
AWS
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STG304

Lessons from the vanguard: Build modern apps using Amazon S3

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Agenda

Overview

Characteristics of modern applications

Amazon S3 building blocks for modern applications

- S3 Access Points
- S3 event notifications
- S3 X-Ray integration
- S3 Lens

Customer example



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Modern applications: from monoliths to microservices

Monolith apps
Do everything



- Single app
- Must deploy entire app
- One database
- Organized around technology layers
- State in each runtime instance
- One technology stack for entire app

Microservices
Do one thing



- Minimal function services
- Deployed separately, interact together
- Each has its own datastore
- Organized around business capabilities
- State is externalized
- Choice of technology for each microservice

Amazon Simple Storage Service (S3)



Wide range of cost-effective storage classes

Easily manage data and access controls

Query-in-place services for analytics

Most supported cloud storage service

Unmatched security, compliance, and audit capabilities

Serverless tenets

No server management
Flexible scaling
Pay for value
Automated high availability

Amazon Simple Storage Service (S3)



Exabytes stored across trillions of objects around the world

Increasing innovation with 7 storage classes

Decreasing costs and prices >80% since 2006

235+ distributed micro-services in 3 or more AZs per Region

Scale to million of requests per second

Building blocks for modern applications

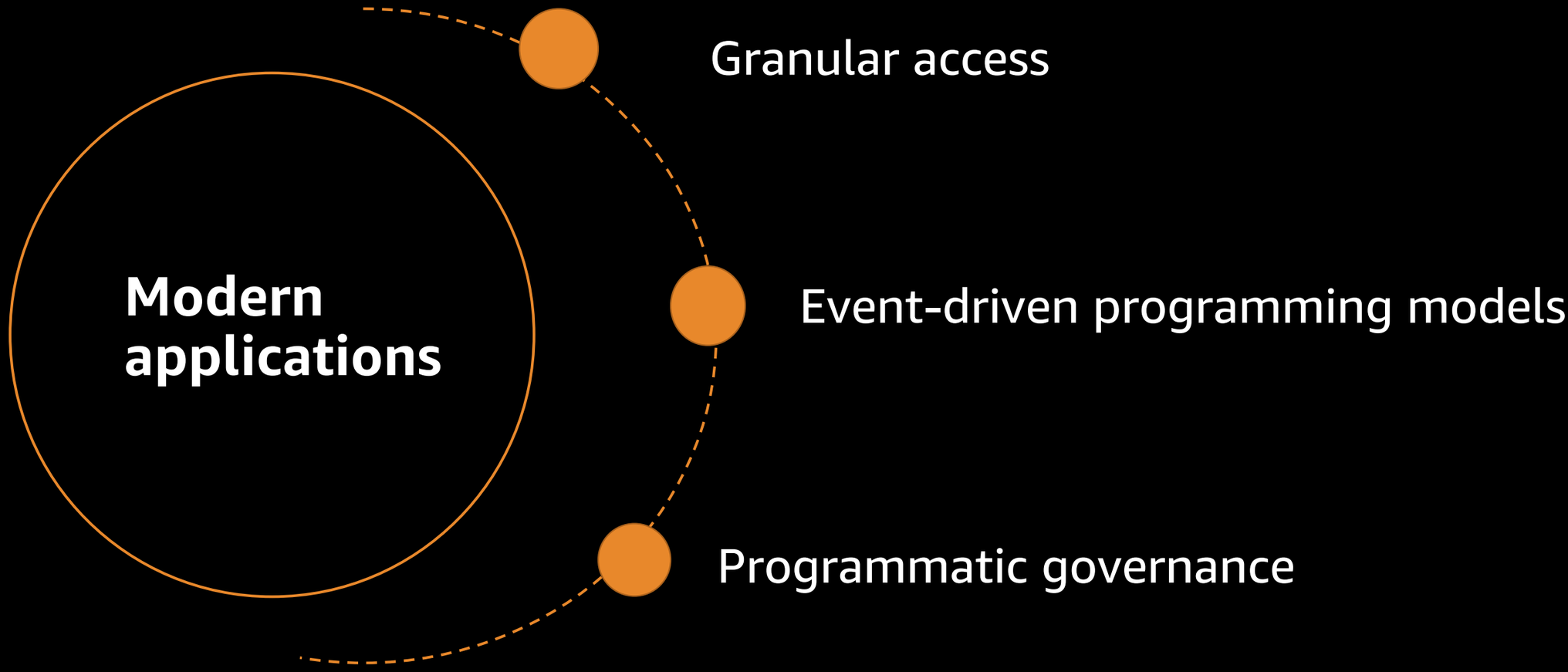


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Modern applications

“Invention requires two things, the ability to try a lot of experiments, and not having to live with the collateral damage of failed experiments.”



