

# AWS State, Local, and Education Learning Days

Phoenix, AZ

3:15pm – 4:15pm

**300**  
level

Designing modern applications in AWS

Unlock Serverless Potential: Reduce Costs, Boost Scalability, and Enhance Security with Cloud-Native Architectures.

**aws Learning Days**  
State, Local, and Education



# Designing modern applications in AWS

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# Voice of the Customer

- What's your biggest challenge when modernizing legacy applications?
- What keeps you up at night about your current application architecture?
- How many of you have experience with Infrastructure as Code?

# Architecting on AWS is different

## Legacy

Monolith (app + DB tightly coupled)

Vertical scaling (big VMs)

One language/stack

Manual deployments

Fragile updates

Owned infrastructure

## Modern (AWS)

Modular (microservices, event, SOA) architectures

Automated scaling

Polyglot, fit-for-purpose technology

Automated pipelines (CI/CD)

Independent service delivery

Managed services, focus on delivery business value

# Architecting on AWS is different

- It's not just about stringing together services, but about building scalable, elastic, resilient, secure, reliable and cost-efficient solutions using managed cloud-native services
- Leverage cloud-scale, robust infrastructure
- The cost model frees architects up to do more & more cost-efficiently; promotes innovation
- Emphasis on composable architectures of distributed, modular & reusable components; generally, service-oriented

# Architecting on AWS is different

- Servers/hosts are no longer the atomic unit of architecture
- Infrastructure-as-code: infrastructure as cattle, not pets
- Hyper automation as a strategy
- Expanded integration and orchestration pathways (asynchronous, event-driven, “everything-as-an-API” decoupling)

# Principles of Modern Cloud System Architecture

## Systems

Build flexibly for the future with loosely coupled services and component-based architecture



Require auto-scaling and load balancing



Use purpose-built services



Govern architecture across the enterprise



Ensure performance and skill alignment



Offer seamless storage functionality



Decouple infrastructure & experience



Work backwards from business needs



Leverage automation and containers

# Principles of Modern Cloud System Architecture

## Experience

Deliver holistically with user-centered design, accessibility, and reusable components



Require scalable public and worker interfaces



Segment and personalize



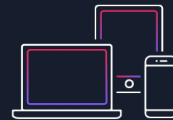
Develop a unified design approach



Ensure performance and skill alignment



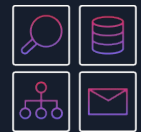
Use seamless data to make decisions



Decouple data and channels



Work backwards from user needs



Leverage reusable components

# What is the AWS Well-Architected Framework?



Pillars & Lenses



Design principles



Questions



Best Practices

# Pillars of the AWS Well-Architected Framework

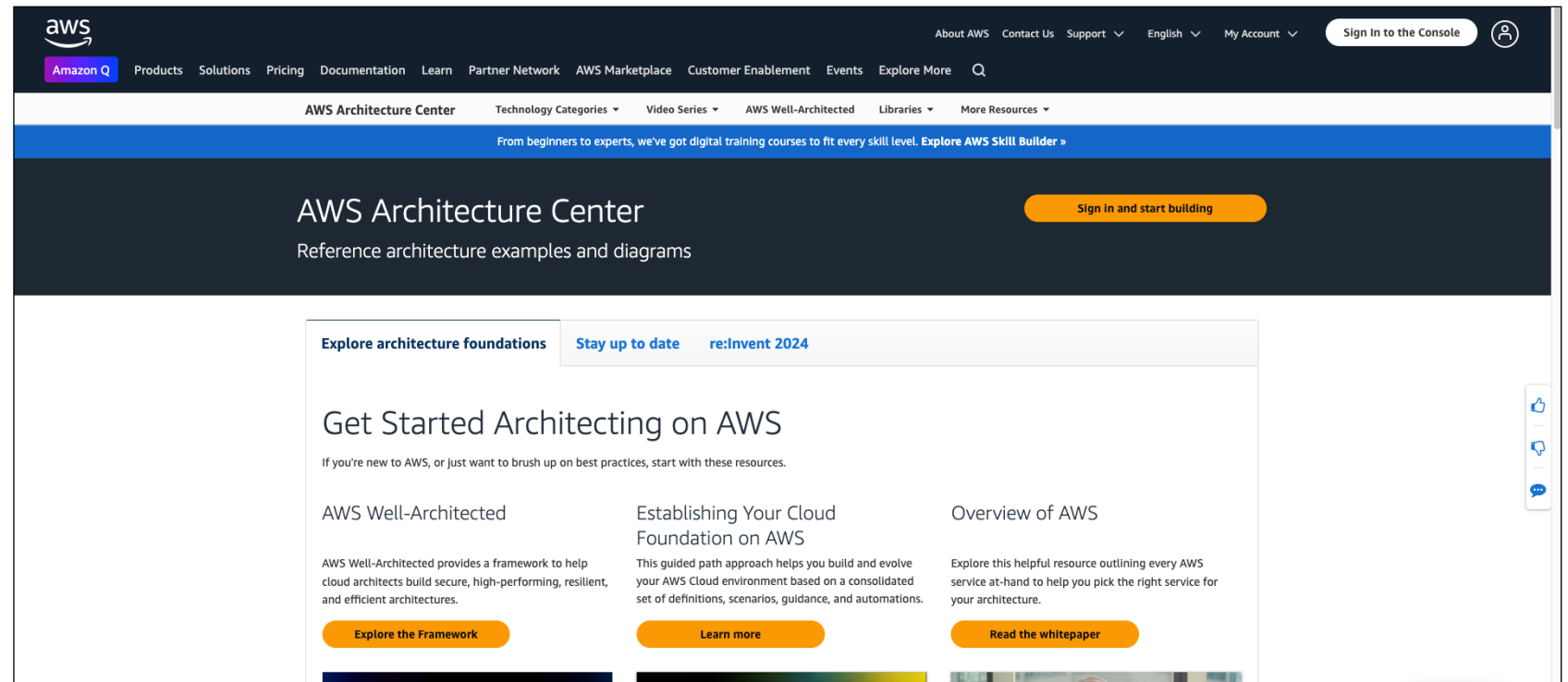


# AWS Architecture Center

- Library of content including
  - Patterns
  - Reference Architectures
  - Guidance
  - Solutions, and more
- Links and other resources for architecting on AWS
- Video Series like 'This is My Architecture' and 'How to Build This'
- Architecture Best Practices



