
AWS
re:Invent

SEC 305

The busy manager's guide to encryption

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Senior Product Manager, Tech

AWS

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Agenda

Security and defense in depth

Envelope encryption

Asymmetric permissions

Client-side encryption

Building an application

Related session

https://www.youtube.com/watch?v=-ObImxw1PmI

What is security?

Goal

Reduce risk

- Data exposure
- Loss of control

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Goal

Reduce risk

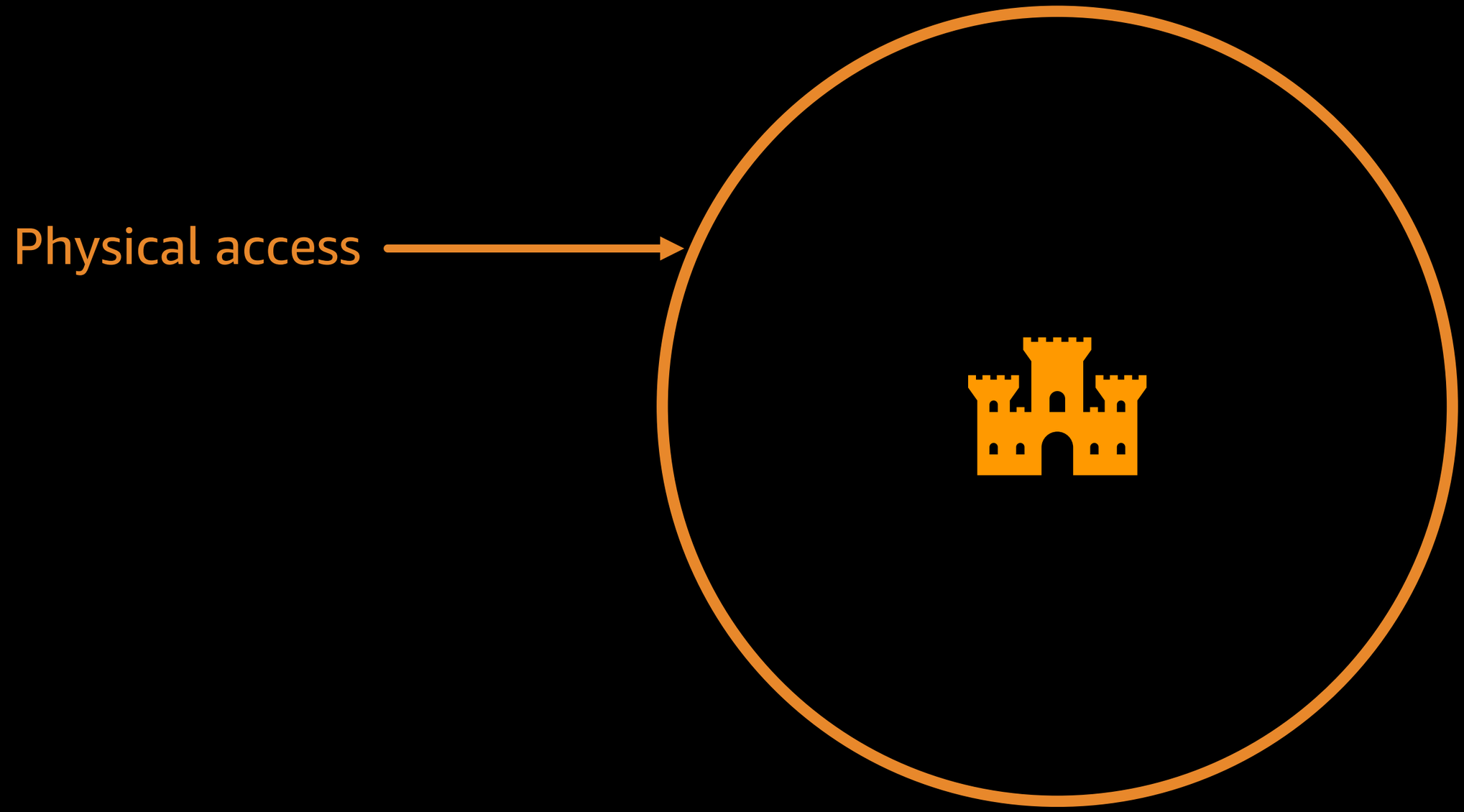
- Data exposure
- Loss of control

Risk types

- Inadvertent
- Malicious

Defense in depth

Defense in depth



Defense in depth

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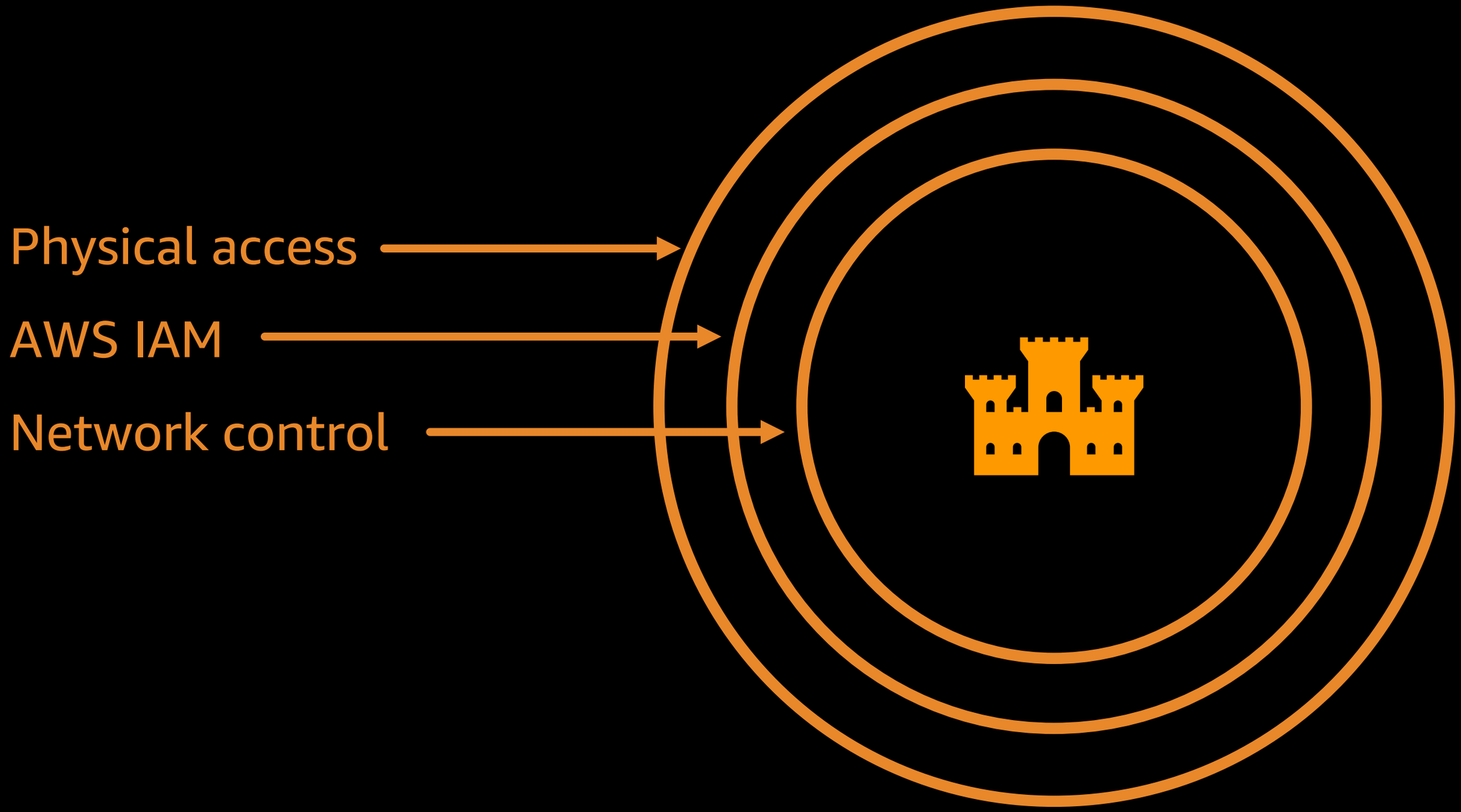

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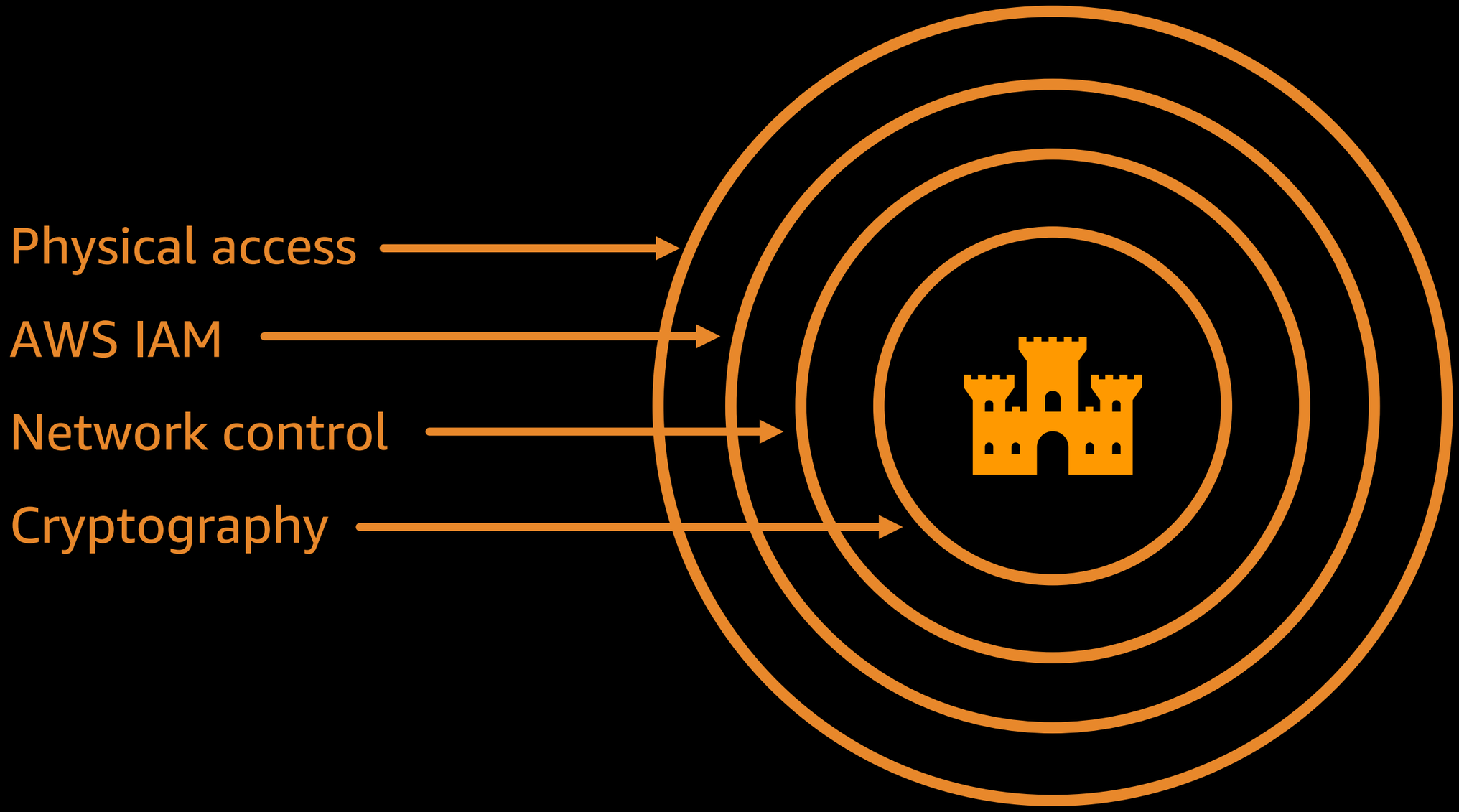

Defense in depth

Why encrypt?

- Keep data confidential
- Demonstrate compliance
- Improve agility

Paving the trusted path

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Paving a trusted path

You need to access data (often)