Granular access



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S3 Access Points

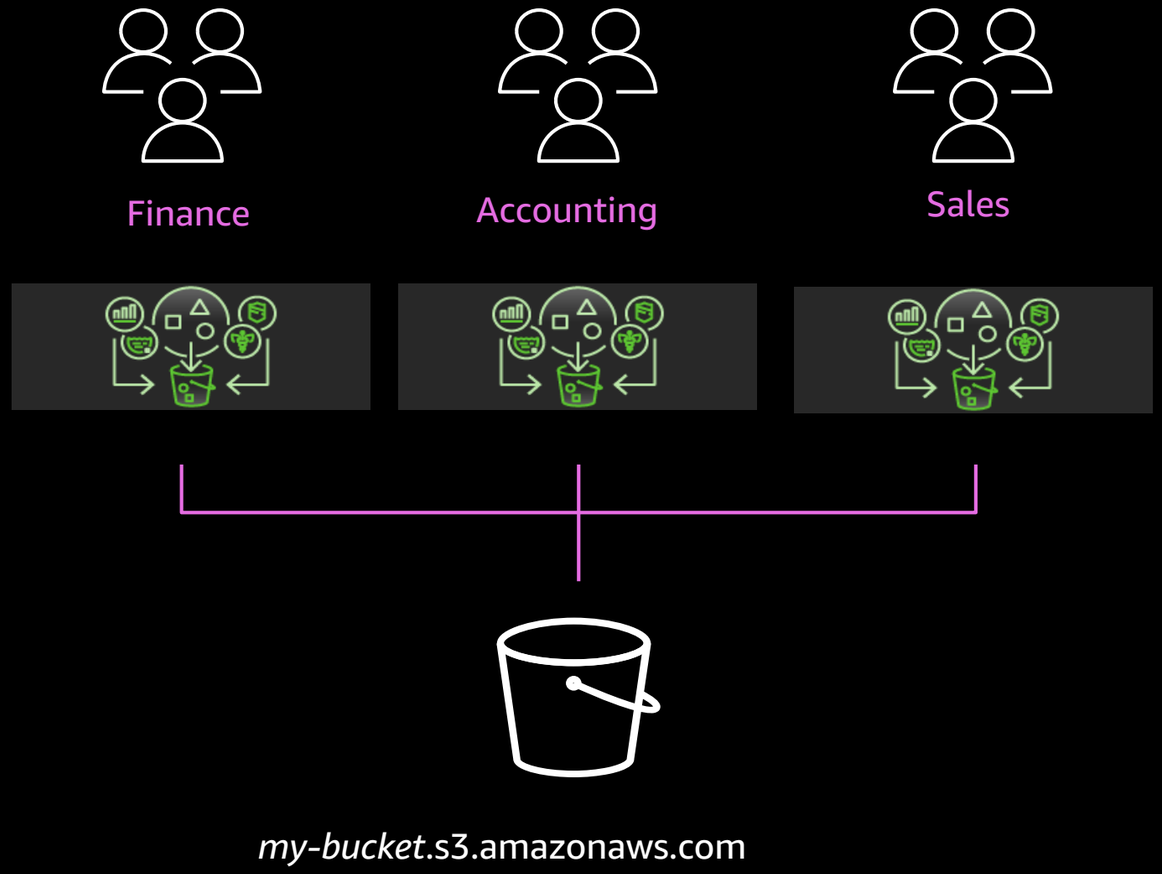
Simplified control for shared buckets accessed by many teams

USE CASES

Decentralized teams

Data lakes

Cross-account data exchange



S3 Access Points

Bucket hostname: mycomdata.s3.us-west-1.amazonaws.com

ap1 Access Point policy

AP hostname: ap1-123456789012.s3-accesspoint.us-west-1.amazonaws.com
ARN: arn:aws:s3:us-west-1:123456789012:accesspoint/ap1

ap2 Access Point policy

AP hostname: ap2-123456789012.s3-accesspoint.us-west-1.amazonaws.com
ARN: arn:aws:s3:us-west-1:123456789012:accesspoint/ap2



