
AWS
re:Invent

ENT201

Billing management and cost control

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You.

A little bit about *yourself*

- Cloud financial management (CFM) or financial operations (FinOps)
- Finance and procurement teams
- Tech team or application owner
- Lost (what session is this again?)

Modernizing IT finance to be cloud-ready

CLOUD FINANCIAL MANAGEMENT TOOLBOX

See



AWS Cost Explorer
Cost and usage reports
Cost categories

Save



Savings plans
Reserved instances
Right sizing

Plan



AWS Budgets
AWS Budget Reports
AWS Budget Actions

Run



Billing console
Anomaly detection
Purchase order (PO) management

Where we're headed

WHAT DOES BILLING AND COST MANAGEMENT SUCCESS LOOK LIKE?

- Establish guardrails
- Set and track budgets
- Avoid billing surprises
- Gain control over purchasing



Let’s jump in



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Establishing guardrails

Mechanisms to balance speed of innovation with cost governance



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Evolving finance and technology partnership

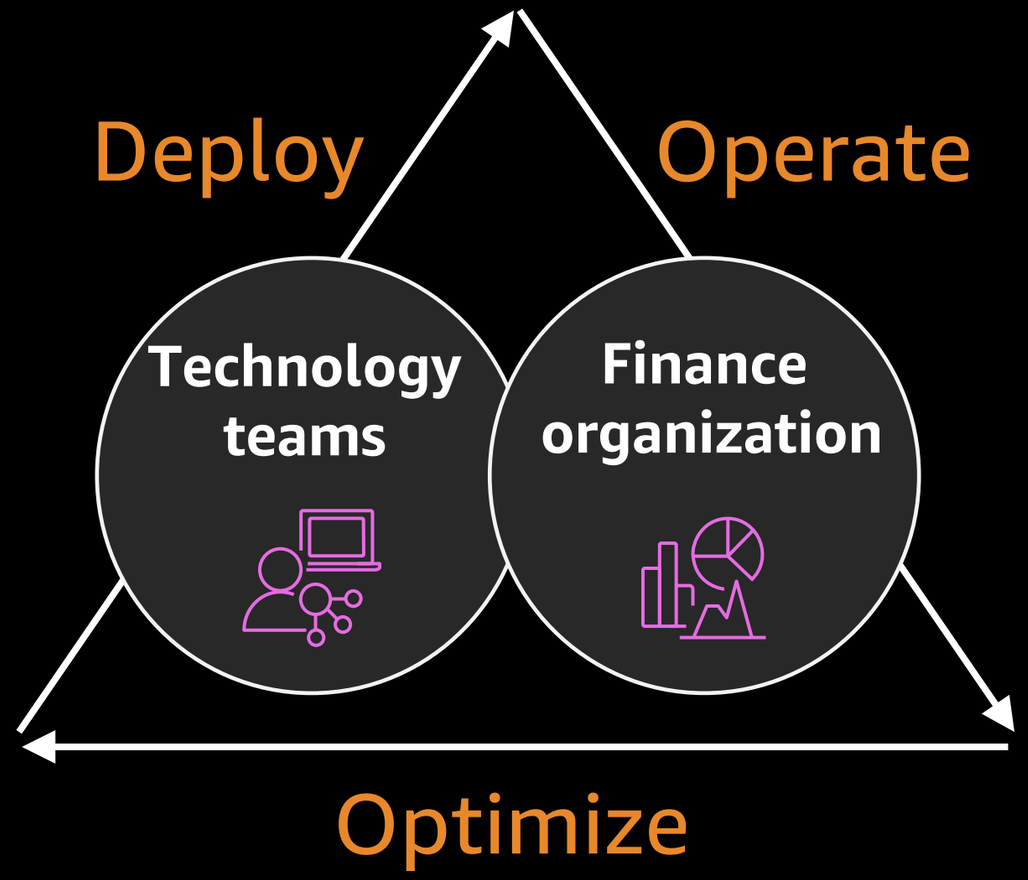
CENTRALIZED VS. DECENTRALIZED CLOUD FINANCIAL MANAGEMENT (CFM)

FinOps or CFM team

- Organization-wide policies and central governance
- Cost allocation and reporting
- Commitment purchases and contracts

Everyone

- Cost management
- Cost-aware architectures
- Ongoing optimization



Establishing guardrails for your organization

STRATEGY FOR ACCOUNT AND COST ALLOCATION, AND POLICIES TO CONTROL RESOURCE USAGE



Who has access to which resources?