- Read path
- Write path

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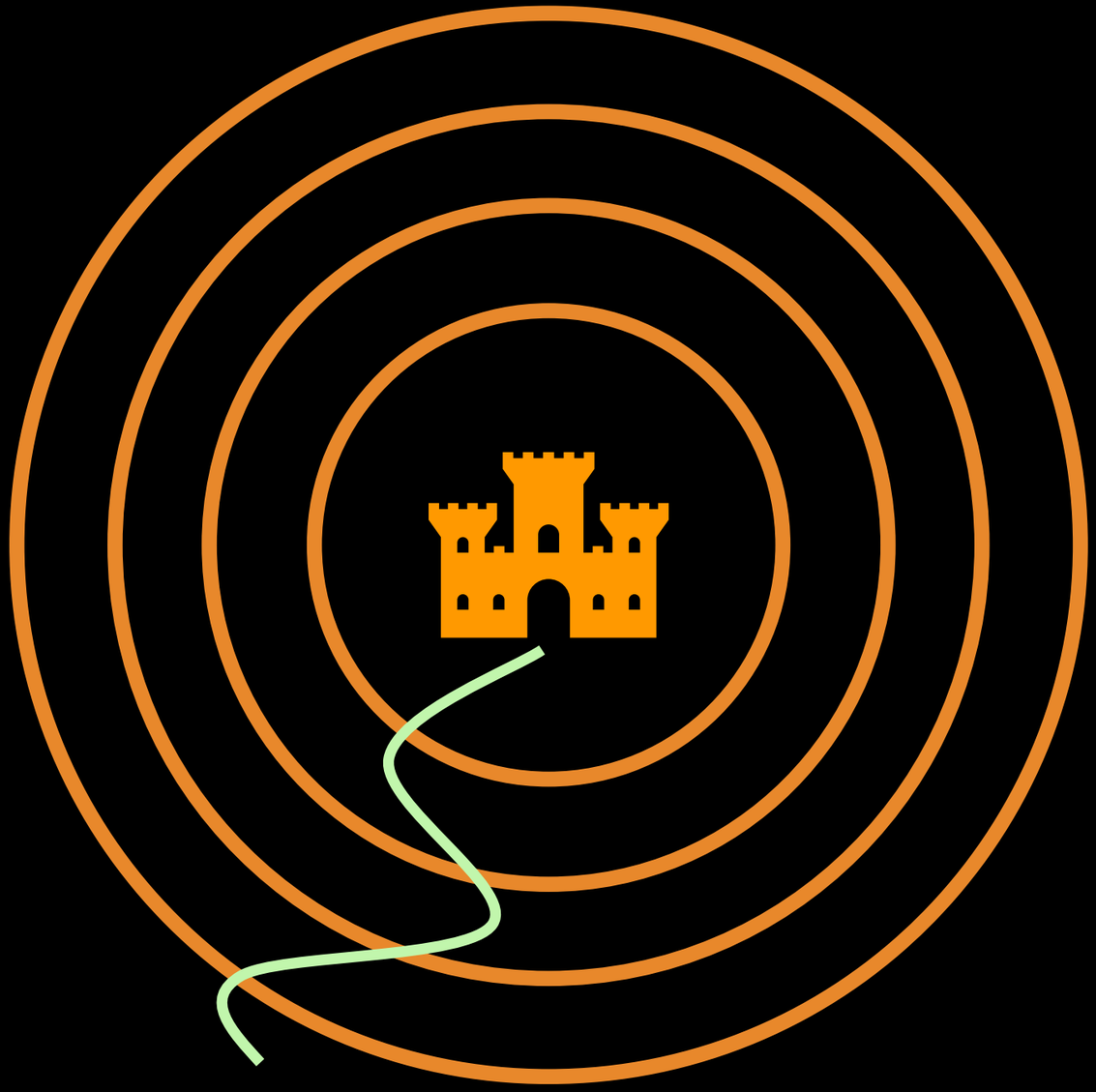
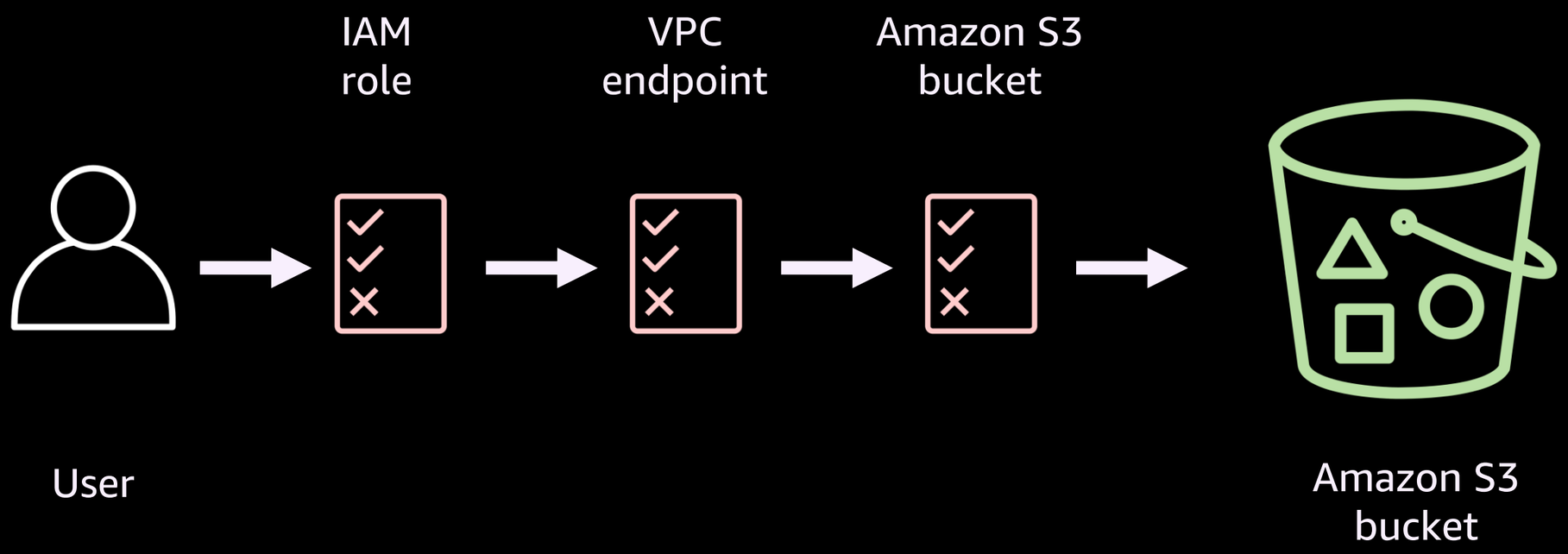
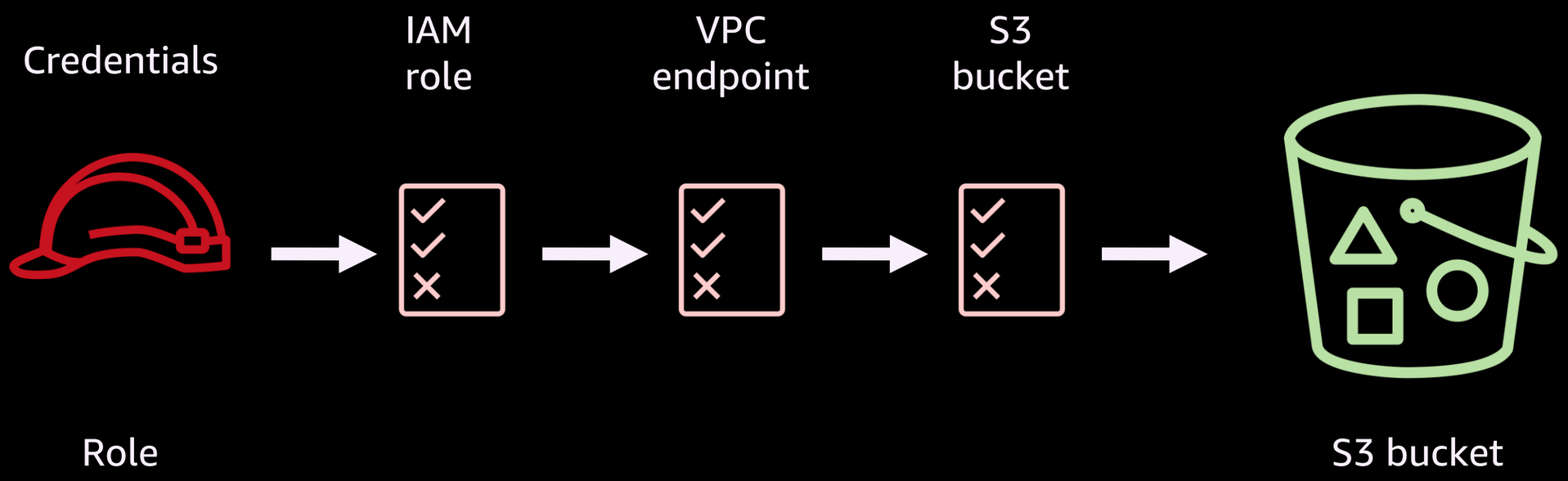


Defense in depth



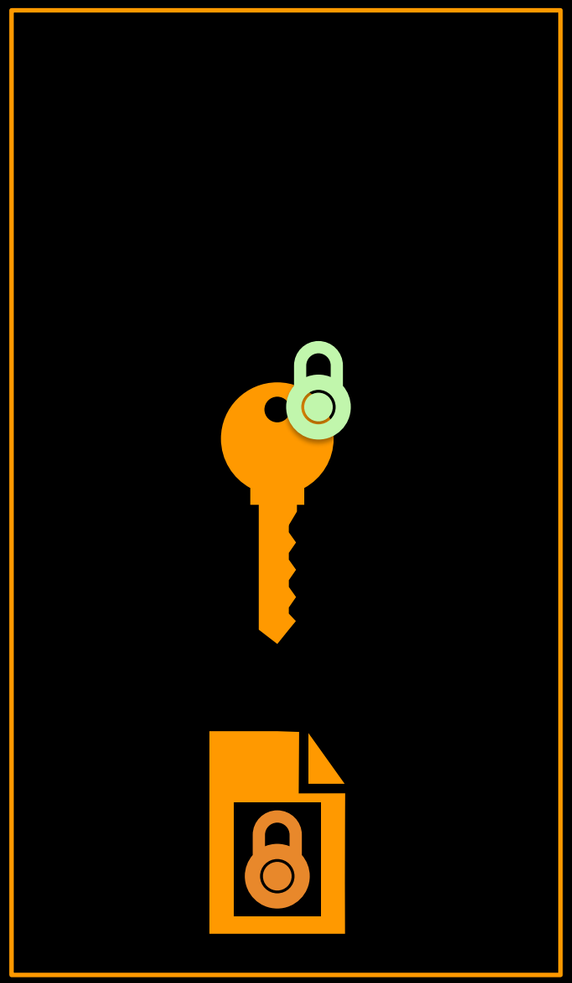
Defense in depth



	Permission model	Logging	Complexity
SSE-S3	S3	S3	Low

Envelope encryption

Envelope encryption



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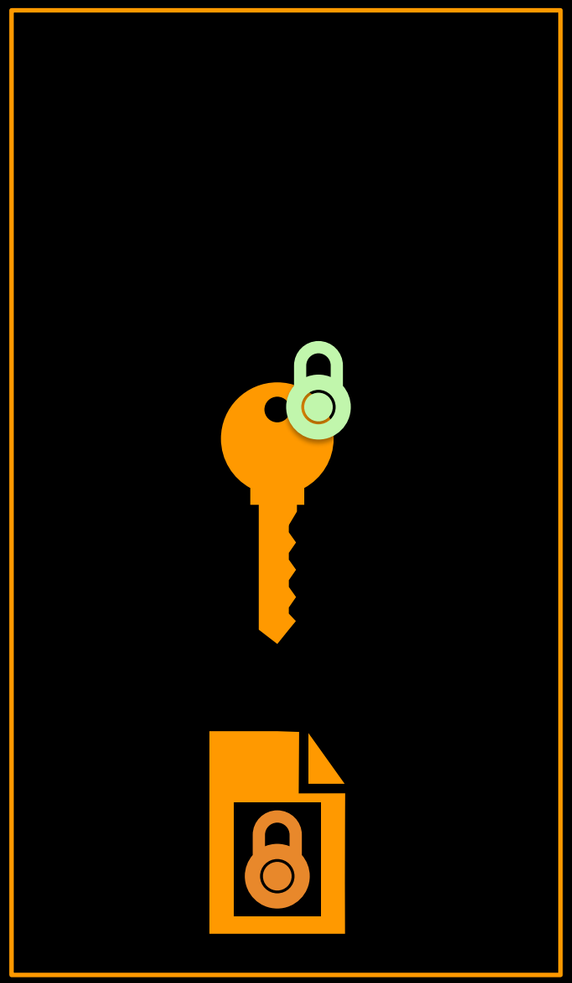
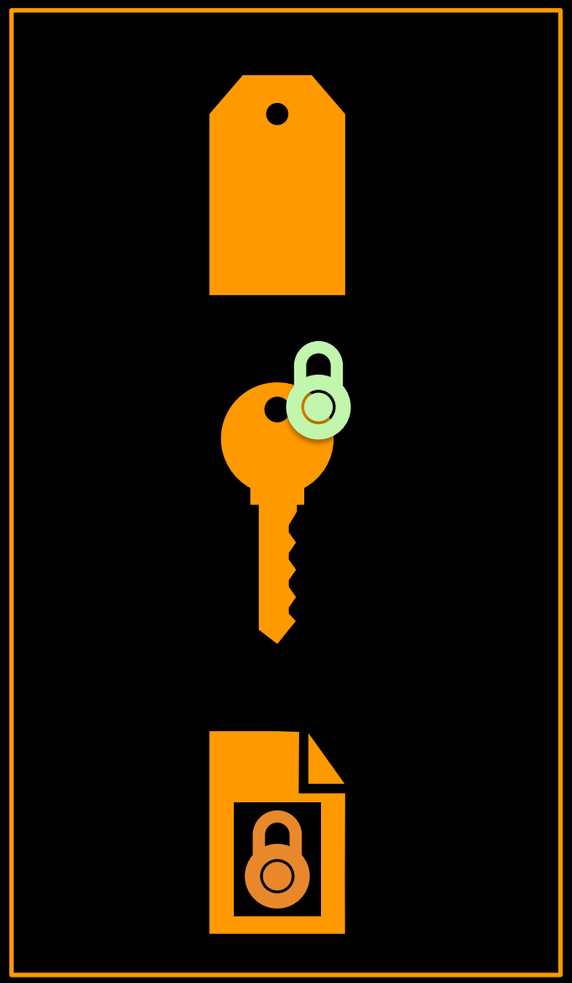


Which key was used to encrypt this key?