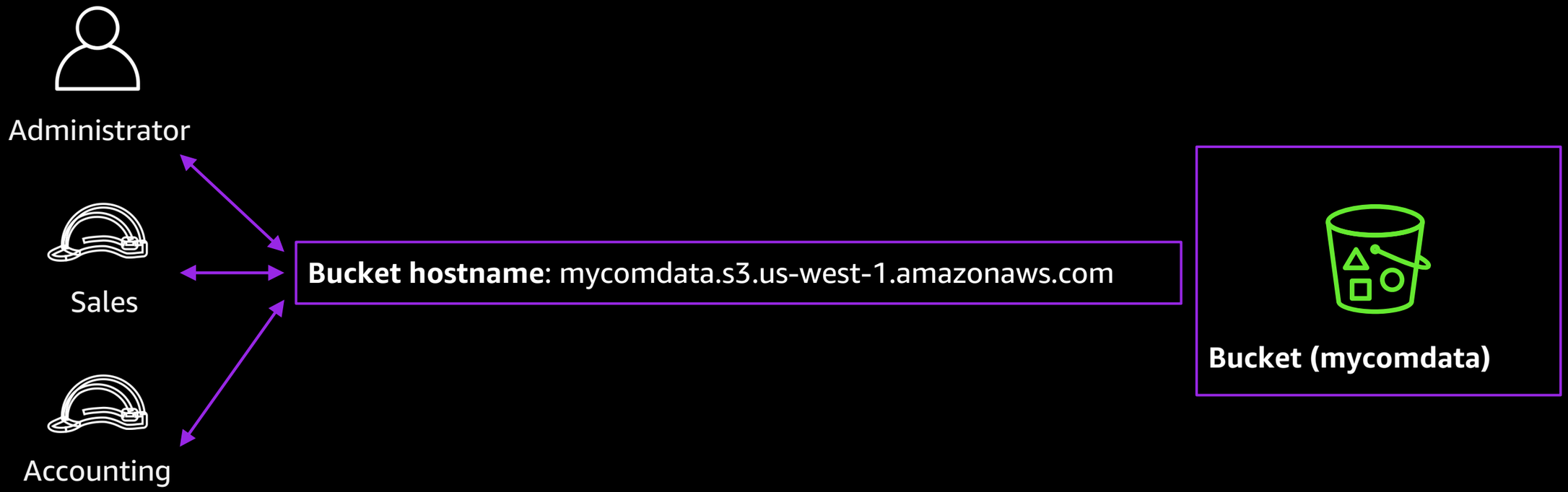
Access Points

Bucket policy

Bucket (mycomdata)

S3 Access Points

All users would access objects directly through the bucket using the bucket hostname



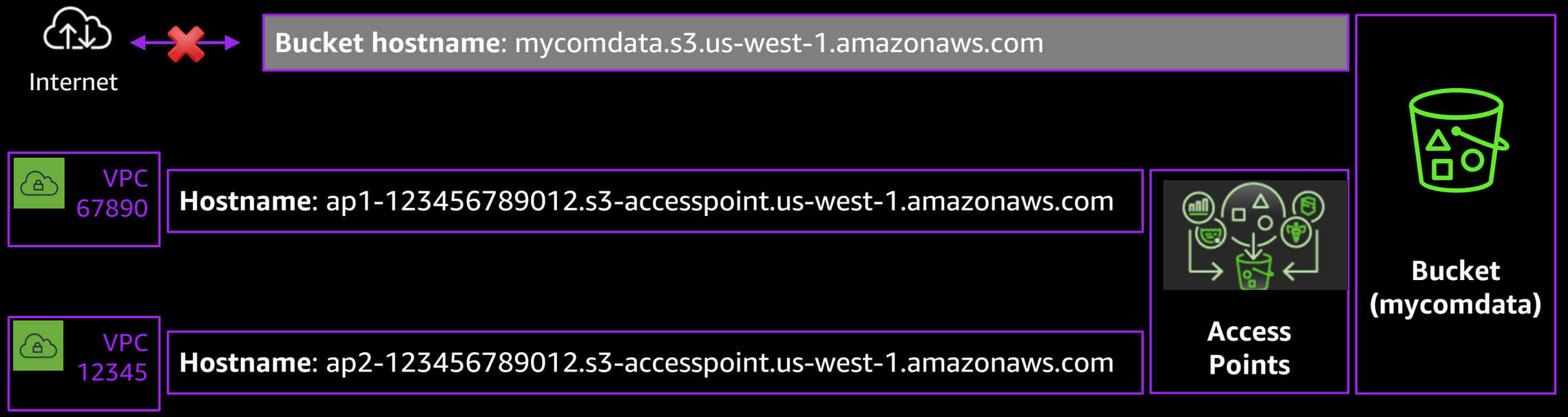
S3 Access Points

Users can access objects through dedicated access points in addition to the bucket directly



S3 Access Points

Access Points can be configured to limit access to a specified VPC only



Event-driven programming models



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Event-driven programming models