<https://aws.amazon.com/architecture>



The screenshot shows the AWS Architecture Center homepage. At the top, there's a navigation bar with the AWS logo, 'Amazon Q', and various menu items like 'Products', 'Solutions', 'Pricing', 'Documentation', 'Learn', 'Partner Network', 'AWS Marketplace', 'Customer Enablement', 'Events', and 'Explore More'. A search icon is also present. Below the navigation bar, there's a sub-navigation bar with 'AWS Architecture Center' and several dropdown menus: 'Technology Categories', 'Video Series', 'AWS Well-Architected', 'Libraries', and 'More Resources'. A blue banner below this contains the text 'From beginners to experts, we've got digital training courses to fit every skill level. Explore AWS Skill Builder >'. The main heading is 'AWS Architecture Center' with a sub-heading 'Reference architecture examples and diagrams' and a 'Sign in and start building' button. Below this, there's a section titled 'Explore architecture foundations' with a 'Stay up to date' link and a 're:Invent 2024' tag. The main content area features a 'Get Started Architecting on AWS' section with a sub-heading 'If you're new to AWS, or just want to brush up on best practices, start with these resources.' Below this, there are three columns of content: 'AWS Well-Architected' with a 'Explore the Framework' button, 'Establishing Your Cloud Foundation on AWS' with a 'Learn more' button, and 'Overview of AWS' with a 'Read the whitepaper' button. A vertical sidebar on the right contains social media sharing icons.