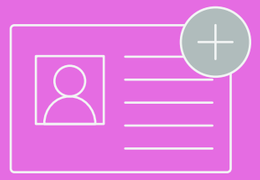
How do we logically group accounts and policies?



How do we logically group resources?

Control as you scale

ESTABLISH CENTRAL POLICIES TO DRIVE GOVERNANCE AT SCALE



AWS Identity and Access Management (IAM)

- Create and manage users and groups to allow and deny access to AWS resources
- Control what operations can be performed by an entity or by AWS services
- Specify permissions to control which 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 (SCPs) to apply policies to OU and accounts for guardrails

Billing console

BILLING, PAYMENTS, AND COST MANAGEMENT



AWS billing console

Getting started

- Review usage and month-to-date spend
- Configure billing and payment preferences
- Establish cost category rules to group and multilevel hierarchies to manage spend
- Set on rules for sharing discounts
- Go!

Elastic Compute Cloud		**$1,181.41**
US East (N. Virginia)		**$845.47**
Amazon Elastic Compute Cloud running Linux/UNIX		$120.47
$0.00 per Linux t2.micro instance-hour (or partial hour) under monthly free tier	750 Hrs	$0.00
$0.0058 per On Demand Linux t2.nano Instance Hour	1,788 Hrs	$10.37
t2.nano Linux instance usage covered by Compute Savings Plans	1,040 Hrs	-$6.03
$0.0116 per On Demand Linux t2.micro Instance Hour	144 Hrs	$1.67
t2.micro Linux instance usage covered by Compute Savings Plans	144 Hrs	-$1.67
$0.096 per On Demand Linux m5.large Instance Hour	1,341 Hrs	$128.74
m5.large Linux instance usage covered by Compute Savings Plans	780 Hrs	-$74.88
$0.133 per On Demand Linux r4.large Instance Hour	448 Hrs	$59.58
r4.large Linux instance usage covered by Compute Savings Plans	261 Hrs	-$34.71
$0.20 per On Demand Linux m4.xlarge Instance Hour	448 Hrs	$89.60
m4.xlarge Linux instance usage covered by Compute Savings Plans	261 Hrs	-$52.20
Amazon Elastic Compute Cloud running Linux/UNIX Reserved Instances		$0.00
Linux/UNIX (Amazon VPC), c5.large reserved instance applied, c5.large instance used	448 Hrs	$0.00
USD 0.0 hourly fee per Linux/UNIX (Amazon VPC), c5.large instance	720 Hrs	$0.00
USD 0.0 hourly fee per Linux/UNIX (Amazon VPC), c4.large instance	720 Hrs	$0.00
Amazon Elastic Compute Cloud running Linux/UNIX Spot Instances		$442.61
r4.xlarge Linux/UNIX Spot Instance-hour in US East (Virginia) in VPC Zone #7	4,506.805 Hrs	$386.23
t3.medium Linux/UNIX Spot Instance-hour in US East (N. Virginia) in VPC Zone #12	4,510 Hours	$56.38
Amazon Elastic Compute Cloud running Windows Spot Instances		$253.46
c3.large Windows Spot Instance-hour in US East (Virginia) in VPC Zone #7	2,255 Hrs	$253.46
EBS		$28.93
$0.00 for 480 Mbps per m5.large instance-hour (or partial hour)	447 Hrs	$0.00
$0.00 for 525 Mbps per c5.large instance-hour (or partial hour)	448 Hrs	$0.00
$0.00 per GB-month of General Purpose (SSD) provisioned storage under monthly free tier	20.067 GB-Mo	$0.00
$0.000 for 750 Mbps per m4.xlarge instance-hour (or partial hour)	448 Hrs	$0.00
$0.10 per GB-month of General Purpose SSD (gp2) provisioned storage - US East (Northern Virginia)	289.298 GB-Mo	$28.93
Elastic Load Balancing - Application		$0.00
$0.00 per Application LoadBalancer-hour (or partial hour) under monthly free tier	448 Hrs	$0.00

Setting and tracking budgets

Setting and managing expectations across your organization



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Adapting traditional IT planning to be cloud-ready

