

AWS Pricing Models

AWS SECURITY AND COST MANAGEMENT CONCEPTS



Dev Bhosale

Principal Data & Cloud Architect

Pricing models

Feature	Pay-as-you-go	Save when you commit	Pay less by using more
Flexibility	Very high	Low	Medium
Cost Savings	No upfront savings	High savings	Volume-based savings
Budget Predictability	Low	High	Medium

Postpaid



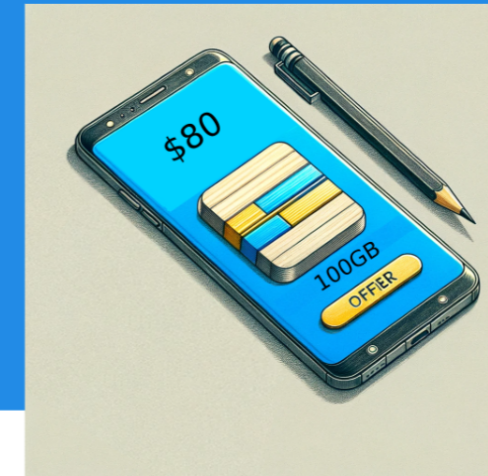
\$0.25/GB

6 month - 10GB



\$0.10/GB

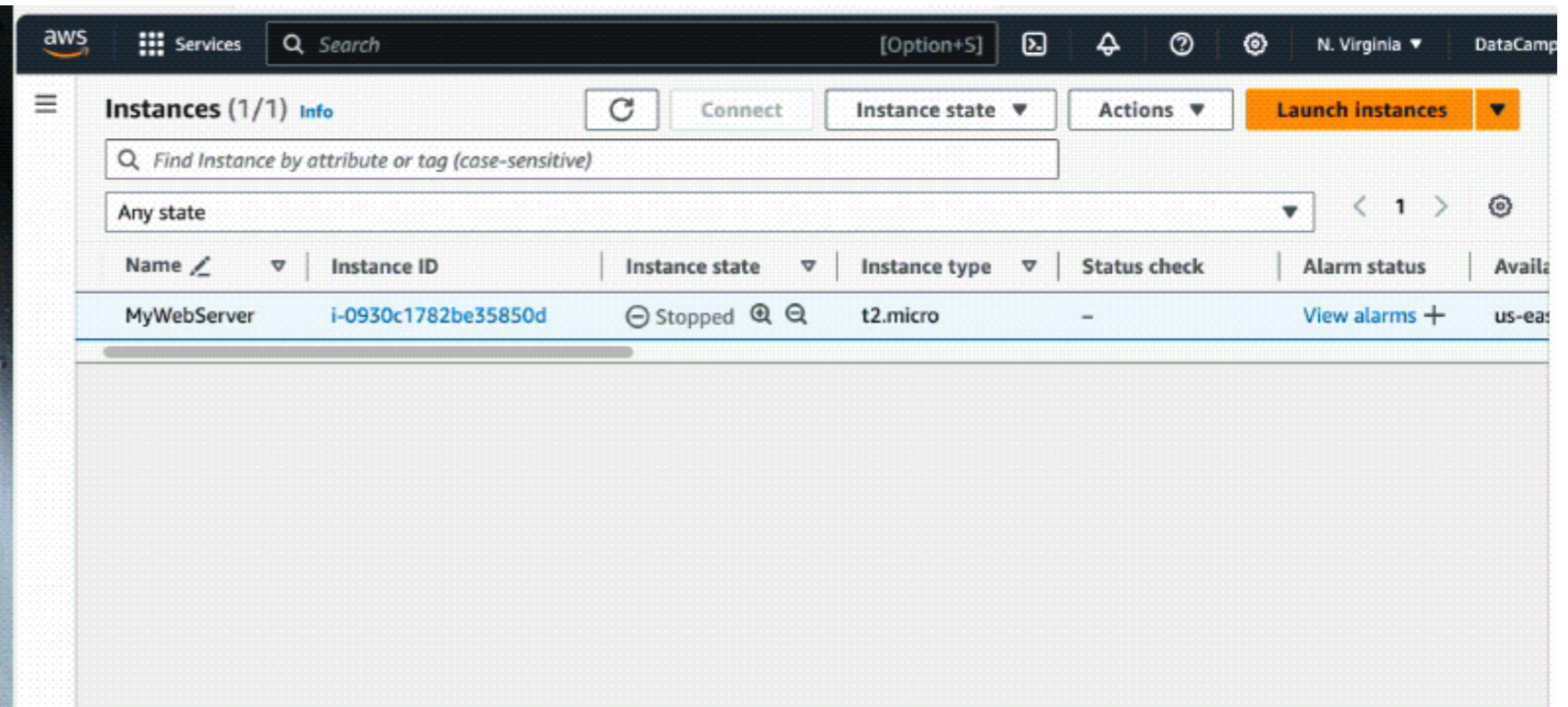
Unlimited-1 month



\$0.01/GB

Pay-as-you-go

- Pay-as-you-go approach for the vast majority of our cloud services
- You pay only for the individual services you need, for as long as you use them



Save when you commit

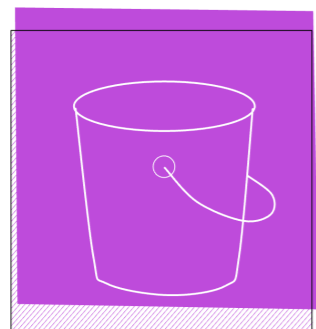
- Savings for a 1-year or 3-year commitment
- Increased savings with higher commitment
- Additional savings for upfront payment vs. monthly payments

EC2 Commitment	Monthly cost	Discount
None (pay-as-you-go)	\$734.67	0%
1-year commitment	\$487.07	33.07%
3-year commitment	\$332.15	54.78%

Pay less by using more

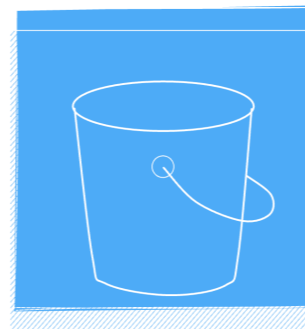
- Volume discounts decrease cost per GB with more use
- Economies of scale apply
- Similar to wholesale vs retail pricing