Envelope encryption



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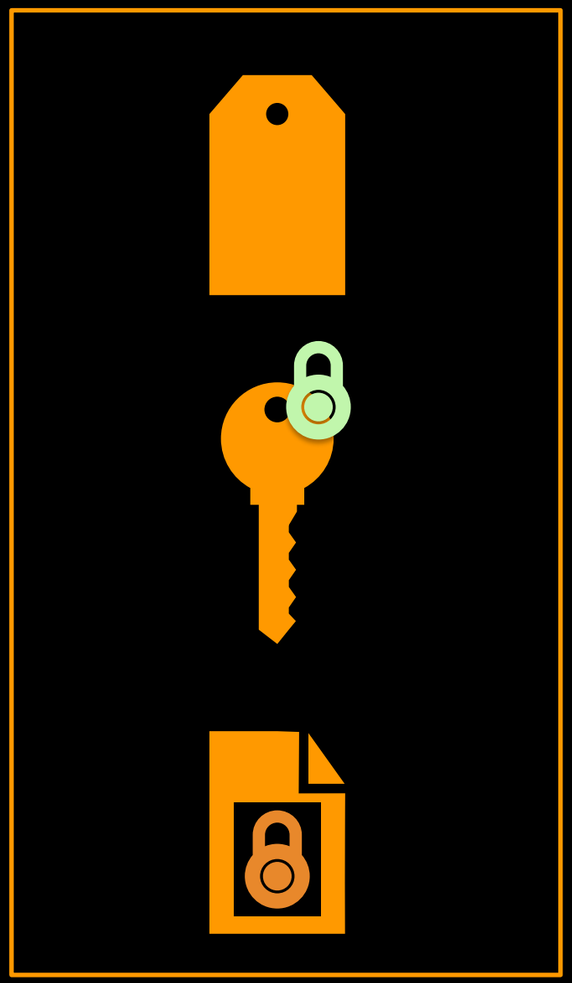

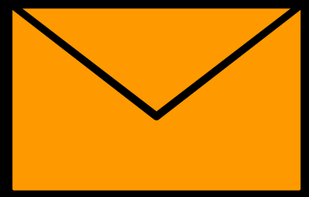

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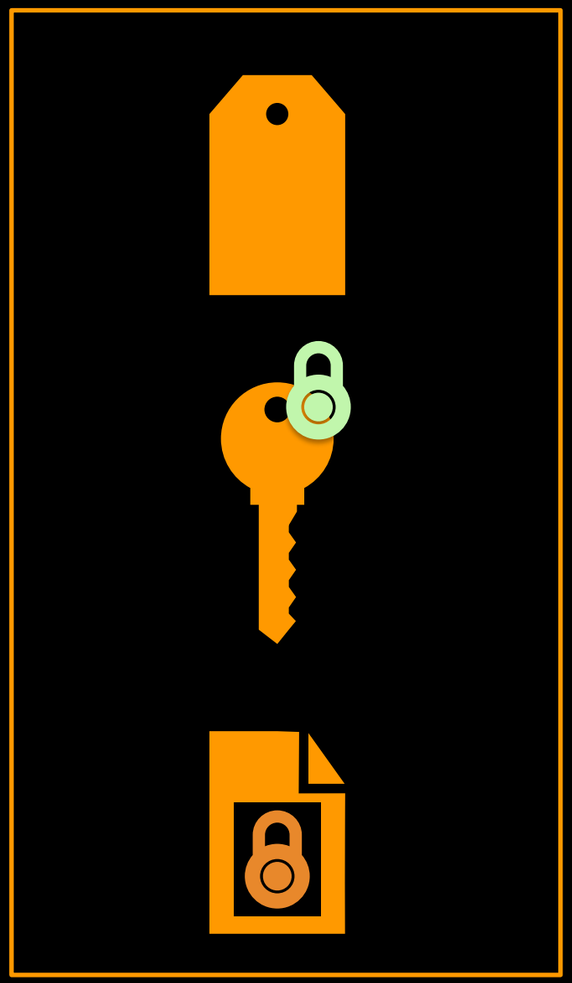
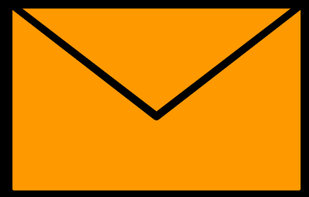
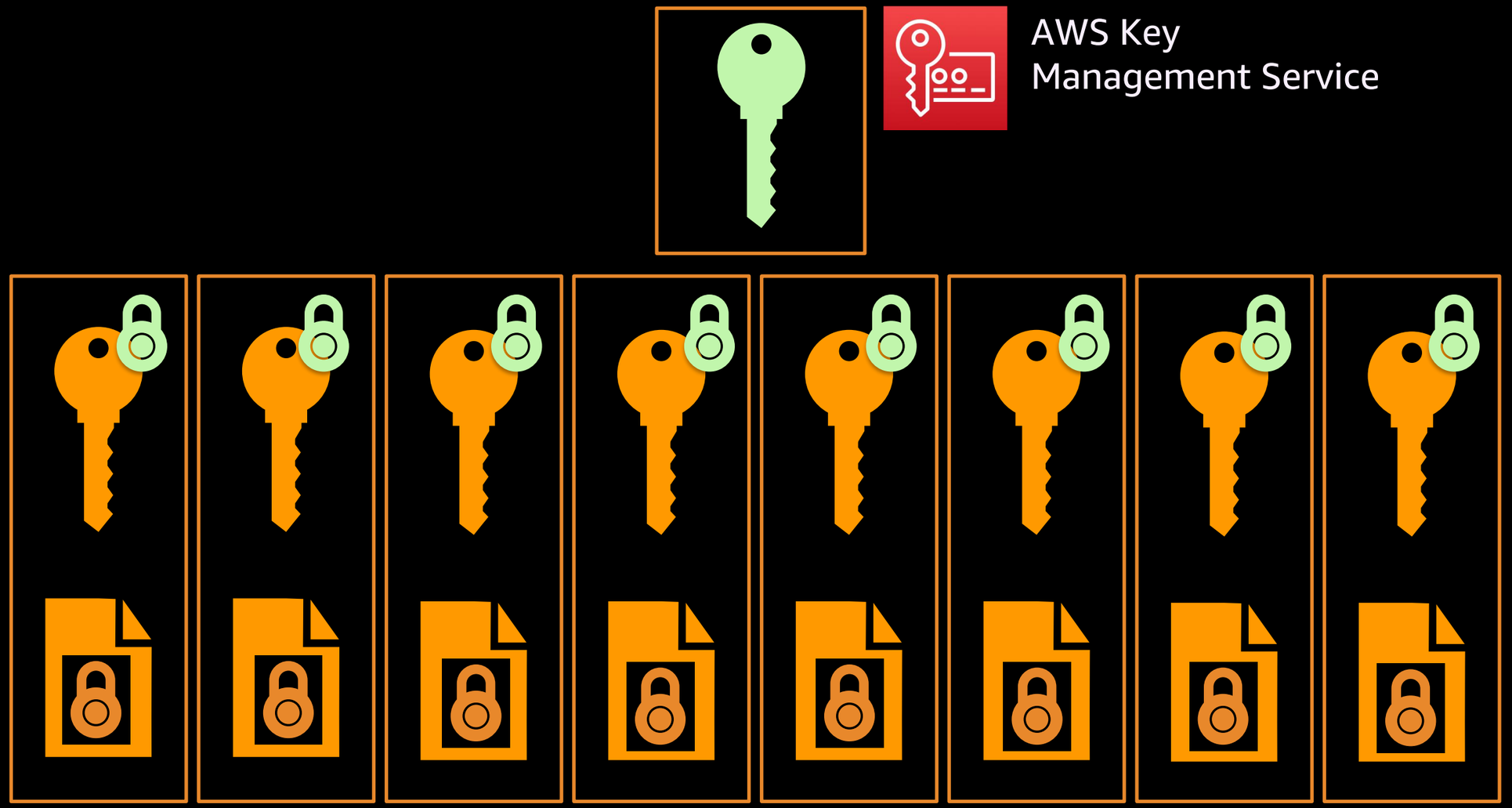




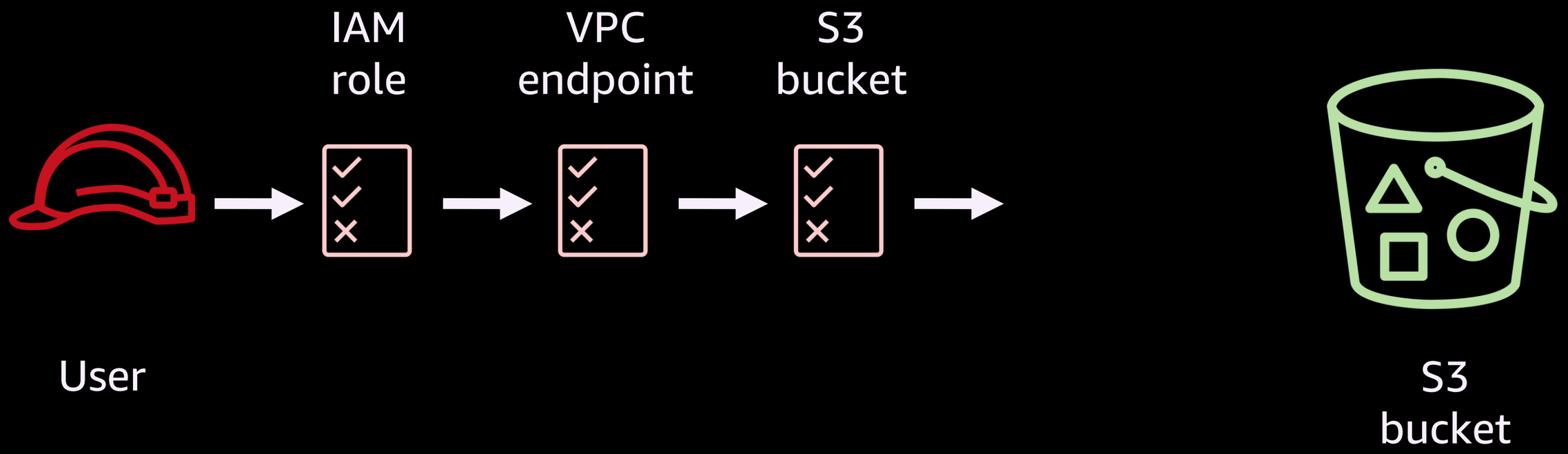
(Not to scale)

Key hierarchy

Key hierarchy



Defense in depth



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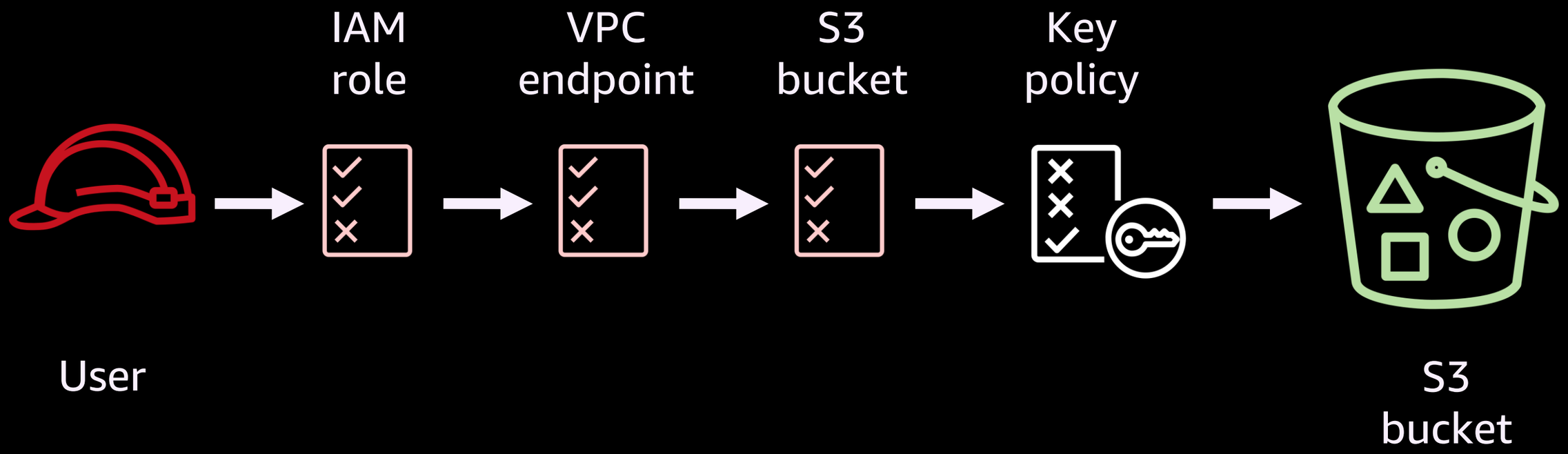

	Permission model	Logging	Complexity
SSE-S3	S3	S3	Low
SSE-KMS	S3 + KMS	S3 + KMS	Medium

Asymmetric permissions

Policies

IAM policy

```
{
  "Version": "2012-10-17",
  "Statement": {
    "Effect": "Allow",
    "Action": [
      "kms:ListKeys",
      "kms:ListAliases"
          ],
    "Resource": "*"
     }
}
```

Key policy

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          ],
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     }
}
```

Policies

Administer

```
"Action": [
            "kms:ListAliases",
            "kms:Create*",
            "kms:Describe*",
            "kms:Enable*",
            "kms:List*",
            "kms:Put*",
            "kms:Update*",
            "kms:Revoke*",
            "kms:Disable*",
            "kms:Get*",
            "kms:Delete*",
            "kms:TagResource",
            "kms:UntagResource",
            "kms:ScheduleKeyDeletion",
            "kms:CancelKeyDeletion"
]
```

Policies

Use

```
"Action": [
      "kms:Encrypt",
      "kms:Decrypt",
      "kms:ReEncrypt*",
      "kms:GenerateDataKey*",
      "kms:DescribeKey"
]