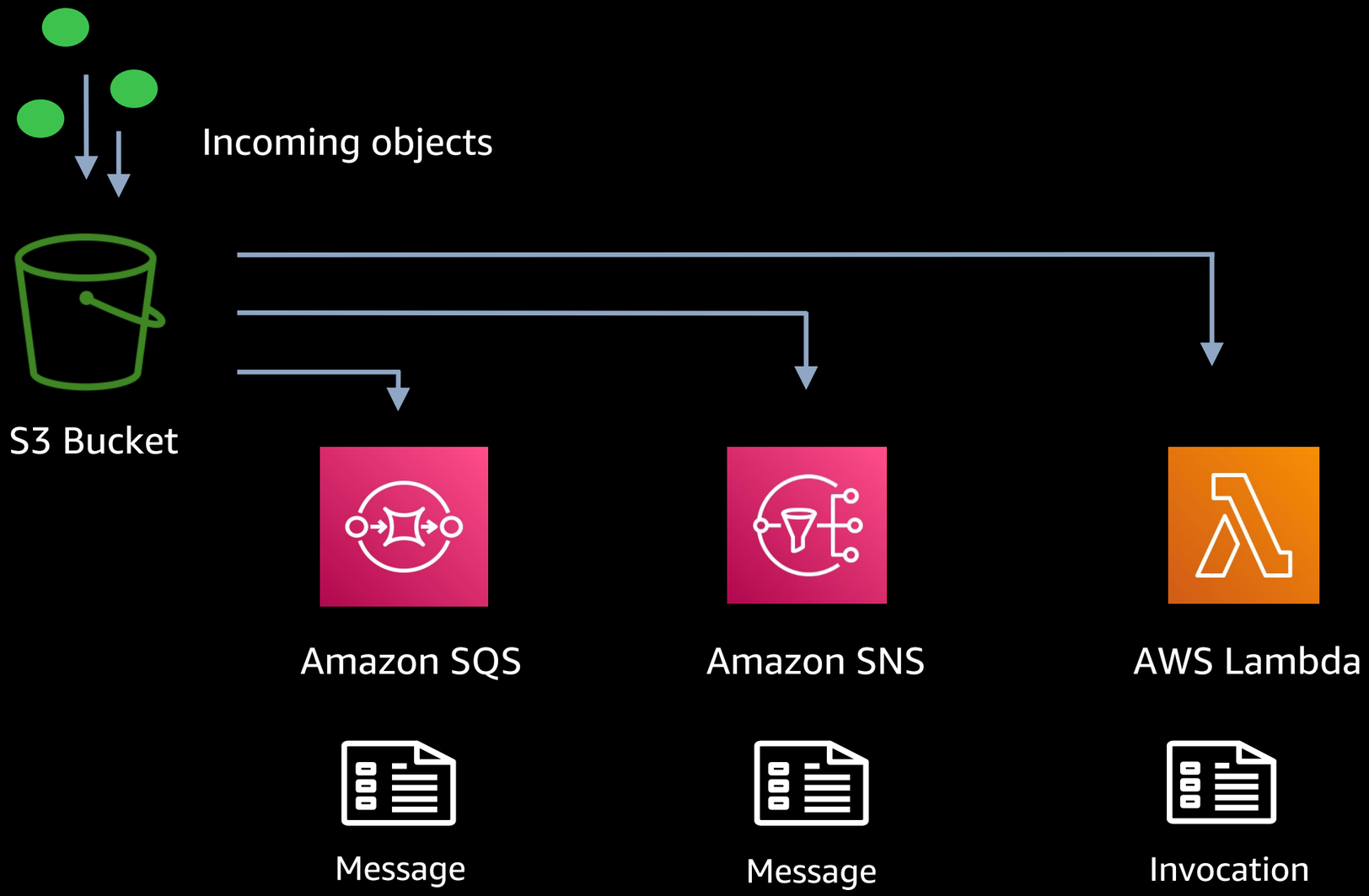
Microservices still need to interact and communicate

- Approach, not a language
- Signal on state change
- Unlike traditional request-driven models
- Decouple and scale

S3 events notification

Reliable and scalable notifications

- At-least once delivery
- Multiple delivery destinations
- Low latency, no charge
- Notifications on create, delete, restore



S3 events notification – Image sharing app

- Community feedback
- Polling-based architecture

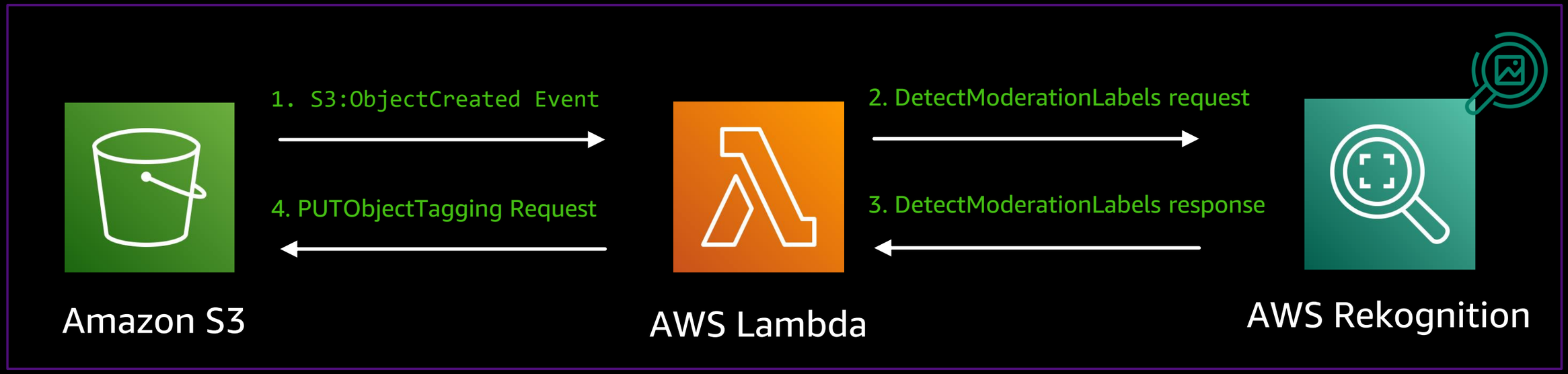


- Automated and scalable
- Faster

- Setup S3 event notification configuration
- Select destination
- Event delivery

```
"Records":[
  {   "awsRegion":"us-west-2",
      "eventTime":"1970-01-01T00:00:00.000Z",
      "eventName":"ObjectCreated:Put",
      "userIdentity":{
         "principalId":"AIDAJDPLRKLG7UEXAMPLE"
      },
      "s3":{
         "s3SchemaVersion":"1.0",
         "configurationId":"testEventRule",
         "bucket":{
            "name":"mybucket",
         },
         "object":{
            "key":"HappyFace.jpg",
            "size":1024,
            "eTag":"d41d8cd98f00b204e9800998ecf8427e",
            "versionId":"096fKKXTRTtl3on89fVO.nfljtsv6qko",
         }}
  } ]
```