UP to 50TB Storage



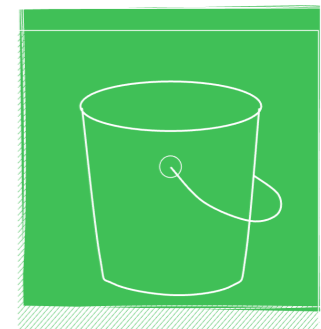
0.023 GB/month

51-100TB Storage



0.022 GB/month

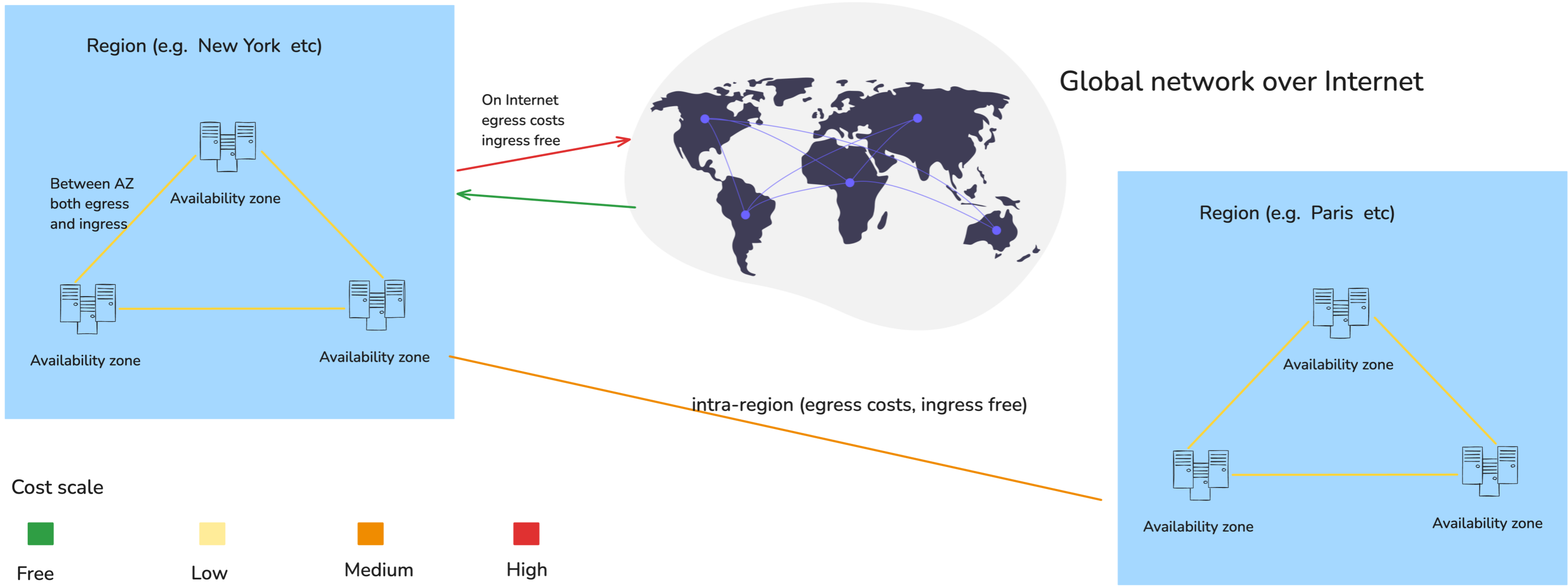
500TB+ Storage



0.021 GB/month

Bandwidth costs

AWS Data Transfer Costs



Pricing calculator

Select the container and options to find your best price

☐ Compute Savings Plans

One plan that automatically applies to all usage on EC2, Fargate, and Lambda. Up to 66% discount. [Learn more](#)

Reservation term

☐ 1 year

☒ 3 year

Payment Options

☒ No upfront

☐ Partial upfront

☐ All upfront

Upfront: 0.00

Monthly: 384.42/Month

☐ EC2 Instance Savings Plans

Get deeper discount when you only need one instance family and region. Up to 72% discount. [Learn more](#)

Reservation term

☐ 1 year

☒ 3 year

Payment Options

☒ No upfront

☐ Partial upfront

☐ All upfront

Upfront: 0.00

Monthly: 334.27/Month

☐ On-Demand

Maximize flexibility. [Learn more](#)

Expected utilization

Enter the expected usage of Amazon EC2 instances

Usage

100

Usage type

Utilization percent per month

Instance: 0.928/Hour

Monthly: 677.44/Month

☒ Spot Instances

Minimize cost by leveraging EC2's spare capacity. Recommended for fault tolerant and interruption tolerant applications. [Learn more](#)

The historical average discount for m4.xlarge is 66%

Assume percentage discount for my estimate

66

Actual spot instance pricing varies

With spot instances, you pay the spot price that's in effect for the time period your instance is running

Instance: 0.928/Hour

Monthly: 230.33/Month

Amazon EC2 On-Demand instances cost (Monthly): 230.33

Total Upfront cost: 0.00 USD

Total Monthly cost: 230.33 USD

Show Details ▲

Cancel

Update

https://calculator.aws

Let's practice!

AWS SECURITY AND COST MANAGEMENT CONCEPTS

Manage AWS Budgets and Costs

AWS SECURITY AND COST MANAGEMENT CONCEPTS



Dev Bhosale

Principal Data & Cloud Architect

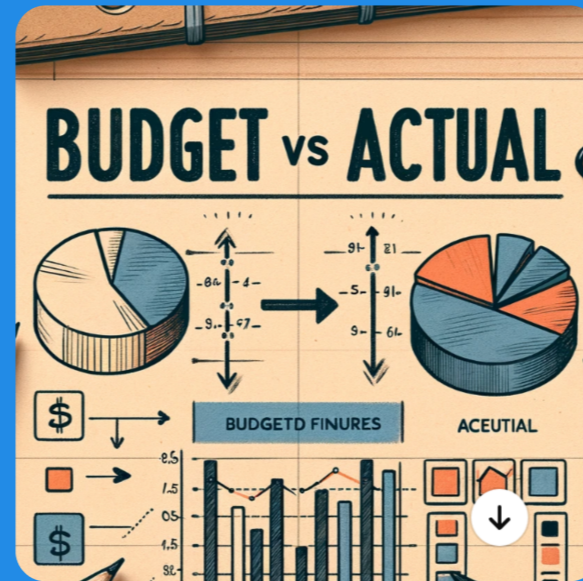
How to manage AWS costs

1



Analyze costs

2



Set budgets

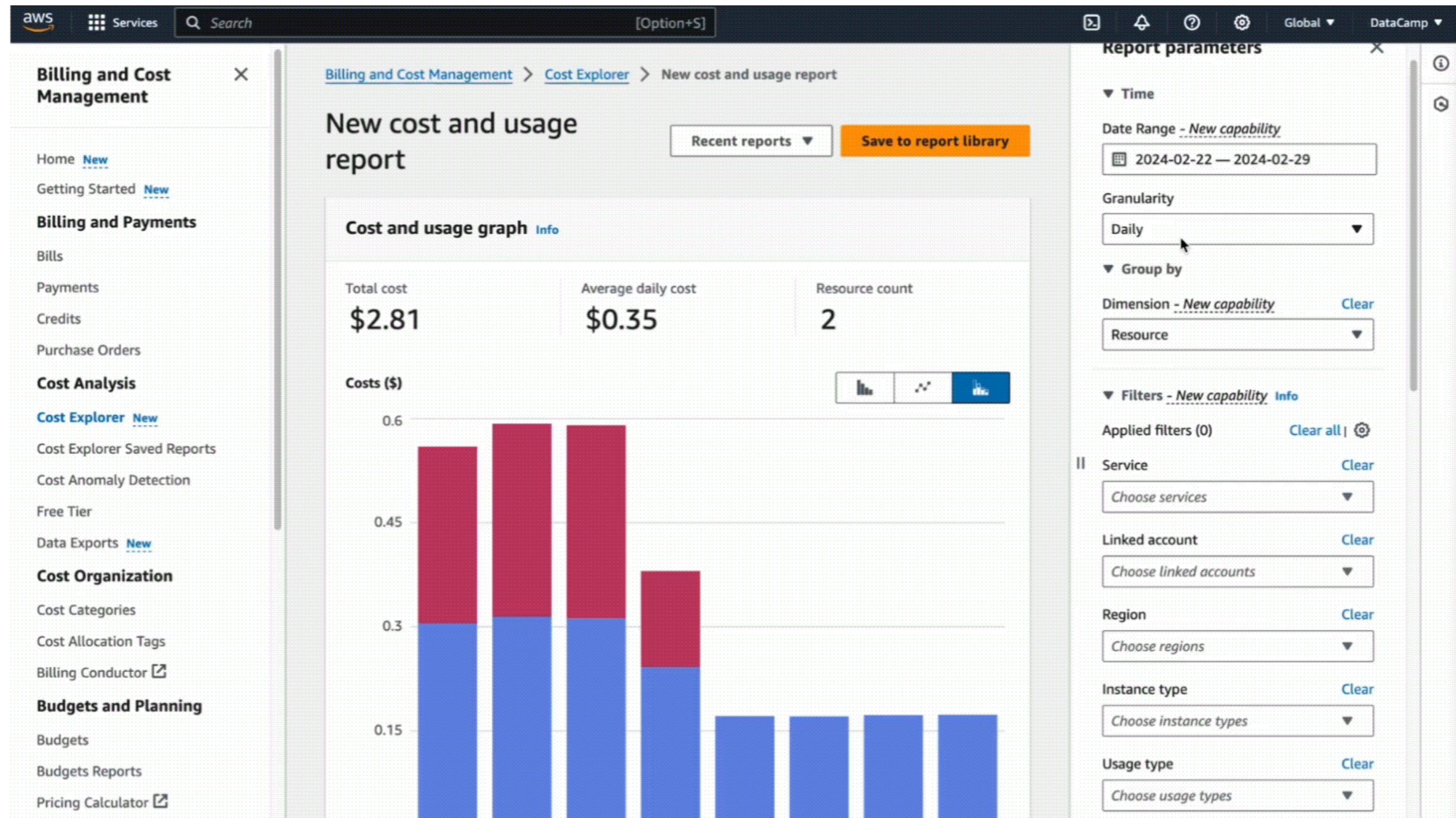
3



Respond with actions

1. Analyze costs
2. Set budgets
3. Respond with actions

Cost explorer



Budgets in action

The screenshot shows the AWS Billing and Cost Management console. The left sidebar contains navigation links for Billing and Cost Management, Home, Getting Started, Billing and Payments, Cost Analysis, Cost Organization, and Budgets and Planning. The main content area is titled 'Choose budget type' and includes a 'Budget setup' section with two options: 'Use a template (simplified)' (selected) and 'Customize (advanced)'. Below this is a 'Templates - new' section with four templates: 'Zero spend budget', 'Monthly cost budget' (selected), 'Daily Savings Plans coverage budget', and 'Daily reservation utilization budget'. The 'Monthly cost budget' template is expanded, showing a 'Budget name' field with the value 'My Monthly Cost Budget'.