DYNAMIC CLOUD USAGE DESERVES AGILE, DYNAMIC BUDGETING



Forecast

Budgeting and forecasting variable cloud usage

Cross-functional business planning

Machine Learning (ML)-backed, sophisticated forecasting

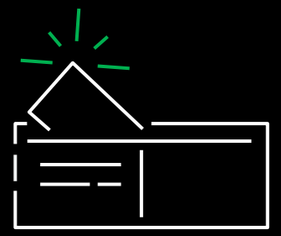


Monitor

Track variable cost and usage daily, weekly, monthly

Monitor reserved instance / savings plan (RI / SP) coverage and utilization

Receive alerts before and when threshold is met



Report

Report actual or forecasted cost and usage

Establish cadence for review

Schedule reports for disseminating



Respond

Automated response when budgets are at risk

Flexible – alerts are not met with one-size-fits-all response

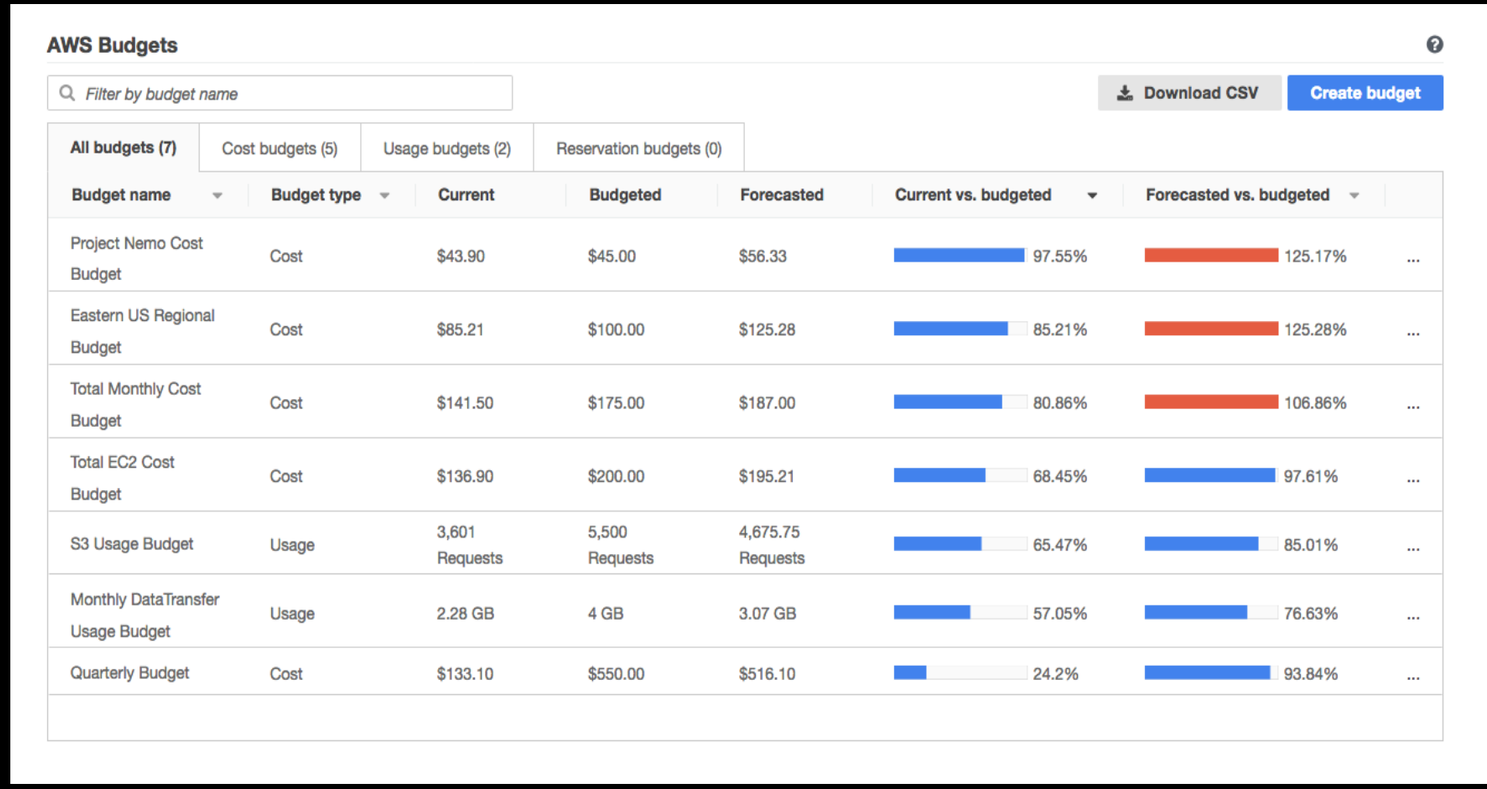
Reinforce security and access-control policies