# Let's get out the chalk



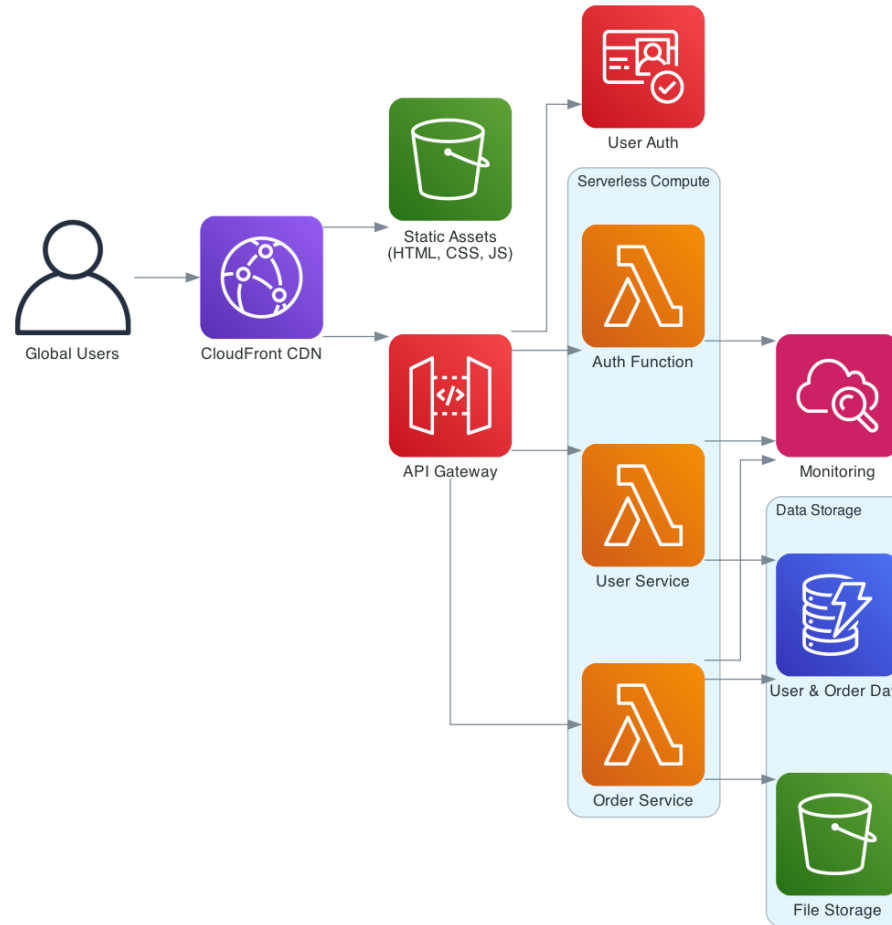
# Chalk #1 Traditional vs Modern



Traditional vs Modern Architecture

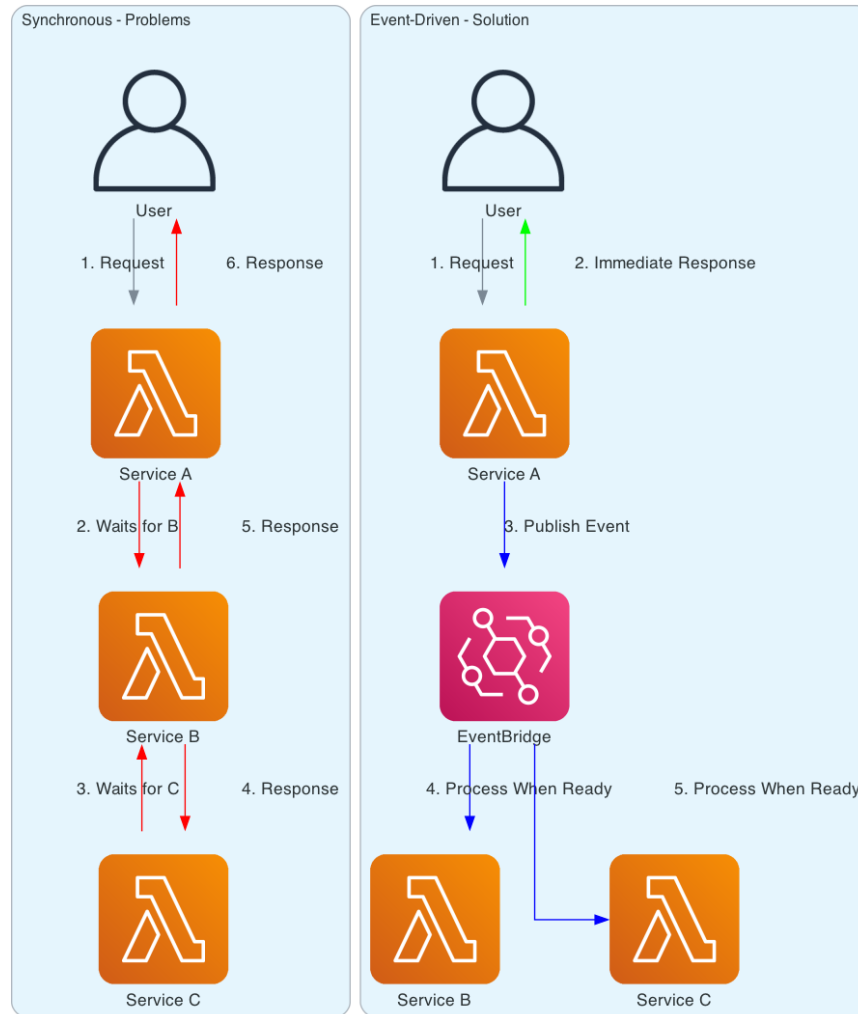


# Chalk #2 Modern Web App



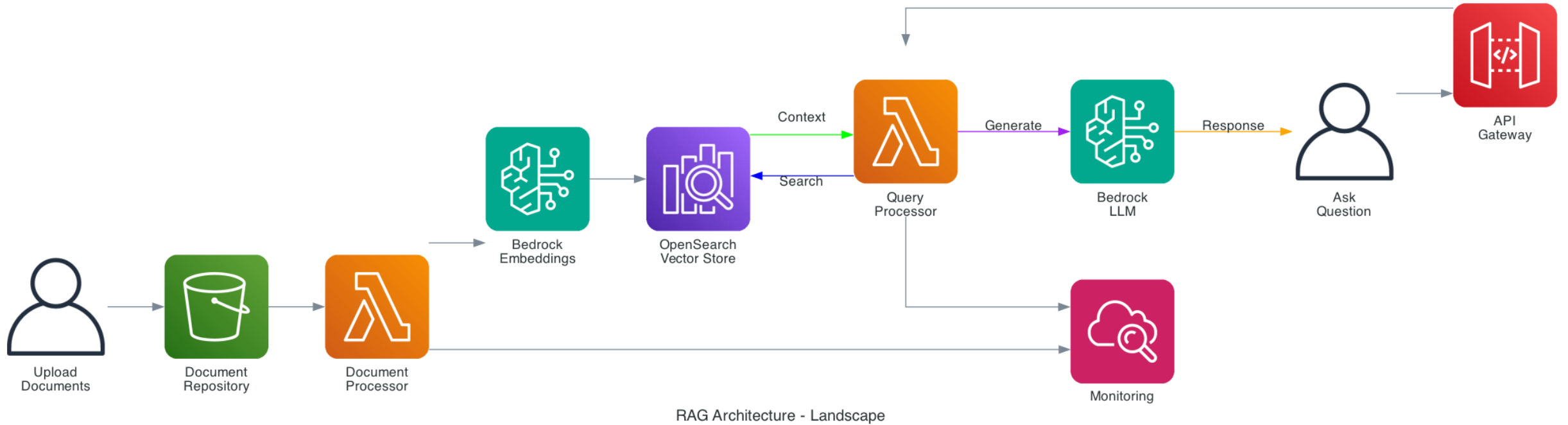
Modern Web Application - Step by Step Build

