
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

COP203

Manage and control your AWS costs

Matt Berk (he/him)
Enterprise Support Lead
AWS

Bowen Wang (she/her)
Principal Product Marketing Manager
AWS

Christian Martini (he/him)
Sr. Manager of IT Governance
Mercado Libre

Sebastian Barrios (he/him)
VP of Technology
Mercado Libre

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A little bit about us

Bowen Wang



Principal Product Marketing Manager, AWS

Based in Seattle

Prior role at AWS: Cloud Economics, Digital Marketing

Past life: Tech startup

Matt Berk



Sr. Technical Account Manager, Enterprise Support Lead, AWS

Based in New York

Past life: System Engineering, Solution Consultant

Sebastian Barrios



VP of Technology, Mercado Libre

Based in Argentina

Past life: Cabify, Yaxi

aws

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Why are we here today?

"Is there an easy way for me to manage all of my user accounts and their permissions?"

"How can I track resources created by my team and monitor their usage?"

"Can I create an environment where my users can access resources quickly yet in a governed way?"



IT/Operations

aws

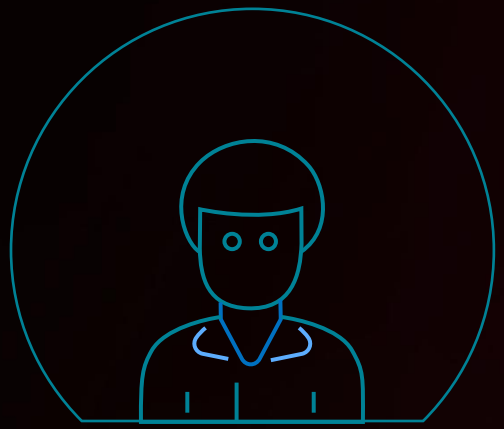
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Why are we here today?

"How can I make sure I don't go over my budget limit?"

"Is there an easy way to deploy resources in a way that has proven to work?"

"I want to make sure my new and existing workloads pass the cost review."



Engineer/Developer/Cloud architecture

aws

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Why are we here today?

"We want to properly allocate budget to each team and track their spend against the target."

"How can we raise cost awareness across the organization, i.e., engineering team?"

"How can I cascade any cost control policies down to the individuals?"



FinOps, CCOE

aws

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Where we're headed

WHAT DOES EFFECTIVE CLOUD FINANCIAL MANAGEMENT LOOK LIKE?

- Governance, control, and agility
- Deploying guardrails
- Usage monitoring and alerting
- Mercado Libre's journey
- Wrap-up



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Why cloud governance?

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Why AWS Cloud Ops?



Return on Investment

241% ROI over 3 years*



Staff productivity

62% more efficient IT infrastructure staff



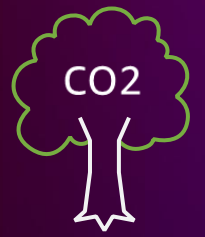
Operational resilience

57% decrease in downtime



Business agility

37% decrease in time to market



Carbon savings

88% reduction in carbon footprint of IT operations

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Based on independent research of 1,500 AWS enterprise customers
*Source: "The Total Economic Impact of AWS Cloud Operations: Cost Savings And Business Benefits Enabled By Operation on AWS. May 2022. A commissioned study conducted by Forrester Consulting on behalf of Amazon Web Services."

Why cloud financial governance?

SAFEGUARDING YOU FROM ANYTHING THAT CAN GO WRONG FROM GOING WRONG



Eliminate shadow IT spend



Standardize how cloud resources are procured and deployed



Establish fiscally responsible cloud usage at scale

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Cloud financial governance and controls



Governance

Definition of processes, policies, and procedures regarding how cloud is consumed

Manifest as frameworks that standardize cloud usage across organizations and lines of business



Controls

Implementation of processes, policies, and procedures to operationalize the governance

Can be implemented proactively or reactively

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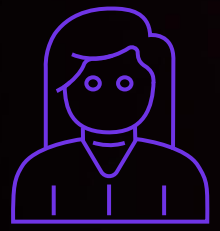
Deploying guardrails

STANDARDIZE HOW CLOUD RESOURCES ARE PROCURED AND DEPLOYED

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Asks



FinOps

Define internal CFM policies



IT/Operations

Easier way to manage all accounts and permissions



Engineer/Developer

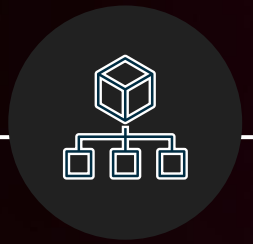
Provision workloads that adhere to best practices



Solutions



AWS Identity and Access Management (IAM)



AWS Organizations



AWS Control Tower



AWS Config

aws

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Discourage maverick spend

AWS CONSOLIDATED BILLING

Problem

Maverick spend not in compliance with procurement process

Risks

Reduced purchasing power and cost savings

Decrease in org efficiency

Solution

Consolidated billing

Benefits

Single invoice and payment

Volume discounts

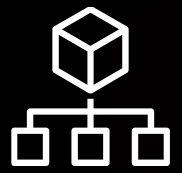
Commitment-based discount float

Visibility into all cloud resources

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Centrally manage and govern across accounts

AWS ORGANIZATIONS



Manage and define your organization and accounts



Control access and permissions



Audit, monitor, and secure your environment for compliance



Share resources across accounts



Centrally manage costs and billing

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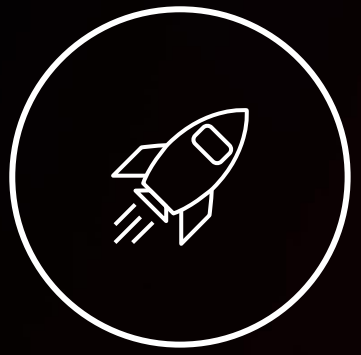
Easily set up and govern a secure multi-account environment