AWS Budgets

SET CUSTOM BUDGETS THAT ALERT YOU WHEN YOU EXCEED YOUR BUDGET THRESHOLD

AWS Budgets

- Create custom budgets to track cost, usage, or RI / SP coverage and utilization
- Track with daily, monthly, quarterly, or annual granularity
- Track across multiple dimensions, such as service, linked account(s), cost category, region, tag, and more.
- Receive alerts when your cost and usage exceed (or are forecasted to exceed) predefined thresholds; receive summary notifications daily, weekly, or monthly



Introducing AWS Budget Actions

AUTOMATED RESPONSES TO STOP OR APPROVE WHEN YOU REACH OR EXCEED BUDGET THRESHOLDS

Apply IAM and SCPs

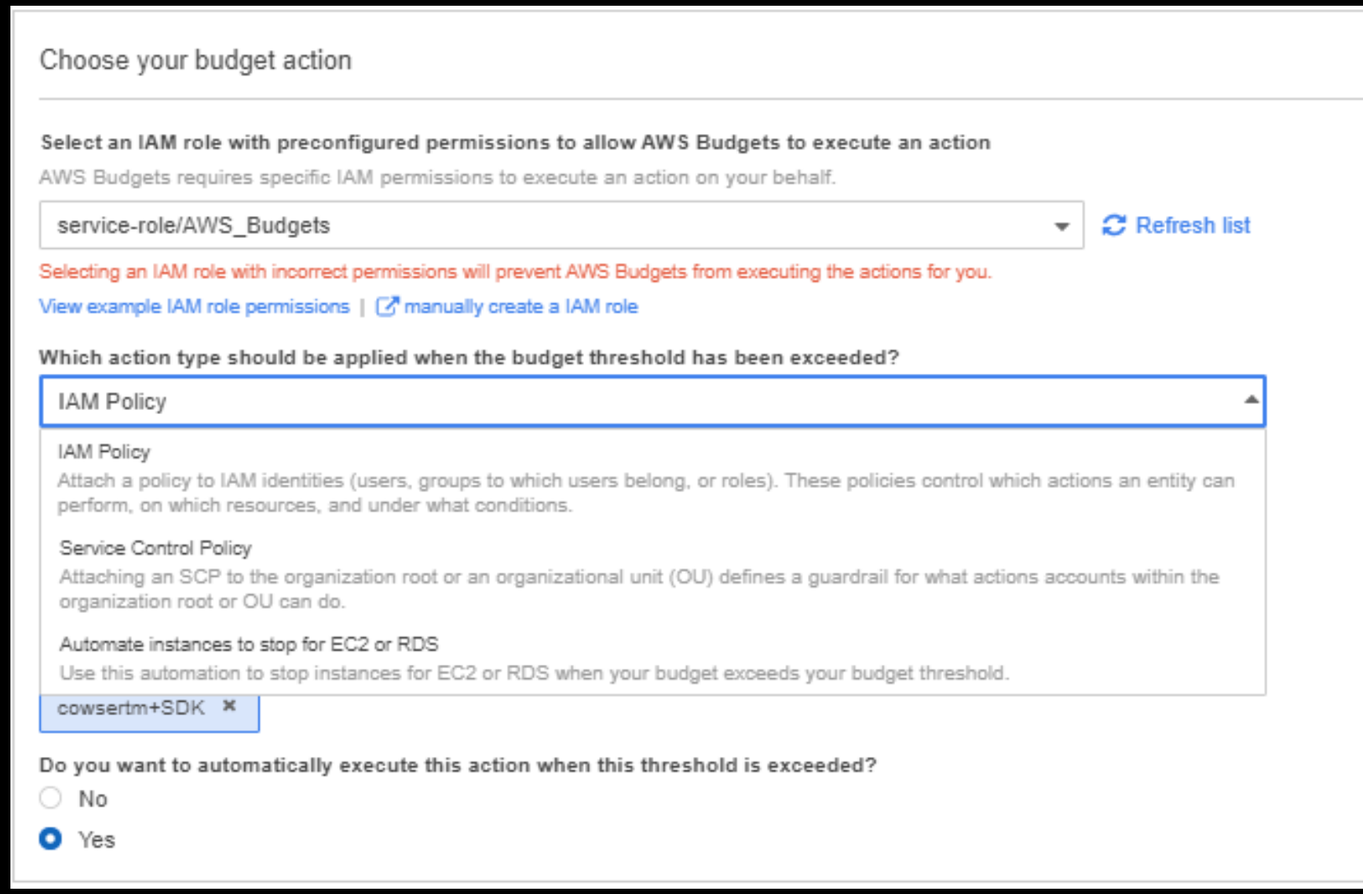
Apply IAM and SCPs to your users, groups, roles, or OUs within your AWS Organization once a budget threshold has been exceeded to limit further resource provisioning.