# Chalk #3 Synchronous vs Event Driven

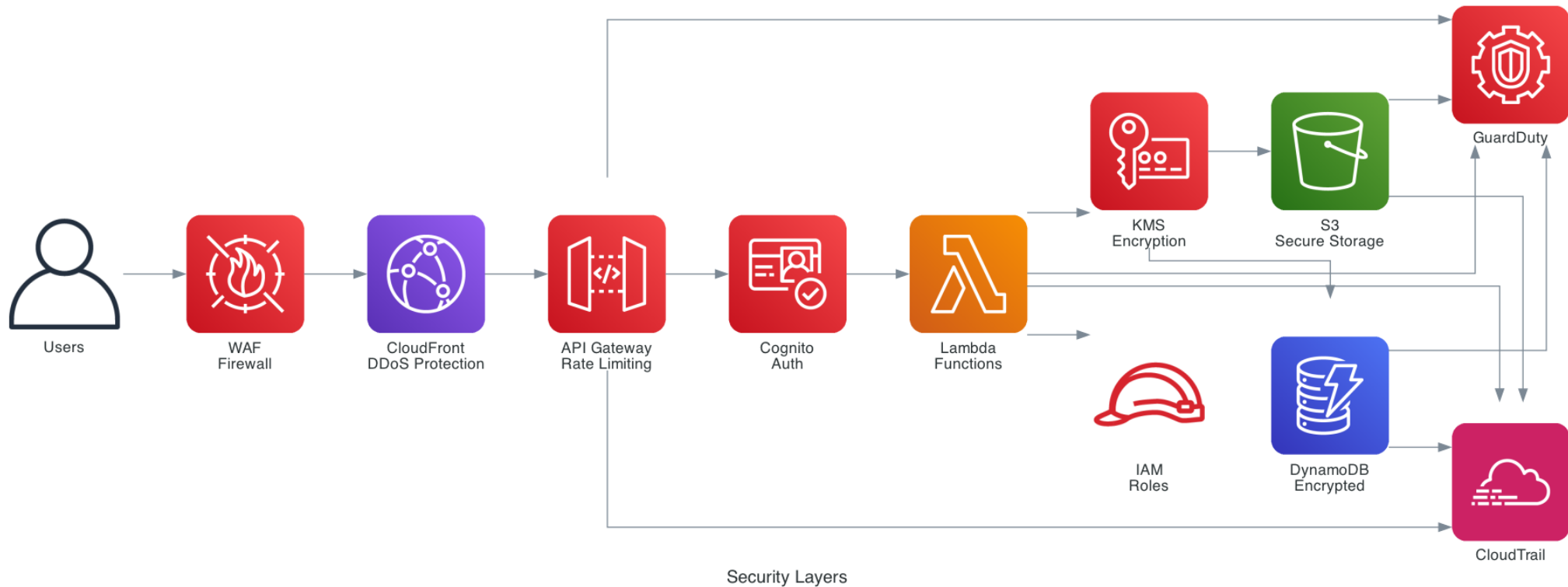


Event-Driven vs Synchronous

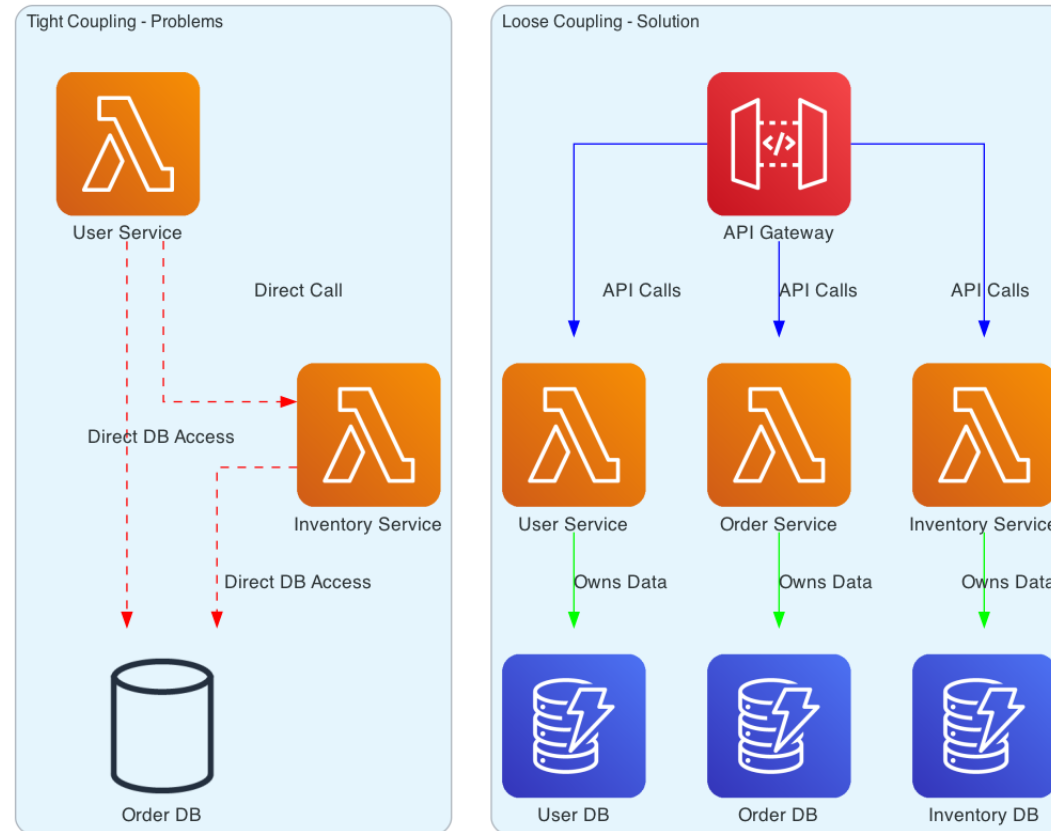
# Chalk #4 Rag Architecture



# Chalk #5 Security Layers

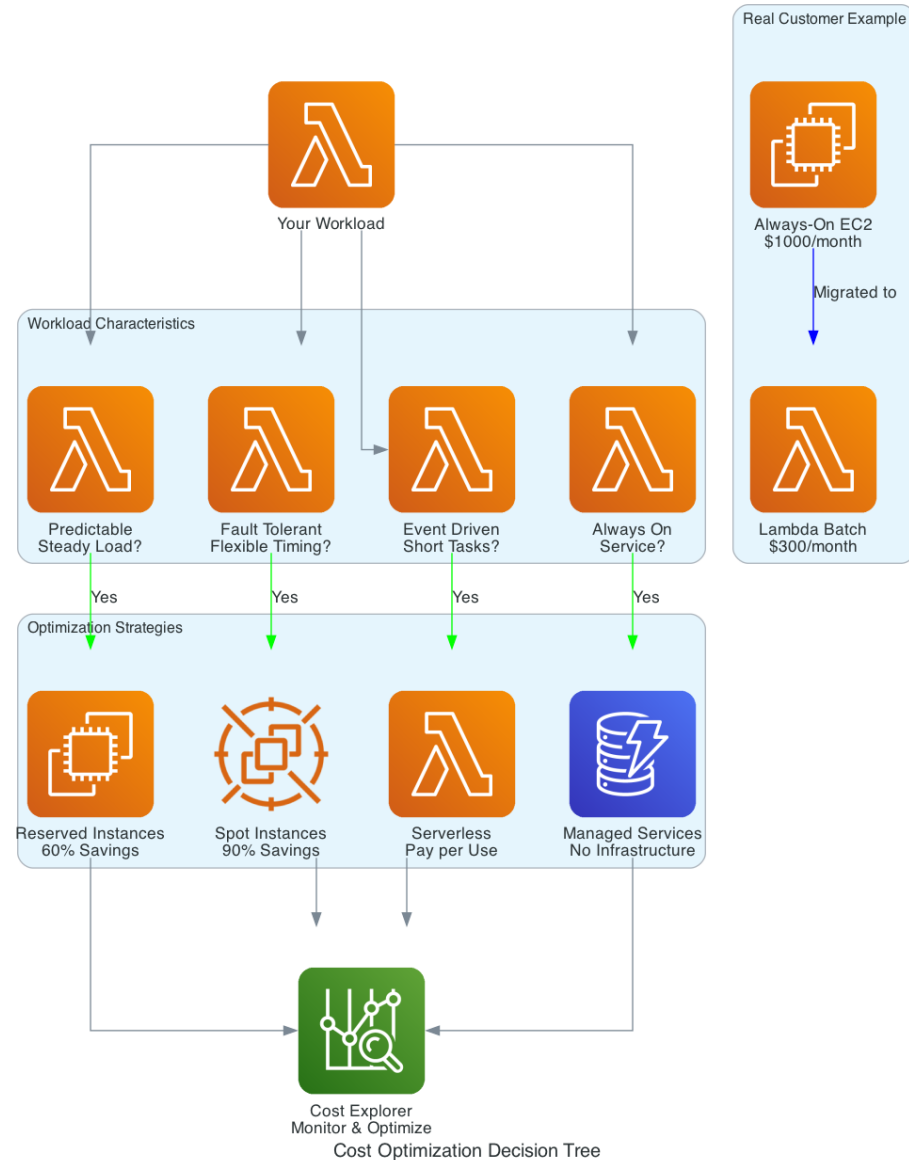


