
AWS
re:Invent
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WPS306-R

Using serverless & container services for public sector applications

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AWS

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Agenda

Computing in modern applications

Design factors for serverless and containers

Modern app public sector use cases

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Computing in modern applications



AWS Lambda

Event-driven serverless compute



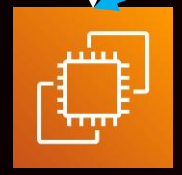
Amazon Elastic Container Service (Amazon ECS)

Fully managed container orchestration



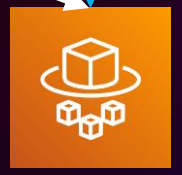
Amazon Elastic Kubernetes Service (Amazon EKS)

Fully managed container orchestration for Kubernetes



Amazon EC2

Scalable VM



AWS Fargate

Serverless compute for containers (ECS and EKS)

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Design factors

Scaling

Resiliency

Resource configuration

AWS service integration

Decision Checkpoint 1

Security

Tooling

Open-source software (OSS) prioritization

Decision Checkpoint 2

Total cost of ownership (TCO)

Ops and management overhead

Time to market

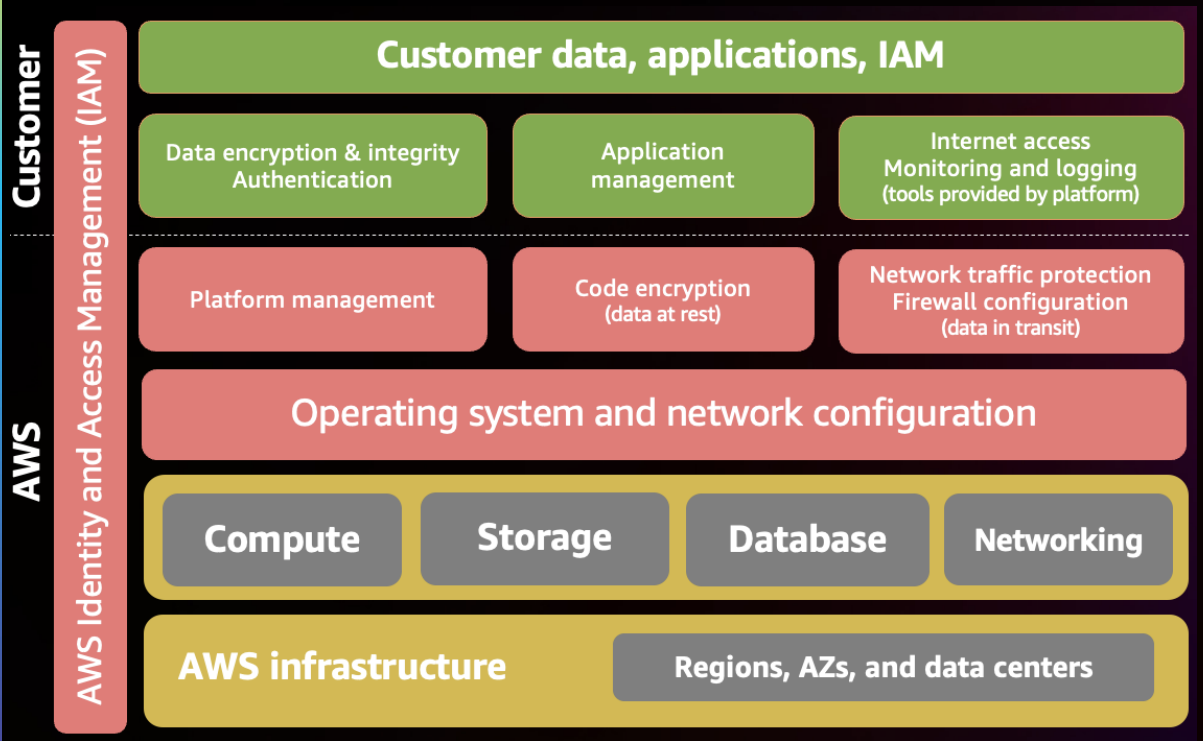
Decision Checkpoint 3

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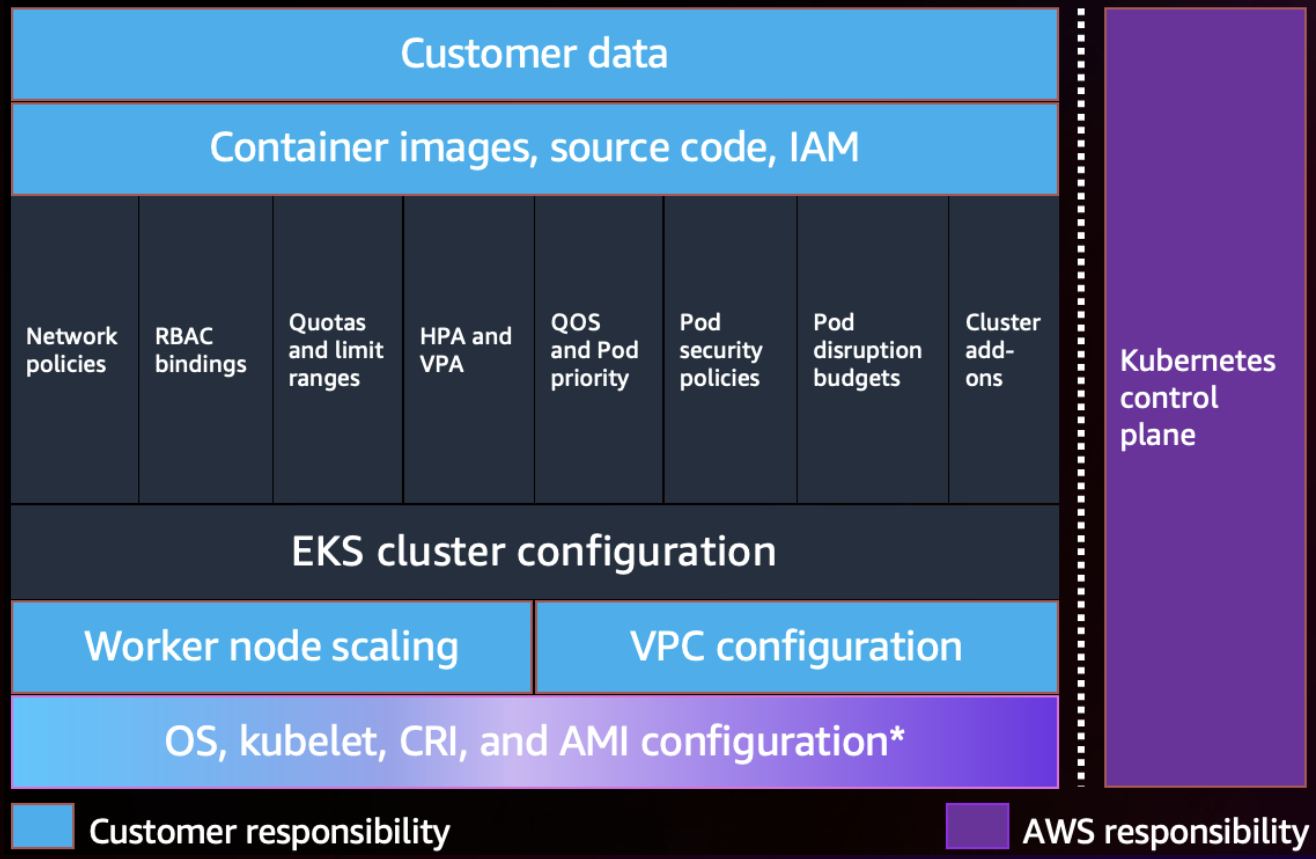
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Shared responsibility model

Serverless



Amazon EKS with managed node group



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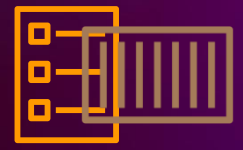
Resource configuration



AWS Lambda

- Allocate memory, CPU allocated proportionally
- Choose memory from 128 MB to 10 GB
- CPU core allocated proportionally between 1 and 6 cores
- Max runtime 15 minutes
- Choose between x86 or Graviton