AWS CONTROL TOWER

The easiest self-service solution to automate the setup of **new AWS multi-account environments**



An AWS service offering account creation based on AWS best practices



Deployment of AWS best practice Blueprints and Guardrails



Baseline fundamental accounts to provide standardization of best practices

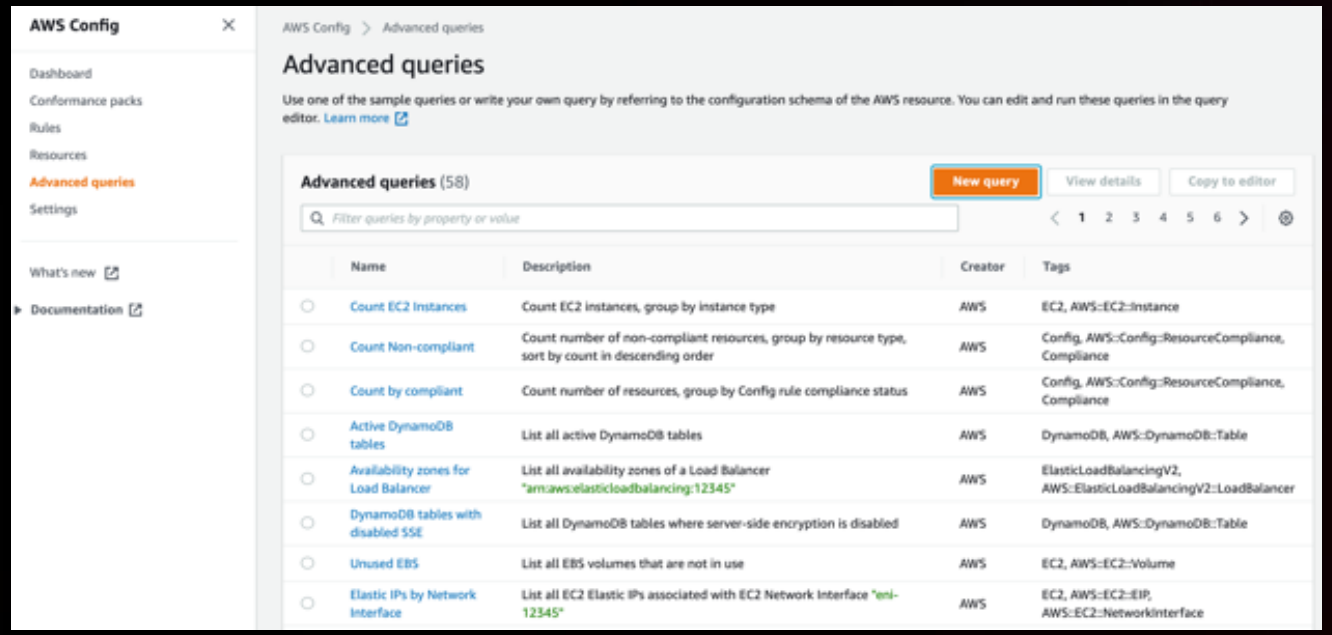


Single pane of glass for monitoring compliance to guardrails

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Enforce compliance at scale

AWS CONFIG



Example: Query resource state metadata without performing AWS service specific API calls

Simplify compliance auditing, security analysis, change management, and operational troubleshooting

- Continuously monitor and record your AWS resource configurations
- Evaluate recorded configurations against desired configurations
- Track configuration changes (up to 7 years of history)
- Provide aggregated view of resource configuration and compliance status across accounts and regions
- Integrate with your own CMDBs (such as ServiceNow)

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Control as you scale

ESTABLISH CENTRAL POLICIES TO DRIVE GOVERNANCE AT SCALE



AWS Identity and Access Management (IAM)

- Create and manage users and groups, and use permissions to allow and deny access to AWS resources
- Control what operations can be performed by an entity or AWS services
- Set permissions to control what operations a user or role can perform on AWS resources



AWS Organizations

- AWS Organizations provides a management framework for AWS accounts
- Organizational units (OU) are sets of AWS accounts logically grouped within an organization
- Use service control policies to apply policies to OU and accounts for guardrails

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Control as you scale

ESTABLISH CENTRAL POLICIES TO DRIVE GOVERNANCE AT SCALE

AWS Identity and Access Management (IAM)

```
"Version": "2012-10-17",
"Statement": [
    {
        "Effect": "Allow",
        "Action": "ec2:*",
        "Resource": "*",
        "Condition": {
            "ForAllValues:StringLike": {
                "ec2:InstanceType": [
                    "t3.*",
                    "a1.*",
                    "m5.*"
```

