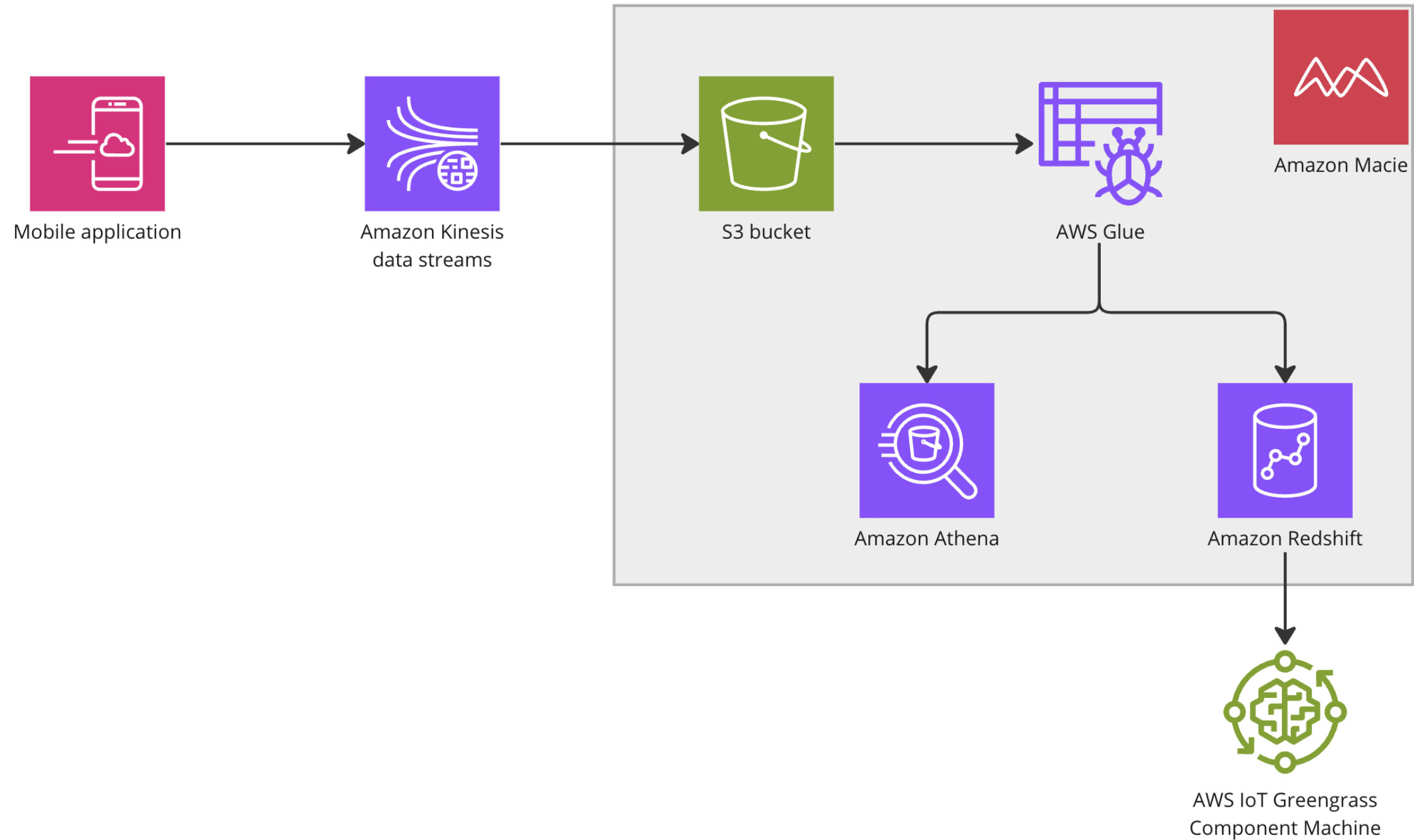




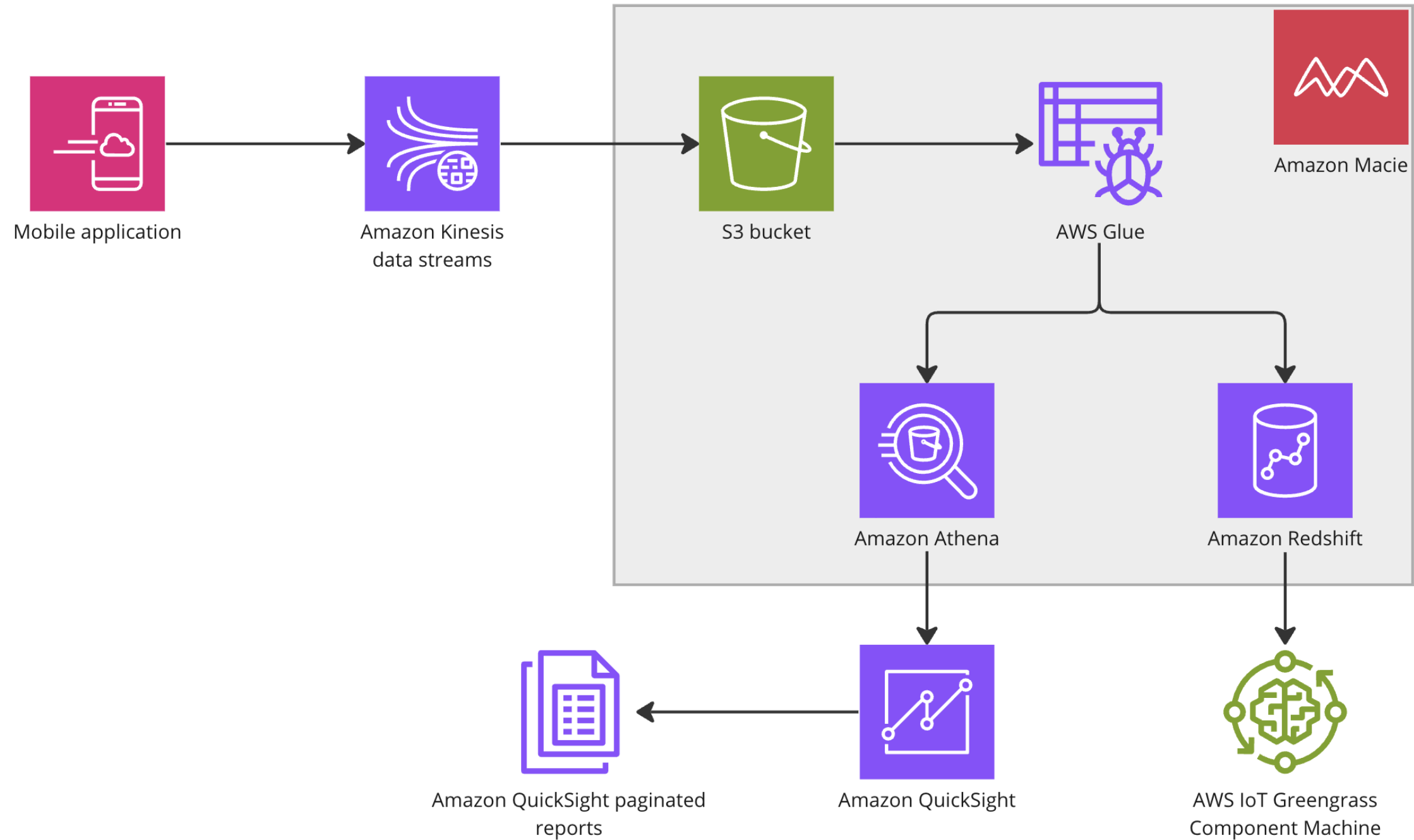
# Creating an end-to-end data workflow



# Creating an end-to-end data workflow



# Creating an end-to-end data workflow



# Let's practice!

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS

# Secondary AWS Service Categories

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS

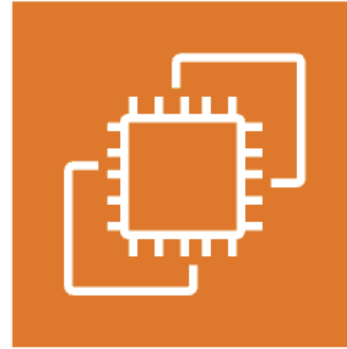


**Rahulraj Singh**  
Technical Product Manager

# Overview of core AWS services



AWS Global Infrastructure



Compute



Storage



Databases



Networking



Analytics and AI

# Secondary services introduction



Application integration