Billing and Cost Management

Home [New](#)

Getting Started [New](#)

Billing and Payments

Bills

Payments

Credits

Purchase Orders

Cost Analysis

Cost Explorer [New](#)

Cost Explorer Saved Reports

Cost Anomaly Detection

Free Tier

Data Exports [New](#)

Cost Organization

Cost Categories

Cost Allocation Tags

Billing Conductor [↗](#)

Budgets and Planning

[Budgets](#)

Budget Reports

Pricing Calculator [↗](#)

Billing and Cost Management > Budgets > Create budget

Choose budget type [Info](#)

Budget setup

☒ **Use a template (simplified)**
Use the recommended configurations. You can change some configuration options after the budget is created.

☐ **Customize (advanced)**
Customize a budget to set parameters specific to your use case. You can customize the time period, the start month, and specific accounts.

Templates - *new*

Choose a template that best matches your use case.

☐ **Zero spend budget**
Create a budget that notifies you once your spending exceeds \$0.01 which is above the AWS Free Tier limits.

☒ **Monthly cost budget**
Create a monthly budget that notifies you if you exceed, or are forecasted to exceed, the budget amount.

☐ **Daily Savings Plans coverage budget**
Create a coverage budget for your Savings Plans that notifies you when you fall below the defined target.

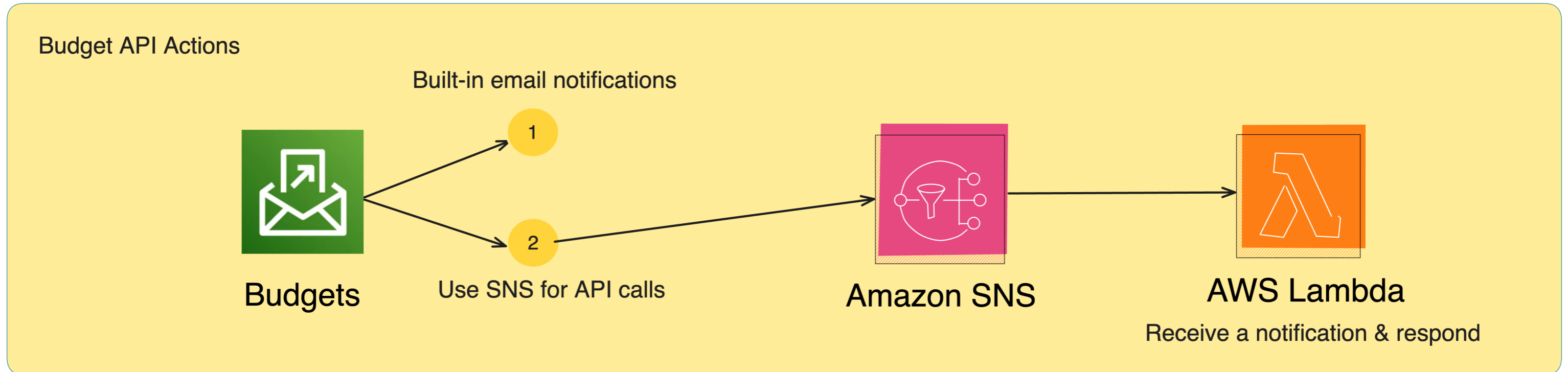
☐ **Daily reservation utilization budget**
Create a utilization budget for your reservations that notifies you when you fall below the defined target.

Monthly cost budget - Template

Budget name
Provide a descriptive name for this budget.