# Chalk #6 Loose Coupling

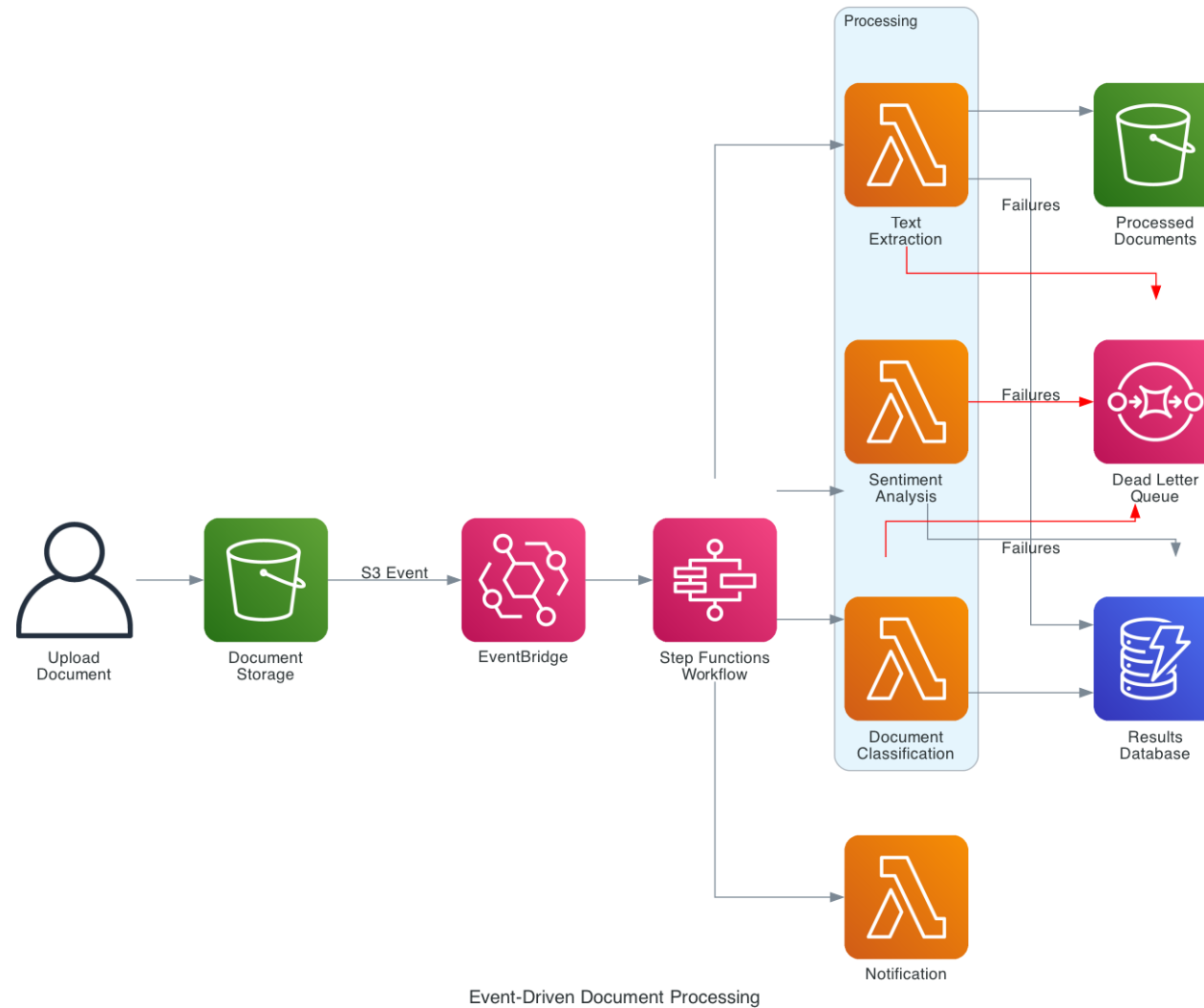


Loose Coupling - Before and After

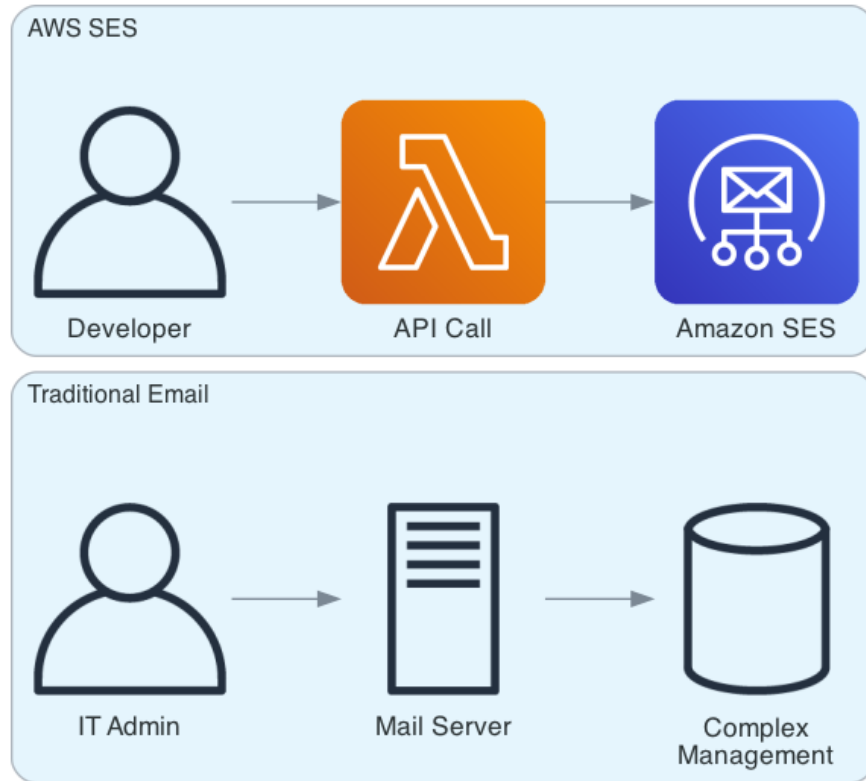
# Chalk #7 Cost Optimization



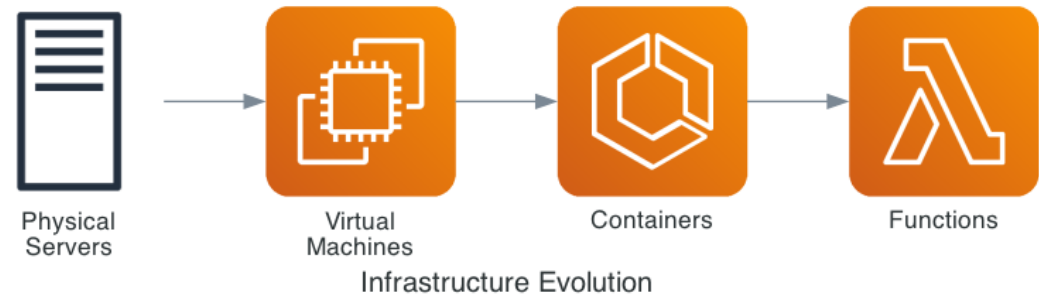
# Chalk #8 Event Driven Document



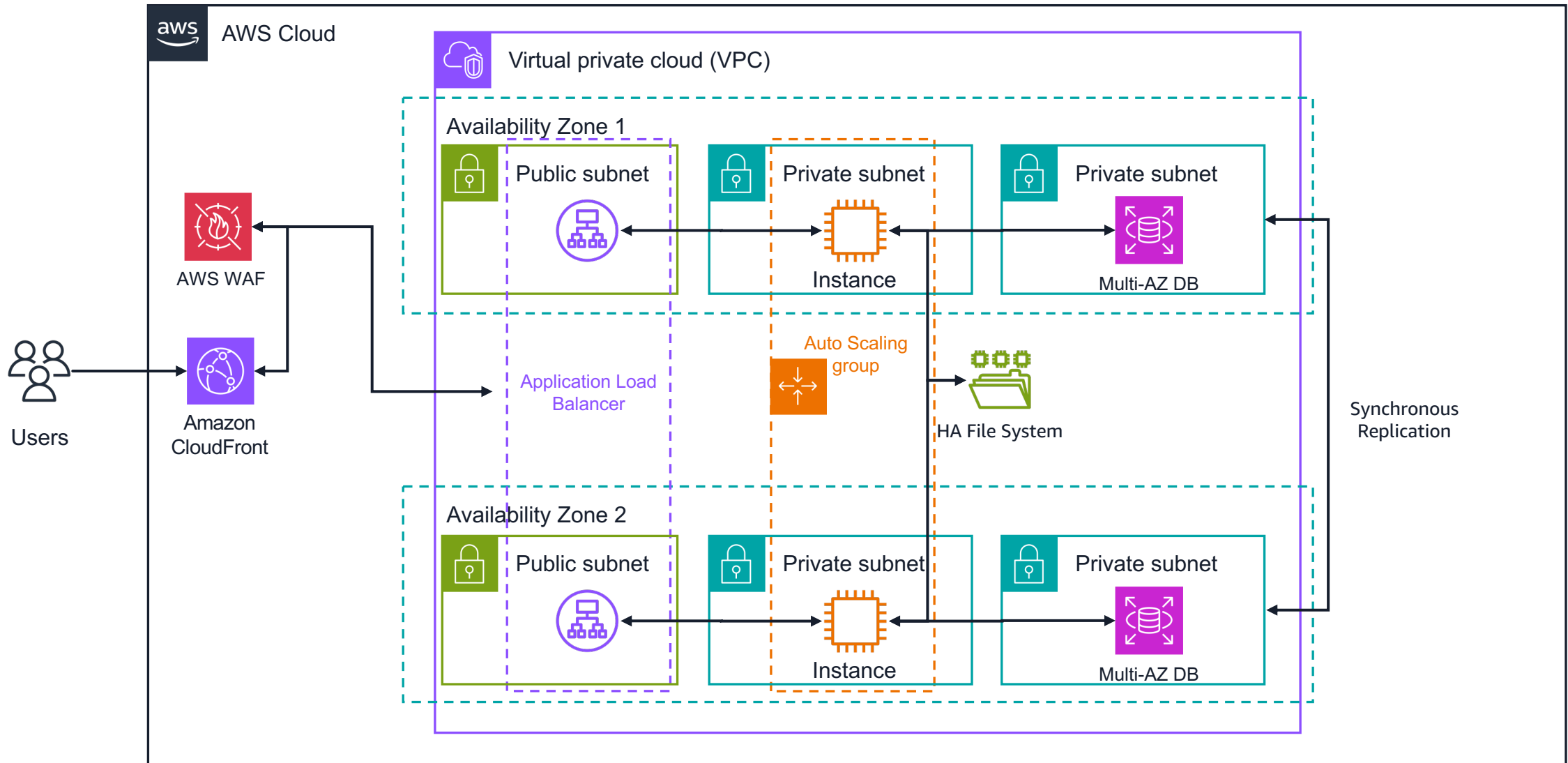