# Secondary services introduction



Application integration



Business enhancement  
services



# Secondary services introduction



Application integration



Business enhancement  
services



Developer tools

# Secondary services introduction



Application integration



Business enhancement  
services



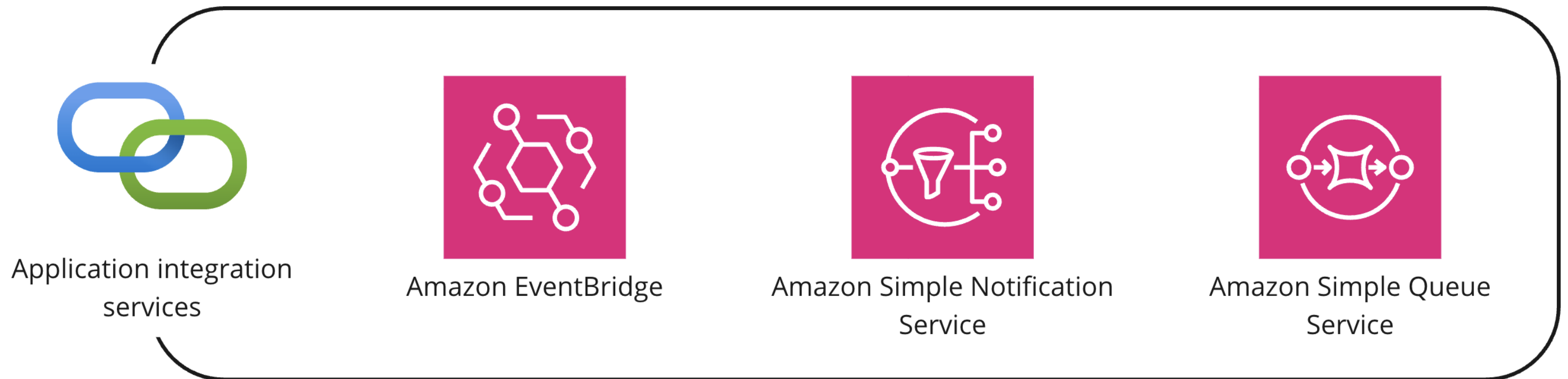
Developer tools



Advanced intelligence services

# Application integration services

- Enhance communication between diverse AWS applications
- Coordinate data and workflows for efficiency
- Crucial for scalable, flexible, interconnected architectures