Restricting users from launching Amazon EC2 families

AWS Organizations

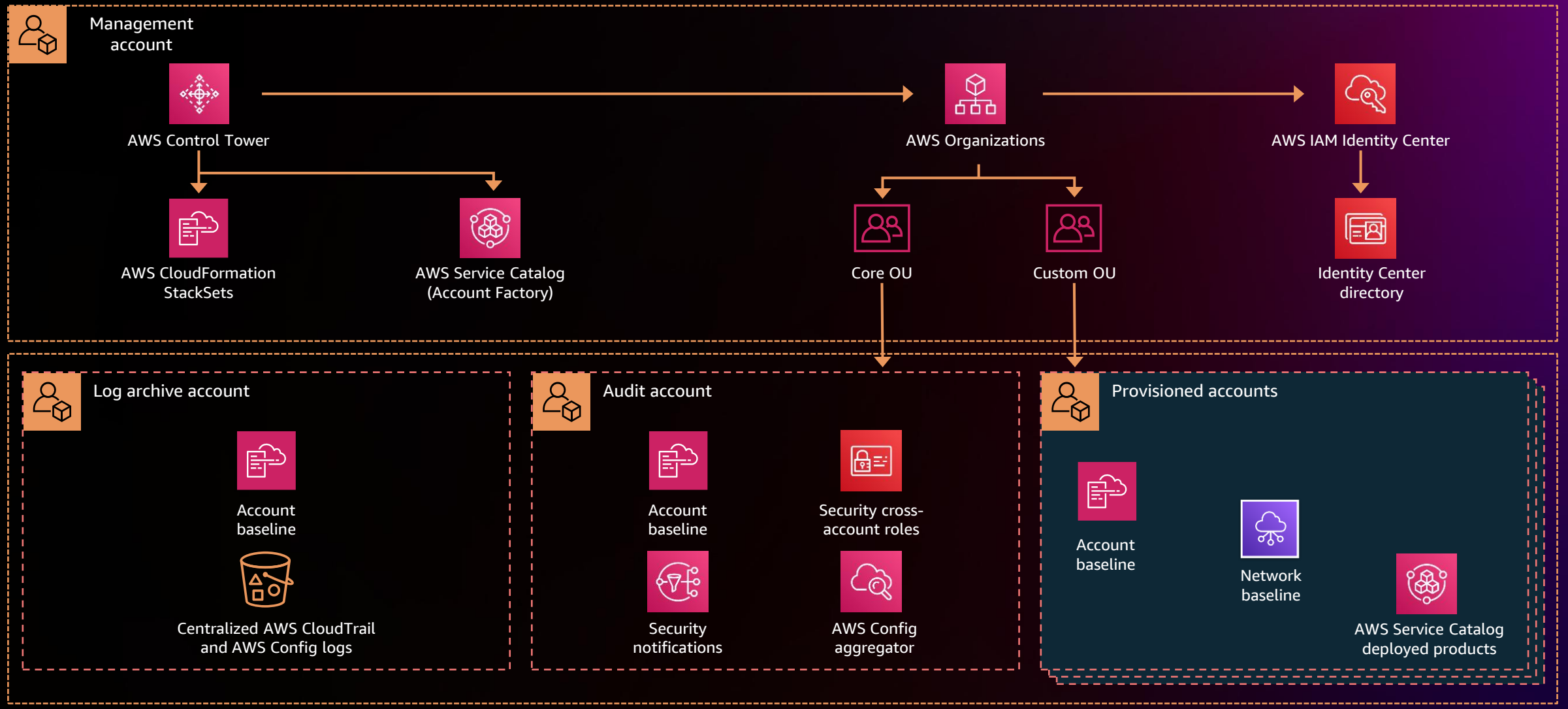
```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "RequireMicroInstanceType",
      "Effect": "Deny",
      "Action": "ec2:RunInstances",
      "Resource": [
        "arn:aws:ec2:*:*:instance/*"
      ],
      "Condition": {
        "StringNotEquals": {
          "ec2:InstanceType": "t2.micro"
```

Restricting OU to only be able to launch t2.micro

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Landing zone provisioned by AWS Control Tower



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Usage monitoring and alerting

TRACK AND ADDRESS COST OVERRUNS WITH CUSTOMIZABLE COST VISIBILITY

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81% of survey respondents overspend*

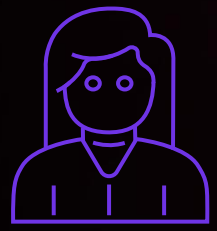
$$\frac{\text{AWS spend/AWS resource usage}}{\text{Units of demand}} = \text{Unit cost/ consumption}$$

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*Survey source: Q. “On average, by how much do you typically exceed your budget on cloud resources?”, Base: N=1,000
Source: 451 Research custom survey, Oct 2022. Copyright 2022 S&P Global.