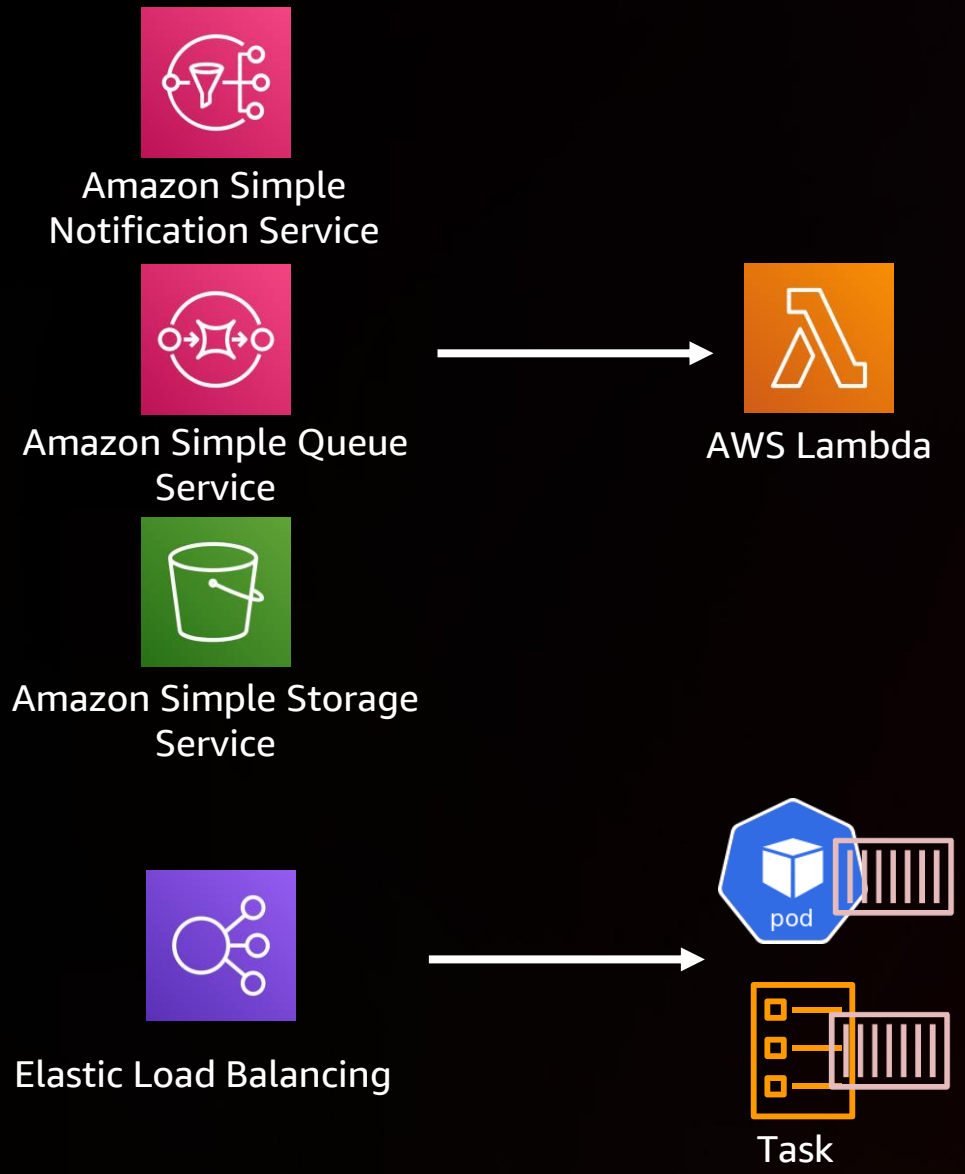
Task

- Configure CPU, memory allocation
- Can choose underlying EC2 instance type appropriate to workload
- For Fargate, max memory is 120 GB, max CPU is 16 vCPU

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AWS service integration



- Lambda has out-of-the-box integration with 100+ AWS services
- EKS and ECS primarily exposed with ALB/NLB

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Serverless and containers are compliant