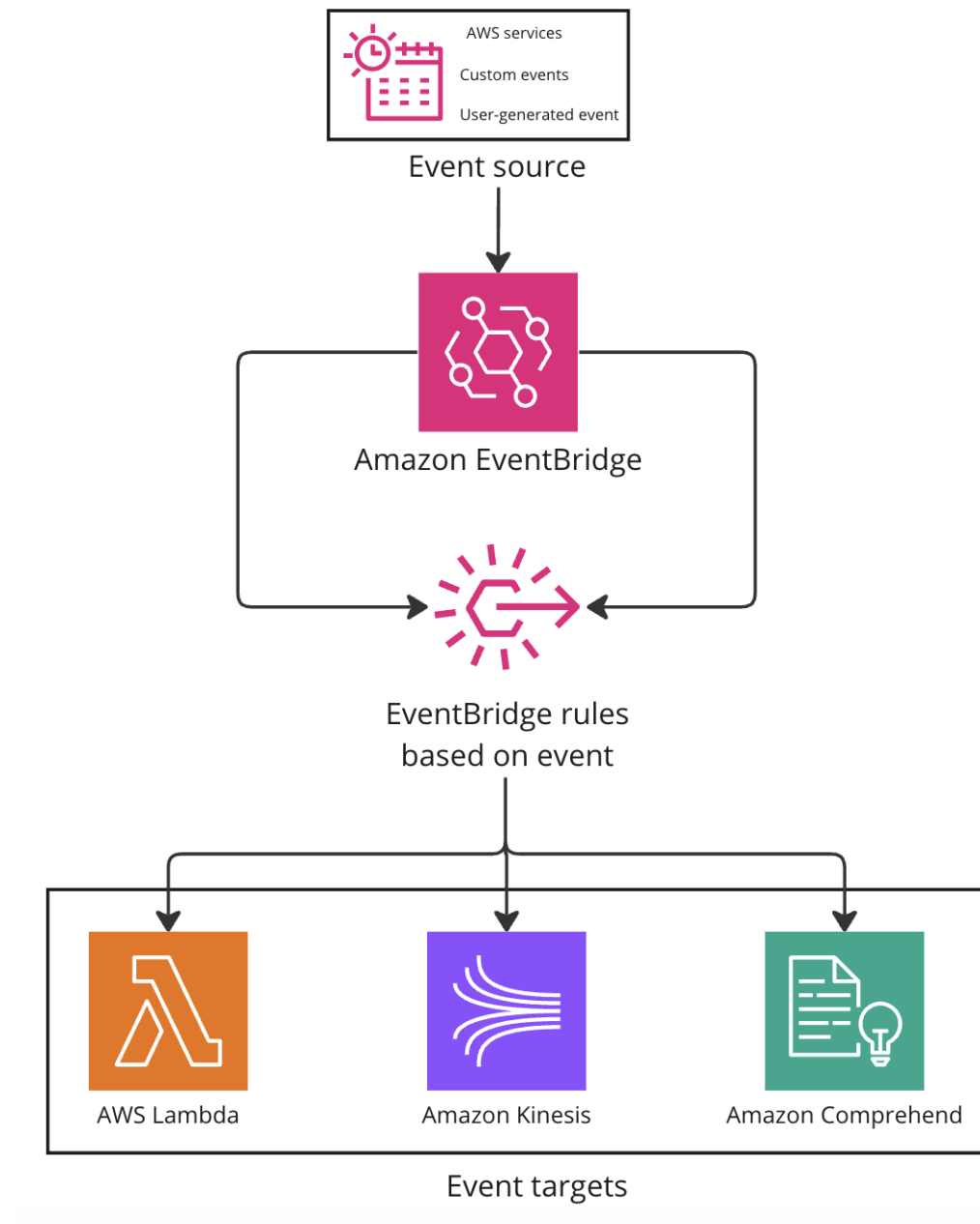
# Amazon EventBridge

## Key features

- Applications that respond to real-world events at any scale
- Connect different software and systems

## Use cases

- Build software without explicit dependencies between systems
- Monitor and audit AWS environments

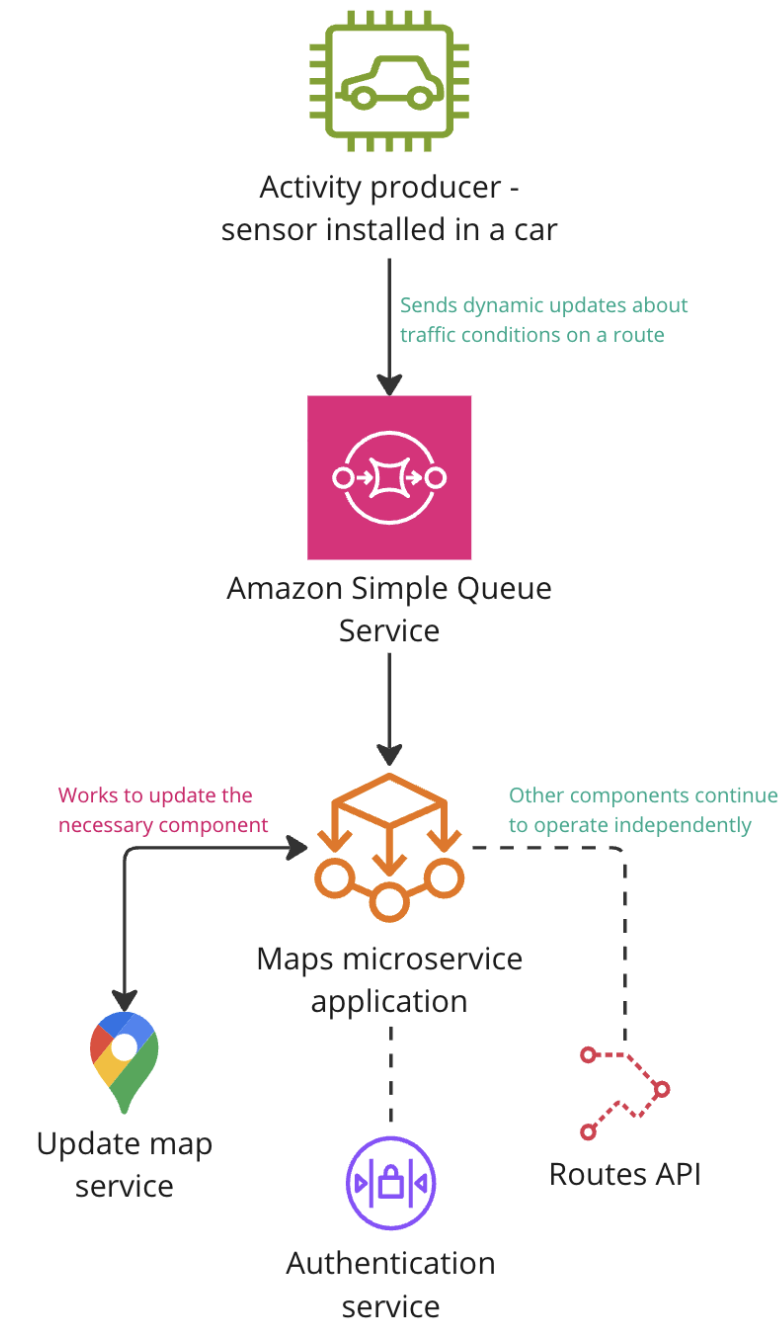


# Amazon Simple Queue Service (SQS)

Messaging for software components, ensuring reliable communication at any volume

## When is SQS used?

- Connect microservices for reliability and scale
- Decouple components for increased background efficiency