My Monthly Cost Budget

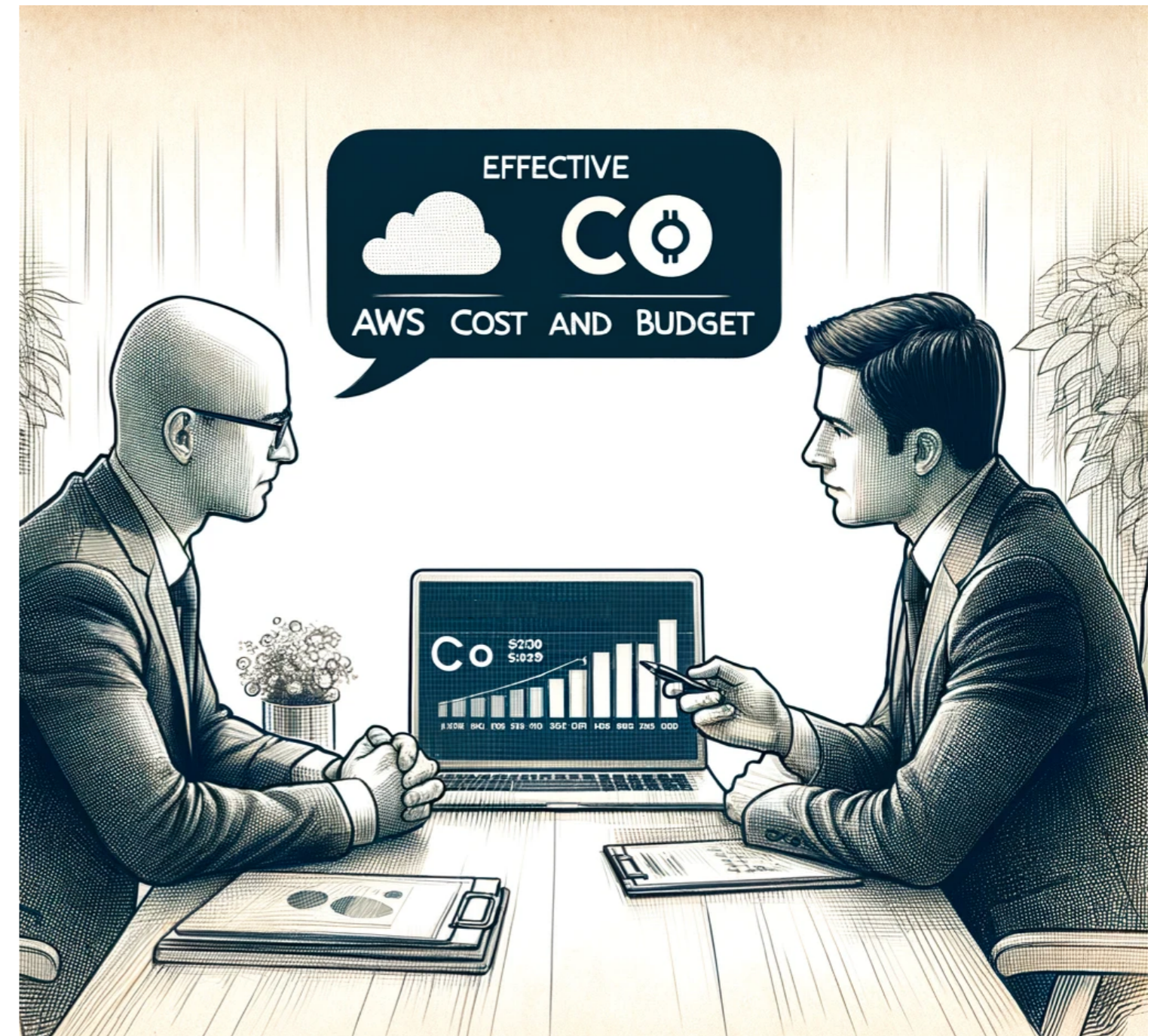
Respond with actions



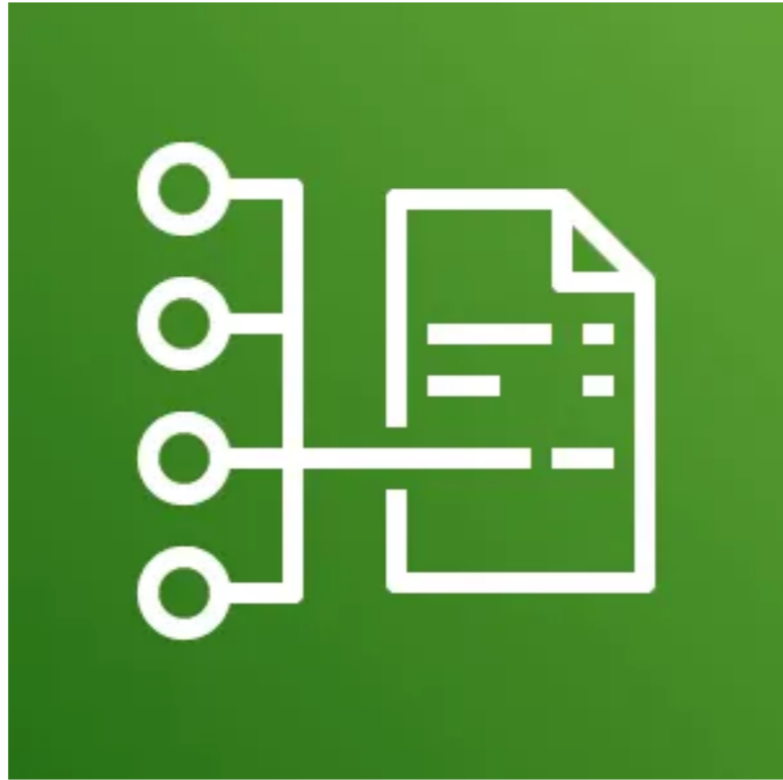
- AWS Budgets has built-in email notifications
- Integrates with SNS for API notifications
- AWS Lambda reacts to SNS budget alerts
- Using Lambda, you can prevent creation of new resources when a budget threshold is reached

Guidelines for budgets

- Budgets doesn't guarantee financial control
- Budgets must be based on accurate, specific business needs
- Effective budgets consider all costs, are goal-oriented



Billing Conductor



- Organize cloud costs by project
- Track spending for different teams or users
- Create custom billing reports
- Improve budgeting and cost visibility

AWS Billing Conductor

Reserved instance flexibility

- Save money with Reserved Instances
- Flexibly adjust instance size
- Discounts apply within instance family
- Purchased capacity is calculated using normalization table

Instance Size	Normalization Factor
nano	0.25
micro	0.5
small	1
medium	2
large	4
xlarge	8
2xlarge	16
4xlarge	32
8xlarge	64
10xlarge	80
16xlarge	128
32xlarge	256

Let's practice!

AWS SECURITY AND COST MANAGEMENT CONCEPTS

Cost Allocation, Billing, and Support

AWS SECURITY AND COST MANAGEMENT CONCEPTS



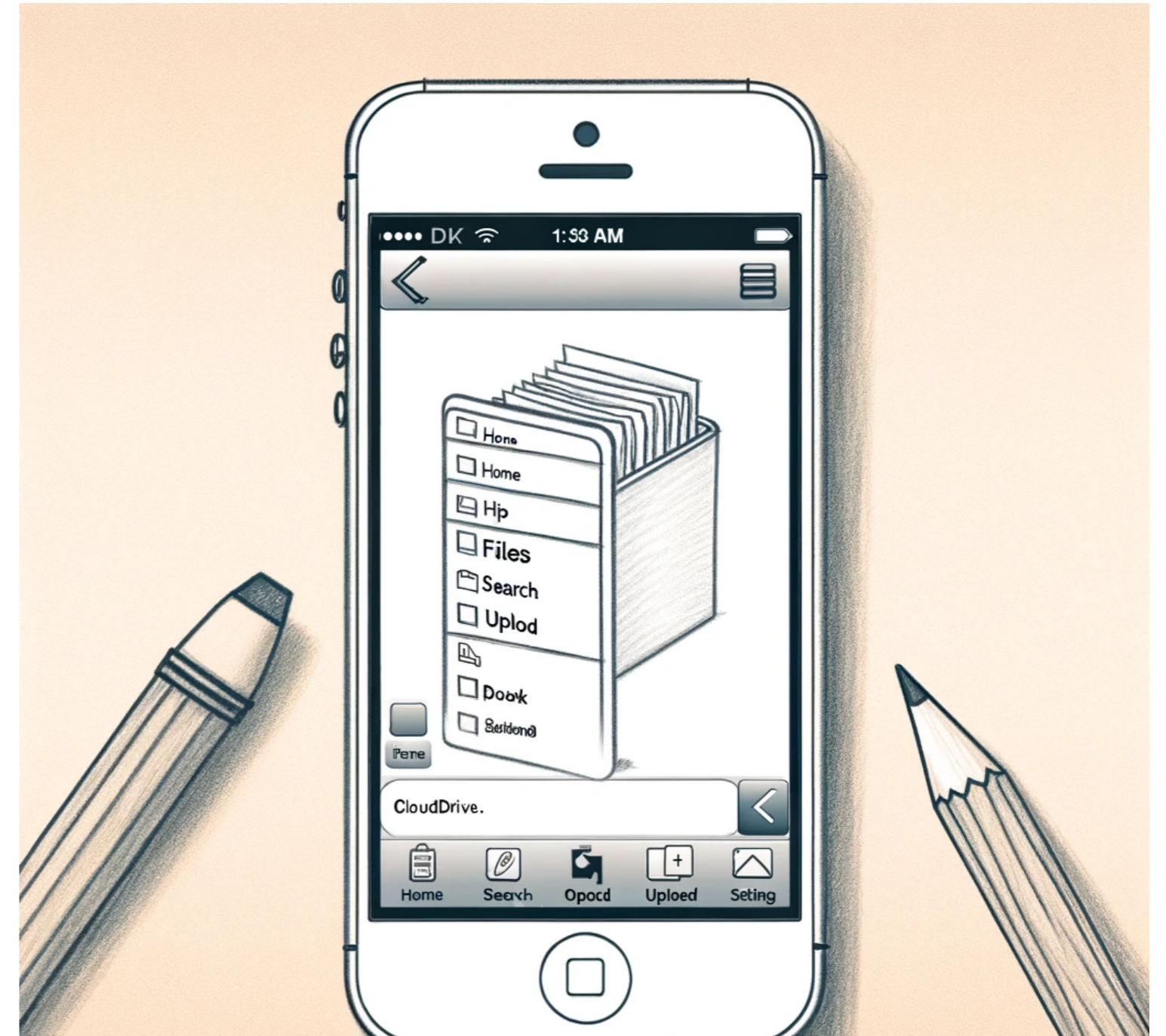
Dev Bhosale

Principal Data & Cloud Architect

How AWS billing works?

- AWS billing breakdown by services

Service	Cost
S3 Storage	\$2,000
S3 Data Transfer	\$13
AWS Cognito	\$400
Web Servers	\$5,533
Load Balancer	\$400
Database	\$2,417
Total	\$10,763



What are cost allocation tags?

[Billing and Cost Management](#) > Cost Allocation Tags

Cost allocation tags [Info](#)