…

"Sid": "Allow attachment of
persistent resources",
"Action": [
      "kms:CreateGrant",
      "kms:ListGrants",
      "kms:RevokeGrant"
]
```

Policies

Encrypt

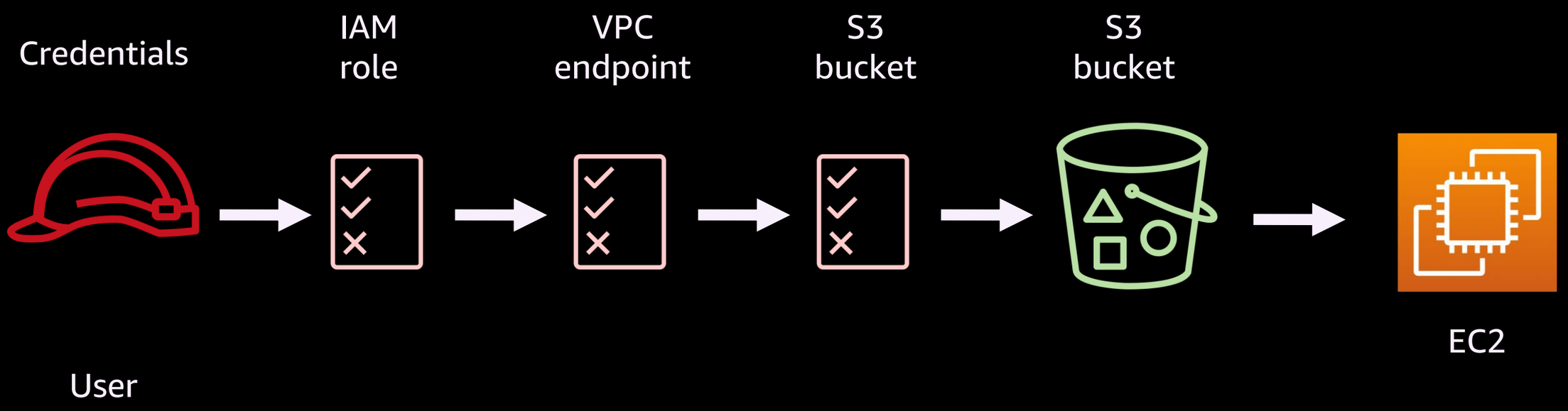
```
"Effect": "Allow",
"Action": [
     "kms:Encrypt",
     "kms:Decrypt",
     "kms:ReEncrypt*",
     "kms:GenerateDataKey*",
     "kms:DescribeKey"
     ]
```

Decrypt

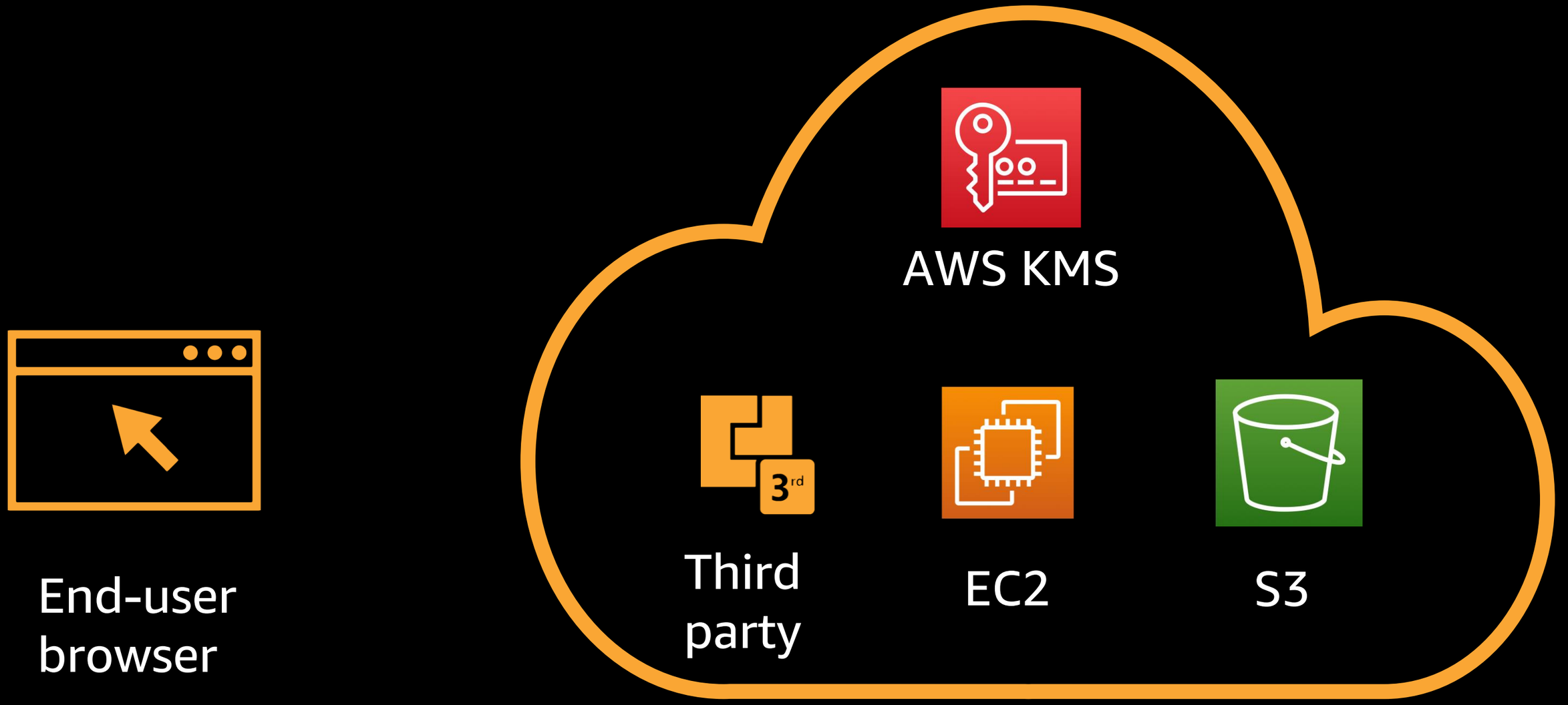
```
"Effect": "Allow",
"Action": [
     "kms:Decrypt",
     "kms:DescribeKey"
     ]
```