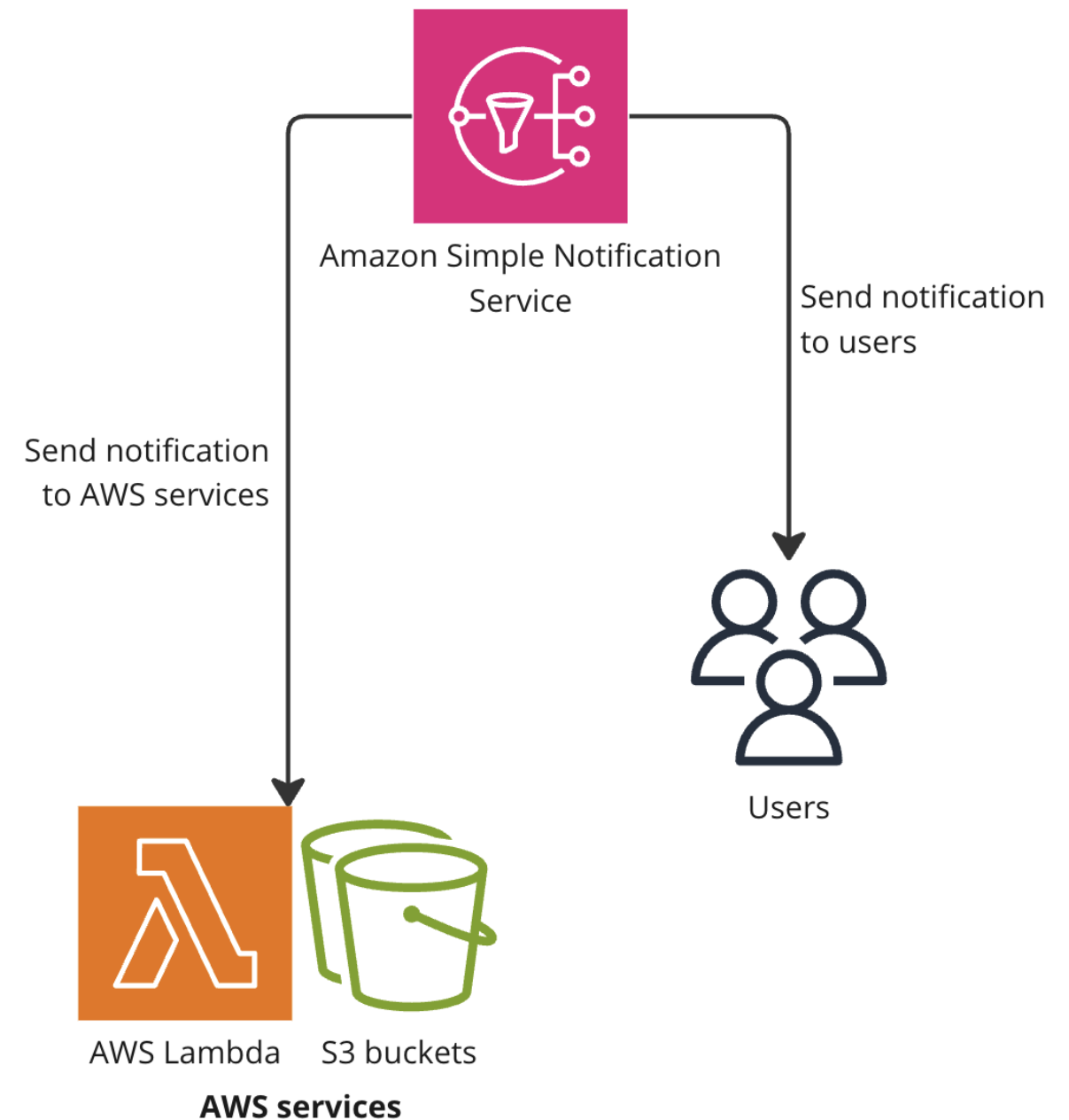


# Amazon Simple Notification Service (SNS)

Facilitating application-to-application (A2A) and application-to-person (A2P) messaging

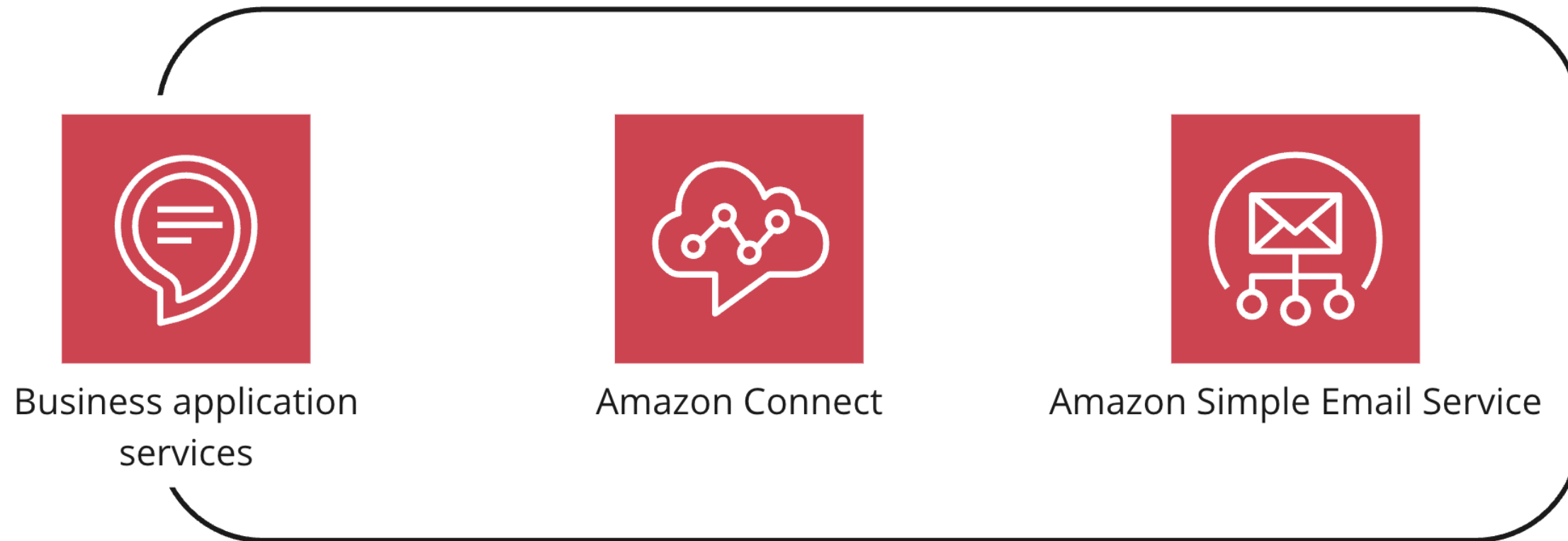
## Use cases

- Send push, SMS, email notifications to customers
- Integrate FIFO messaging between applications



# Business application services

- Streamline operations and enhance efficiency of business applications
- Seamless integration, automation, and improved productivity