Asks



FinOps

Track spend against budget



IT/Operations

Identify ownership behind cost and usage



Engineer/Developer

Keep spend within limit and address unnecessary spend



Solutions



AWS Cost Categories



AWS Budgets



AWS Cost Anomaly Detection



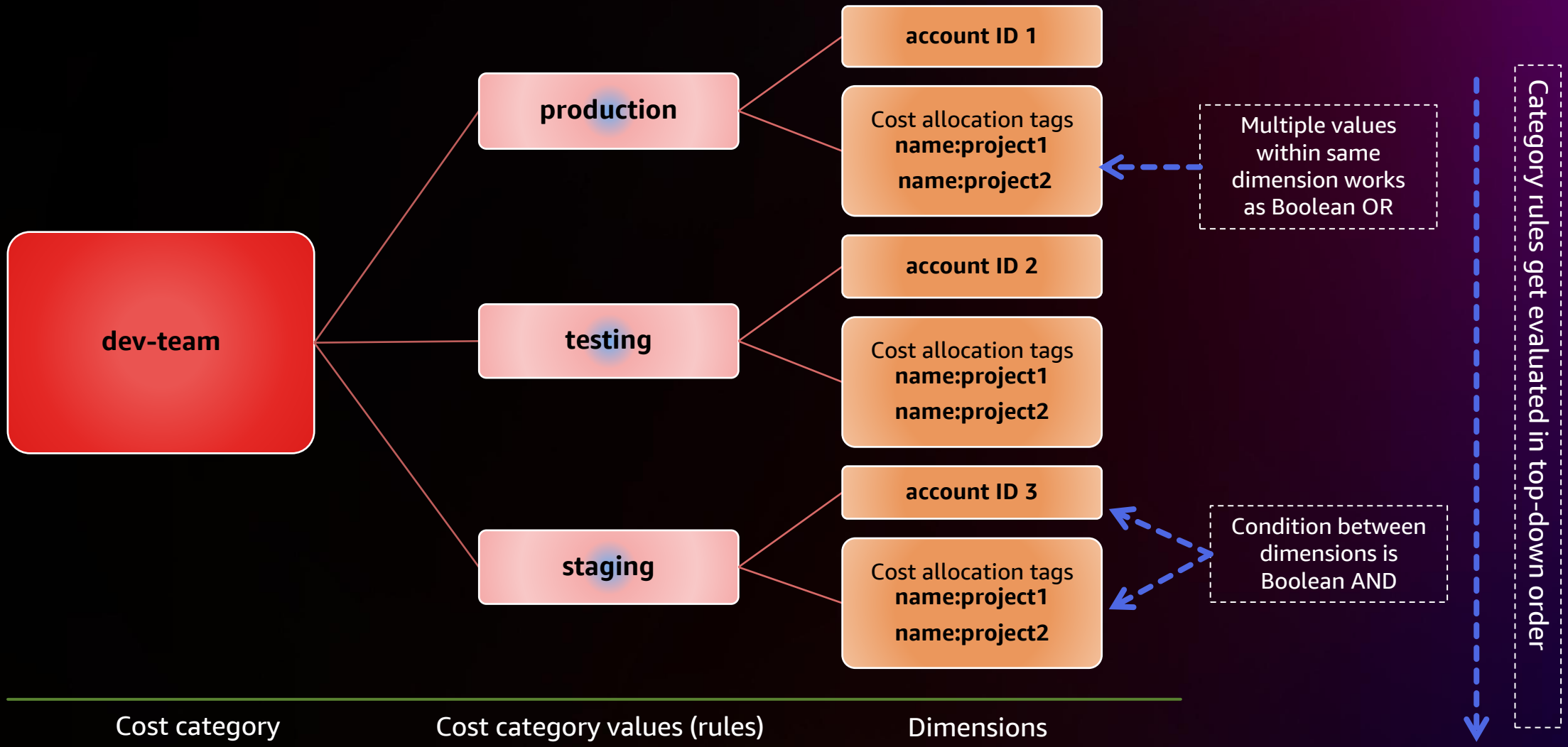
AWS Billing Conductor

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Track and allocate cost and usage

AWS COST CATEGORIES



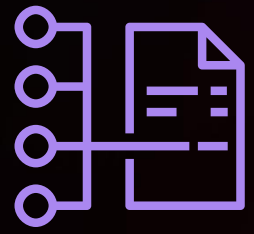
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Aggregate your cost and usage information



Reporting dimensions

- Filters, e.g., date range, Region usage type, tags, cost categories*



Cost categories

- Account, service, tag, charge type, cost categories
- Hierarchical structure
- Retroactive New



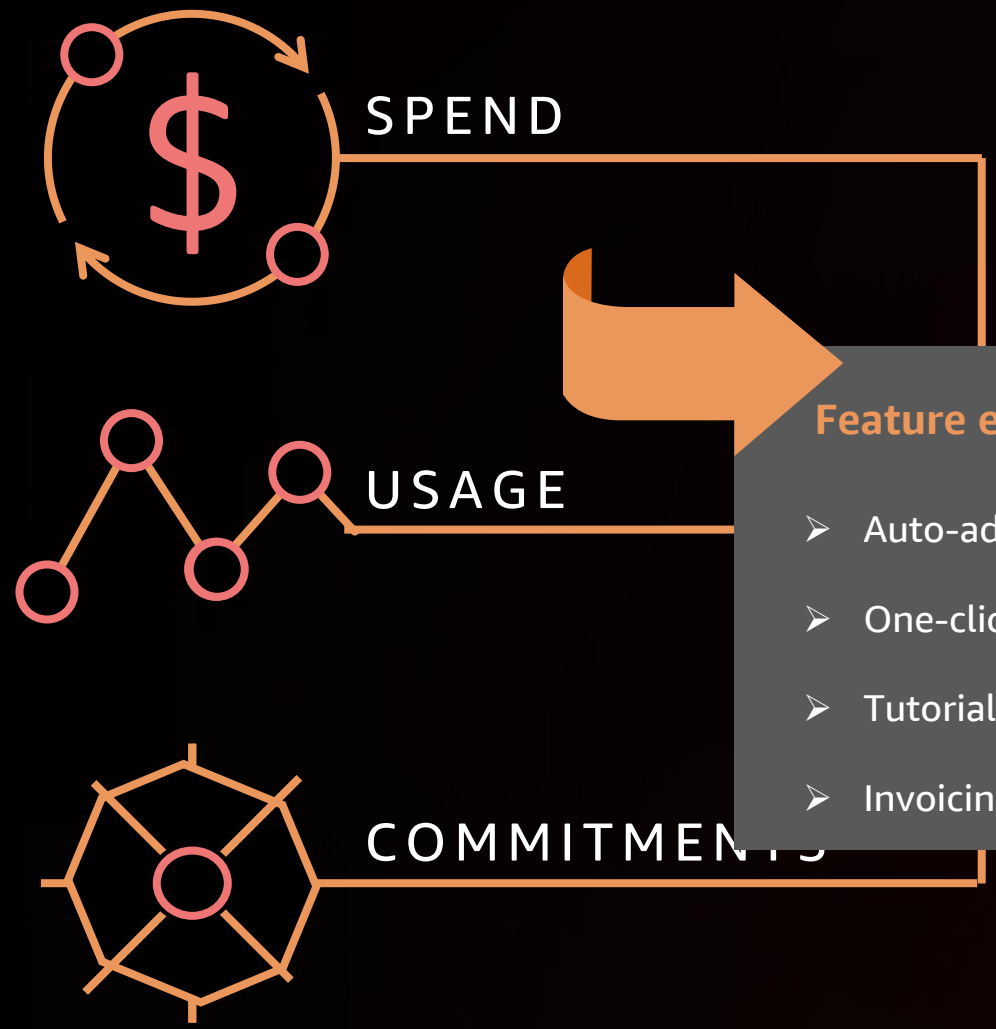
Billing groups

- AWS Billing Conductor
- Financial ownership
- Pricing configuration
- Sharing of benefits