FedRAMP

PCI



AWS Lambda

Amazon S3

Amazon CloudFront

Amazon DynamoDB

Amazon Kinesis Data Streams

Amazon Cognito

Amazon API Gateway

Amazon SNS

Amazon EKS

Amazon ECS

https://aws.amazon.com/compliance/services-in-scope/

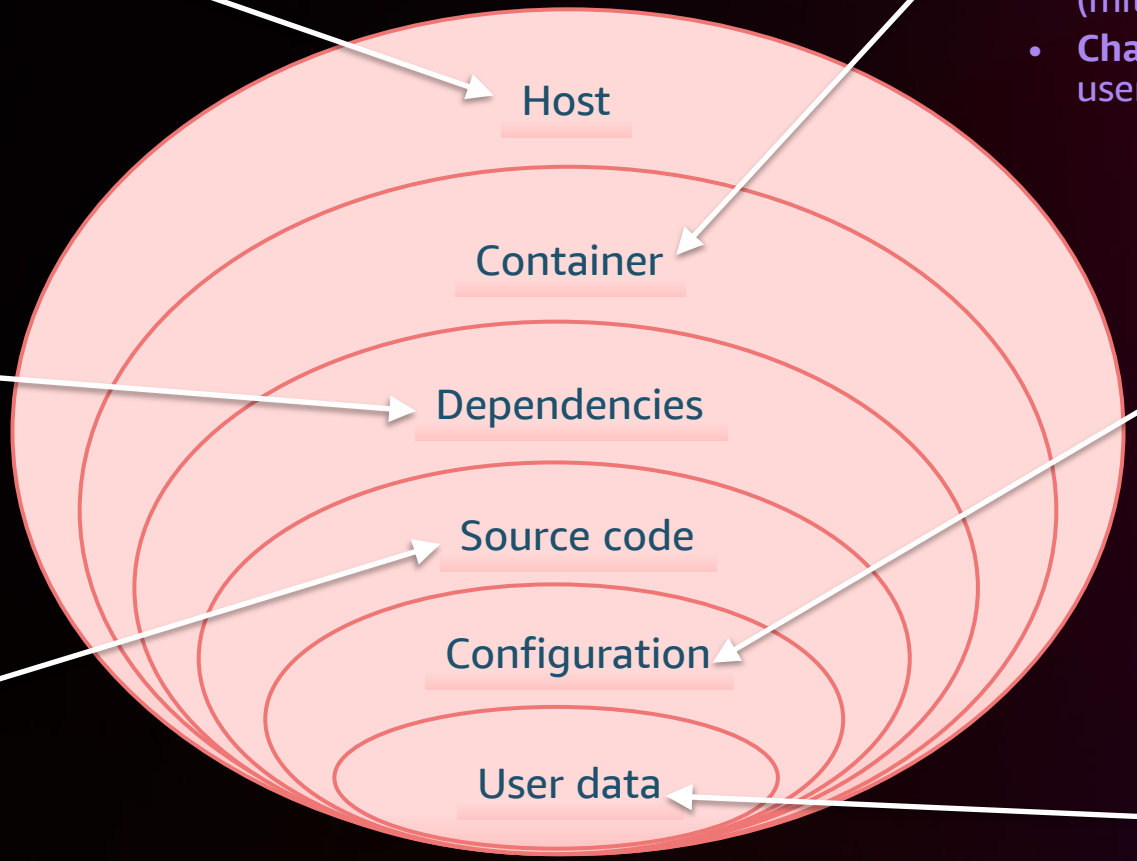
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Container defense in depth model

- Full-blown distro (AL2) vs. container-optimized distribution
- Multi-tenancy requirements
- **Challenges**: Linux packages/CVEs, leaks, GDPR (in Europe)

- Runtime/standards (OCI)
- Immutability of images
- All containers share a kernel (mitigation: Firecracker)
- **Challenges**: unnecessary privileged users, no scans, trust



- Code analysis
- Source available?
- **Challenges**: huge surface, many languages