Client-side encryption

Client-side encryption



Client-side encryption – Use-case



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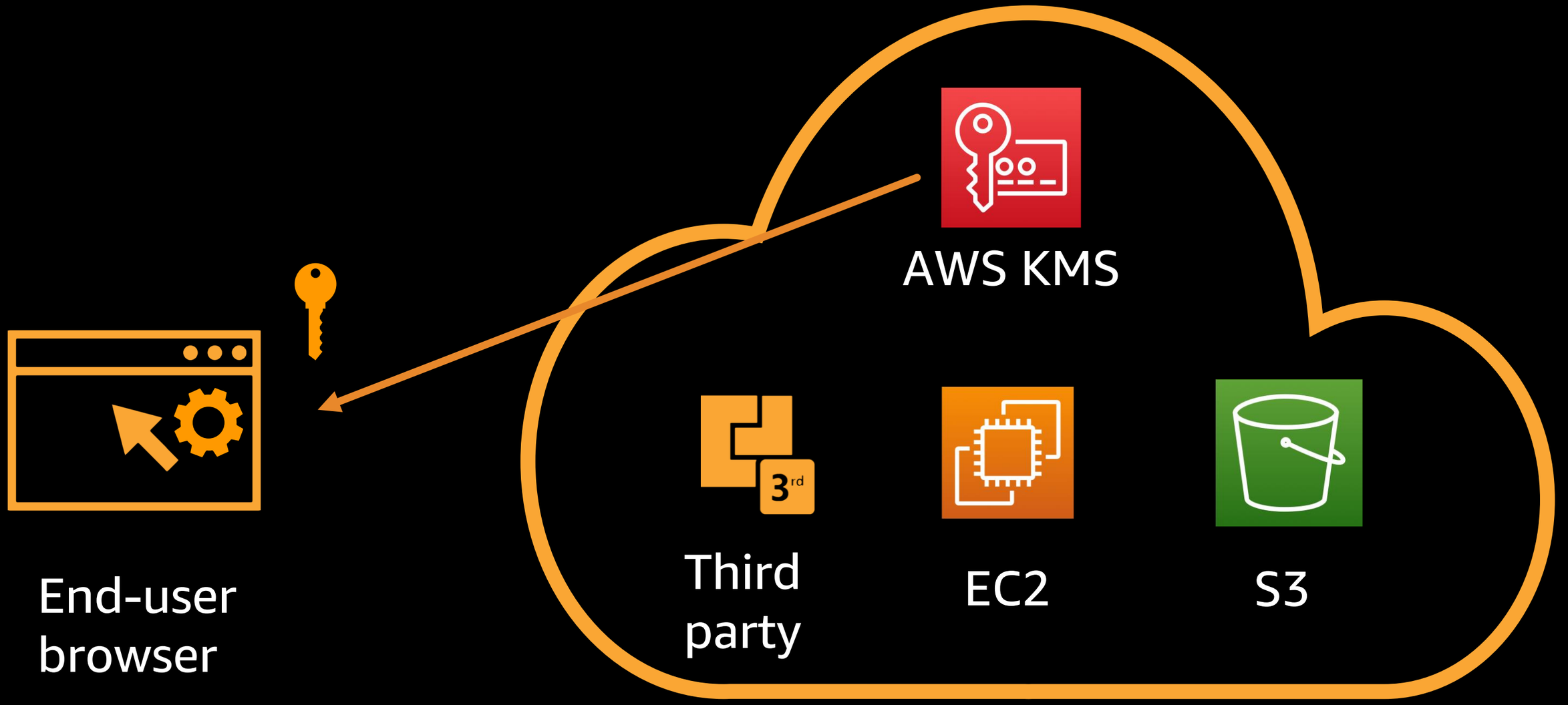
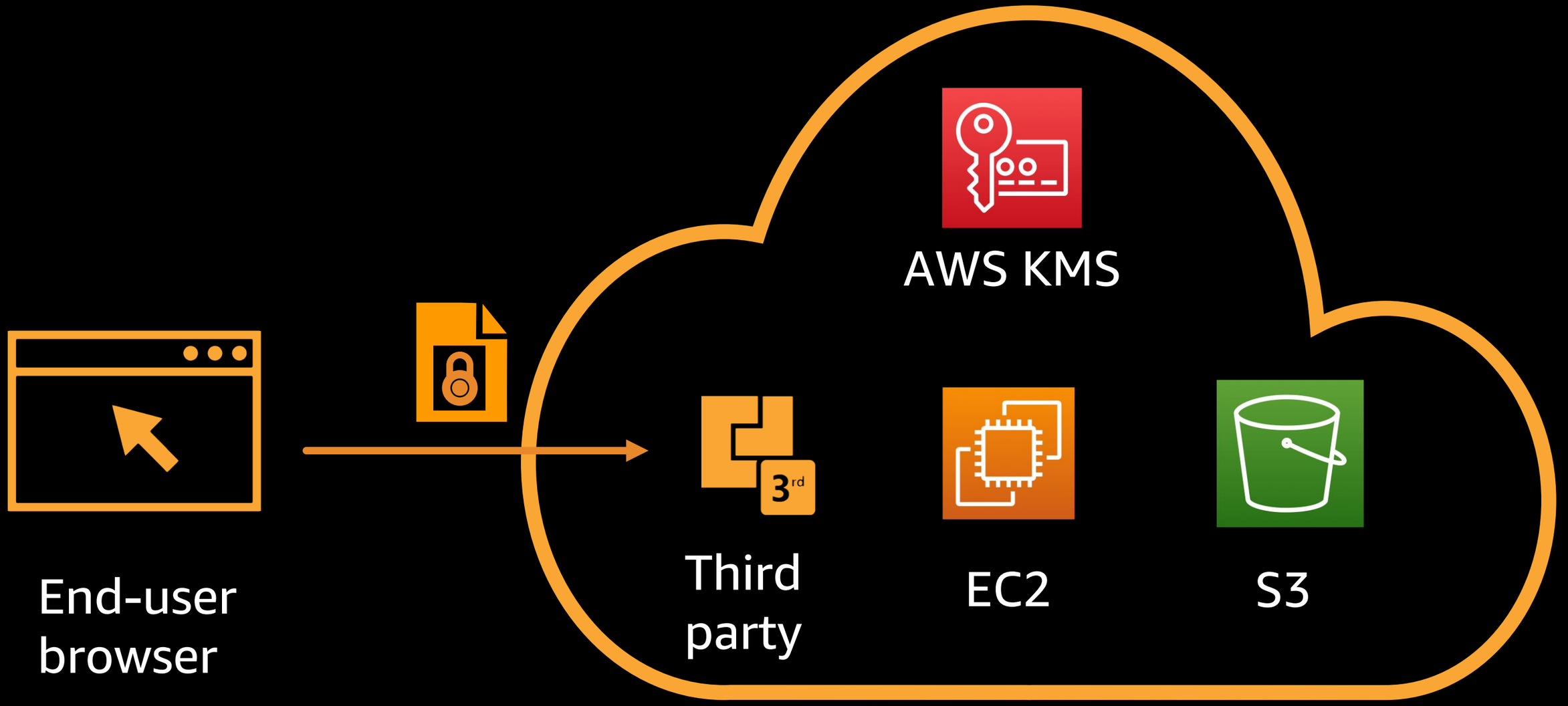
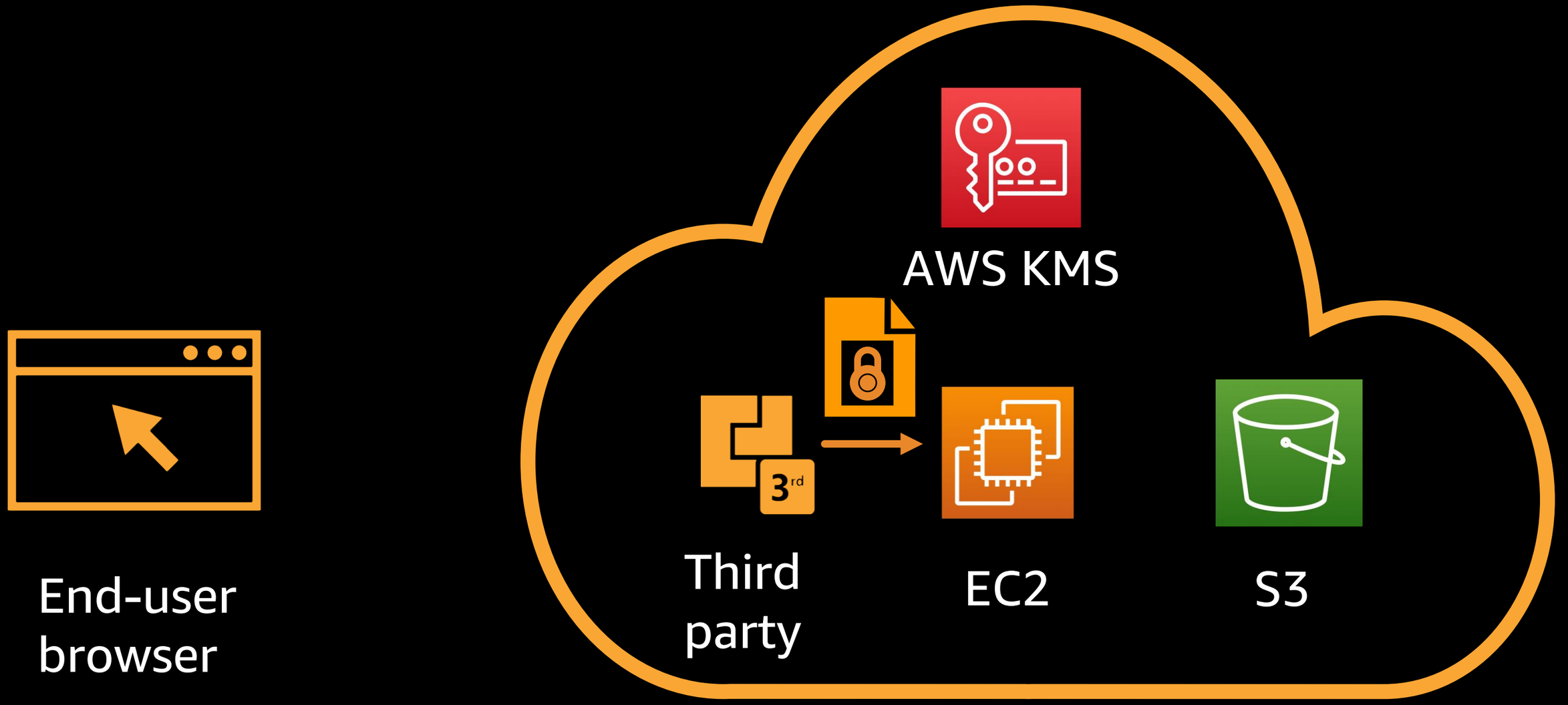


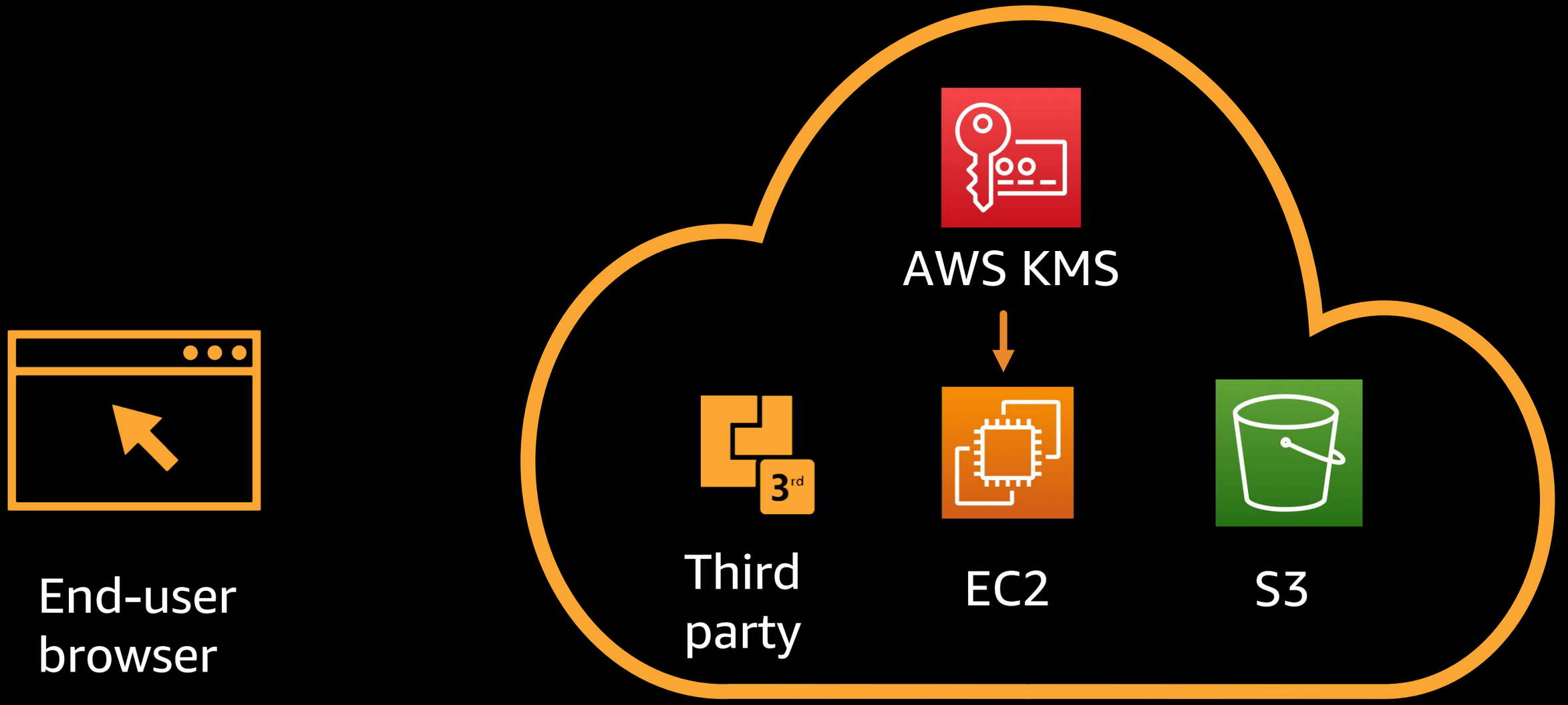
Client-side encryption – Use-case



Client-side encryption – Use-case



Client-side encryption – Use-case



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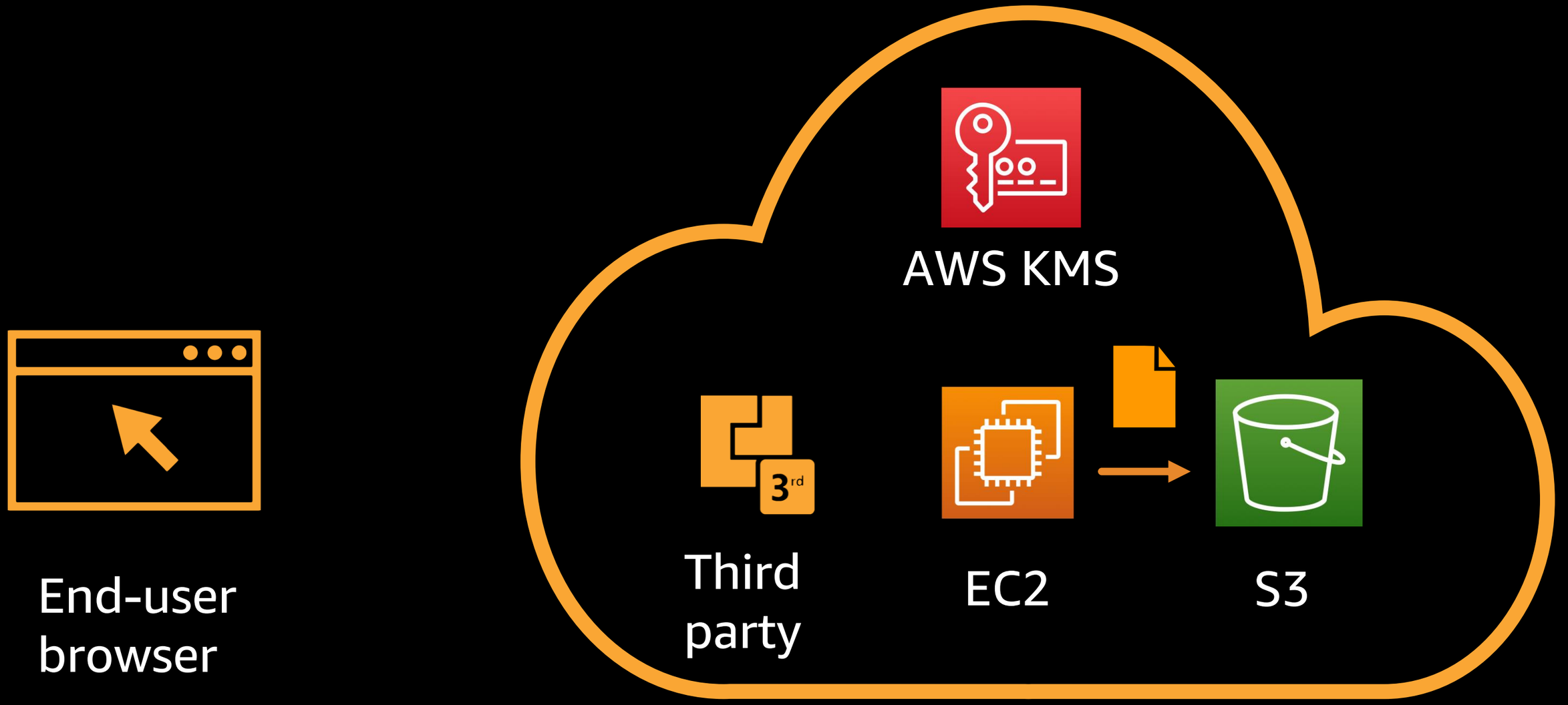