S3 events notification – Image-sharing app




```
var labelResponse = await rekognition.detectModerationLabels(params).promise();
   if (labelResponse.ModerationLabels.length > 0) {
   var params = {
      Bucket: bucket,
      Key: key,
      Tagging: {
        TagSet: [{ Key: "BlockedContent", Value: "true" }]
      } };
     await s3.putObjectTagging(params).promise();
     console.info("Tagged object with BlockedContent=true.");
   }
   else {     console.info('No moderated images detected.');    }  }
```

Who will monitor and debug decoupled services? . . . Not It!

Programmatic governance

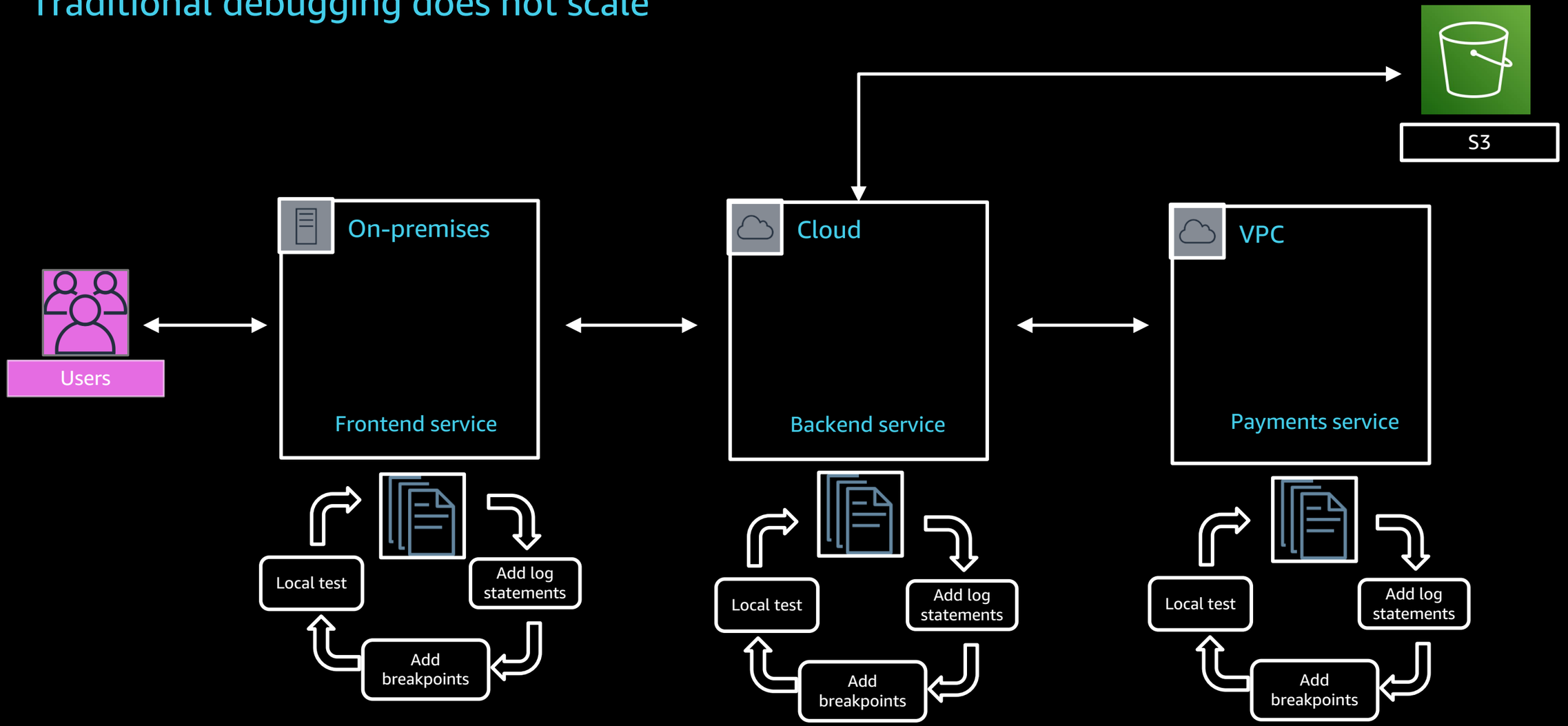


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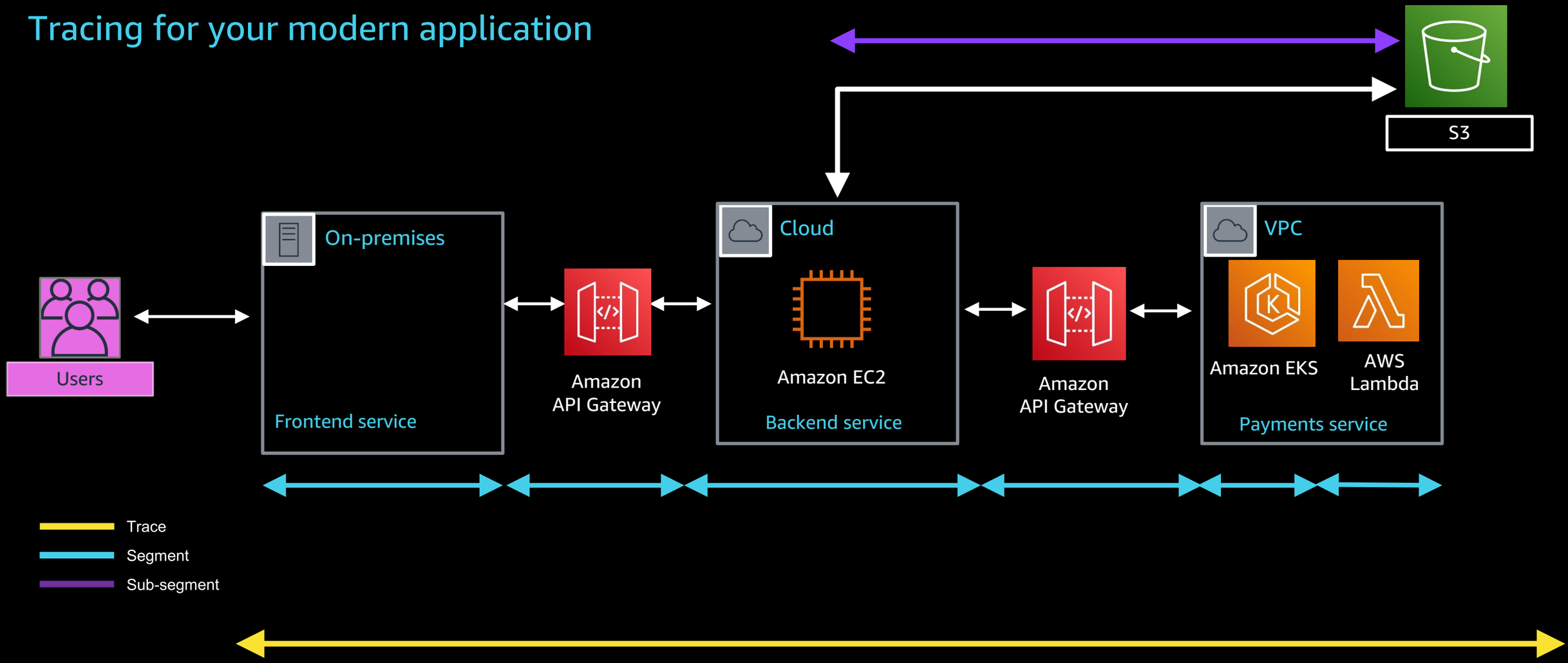
AWS X-Ray with S3

Traditional debugging does not scale



AWS X-Ray for S3

Tracing for your modern application



S3 Storage Lens



Set scope

- Account | Region | Bucket(s)
- Free tier or Upgrade tier



Analyze

- Interactive dashboard
- Drill-down by scope
- Trend data up to 15 months
- Export in CSV / Parquet format

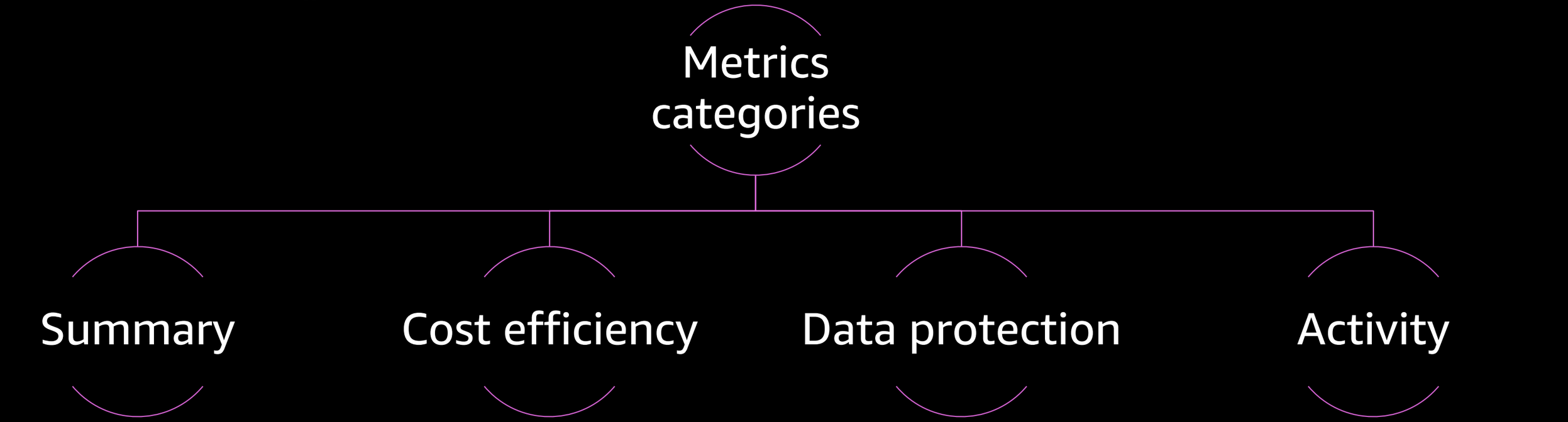


Optimize

- Identify top N growth / decline
- Flag outliers
- Recommendations: Data protection | Cost efficiency