Stop running resources

Target and stop running EC2 or RDS instances within a region or set of regions.

Workflow approval or automated

Configure your actions to require approval before executing or execute automatically for convenience.



Create a budget

Step 1
Select budget type

Step 2
Set your budget

Step 3
Configure thresholds

Step 4
Confirm budget

Configure thresholds

Define your threshold then select whether you would like to send alerts to recipient(s) or setup budget actions. You can send budget alerts via email and Amazon Simple Notification Service (Amazon SNS) topic.

Budgeted Amount: **$10,000.00** Edit

Thresholds: 1

+ New threshold

Define your budget threshold

Set threshold based on:

- (•) Actual cost
- ( ) Forecasted Cost

Alert threshold

80 | % of budgeted amount

Set up your notifications

You can send budget alerts via email, Amazon Simple Notification Service (Amazon SNS) topic or with AWS Chatbot Alerts. When a threshold includes a budget action, it is **required** to input an email recipient or setup an Amazon SNS.

Email recipients (Maximum:10)

Please separate email addresses with commas

▸ **Amazon Simple Notification Service (Amazon SNS)** (Optional)

▸ **AWS Chatbot Alerts** (Optional)

+ Add a budget action

Cancel < Set your budget Confirm budget >

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Avoiding cost surprises

Enhanced control without slowing innovation



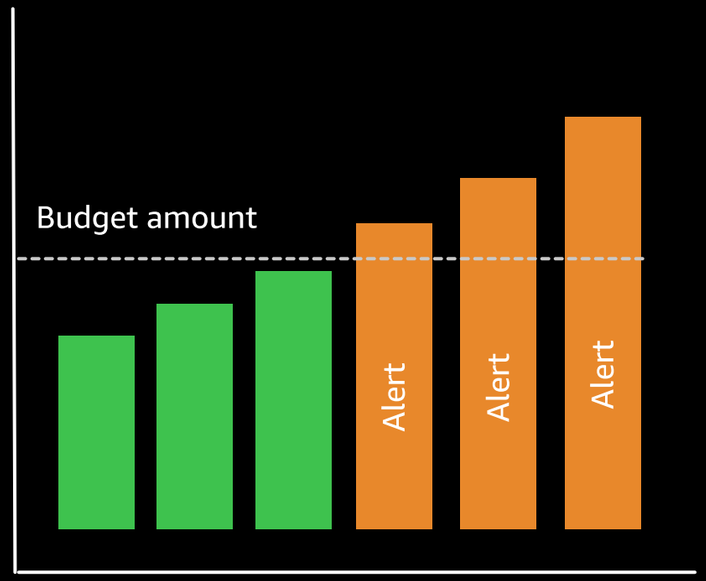
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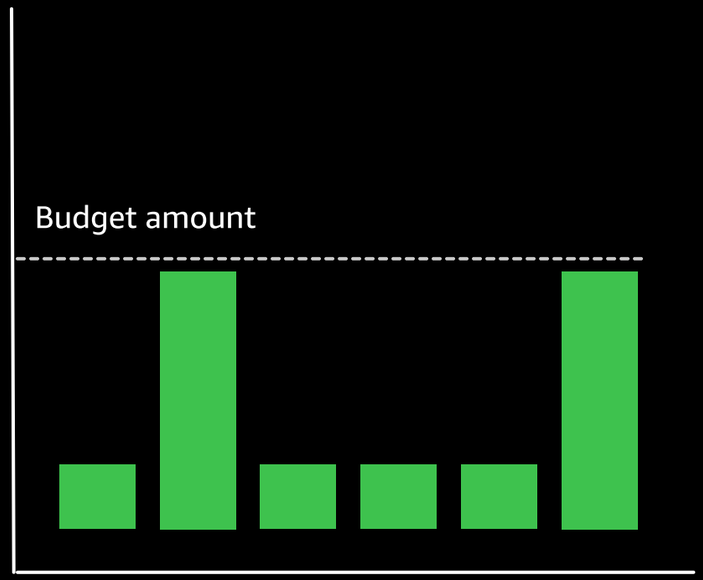
Avoiding cost surprises

AVOIDING COST SURPRISES WITH CONTEXTUALIZED ALERTS

What spend growth is “OK” and what is “abnormal”?



Above budget,
but is that “ok”?