	Permission model	Logging	Complexity
SSE-S3	S3	S3	Low
SSE-KMS	S3 + KMS	S3 + KMS	Medium
SSE-KMS + CSE	S3 + KMS + your app	S3 + KMS + your app	High

Building an application

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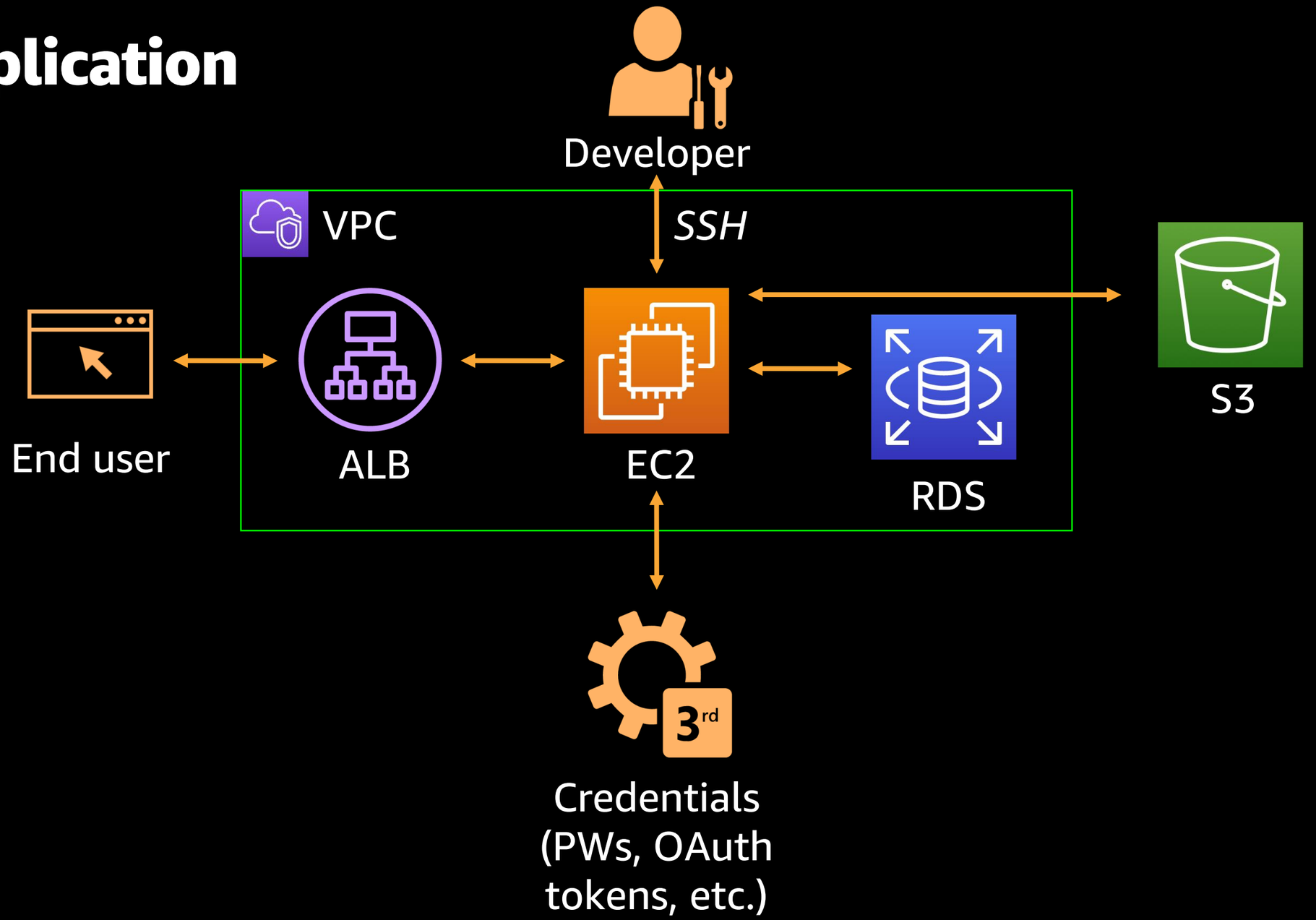
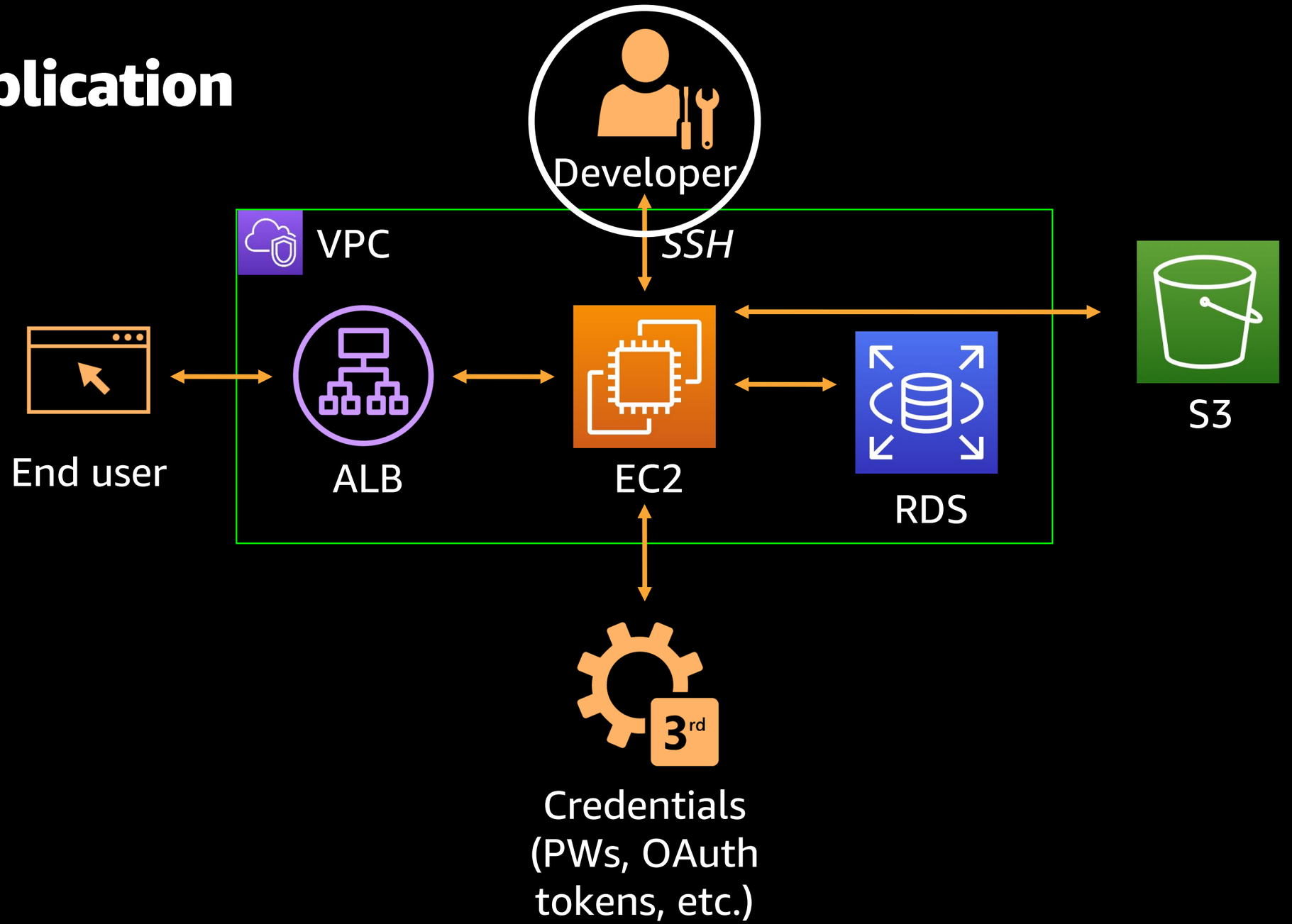
Application



Application



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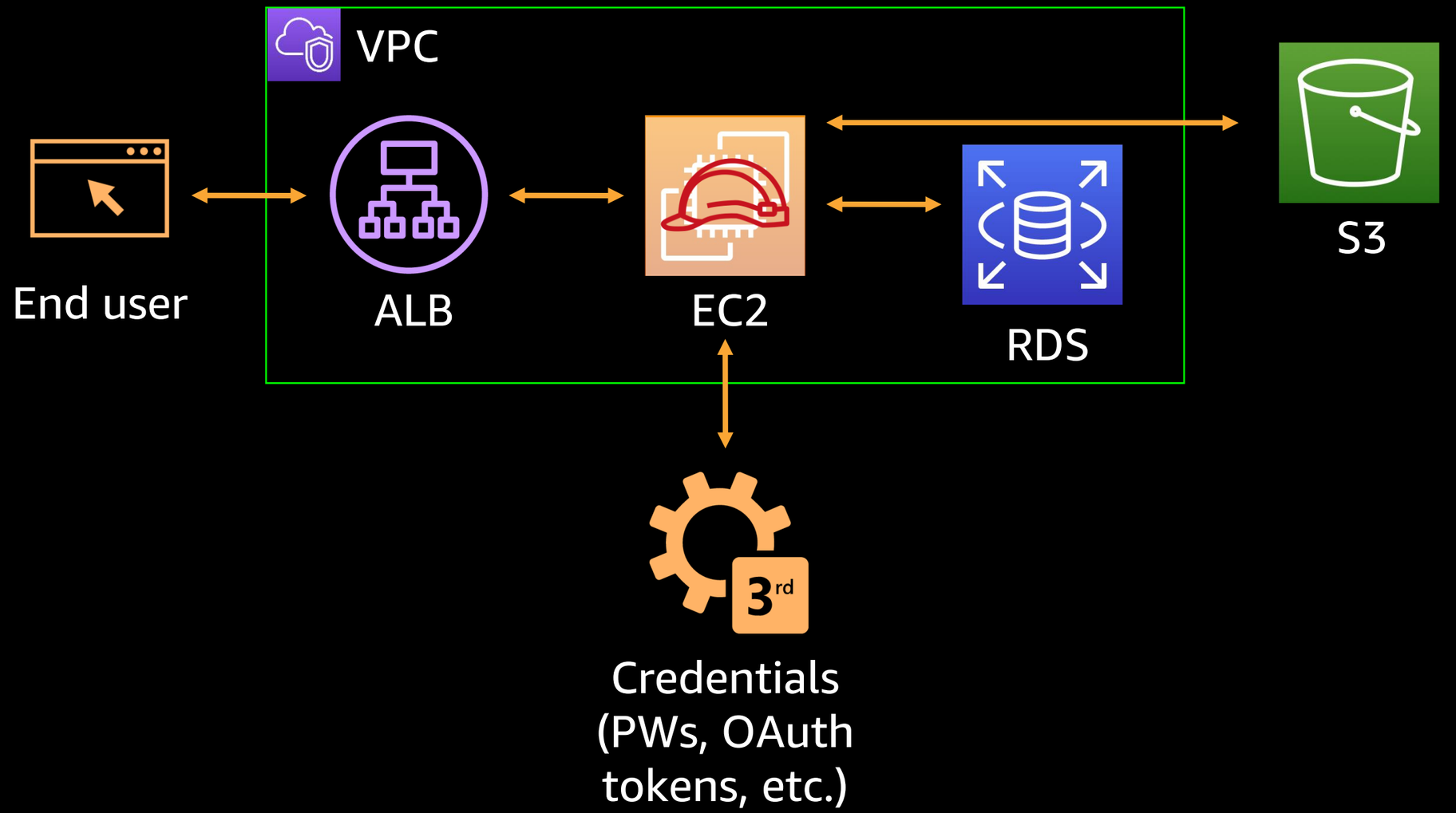
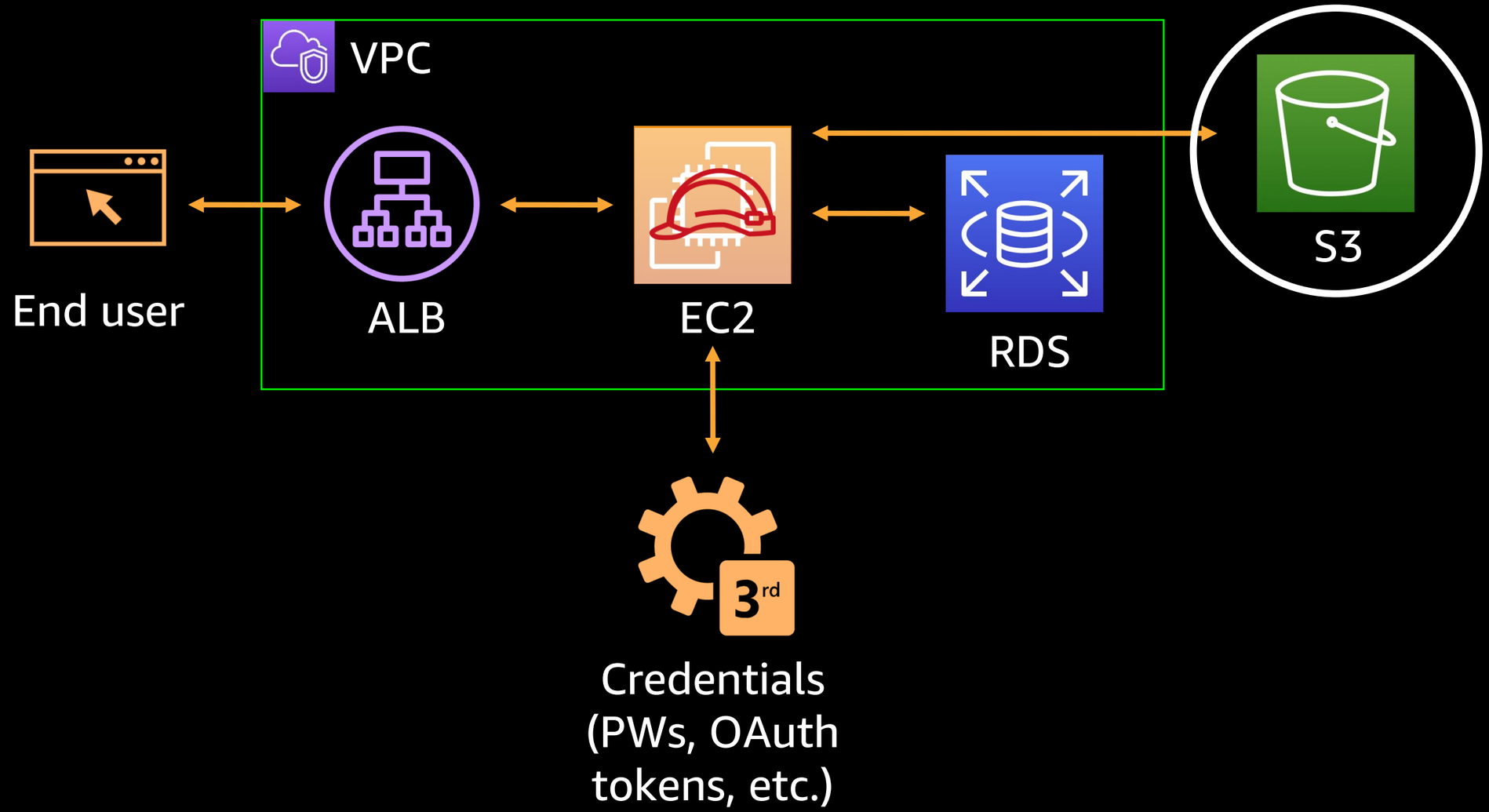
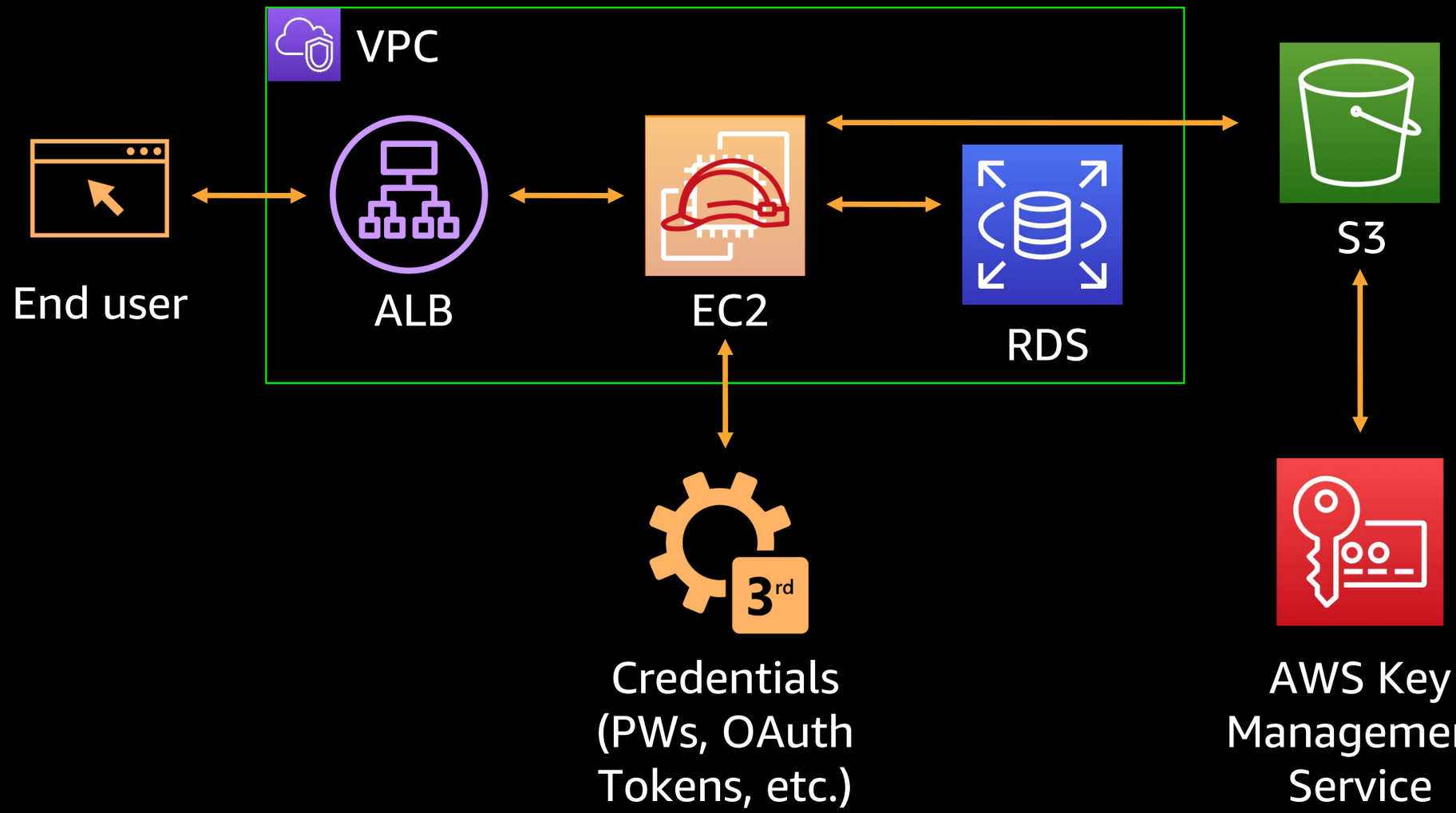