A Storage Lens account dashboard is configured per account automatically for all S3 customers

S3 Storage Lens metrics



- Total storage
- Object count
- Avg. object size
- # Buckets
- # Accounts

- Non-current version bytes
- Non-current version objects
- Delete markers
- Incomplete MPU bytes
- Incomplete MPU counts

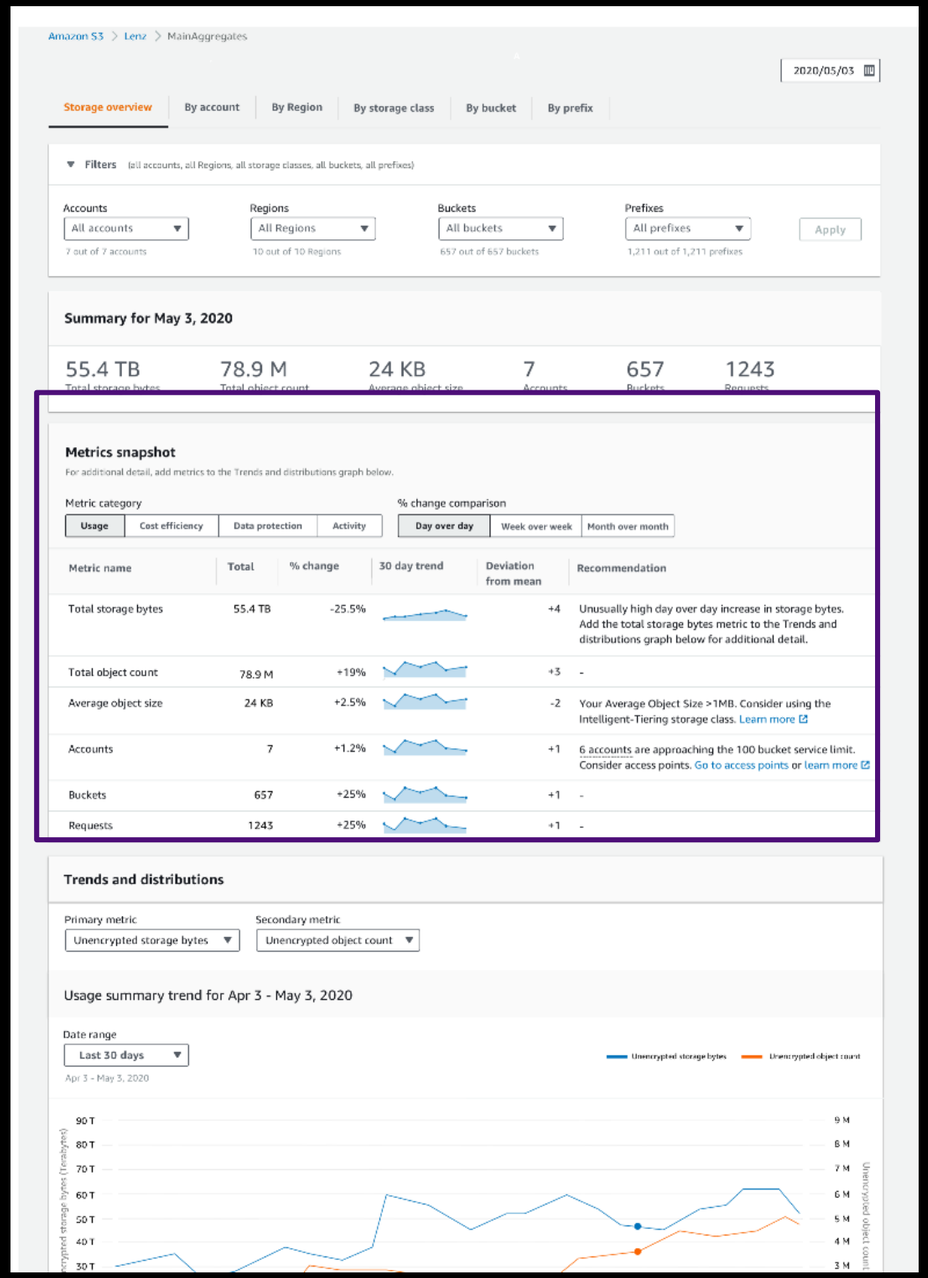
- Encrypted bytes
- Encrypted counts
- Replicated bytes
- Replicated counts
- Object-lock-enabled bytes
- Object-lock-enabled counts