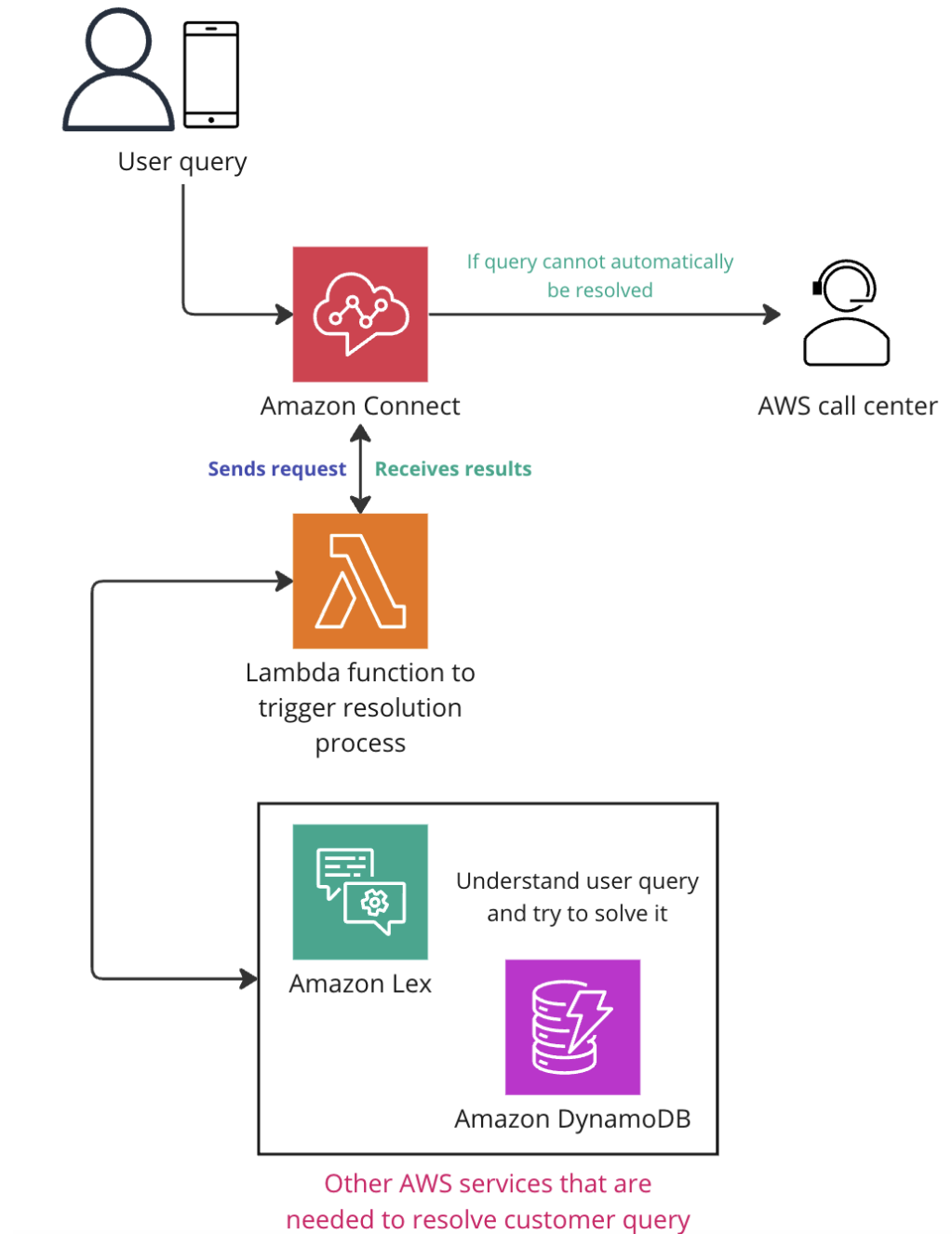
# Stay connected with customers

## Amazon Connect

Cloud-based customer contact center service

### Use cases

- Scalable customer support
- Personalized customer interactions



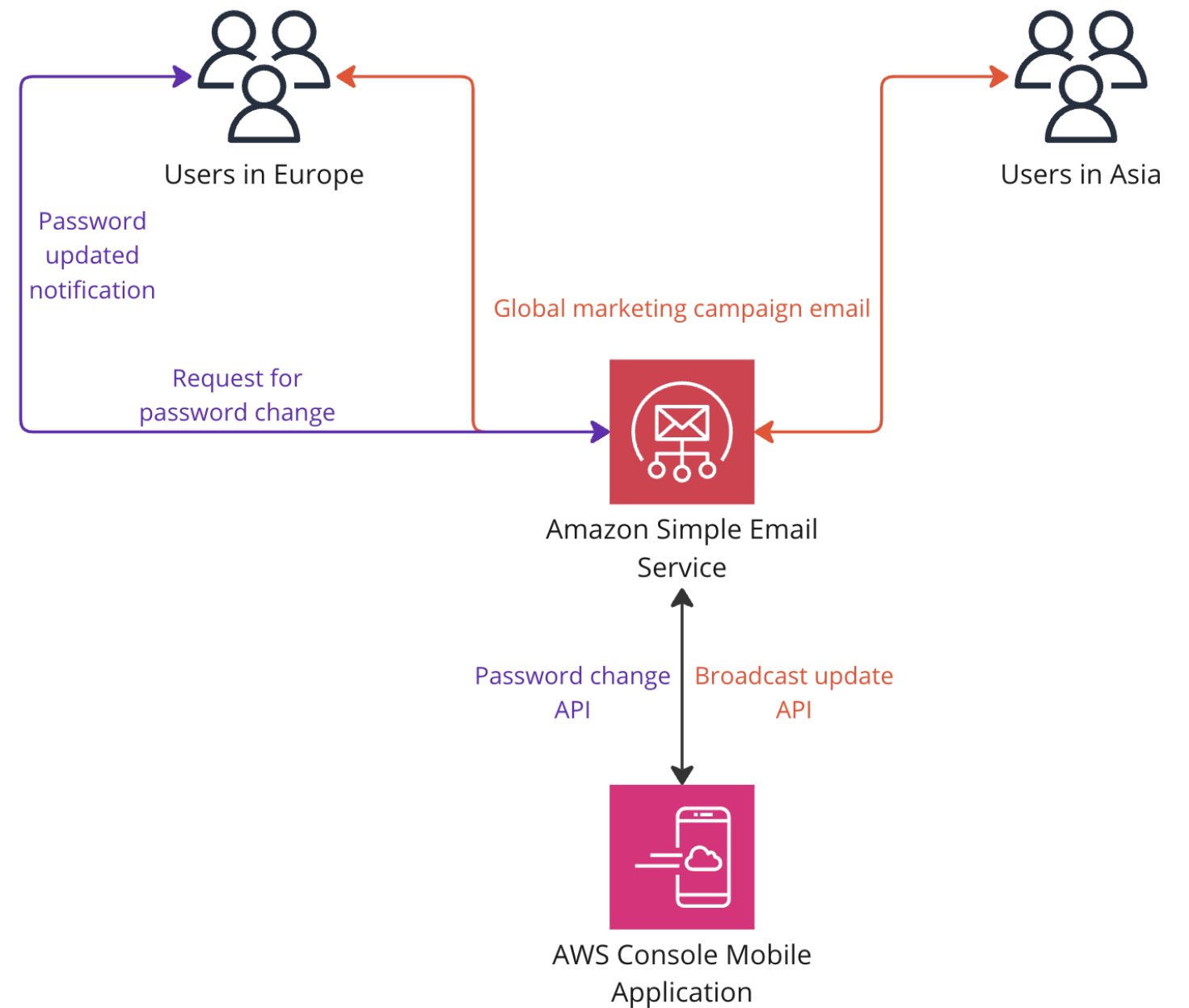


# Amazon Simple Email Service (SES)

Scalable and cost-effective email service supporting marketing and transactional communication