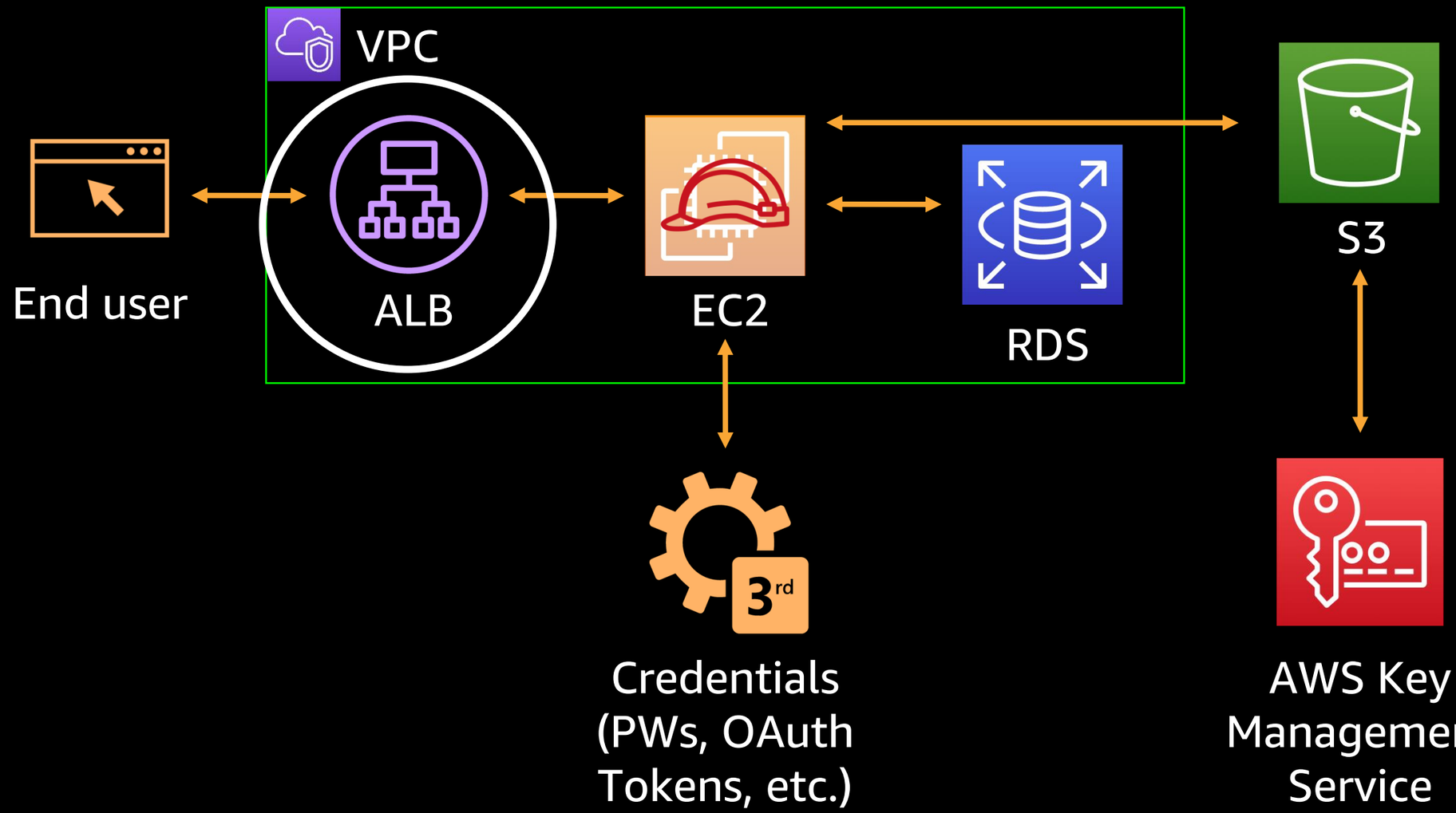
Application



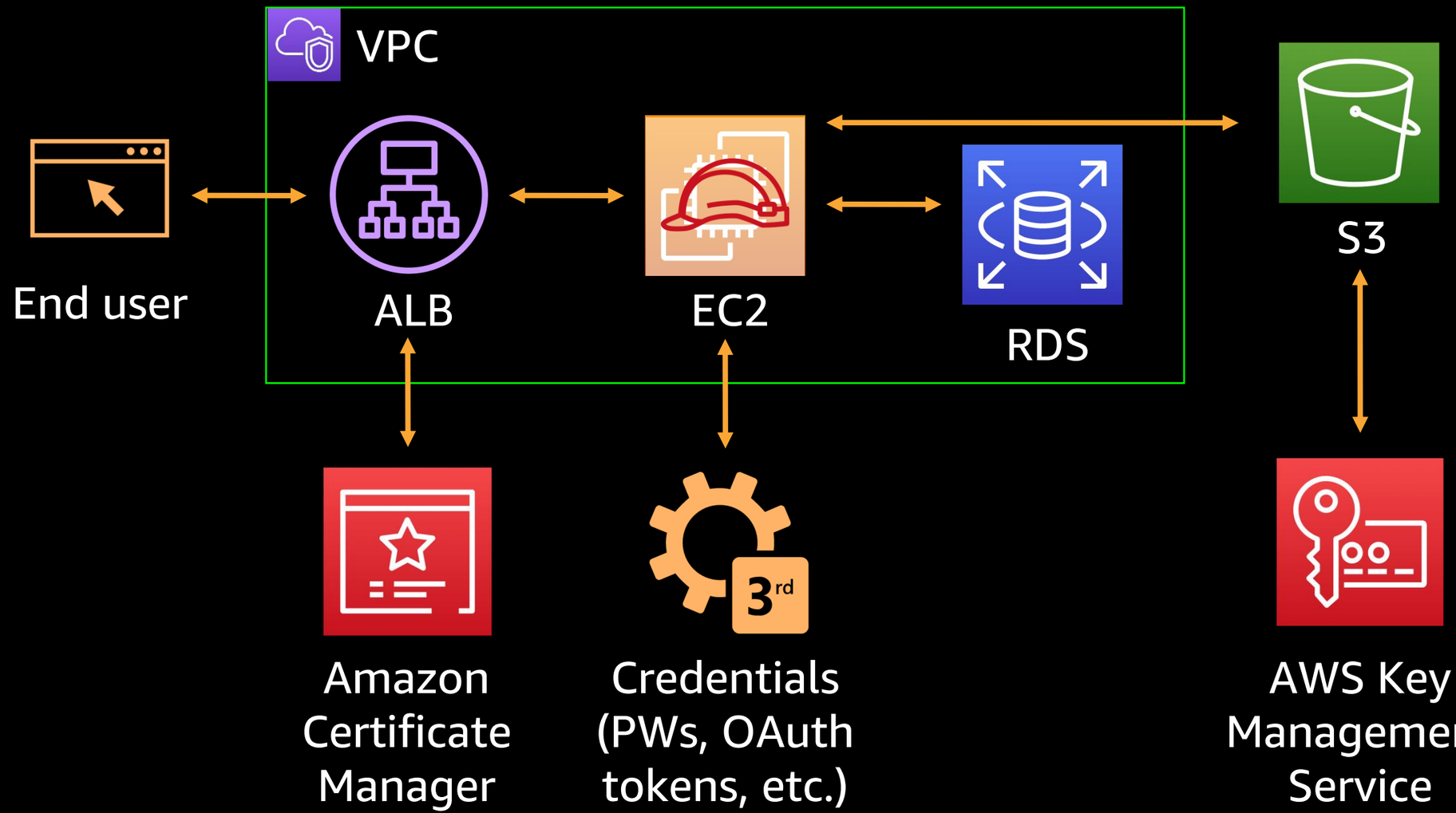
Application



Application



Application



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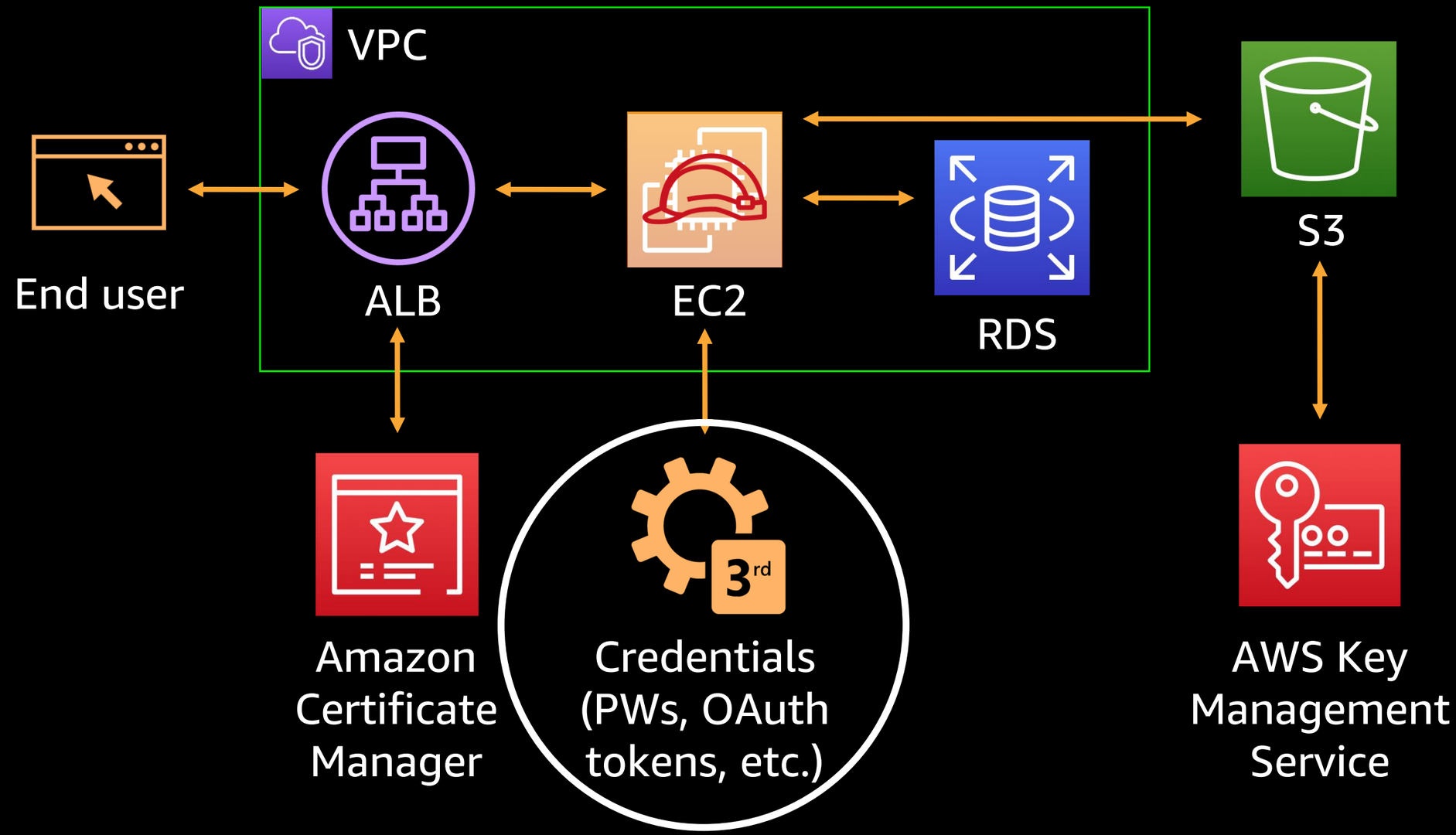

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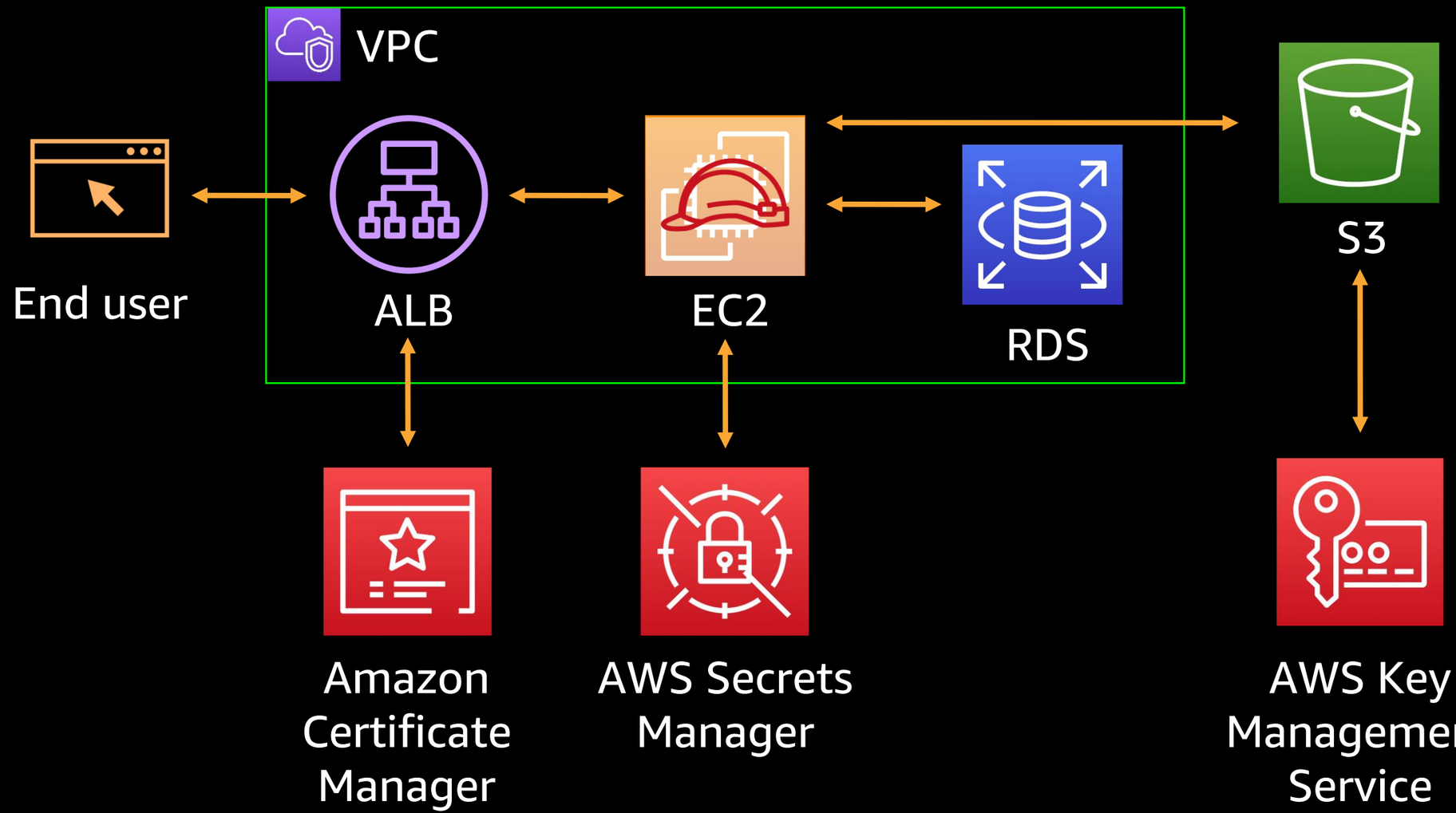

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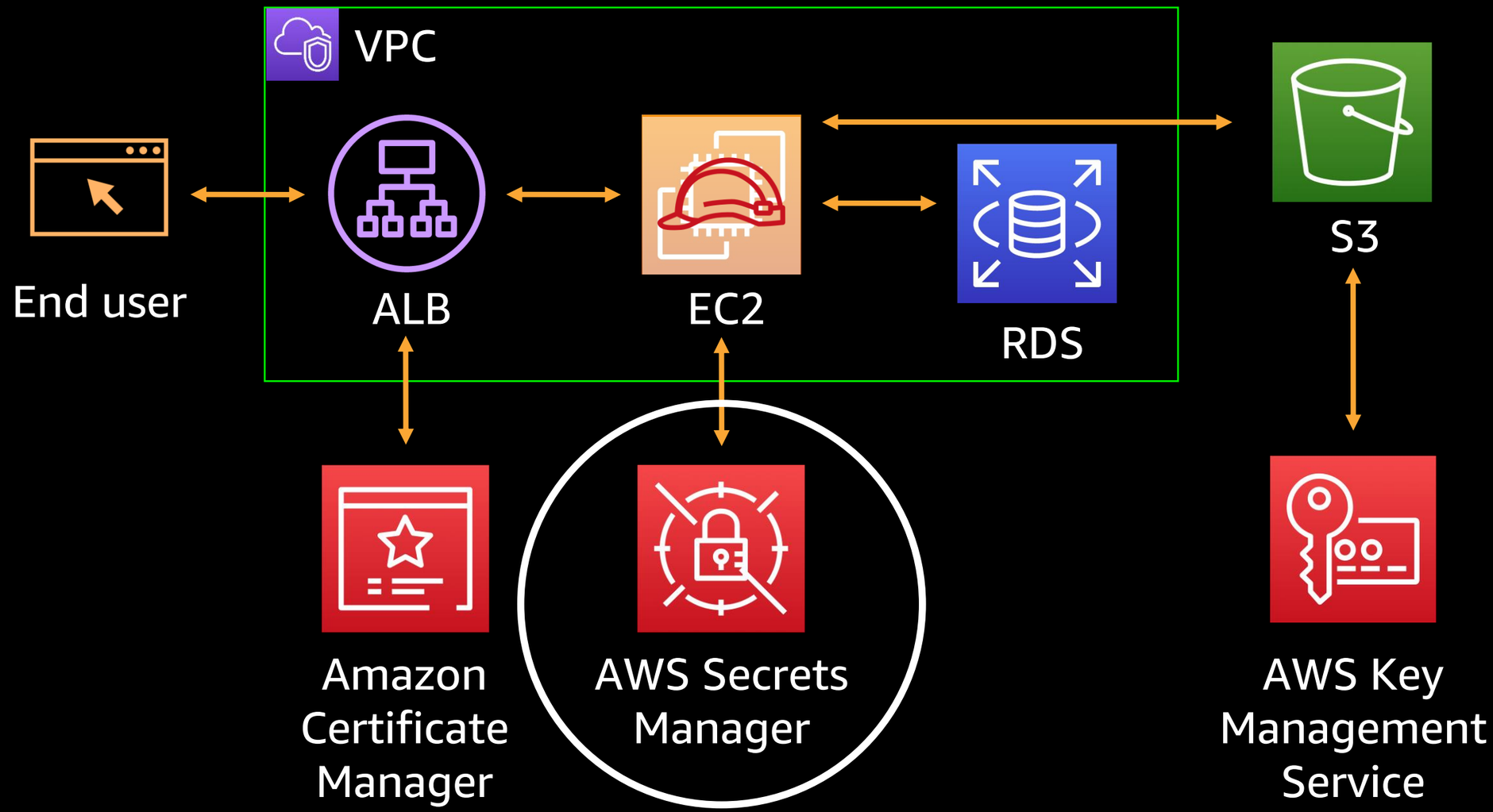

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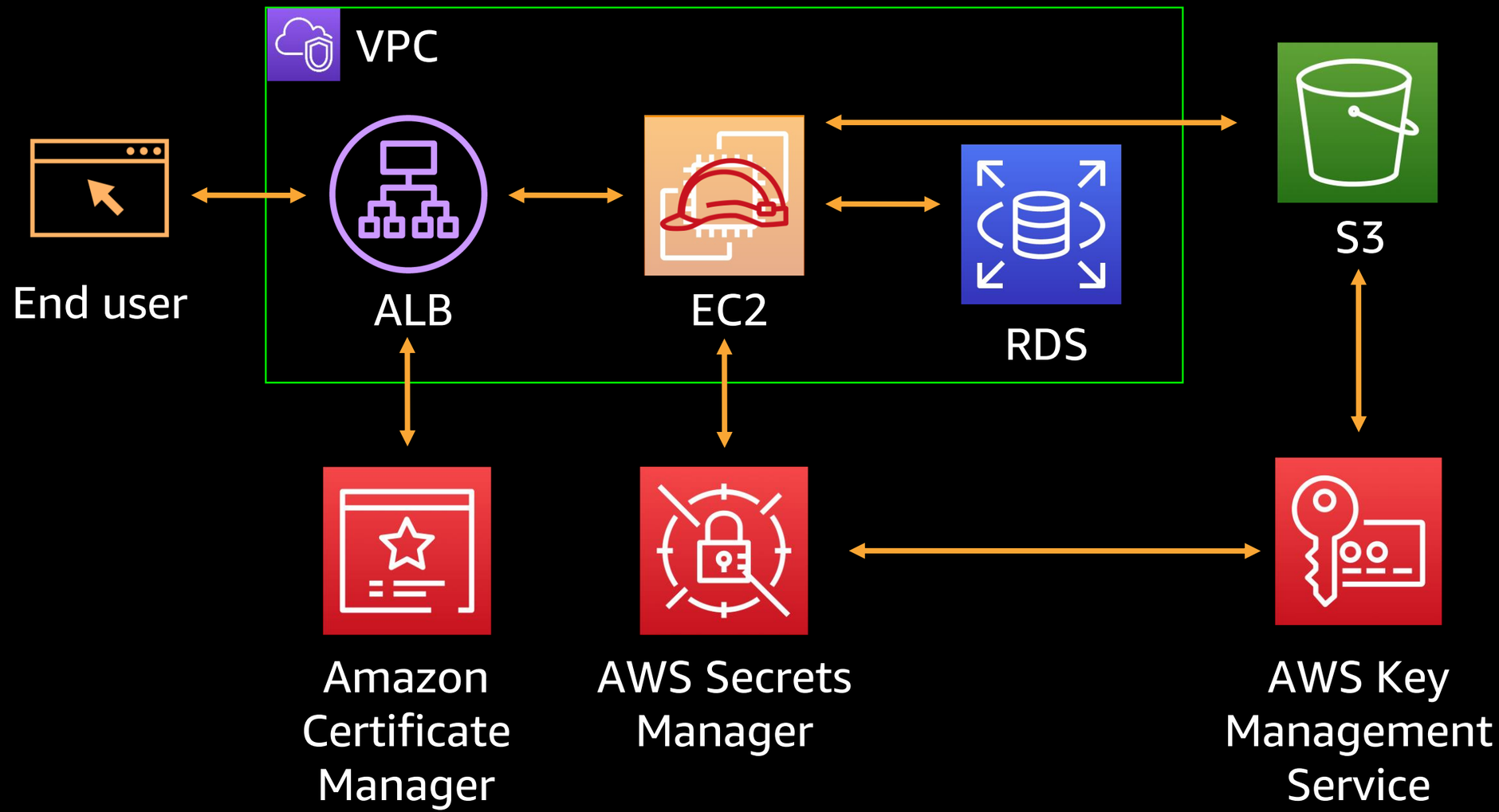