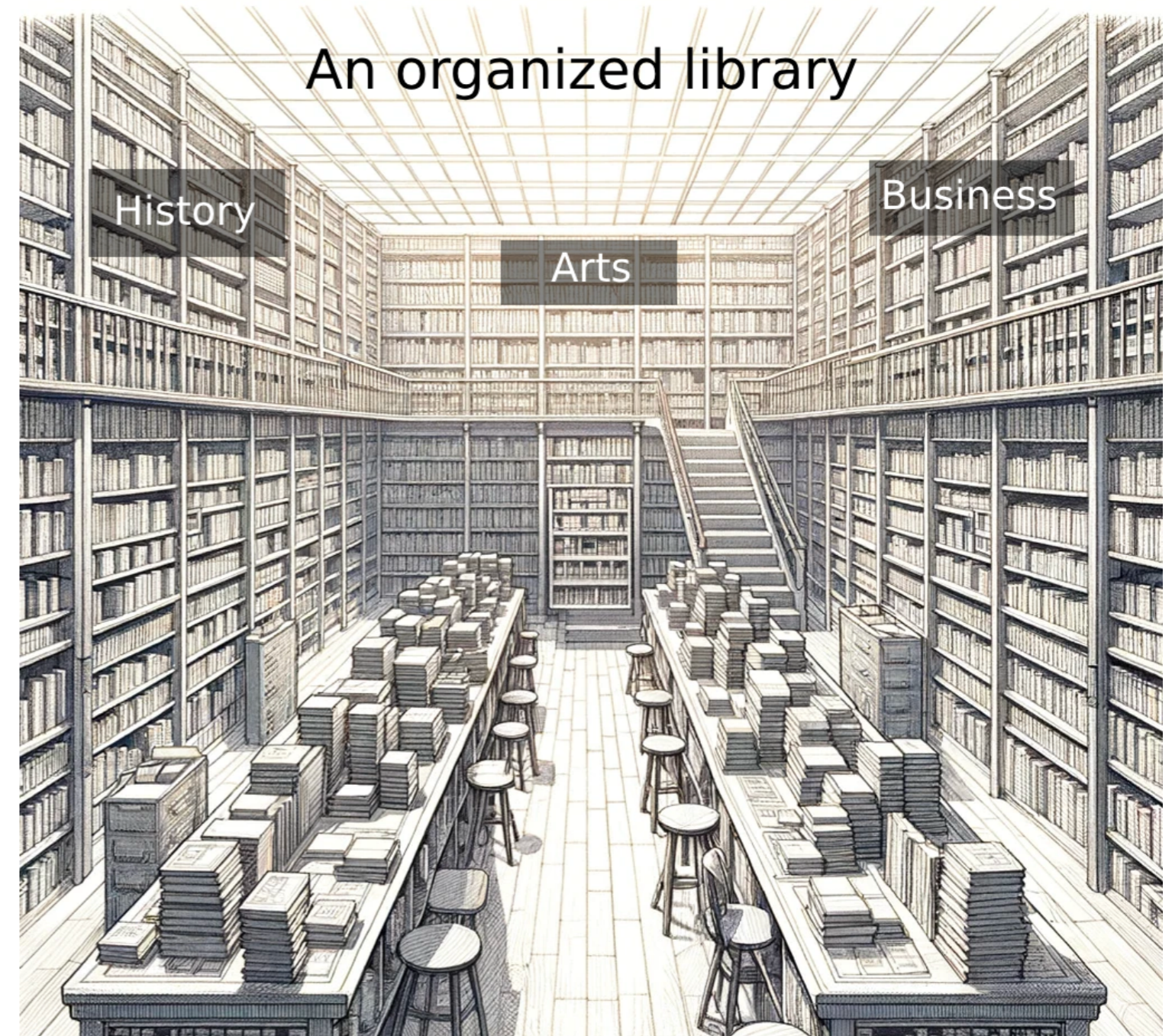
Cost allocation tags activated: 3

[User-defined cost allocation tags](#) | [AWS generated cost allocation tags](#)

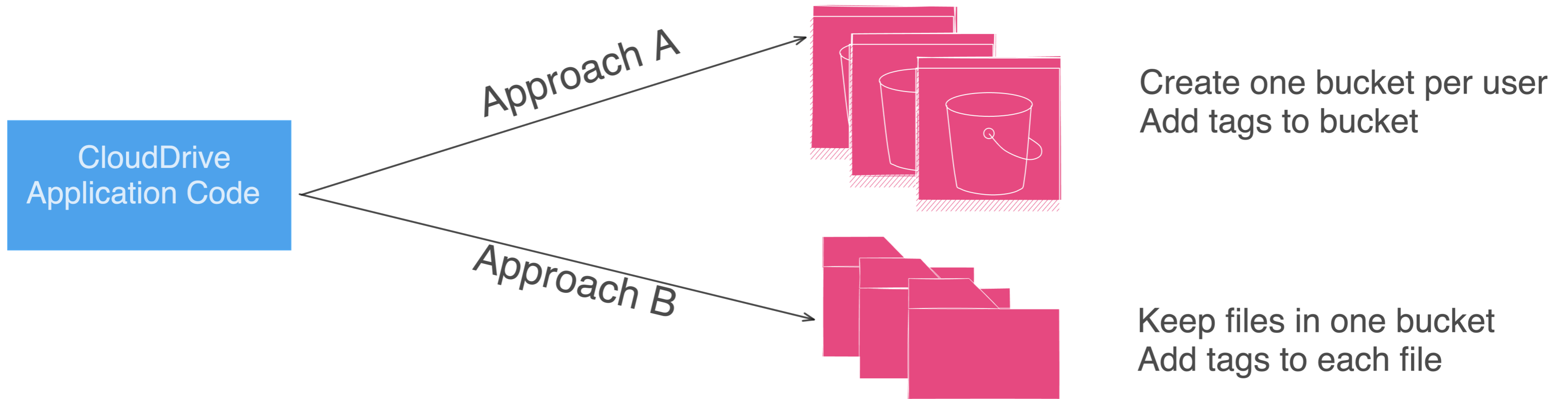
User-defined cost allocation tags (8) [Info](#) [Undo](#) [Deactivate](#) [Activate](#)

< 1 > ⚙️

<input type="checkbox"/>	Tag key ▲	Status ▼	Last updated date ▼
<input type="checkbox"/>	app-username	✓ Active	March 10, 2024, 16:55 (UTC-04:00)
<input type="checkbox"/>	bucketname	✓ Active	March 08, 2024, 10:45 (UTC-05:00)
<input type="checkbox"/>	ManagedByAmazonSageMakerResource	✗ Inactive	-
<input type="checkbox"/>	Name	✗ Inactive	-



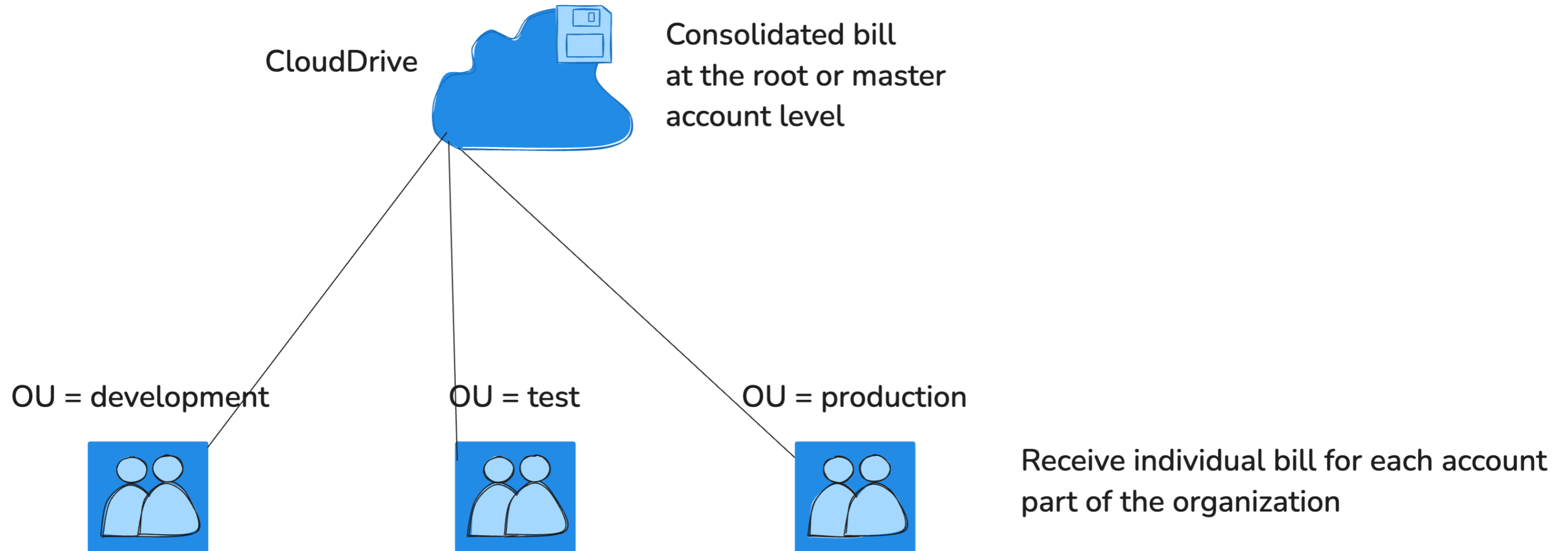
Adding tags to files



Tag values appear on object property

Tags (1) Edit	
Track storage cost of other criteria by tagging your objects. Learn more	
Key	Value
app-username	awesome-datacamp-user

AWS Organization



AWS Health

AWS Health Dashboard

▼ Service health

Open and recent issues

Service history

▼ Your account health

Open and recent issues

Scheduled changes

Other notifications

[Event log](#)

► Your organization health

▼ Health Integrations

Amazon EventBridge

AWS Health Aware [↗](#)

Time zone settings

AWS Health Dashboard

Updated less than 1 min ago



Your account health

Stay informed of important events affecting your AWS resources.

Amazon EventBridge rule

Get notifications for events that might affect your services and resources.