## How is SES used?

- Bulk email sending
- Application-generated emails



# Developer services

- Cohesive environment for simplifying and accelerating the development lifecycle
- Enable collaborative development within teams and tools
- Automated delivery and deployment using CI/CD

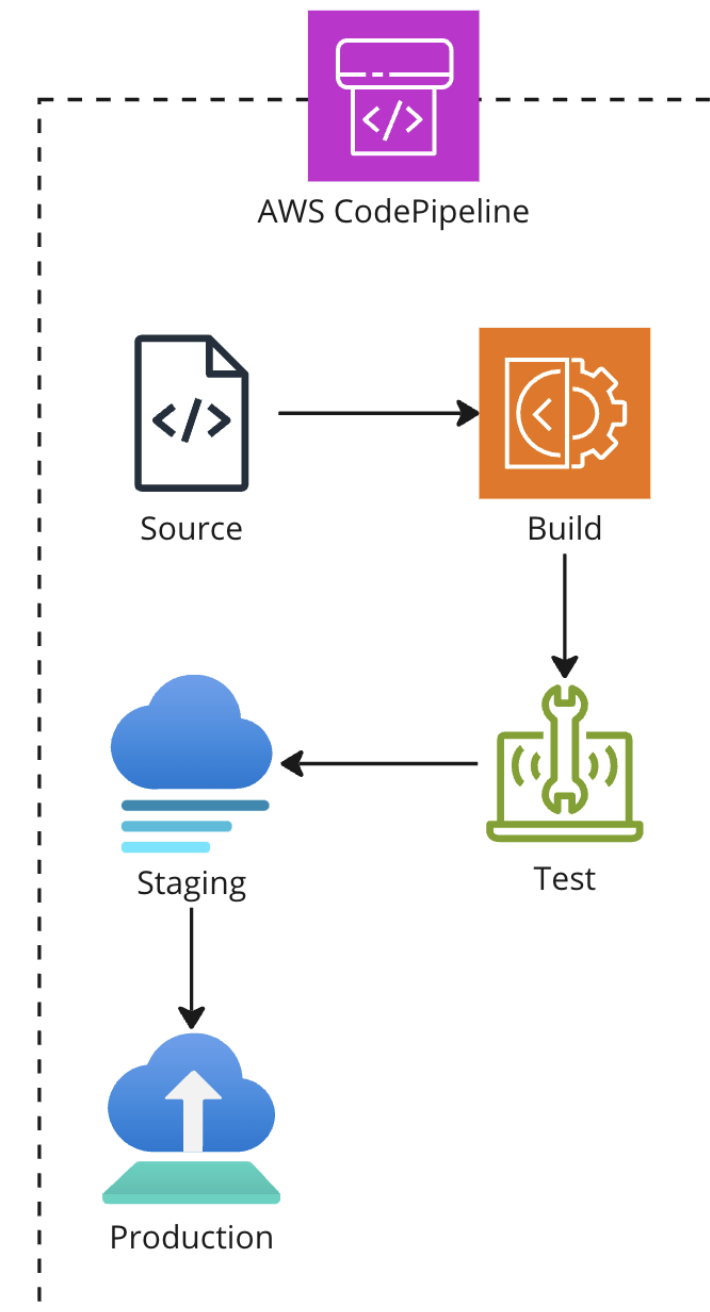


# AWS CodePipeline

Automate continuous delivery pipelines and infrastructure updates

## Use cases

- Update existing pipelines or create new ones with JSON templates
- Real-time notifications on pipeline-affecting events