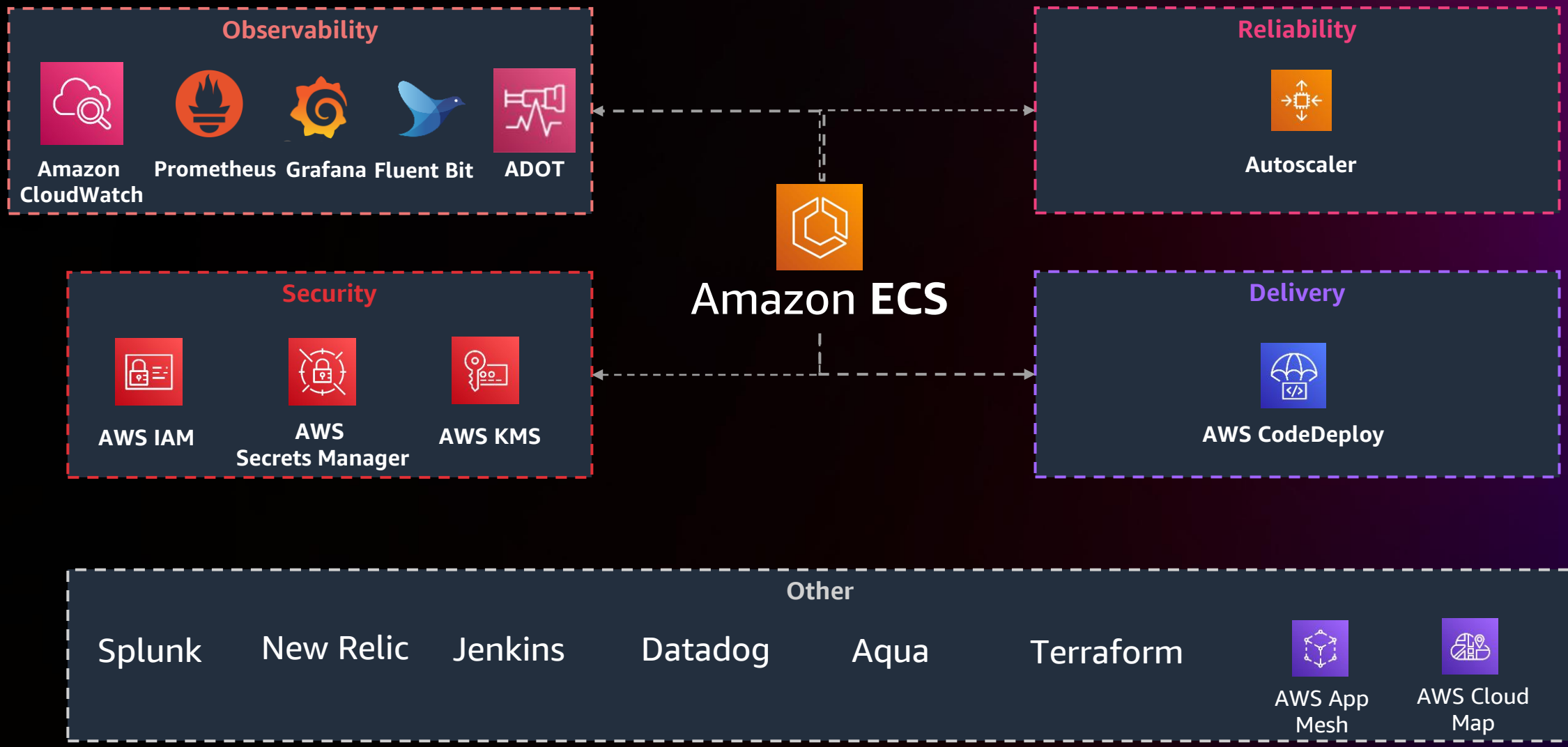
- Sensitive config (such as passwords, API keys)
- **Challenges**: commits-to-source, non-separated access (dev has cleartext password)

- Sanitizing user input
- Static code analysis
- **Challenges**: log leaking

- Business core data
- Personally identifiable information (PII)
- **Challenges**: leaks, GDPR (in Europe)