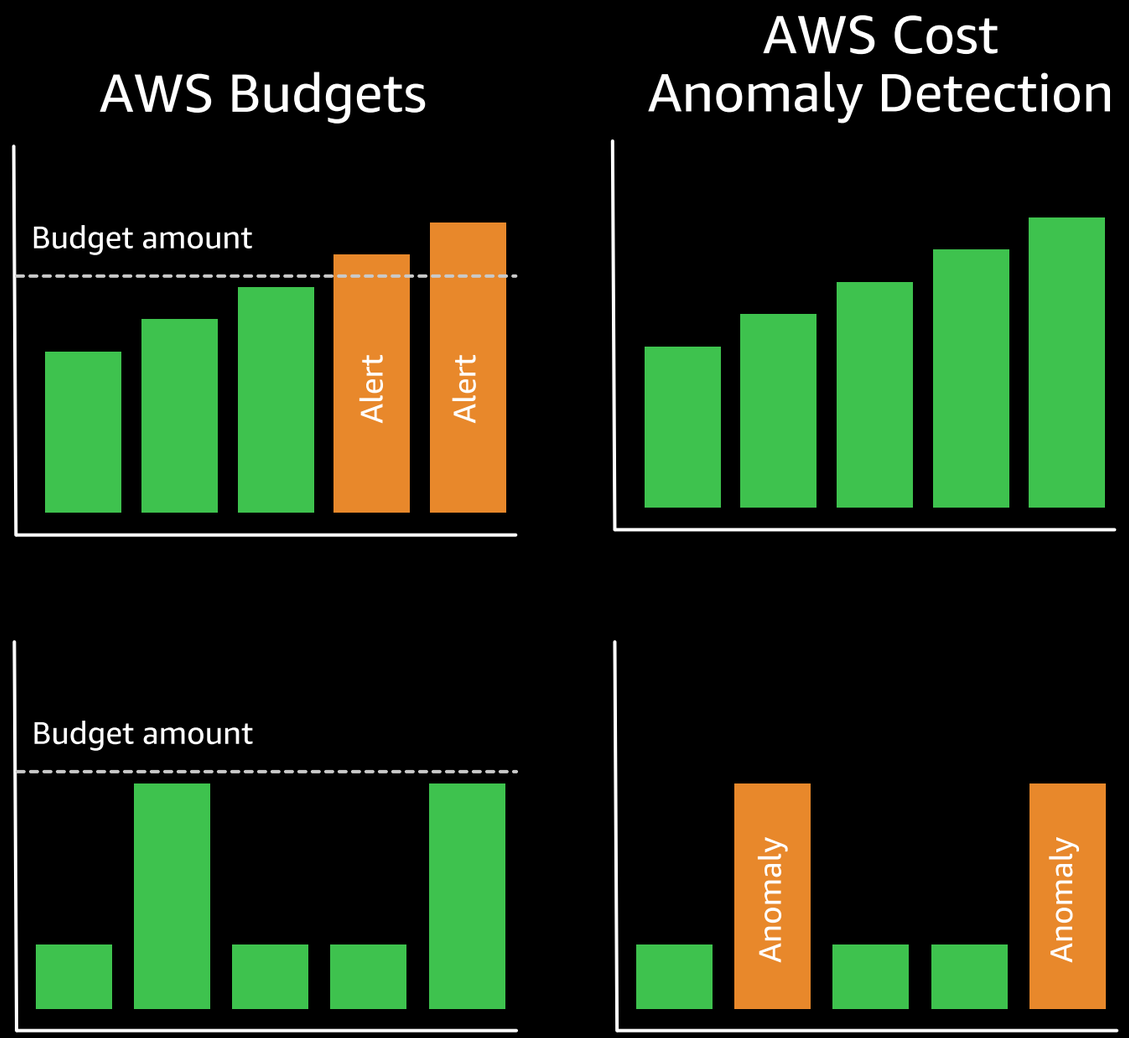
Is this ok?

Introducing AWS Cost Anomaly Detection

MULTI-LAYERED, ML-BASED SERVICE TO PROACTIVELY DETECT COST AND USAGE ANOMALIES

AWS Cost Anomaly Detection

- Automated, contextualized, ML-backed cost anomaly detection
- Root-cause analysis
- Receive individual or daily or weekly summary alerts via email or SNS topic
- Get started in 3 clicks
- (Bonus: It’s free!)