[Configure](#) [↗](#)

[Learn more](#)

Open and recent issues (0)

Scheduled changes (0)

Other notifications (0)

[Event log](#)

Event log

< 1 >

	Event ▾	Status	Event category ▾	Region / Zone Info	Start time ▾	Last update time ▾	Affected resources ▾
<input type="radio"/>	Operational issue - IAM (Global)	Closed	Issue	-	August 29, 2024 at 5:31:00 AM UTC-4	August 29, 2024 at 12:41:14 PM UTC-4	-
					August 15, 2024	August 15, 2024	

AWS support options

Feature	Basic	Developer	Business	Enterprise
Pricing	Free	Pay-per-use	Monthly fee	Monthly fee
Direct Access to Support Engineers	-	Yes (business hours)	Yes (24/7)	Yes (24/7)
24/7 Support	-	-	Yes	Yes
API Access	-	-	Yes	Yes
Support Channels	Forums	Email	Email, Chat, Phone	Email, Chat, Phone
Response Times	-	< 24 hours	< 1 hour	< 15 minutes
Training & Programs	Basic guides	-	Yes	Yes
Technical Account Manager (TAM)	-	-	-	Yes

Let's practice!

AWS SECURITY AND COST MANAGEMENT CONCEPTS

Cost Optimization Strategies

AWS SECURITY AND COST MANAGEMENT CONCEPTS

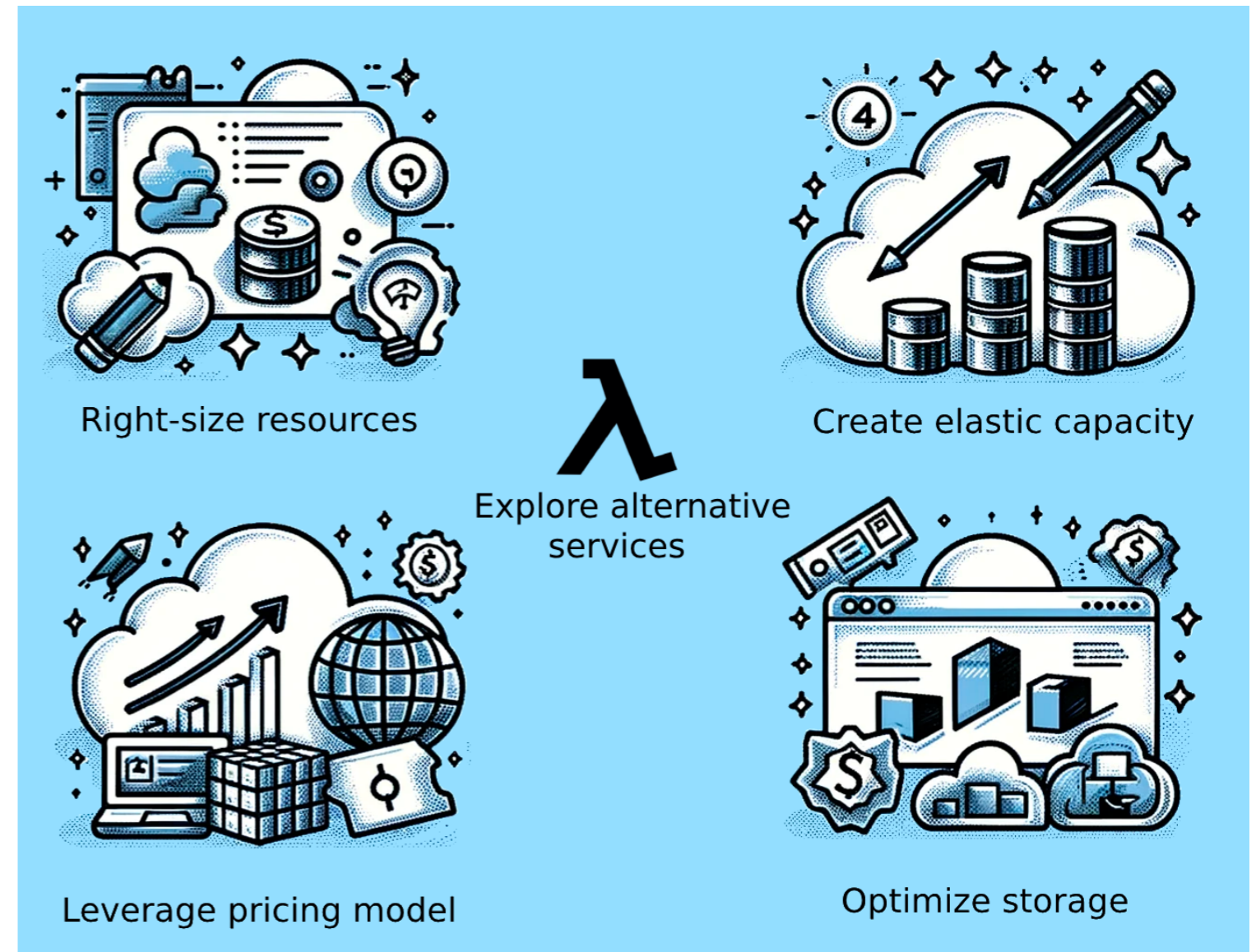


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Cost optimization framework

1. Right-size resources
2. Create elastic capacity
3. Leverage pricing model
4. Explore alternative services
5. Optimize storage

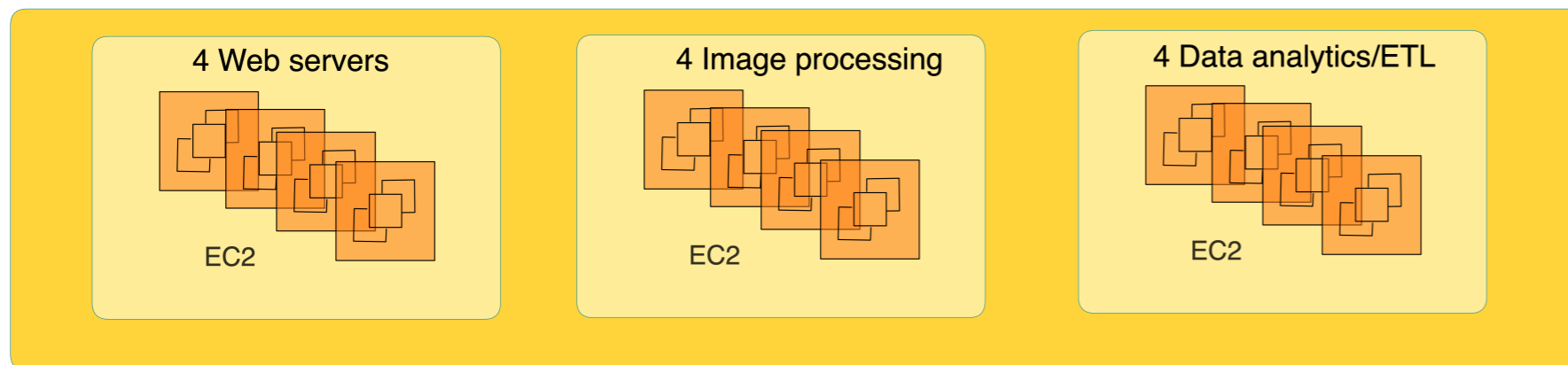


Optimization example

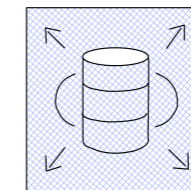
The company's pays AWS \$15,000/month total. \$12,000 for 12 EC2 servers and \$2,000 for a database service and \$1,000 for S3 storage. On-demand rate paid is \$1.36/server-hour.