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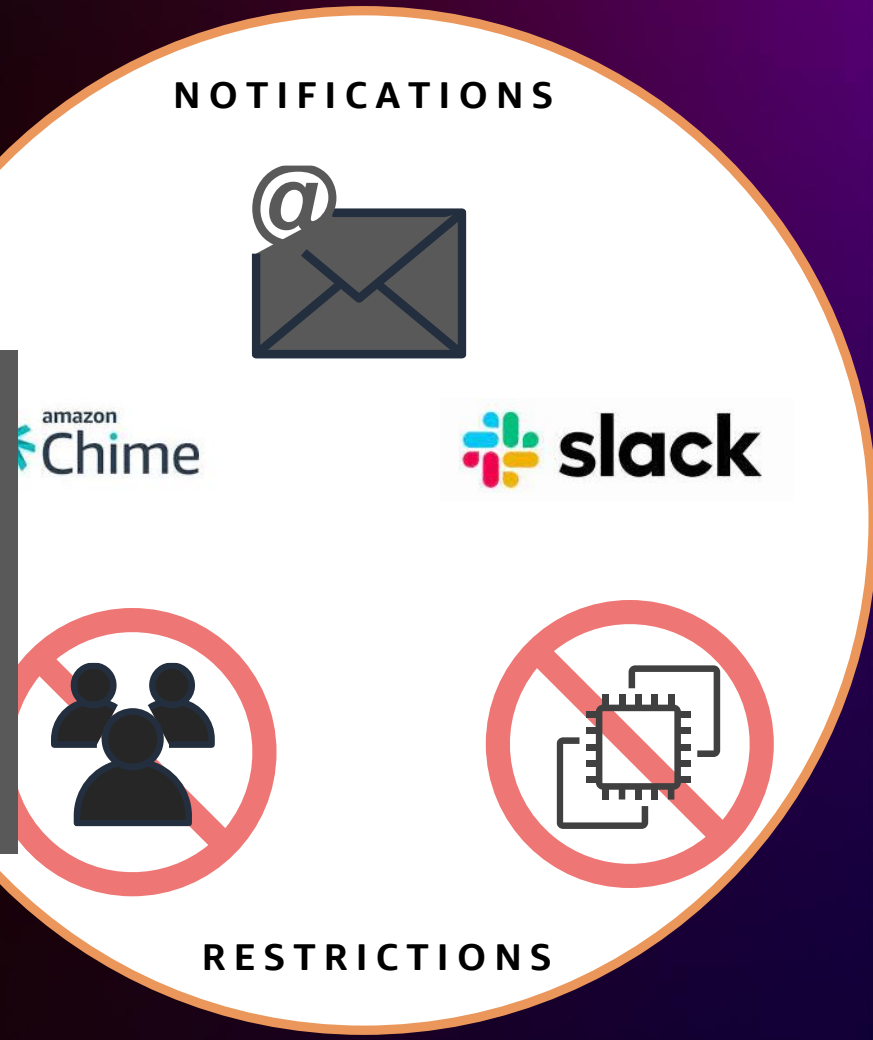
Cost control with flexible budgeting

AWS BUDGETS



Feature enhancements

- Auto-adjusting budget
- One-click budget templates
- Tutorials
- Invoicing and legal entities



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Govern your spend with cost alert and actions



Budget alert

- Cost & usage alert (actual & forecasted)
- Dollar amount threshold
- RI and Savings Plans utilization/coverage rate
- Budget actions: IAM, SCP, running instances



Cost Anomaly Detection (CAD) alert

- Attach to CAD cost monitor
- ML powered spend pattern analysis: expected vs actual
- Root cause report with cost impact



CloudWatch Billing Alarm

- Monitoring of estimated charges vs the defined threshold
- Performance metrics-based alerts
- CloudWatch alarm actions for EC2 instances

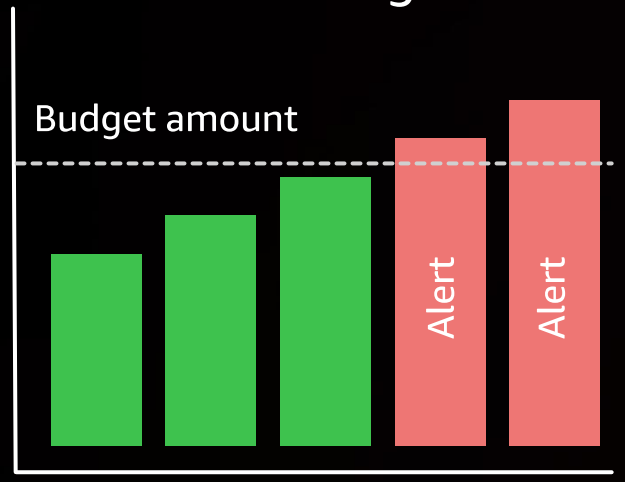
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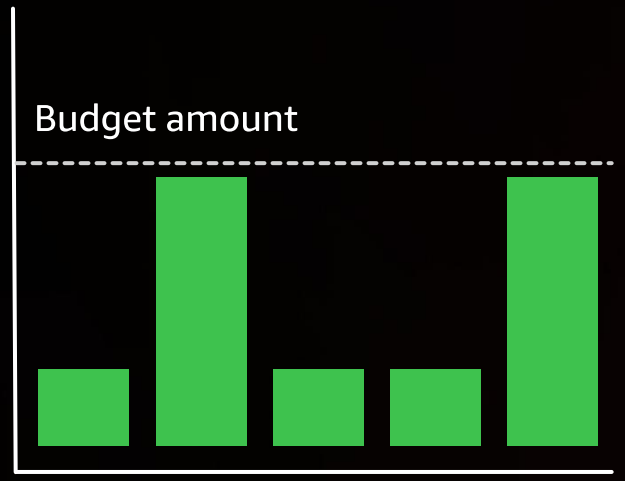
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Not all alerts tell the same story