# Chalk #9 Traditional Evolutions



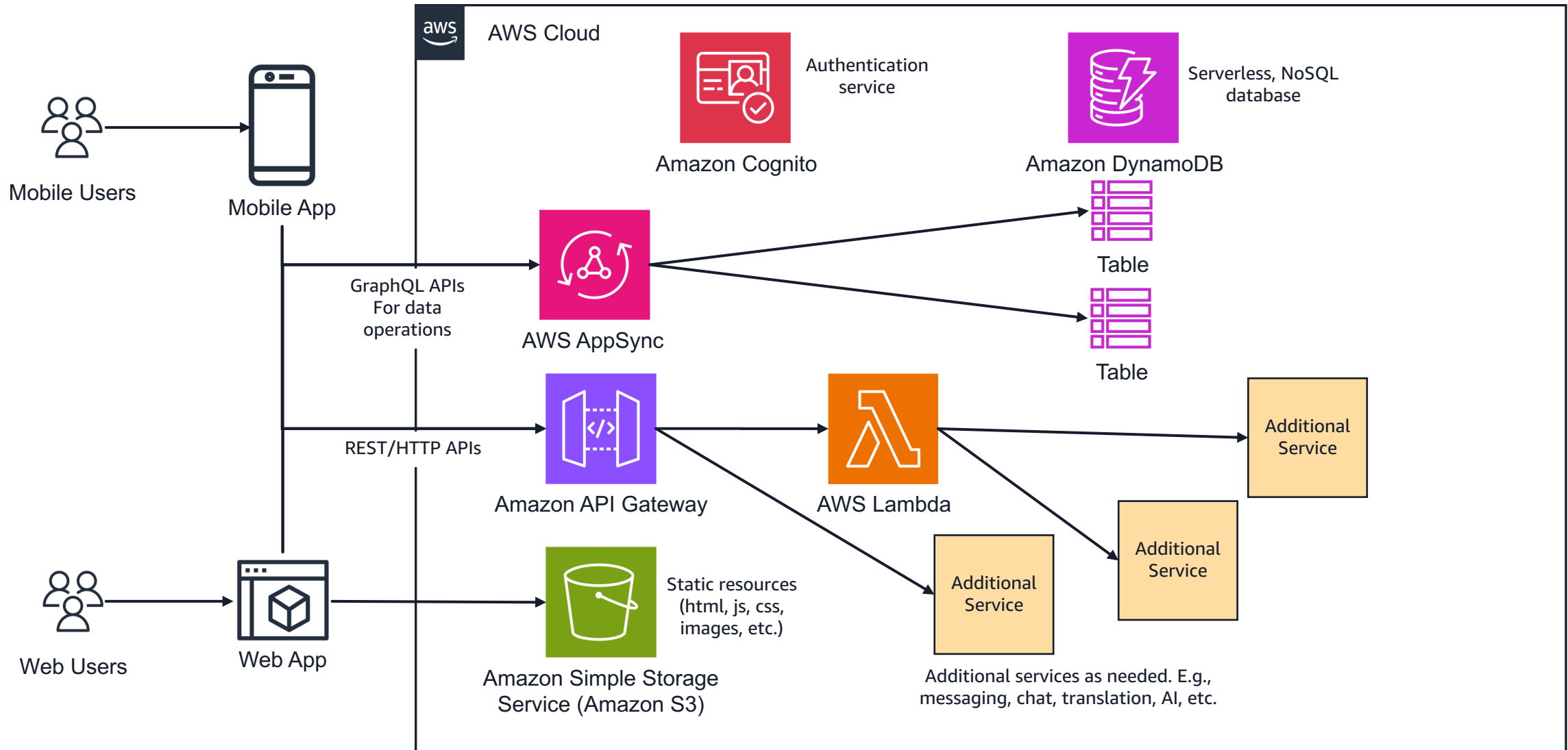
Traditional vs AWS Email



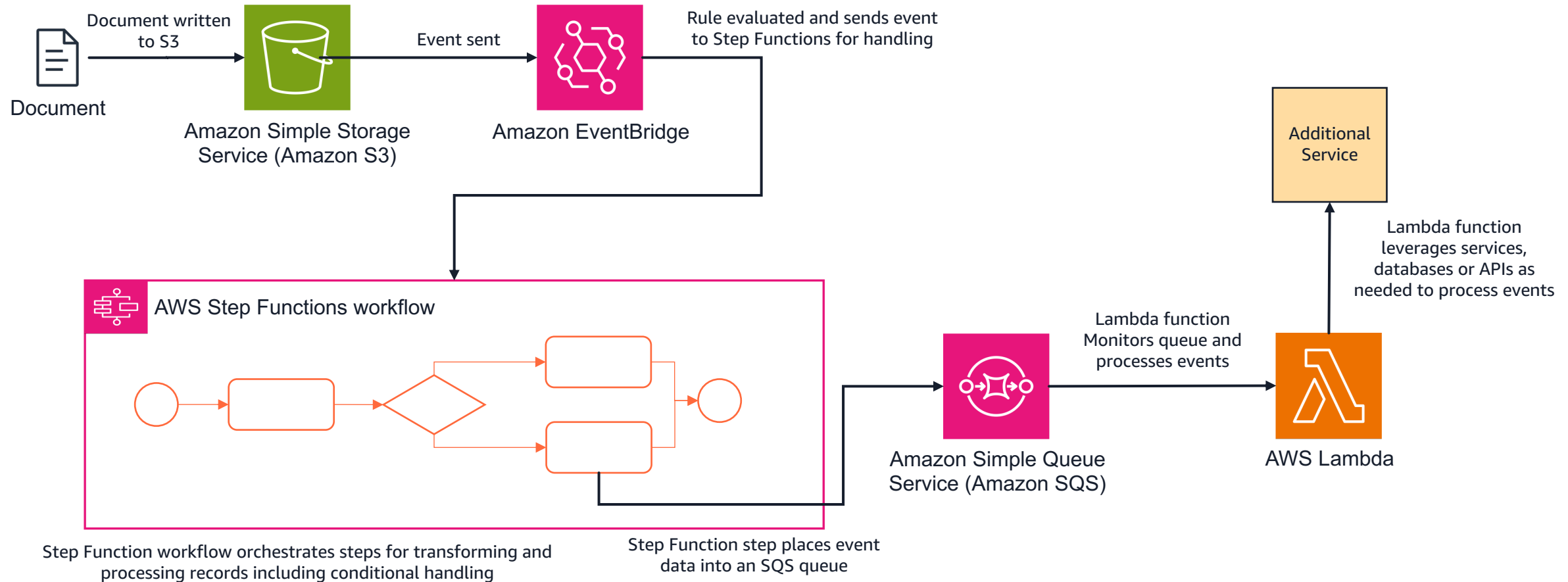
# Highly Available 3-Tier Application



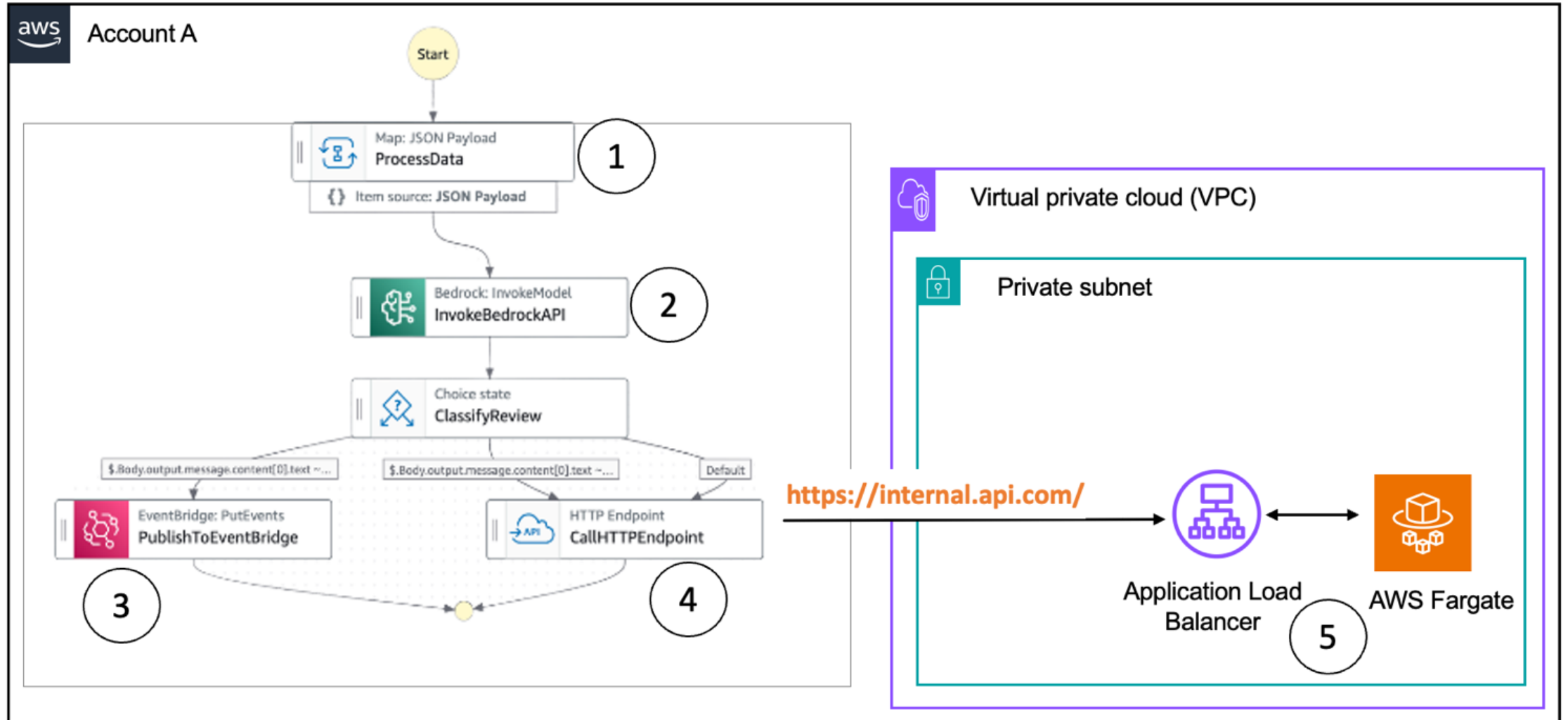
# Serverless Web/Mobile Application with APIs