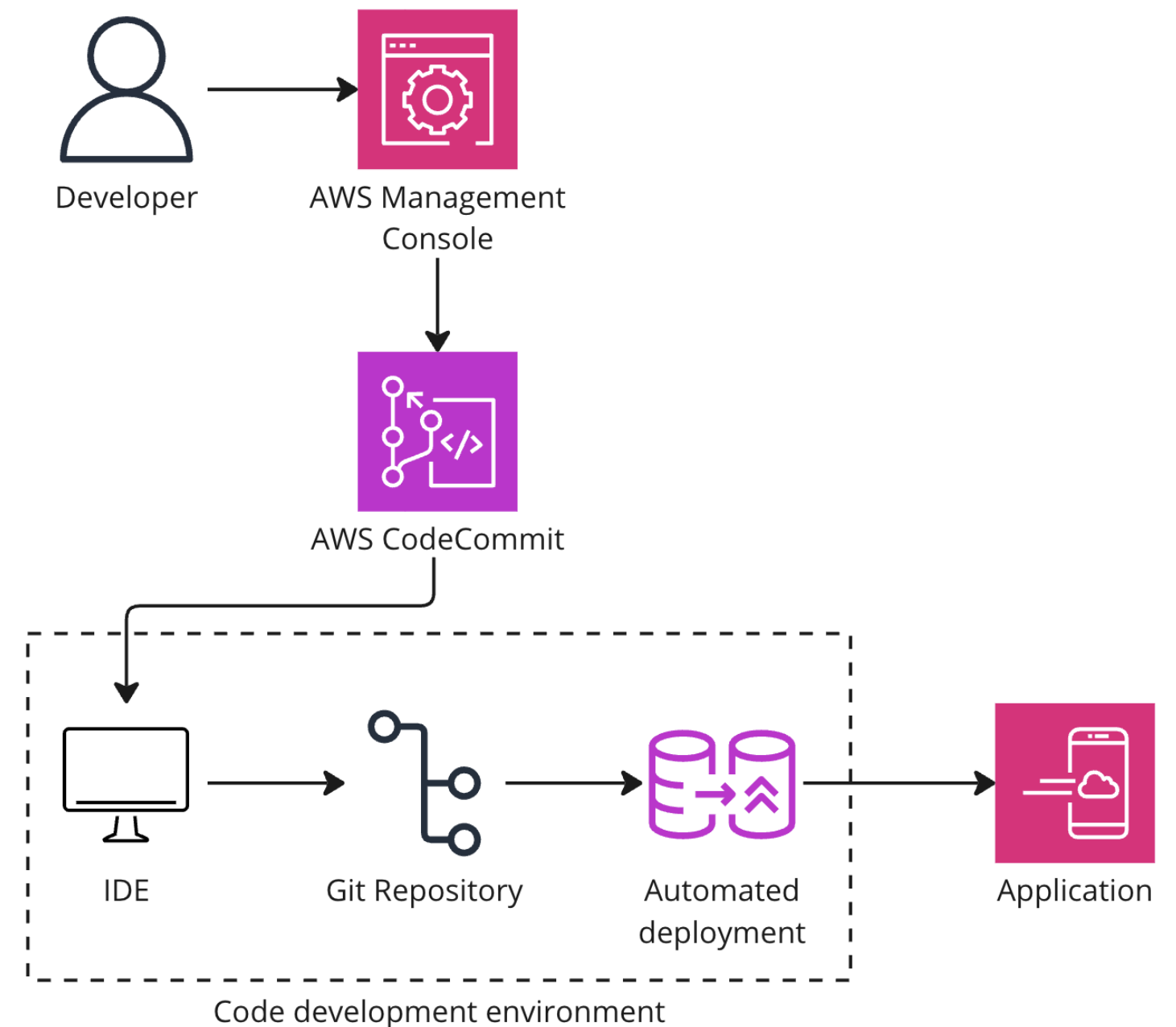


# AWS CodeCommit

Host private Git repositories with a fully managed, scalable source control service

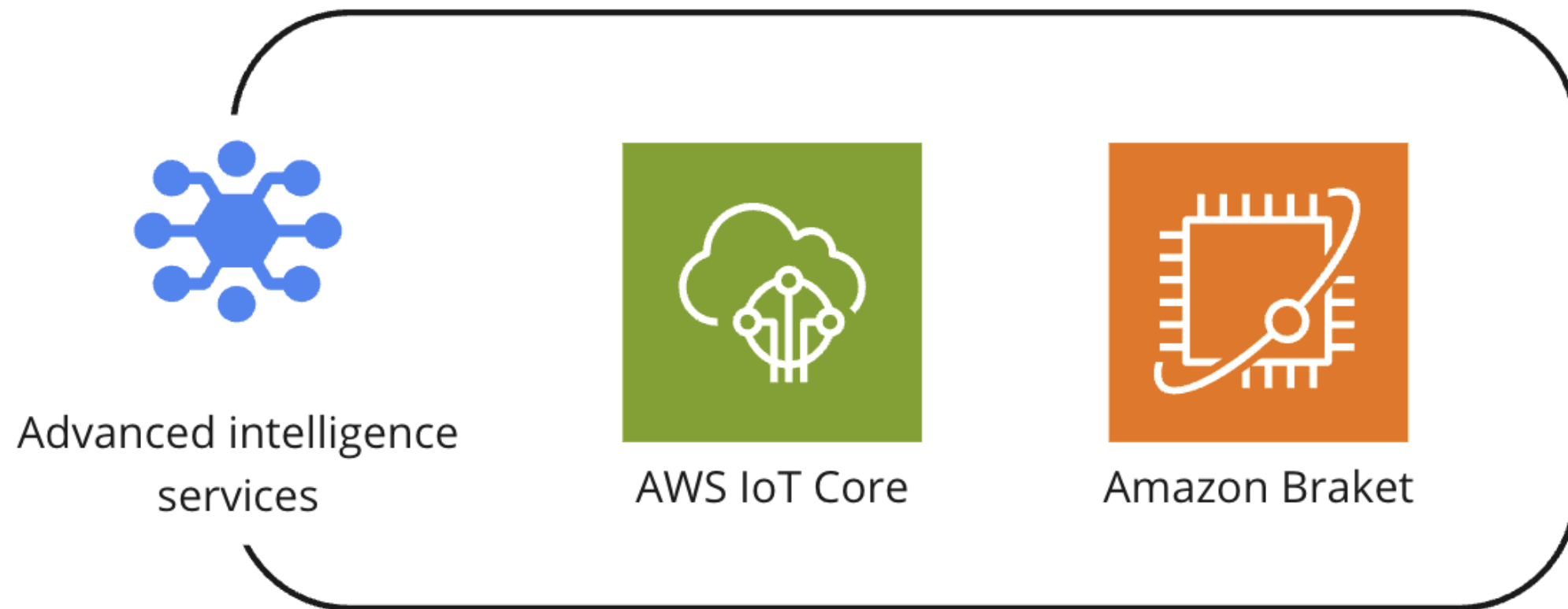
## When to use CodeCommit?

- Facilitate code collaboration with built-in code reviews
- Seamlessly use existing tools, plugins, CI/CD systems, and graphical clients



# Advanced intelligence services

- Extend artificial intelligence reach by linking it to physical devices
- Expand computational capabilities with revolutionary quantum processing technology