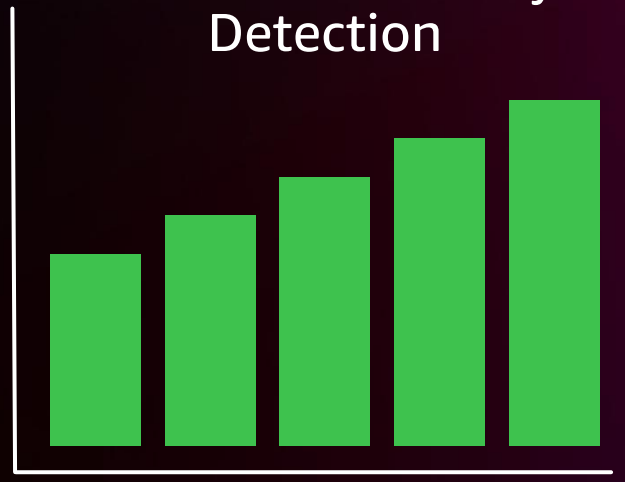
LEVERAGING AWS BUDGETS AND AWS COST ANOMALY DETECTION TO AVOID SURPRISES

AWS Budgets





AWS Cost Anomaly Detection





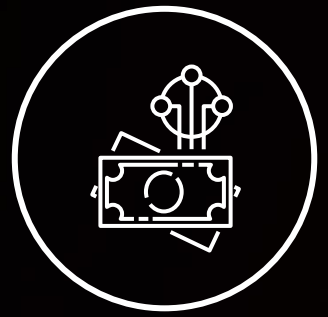
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Govern and control through process

AUGMENT OR EVOLVE EXISTING PROCESS



New cloud workload onboarding



Architecture cost reviews



Service readiness reviews



Change management



Incident management

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Cloud cost management journey

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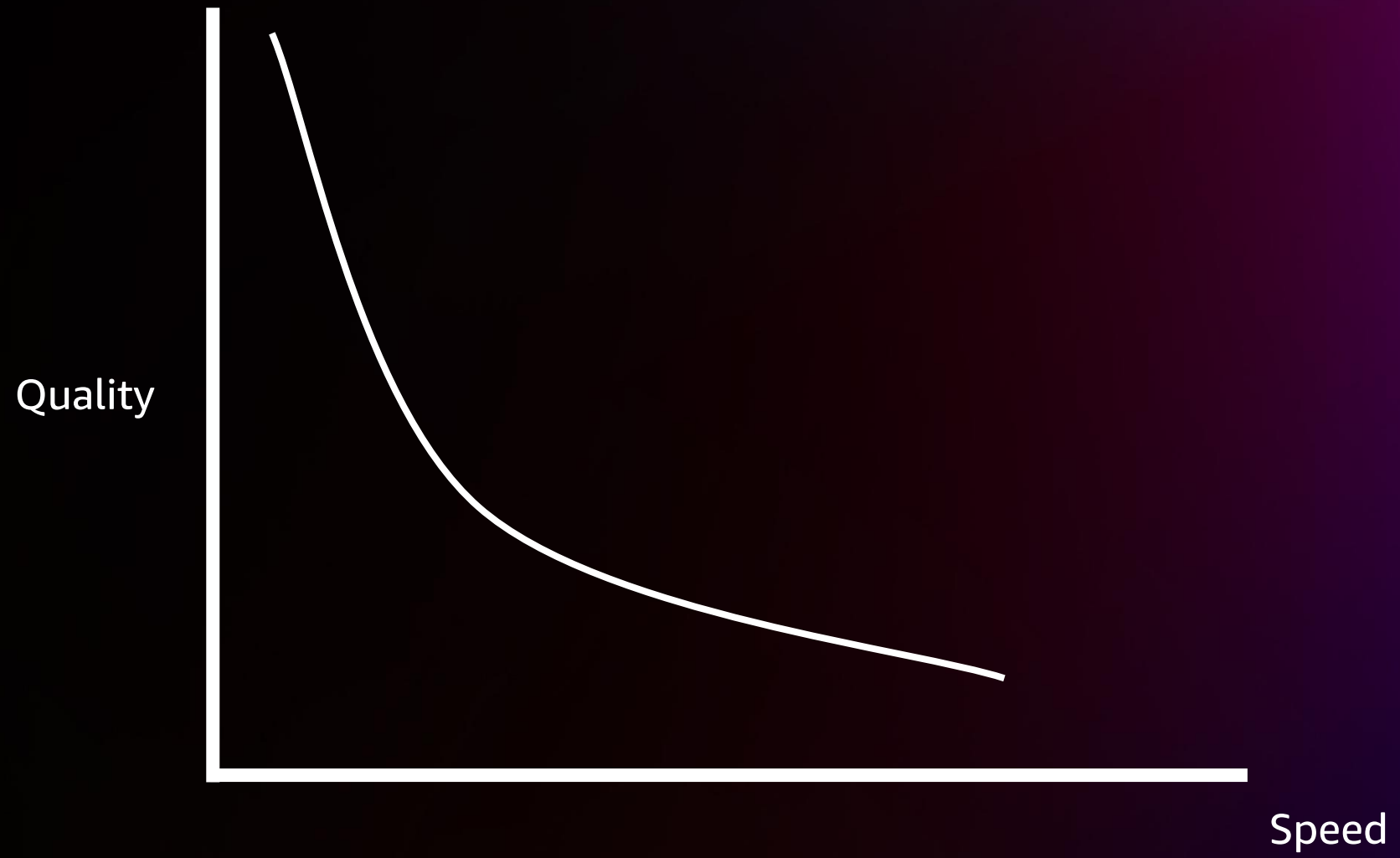
“Nothing is built on stone;
all is built on sand,
but we must build
as if the sand were stone.”