# Event-driven processing

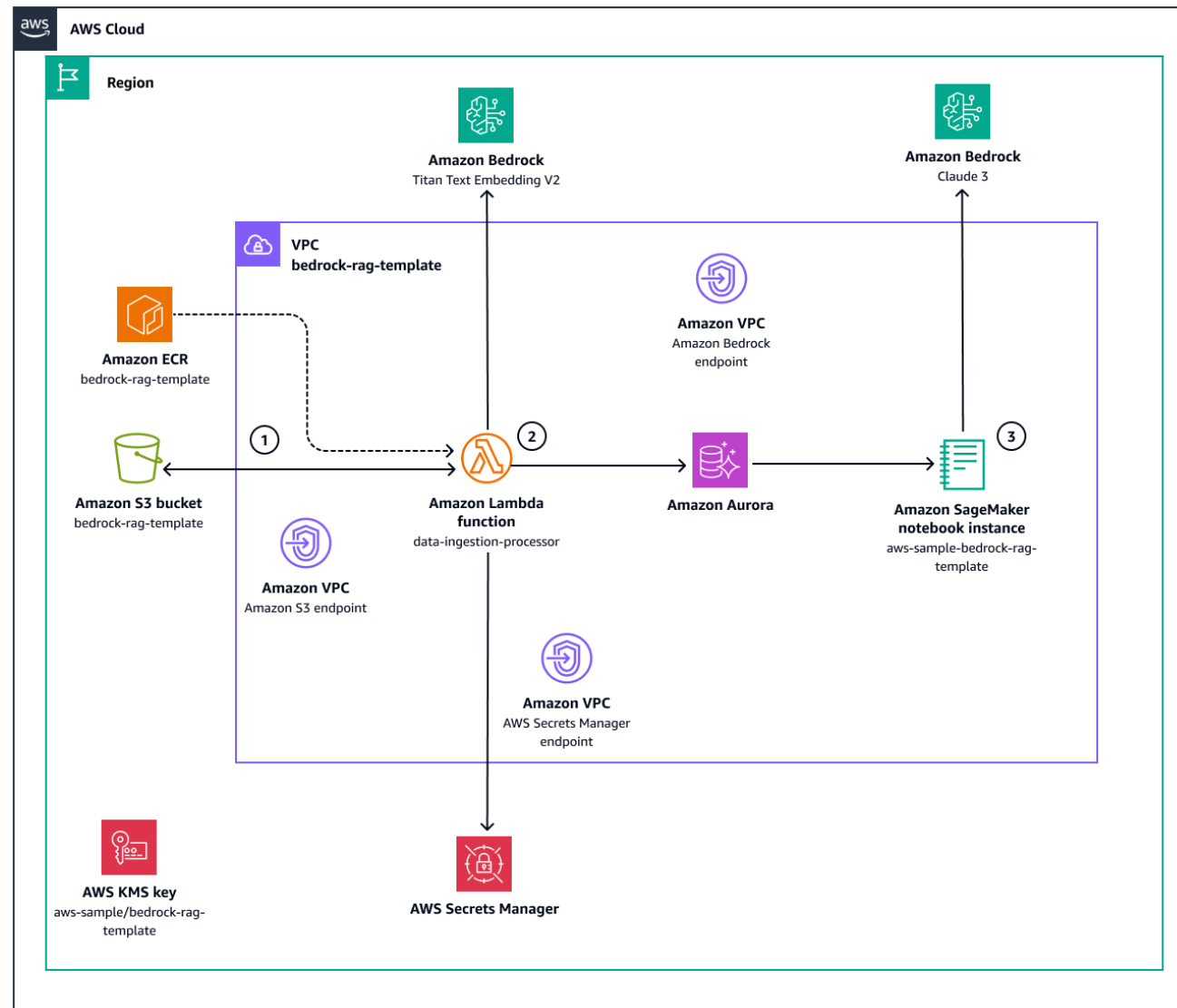


# Orchestrated Asynchronous Processing



Source: <https://aws.amazon.com/blogs/compute/simplifying-private-api-integrations-with-amazon-eventbridge-and-aws-step-functions-2/>

# Generative AI RAG Architecture



Source: <https://docs.aws.amazon.com/prescriptive-guidance/latest/patterns/deploy-rag-use-case-on-aws.html>





# Thank you!

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for this session



**Track: Cloud Fundamentals**

Session: Designing modern applications in AWS