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ECS tooling



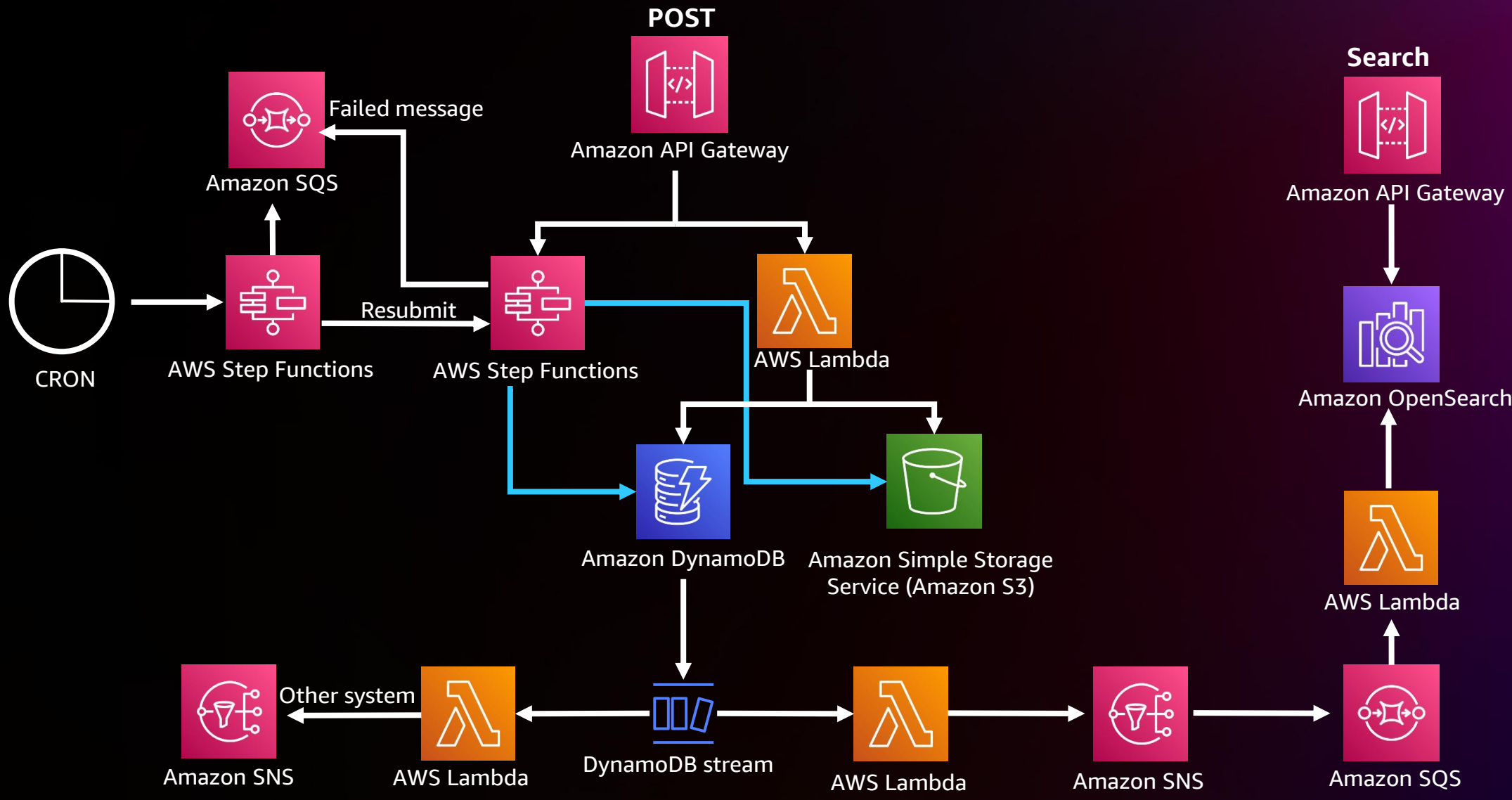
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EKS tooling