How it works

CONTEXTUALIZED SPEND ANALYSIS



Daily spend can be noisy

- “Normal” range $50-100 per day
- 17 daily spend spikes
- Difficult to determine what to investigate and which spike is “expected”

Contextualized patterns

- Seasonality and variability
- Determine weekly and monthly patterns in historical spend
- Large increase on first of the month, decrease on weekends

How it works

CONTEXTUALIZED SPEND ANALYSIS



Residual analysis

- Difference between what you spent and what was expected (“residual”)
- Not all anomalies are spikes

February:

- 2 anomalies that didn’t pass the $150 threshold
- 3 other anomalies in this period
- The rest of the data points are within expected range

AWS Cost Management

Home
Cost Explorer
Reports
Budgets
Anomaly Detection Beta
Recommendations

Savings Plans
Overview
Inventory
Recommendations
Purchase Savings Plans
Utilization report
Coverage report
Cart 0

Reservations
Overview
Recommendations
Utilization report
Coverage report

Preferences
Billing Console
Documentation

Overview Info

Anomaly detection uses custom-built ML models to evaluate your daily account spend for anomalies, while adjusting for seasonality and organic growth.

Anomaly detection summary

Anomalies detected (MTD)	Total cost impact (MTD)	Total spend (MTD)	Total spend (vs. last month)
1	$76.15	$18,289.22	+89%

Anomalies detected (8) Info

Find detected anomalies by property or value | Last 90 days (all) | 1

Detection date	Severity	Duration	Service	Account ID	Total cost impact	Assessment
2020-10-03	Low	2 days	Amazon Relational Database Service	-	$76.15	Not submitted
2020-09-24	Low	7 days	Amazon Relational Database Service	-	$253.73	Not an issue
2020-09-23	Low	1 day	Amazon Relational Database Service,Amazon Elastic Compute Cloud - Compute	[redacted]	$32.50	Not submitted
2020-09-23	Low	1 day	Amazon Relational Database Service,Amazon Elastic Compute Cloud - Compute	[redacted]	$32.50	Not submitted
2020-09-23	Low	6 days	Amazon Redshift		$104.34	Not submitted
2020-09-22	Low	4 days	Amazon Relational Database Service,Amazon Redshift	[redacted]	$99.60	Accurate anomaly
2020-09-22	Low	2 days	-	-	$63.88	Not submitted
2020-09-20	Low	2 days	-	-	$62.61	Not submitted

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Gaining control over purchasing

Enabling legacy procurement processes to be cloud-ready

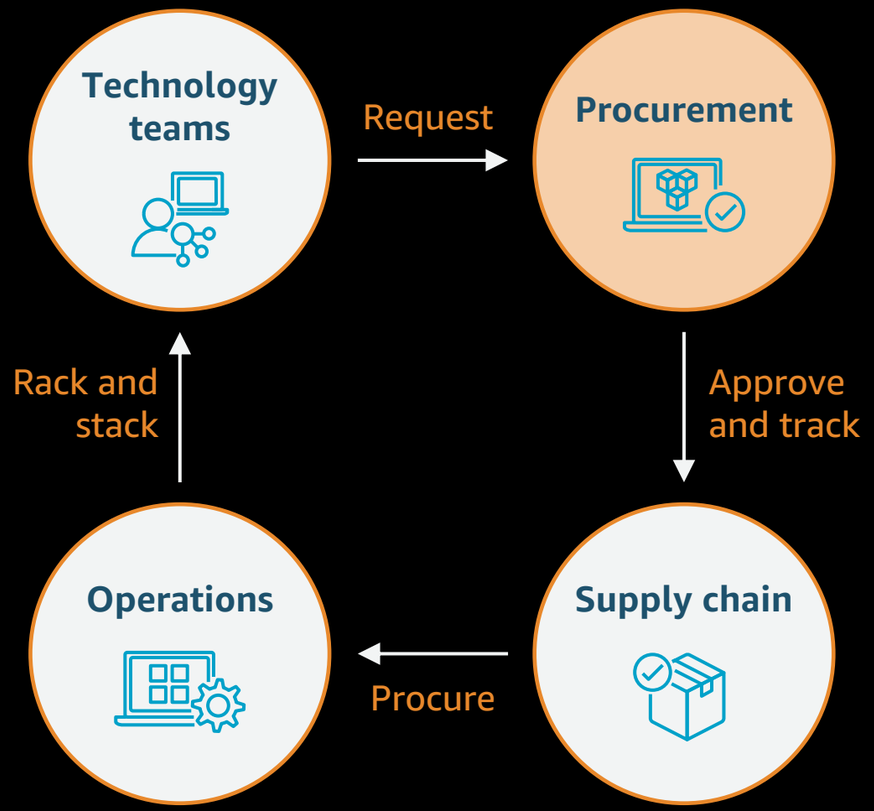


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Evolving procure-to-pay (P2P) processes