\$15,000/month AWS bill

12 EC2 Servers

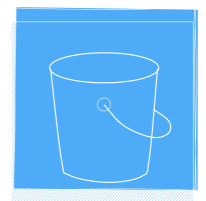


12x \$1,000/server/month = \$12,000/month



Relational Database Service

\$2,000/month



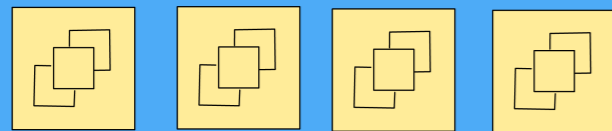
40TB in S3 Storage

\$1,000/month

Optimize size and capacity

- Servers are adequately sized in terms of CPU/memory
- Instead of running four servers 24/7 we can optimize usage
- We can dynamically scale-up and scale-down servers based on traffic surges using auto-scaling group and save at least **50% total server costs**

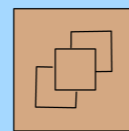
Before pricing model change



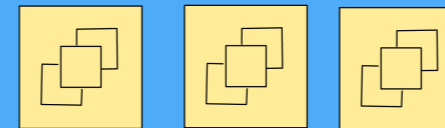
4 servers 24/7 = 96 server hours/day
Total cost \$4,000/month

After pricing model change

1 server for baseline load
Total usage 24 server hours



EC2



3 servers in autoscaling group
Scale up or down
Total usage = 24 hours

Total usage (baseline+surge) = 48 hours

Total cost

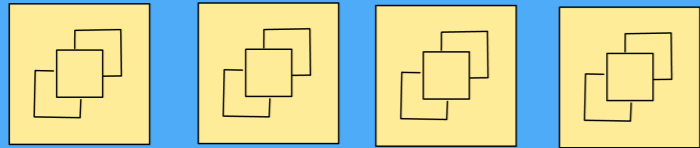
Total usage 48 server hours/day

Total cost = $48/96$ (\$4,000/month)

= \$2,000/month

Leverage pricing model

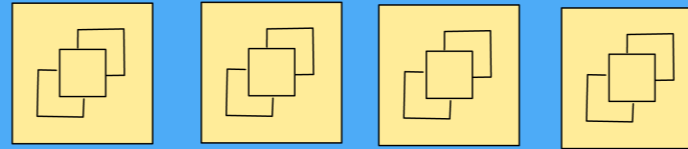
Before pricing model change



4 servers 24/7 = 96 server hours

4 servers x \$1,000/month = \$4,000

After pricing model change



4 spot-instance servers
for 4 hours every night
= 16 server hours

Total cost

16/96 (usage factor)

* 4 server

* \$1000/month/server

* 0.334 66% avg spot discount

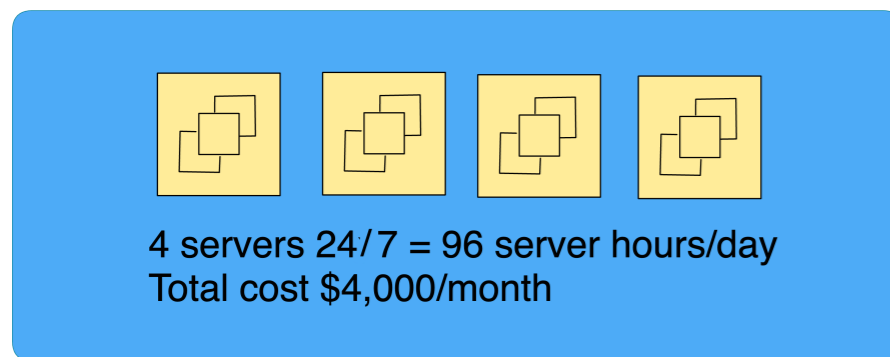
= \$222.66/month

- Spot instances offer average savings of 66%
- Analytics workload needs to run for only four out of 24 hours
- Opportunity to **save 94%** of the analytics server costs

Explore alternatives

- Lambda is a serverless compute service for running code without having to manage servers
- Lambda is ideal for short-term tasks such as image uploads and processing
- One million free requests per month and 400,000 GB-seconds of compute time per month
- Replacing four EC2 servers with Lambda will result in savings of \$4,000/month or **100%** of the image processing server costs

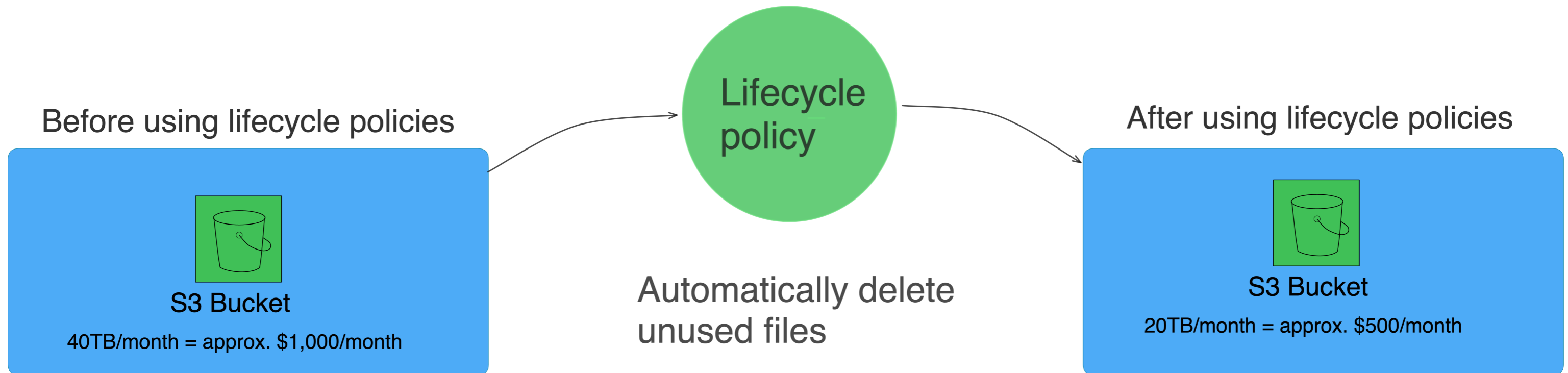
Before using lambda serverless



After using Lambda



Optimize storage



- S3 can grow in size and add to storage costs
- Lifecycle policies can create rules which automatically purge files
- This will save \$500/month or **50%** of the storage costs

Savings summary

- We've saved a whopping 68.52% from the original AWS costs
- Elastic-sizing EC2 servers and using alternative compute such as Lambda
- Actual savings will depend on workload characteristics and the business need

Use cases	Cost/month before optimization	Cost/month After optimization
Web server	\$4,000	\$2,000
Analytics servers	\$4,000	\$222
Image processing servers	\$4,000	0
S3 storage costs	\$1,000	\$500
RDS database	\$2,000	\$2,000
Total	\$15,000	\$4,722

Let's practice!

AWS SECURITY AND COST MANAGEMENT CONCEPTS

Wrap-up

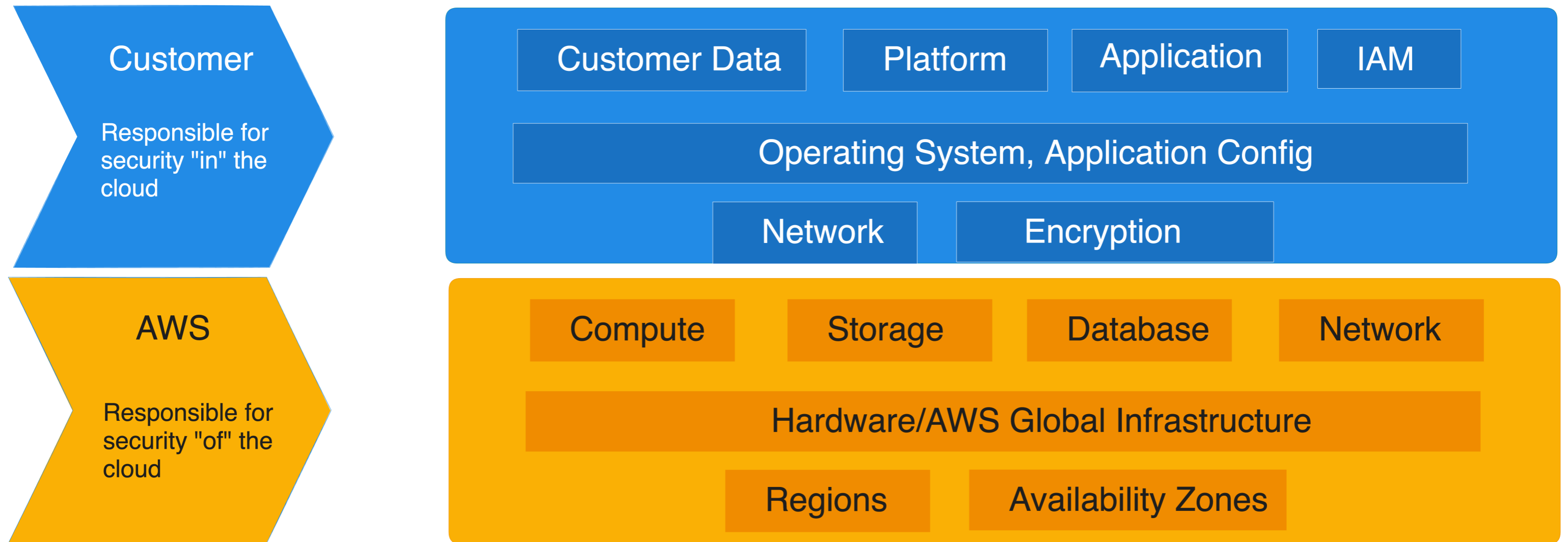
AWS SECURITY AND COST MANAGEMENT CONCEPTS