Jorge Luis Borges

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How many of you have a Platform Team in your organizations?

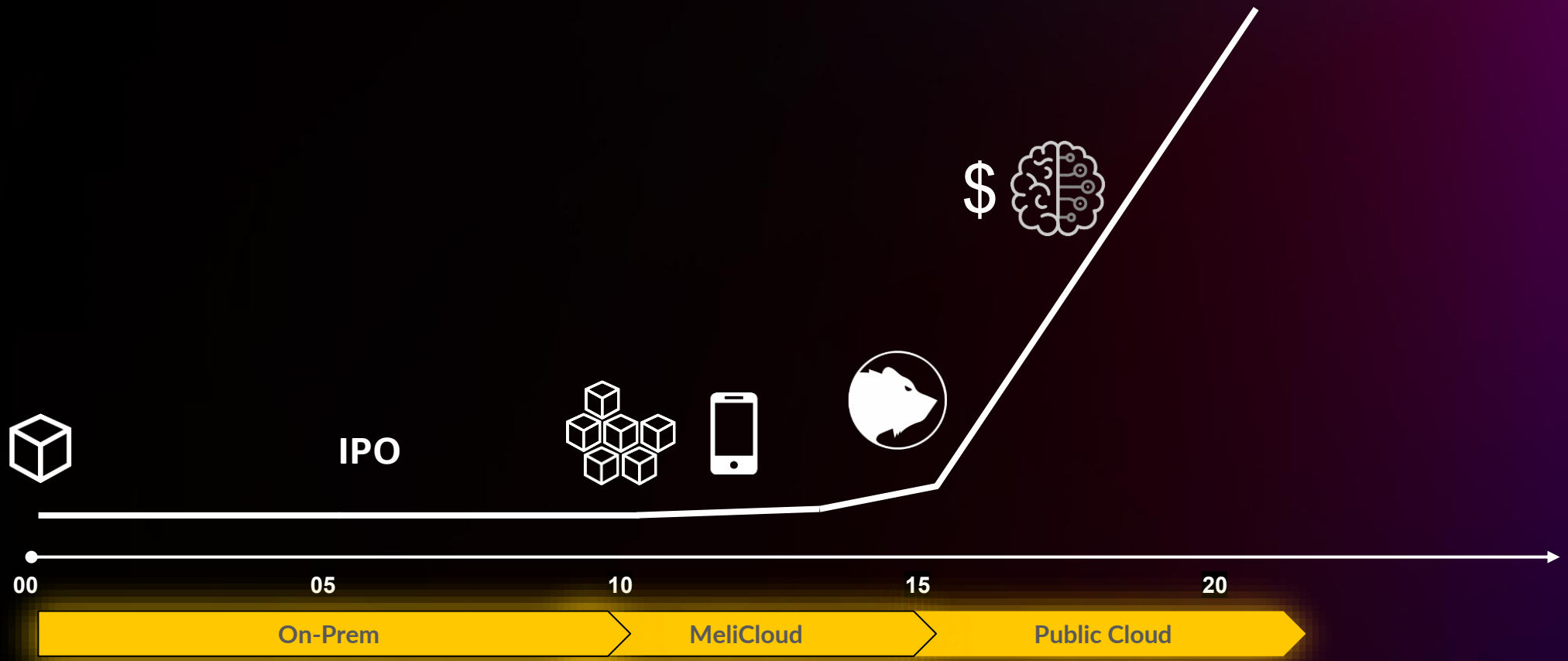
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NUMBER OF IT EMPLOYEES OVER THE YEARS

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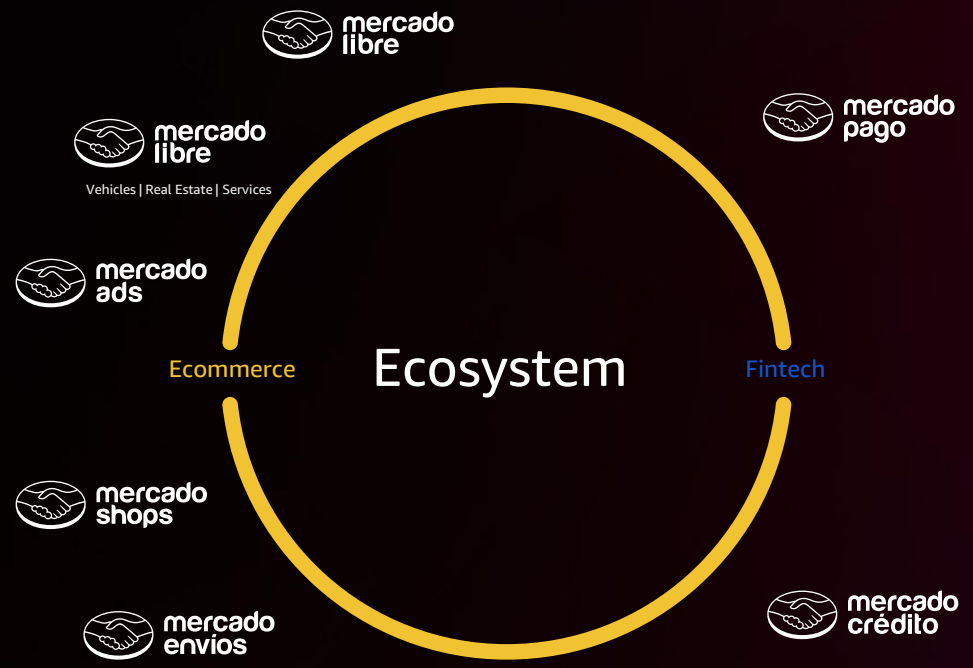
What's MELI?