ADAPTING EXISTING PROCUREMENT PROCESSES TO BE MORE CLOUDY



P2P Challenge

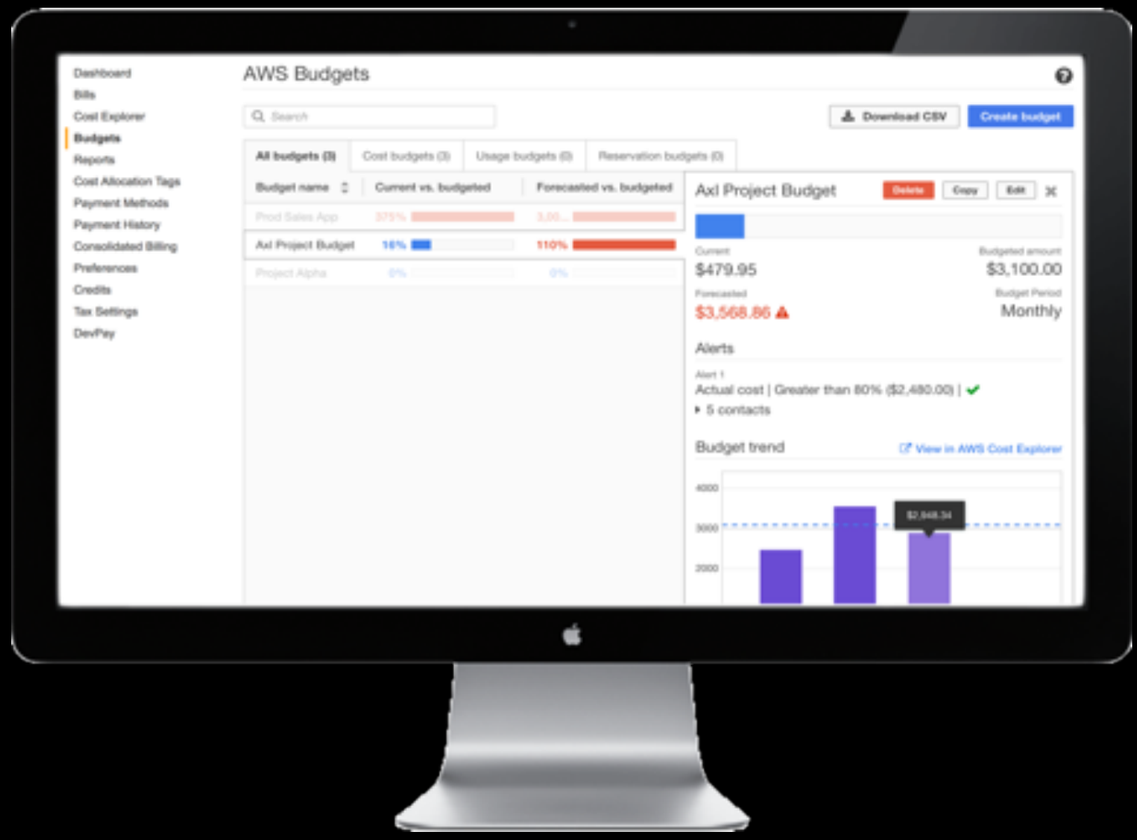
- Process: Select vendor, negotiate contract, generate purchase order, process invoice, pay
- Traditional procurement processes are designed for hardware
- Mapping purchase orders to invoices can be difficult
- Integration with existing enterprise resource planning (ERP) systems

Introducing AWS Purchase Order Management

MANAGING, CONFIGURING, AND TRACKING PURCHASE ORDERS

AWS Purchase Order Management

- Single pane of glass to view and manage all POs
- Define mapping of POs to invoices through line-item configurations
- Manage PO status, track PO balance and expiration, and configure contacts to receive email notifications for PO expiration and balance depletion



Before we go



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Before you go

RESOURCES TO LEARN, CONNECT, AND ROLL UP YOUR SLEEVES

Learn !

AWS Peer Connect

aws.amazon.com/aws-cost-management/cfm-peer-connect/

AWS Cost Management blog

aws.amazon.com/blogs/aws-cost-management/

AWS CFM training

aws.training/

Try !

AWS Budget Actions

aws.amazon.com/aws-cost-management/aws-budgets/

AWS Cost Anomaly Detection

aws.amazon.com/aws-cost-management/aws-cost-anomaly-detection/

AWS Purchase Order Management

aws.amazon.com/aws-cost-management/aws-purchase-order-management/

Thank you!



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