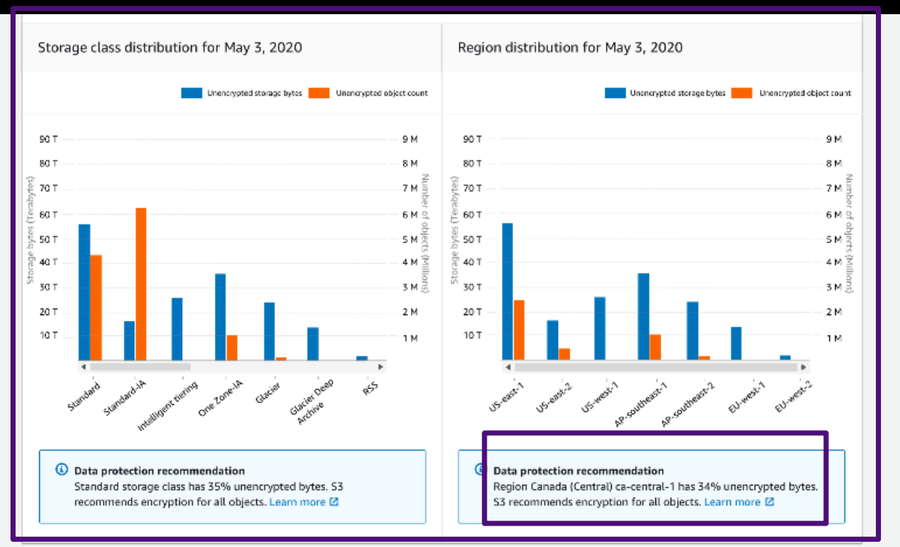
- Requests (GET, PUT, etc.)
- Download / upload bytes
- Select bytes scan / return
- Errors (total, 4xx, 5xx)
- Retrieval rate
- Ingest rate

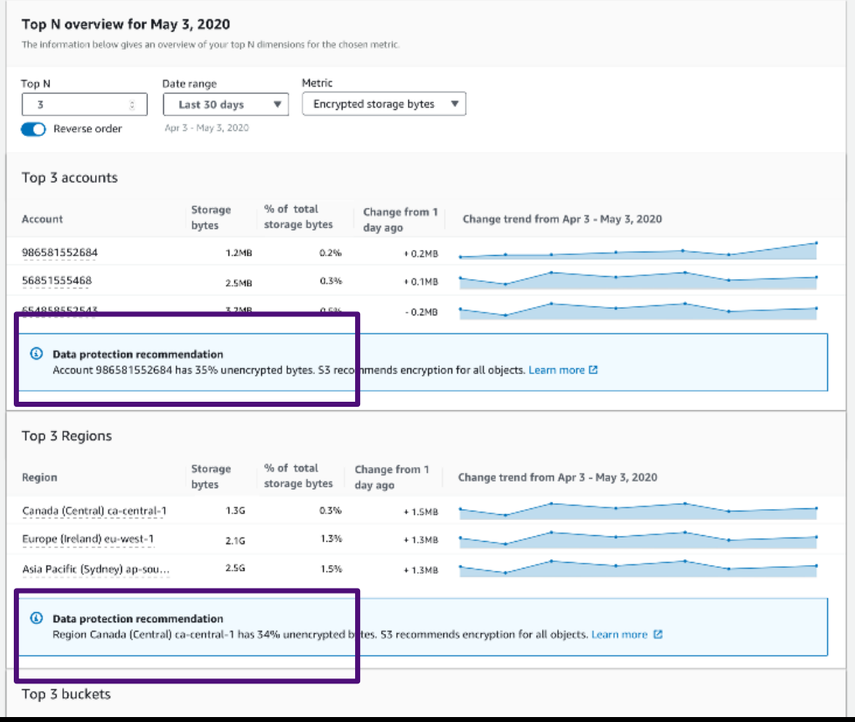
Usage metrics

Activity metrics

S3 Storage Lens – Interactive dashboard







Customer example of a modern application



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Customer example

Storytelling platform, several languages

How it started . . .

Single monolithic application

Slow mobile CX

Difficult to scale

Long deployment cycles

How it’s going . . .

Modernization with S3, Amazon ECS, Amazon RDS, and Amazon Kinesis

Mobile experience renders in seconds

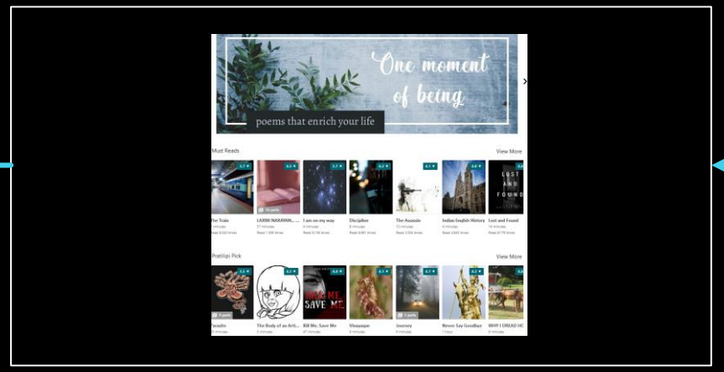
Storage with unlimited capacity and scale

2 pizza team, thousands of code deployments per year

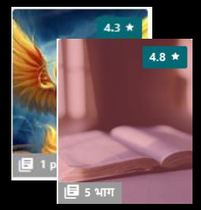
Customer example



AWS Kinesis
40 GB/day



Content platform





Users



Amazon S3



Marketing & Content Management Platform



6 million/day

Thank you!



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