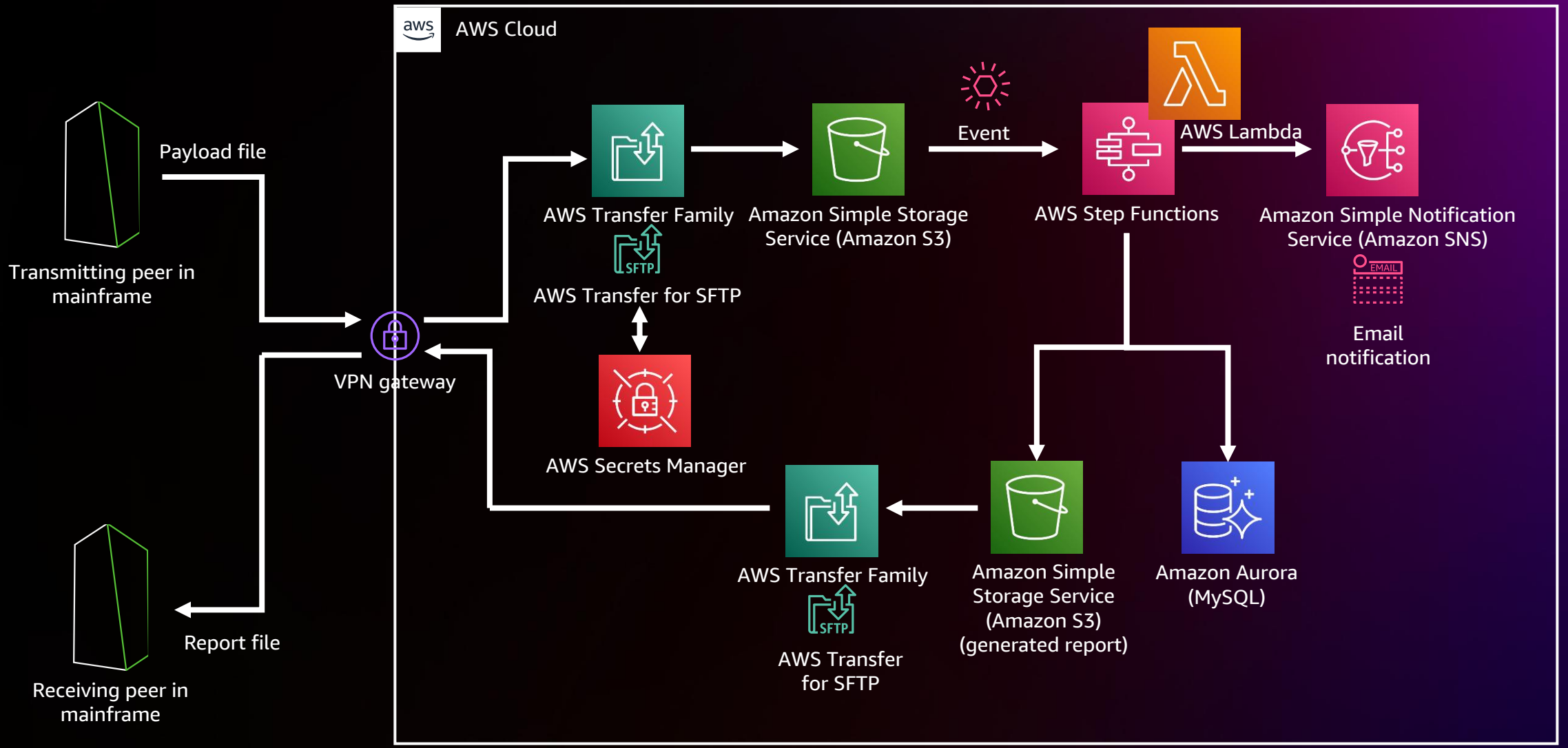
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Tyler Technologies serverless electronic warrants



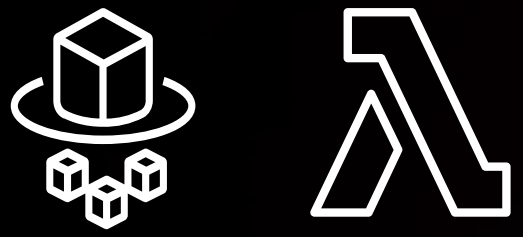
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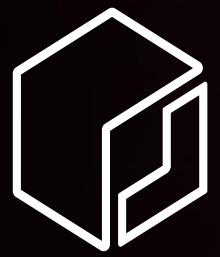
Augmenting mainframe with event driven



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In summary







AWS Fargate & AWS Lambda

Serverless

- No servers to manage
- Pay for resources only when used
- Fargate supports both EKS and ECS
- Lambda is ideal for event-driven architectures

Amazon ECS

Powerful simplicity

- For container-based workloads on AWS
- Opinionated solution for containers
- Reduced time to build and deploy
- Fewer decisions needed

Amazon EKS

Open flexibility

- If you are invested in Kubernetes
- Vibrant ecosystem and community
- Consistent open-source APIs
- Consider resource upskill time

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Thank you!

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