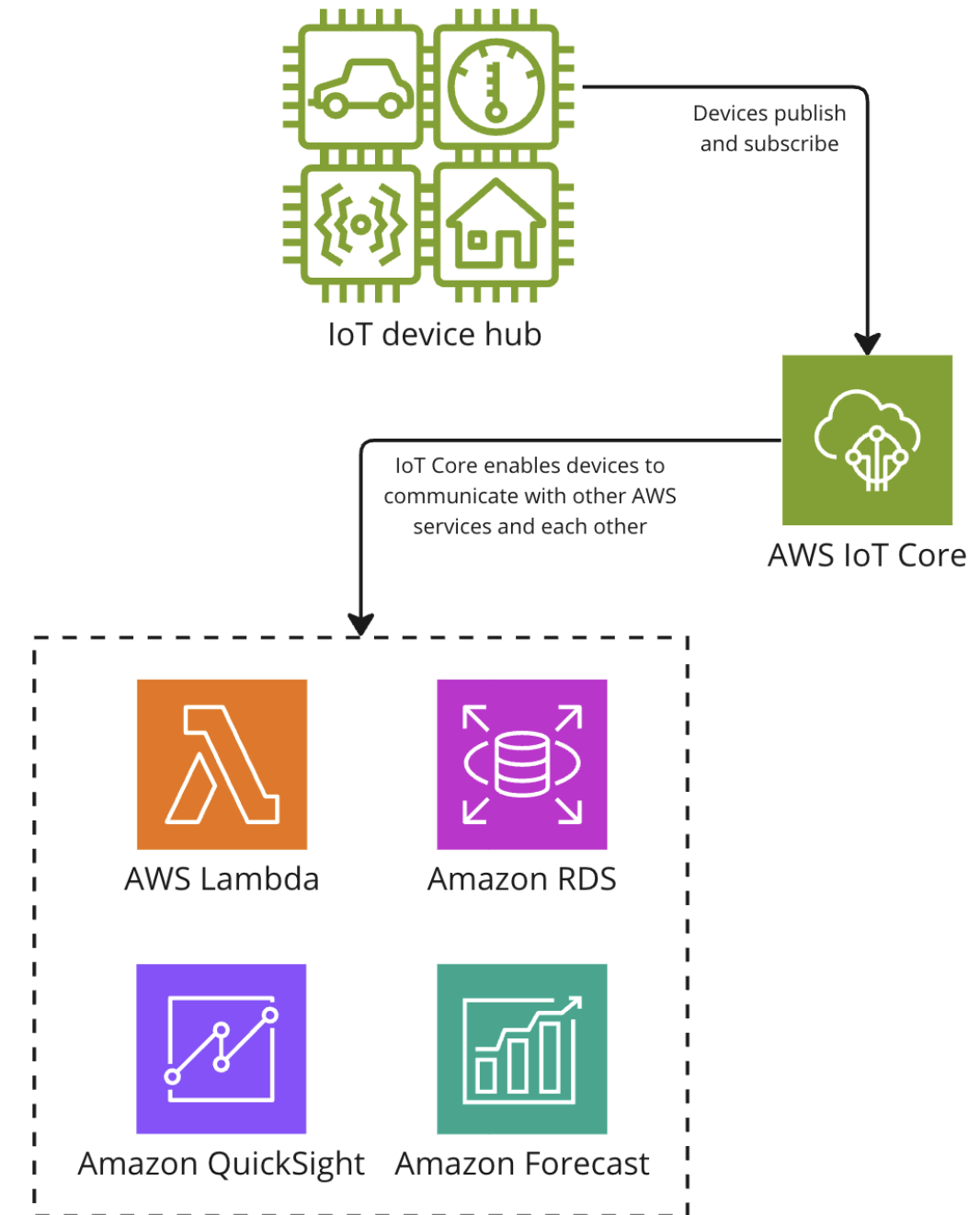


# AWS IoT Core

Secure connections for IoT devices to the cloud, enabling easy device management and scalability

## Use cases

- Develop industrial IoT applications for predictive maintenance and quality monitoring
- Build connected solutions for home automation

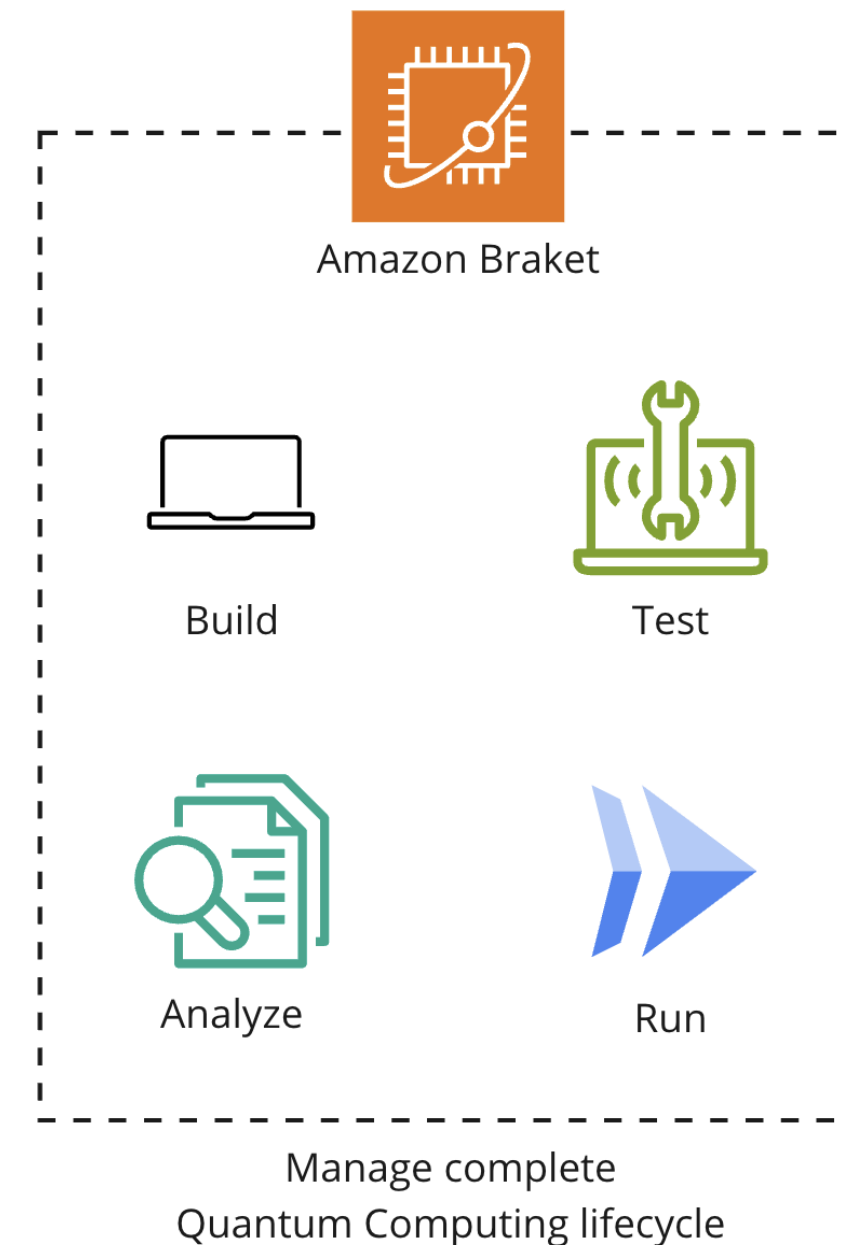


# Amazon Braket

Facilitate quantum computing research with tools, access, and support

## What does Braket do?

- Gives tools for developing quantum algorithms
- Enables testing and exploration of various quantum hardware



# Let's practice!

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS



# Congratulations

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS



**Alex Kuntz**

Head of Cloud Curriculum, DataCamp

# Recap

Core services:

- Compute
- Databases
- Storage
- Networking
- ML & AI
- Analytics



# What's Next?


INTERACTIVE COURSE

## AWS Security and Cost Management

Continue

 Bookmark

• Beginner

 3 hours

 12 videos

 37 exercises

 1,171 participants

2400 XP

- How do you ensure your cloud services are secure?
- How do you keep cloud costs low?

# Congratulations

AWS CLOUD TECHNOLOGY AND SERVICES CONCEPTS