18
Countries

8
Operations

84M
Users

+11K
Developers



~10K
Apps

110+
Services

2,2K+
SKUs

12M
RPS

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Our architecture

Provide consistent developer experience

Unified PaaS

Reusable robust components

Abstractions



Remove complexity

Agility

Make it faster and cheaper

Optimizations

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Our strategy

Reporting structure → Centralized decisions → Exponential accountability

Monitoring and alerts

- Anomaly detection
- Efficiency KPIs
- Optimization opportunities process

Algorithms ecosystem

- Dynamic optimization/ Recommendations
- Resource usage and pricing optimization

Democratize access

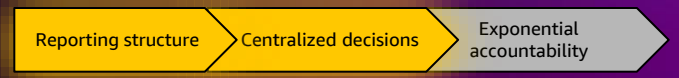
- Increased visibility
- Gamification
- Positive enforcement

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Our tools



	Tool	Source of Data (in AWS)	KPIs	Fury	Off-Fury	AWS	Other
Reporting Structure	Cloud Cost Consoles (AWS & Other)	CUR	-	X	X	X	X
	Tableau (Reporting Structure)	CUR	-	X	X	X	X
Algorithms	Reservator	CUR + Others	Coverage, Usage	X	X	X	X
	Spotifizer	AWS APIs	% Spots	X		X	
	SavingsPlans Optimizer	CUR + Others	% OD	X	X	X	
	Minimizator	Others	Instances per Scope	X		X	X
	Rightsizer	CUR + Others	% CPU and RAM	X		X	X
	Migrator	Others	-	X		X	X
	Inactivator	Others	Test instances	X		X	X
	Coordinator	CUR + Others	-	X		X	X
	Capacitator	CUR	-	X		X	
	Pilot	CloudWatch	-	X		X	X
	EBS Optimizer	CloudWatch	-		X	X	
	DynamoDB Optimizer	CloudWatch	Read/Write Units		X	X	
Cost Visibility	Cloud Billing (Monitoring for Dev Teams)	CUR + Others	-	X	X	X	X
	Custom Dashboards	CUR	-	X			

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Algorithm deep dive

Minimizator

Input: Traffic and performance data

Goal: Have **JUST** the right amount of instances and all apps to handle forecasted traffic

Output: It upscales or downscales the app instances according to the forecast

Inactivator

Input: Traffic and performance data

Goal: Turn off all unused infrastructure

Output: Reduced waste for testing purposes

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Challenges

~130K instances, 25K microservices, ~12M rps & 2,2K SKUs

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Challenges

~130K instances, 25K microservices, ~12M rps & 2,2K SKUs → **Build for scale**

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Challenges

~130K instances, 25K microservices, ~12M rps & 2,2K SKUs → **Build for scale**

11K engineers

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Challenges

~130K instances, 25K microservices, ~12M rps & 2,2K SKUs → **Build for scale**

11K engineers → Getting them to **take action** & reduce waste



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Challenges

~130K instances, 25K microservices, ~12M rps & 2,2K SKUs → **Build for scale**

11K engineers → Getting them to **take action** & reduce waste

10K daily deploys

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Challenges

~130K instances, 25K microservices, ~12M rps & 2,2K SKUs → **Build for scale**

11K engineers → Getting them to **take action** & reduce waste

10K daily deploys → **Speed of change**

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Our results

~40%

in Amazon EC2

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Lessons learned



Keep it simple



Increase CFM maturity as a team



Invest in automation



Plan as early as possible

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Your journey to operating at cloud scale

Get started with AWS Cloud Operations

1) Setup



Establish a secure foundation for governance and compliance

2) Build and migrate



Migrate applications to the cloud, or build new applications

3) Operate



Monitor application performance, detect and remediate noncompliance or operational risks quickly

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How to establish cloud financial governance and controls

Use an **organizational model for CFM** (i.e., Cloud Business Office) to **define, publish,** and **enforce** cloud financial governance and control policies

Safeguard cloud spend by implementing a **baseline level of governance** and **control**

Evaluate impact to **agility** and evolve governance and controls

Accelerate compliance by using AWS Partner offerings or open-source tools

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Join us for other re:Invent sessions



Hands-on

COP307 Track and visualize your AWS cost and usage KPI targets (Workshop)

COP335 Customize billing and cost reporting with AWS Billing Conductor (Builder's session)

COP336 Visualize, understand, and manage your AWS costs (Builder's session)



Chalk Talk

COP208 The others: Optimizing forgotten AWS services

COP217 Ways to avoid cost surprises

COP218 Demystifying cloud unit economics

COP202 Cloud metrics strategy and customizable billing



Breakout

COP205 Simplify your AWS cost estimation

COP207 Cloud cost optimization: Only paying for what you need

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Want to see more AWS Cloud Operations?

Please complete the session survey in the mobile app



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Thank you!

Matt Berk
linkedin.com/in/matthewlberk

Bowen Wang
linkedin.com/in/bowenwang1

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