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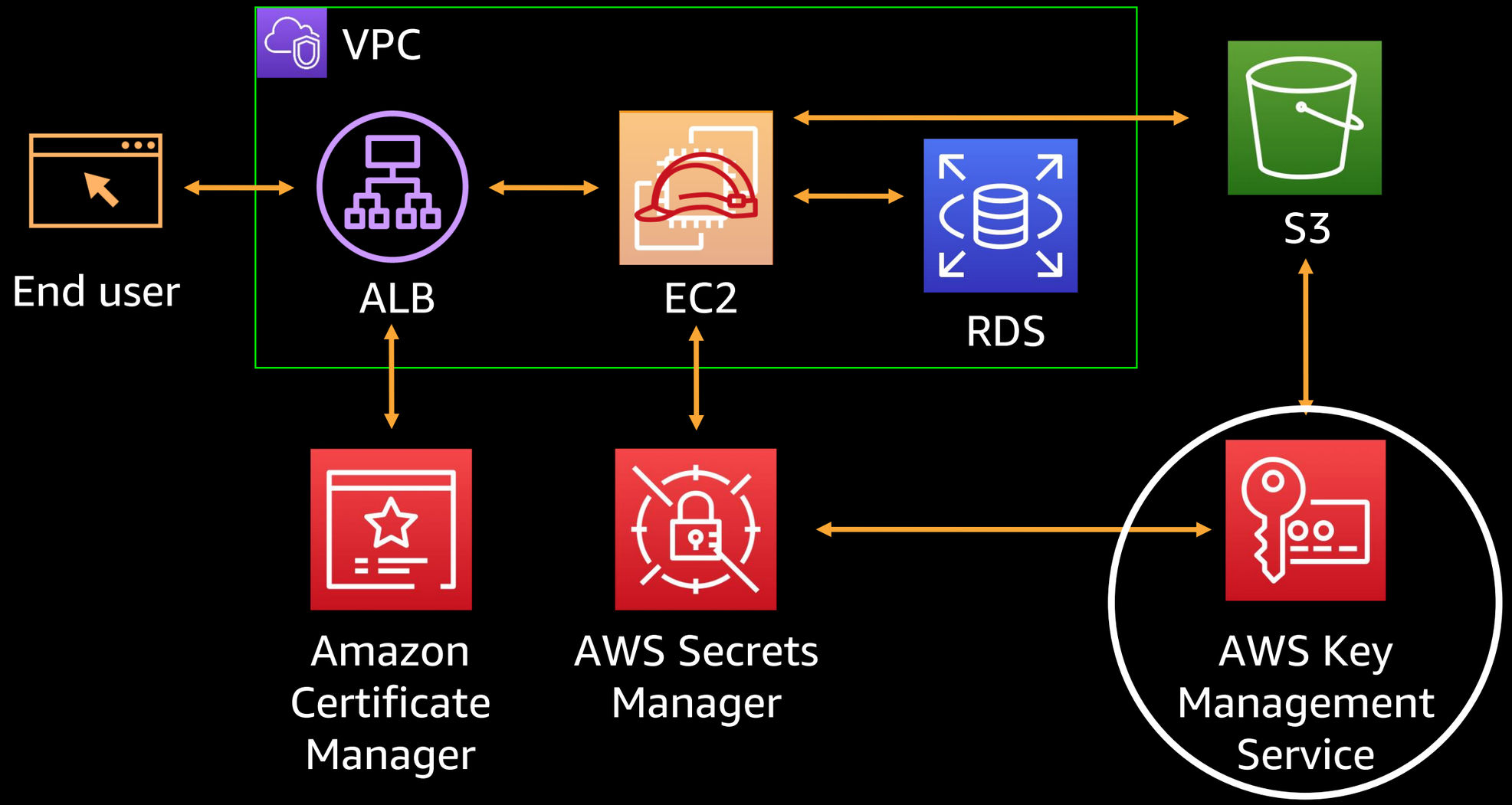

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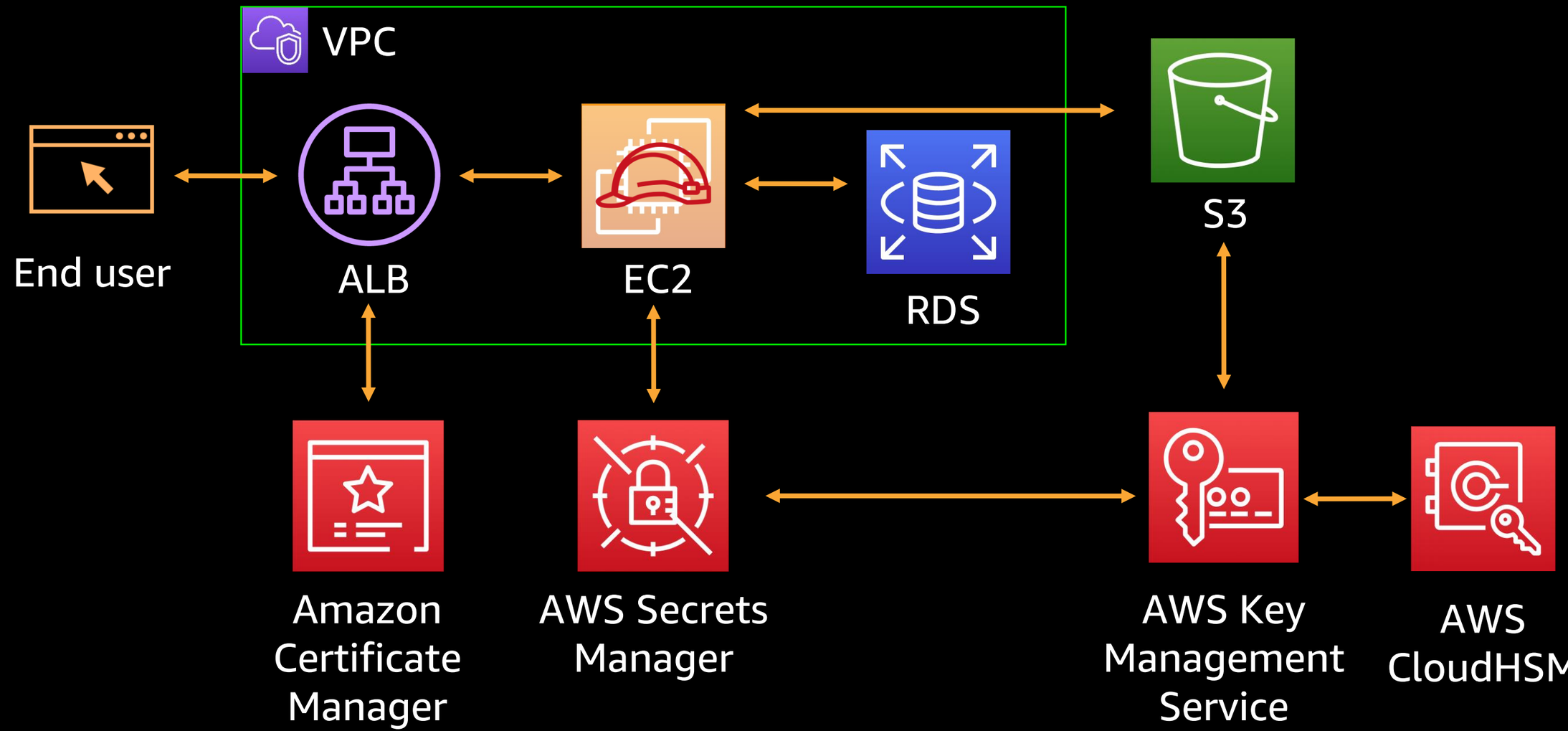

“Nothing is wholly obvious without becoming enigmatic.”

Jean Baudrillard

EGS

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Thank you!

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Please complete the session survey

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