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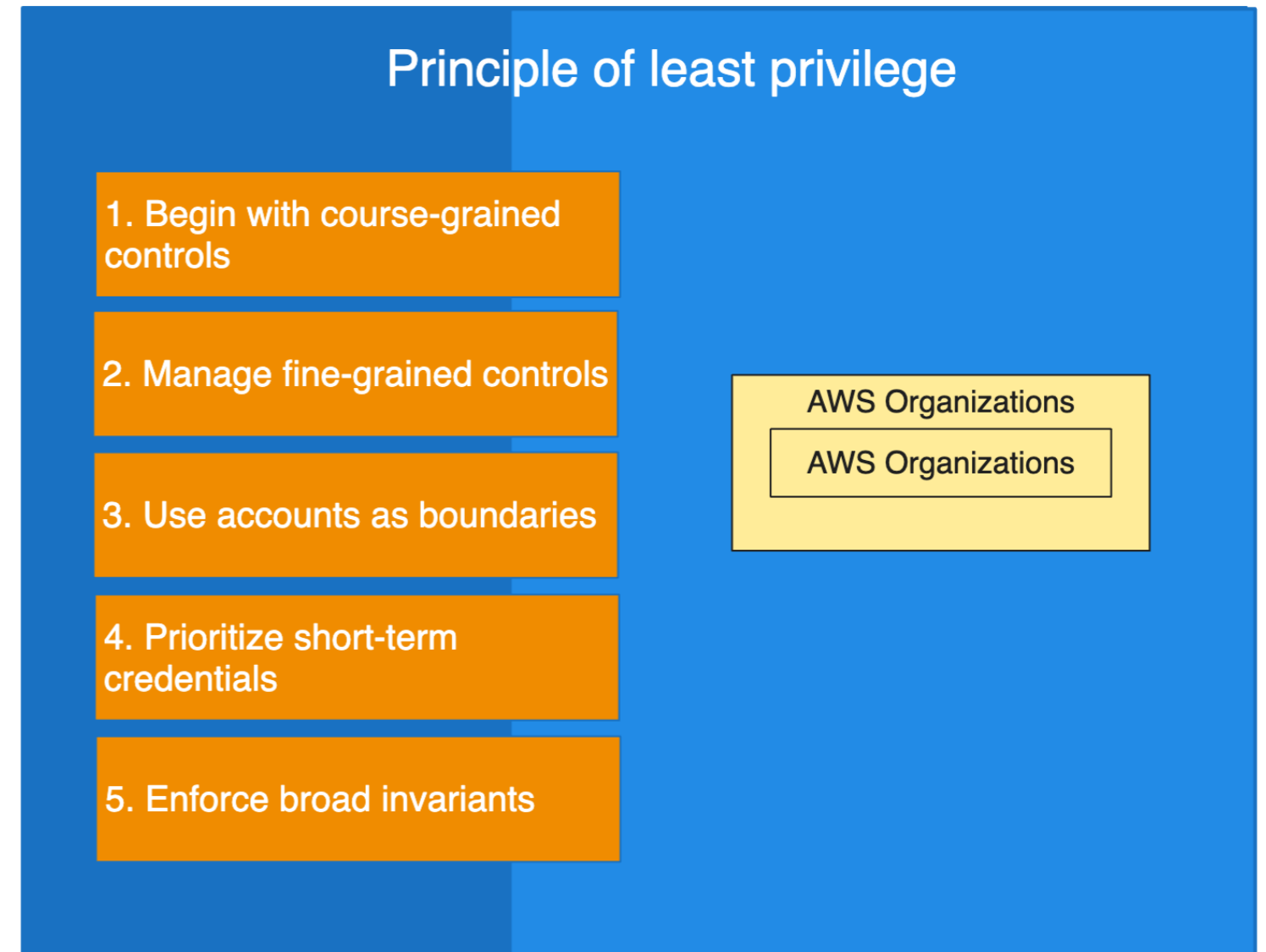
Introduction to AWS Security



- Security concepts and shared responsibilities
- Why end-to-end security is important

Deep dives into Compliance, Governance, and IAM

- Principle of least privilege
- Identity and Access Management (IAM)



Network and Compute Security

Network Security

Subnet design

NACL

Firewall

- Network security
- Compute security

Compute Security



Keep credentials secure



Update Operating System



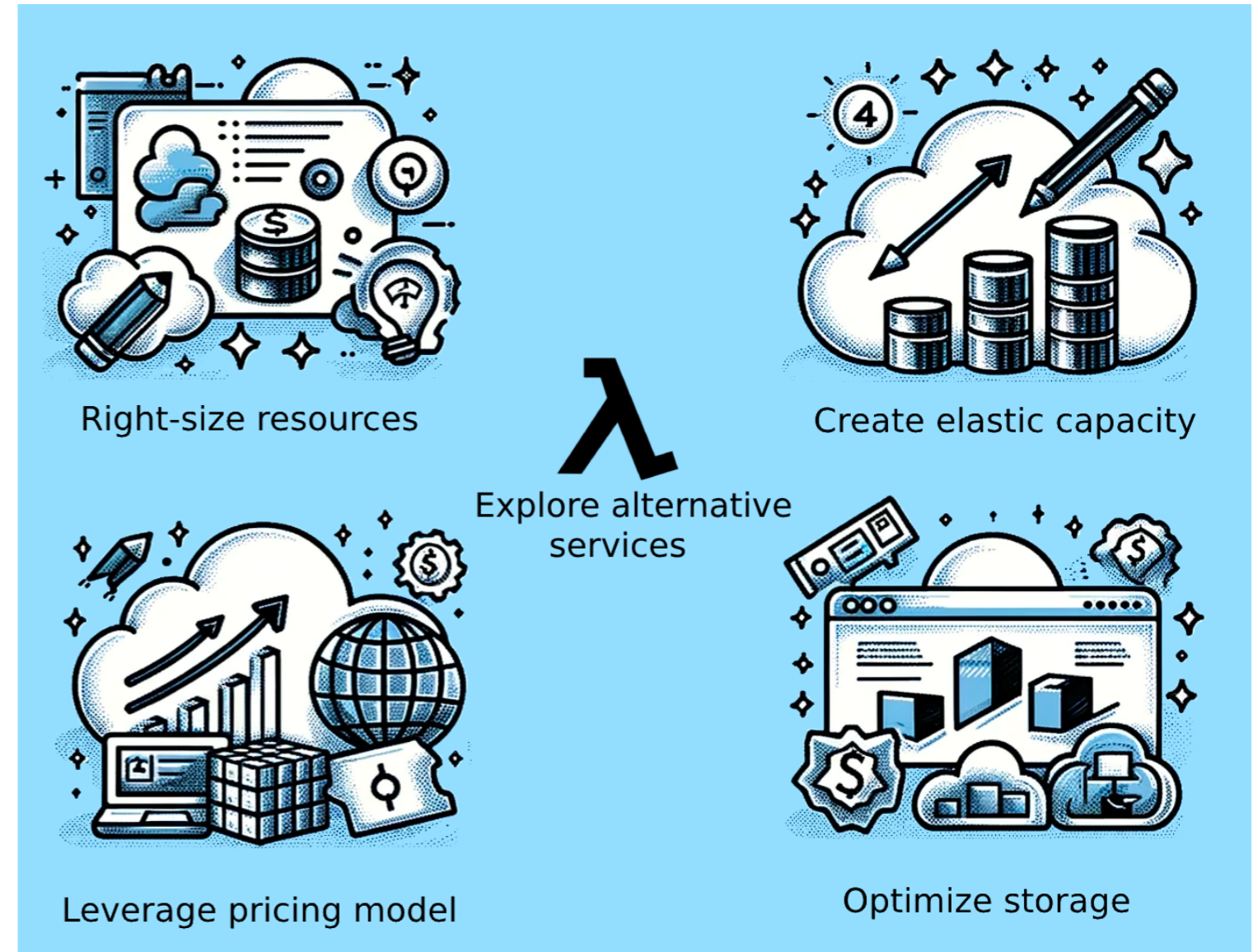
Manage access
using security groups



Use IAM Roles

Mastering AWS Cost Management

- Pricing calculator
- Cost allocation tags
- Cost optimization framework



What's Next?



Congratulations!

AWS SECURITY AND COST MANAGEMENT CONCEPTS