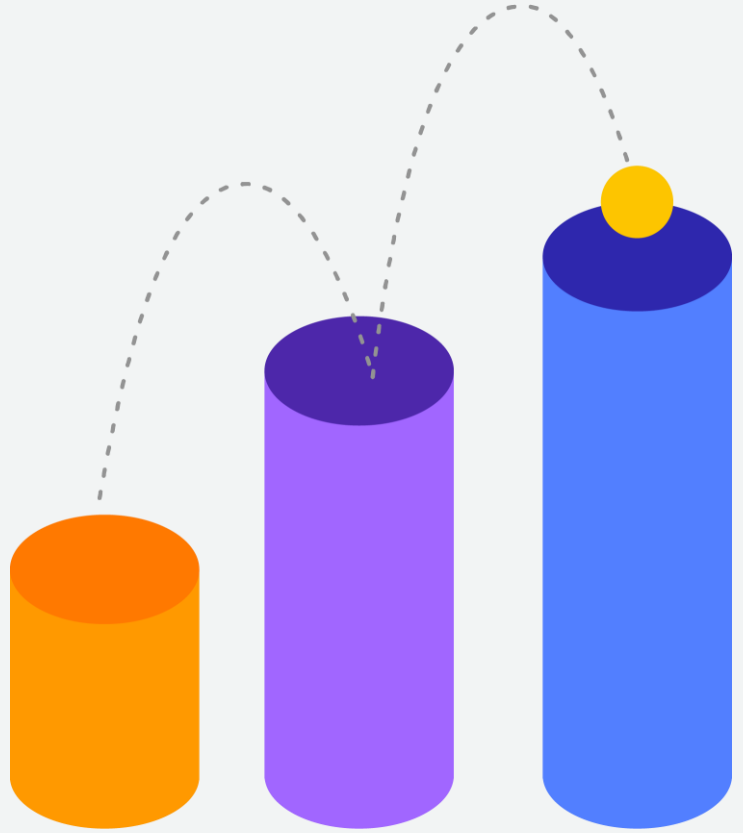
AWS Builders Online Series

Welcome

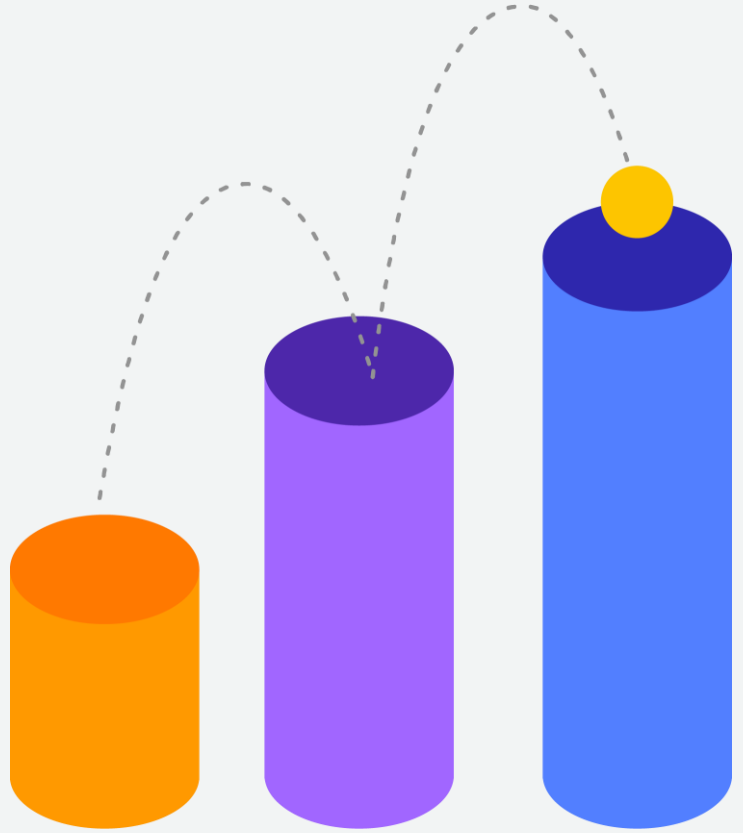


AWS Builders Online Series

Introductory guide to AWS cost management and efficiency

Peter Shi, Cloud Financial Management Lead,
APAC Business Development

AWS



Agenda

The economics of AWS

Using AWS in a cost efficient way

How to manage your spend on AWS

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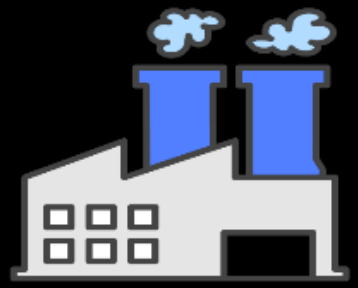
Using AWS in a cost efficient way

How to manage your spend on AWS

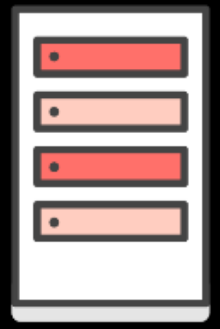
Cloud is the new normal with fewer organisations asking “why” and more asking “how and how fast?”

Industrial Revolution



Shift to on-demand power

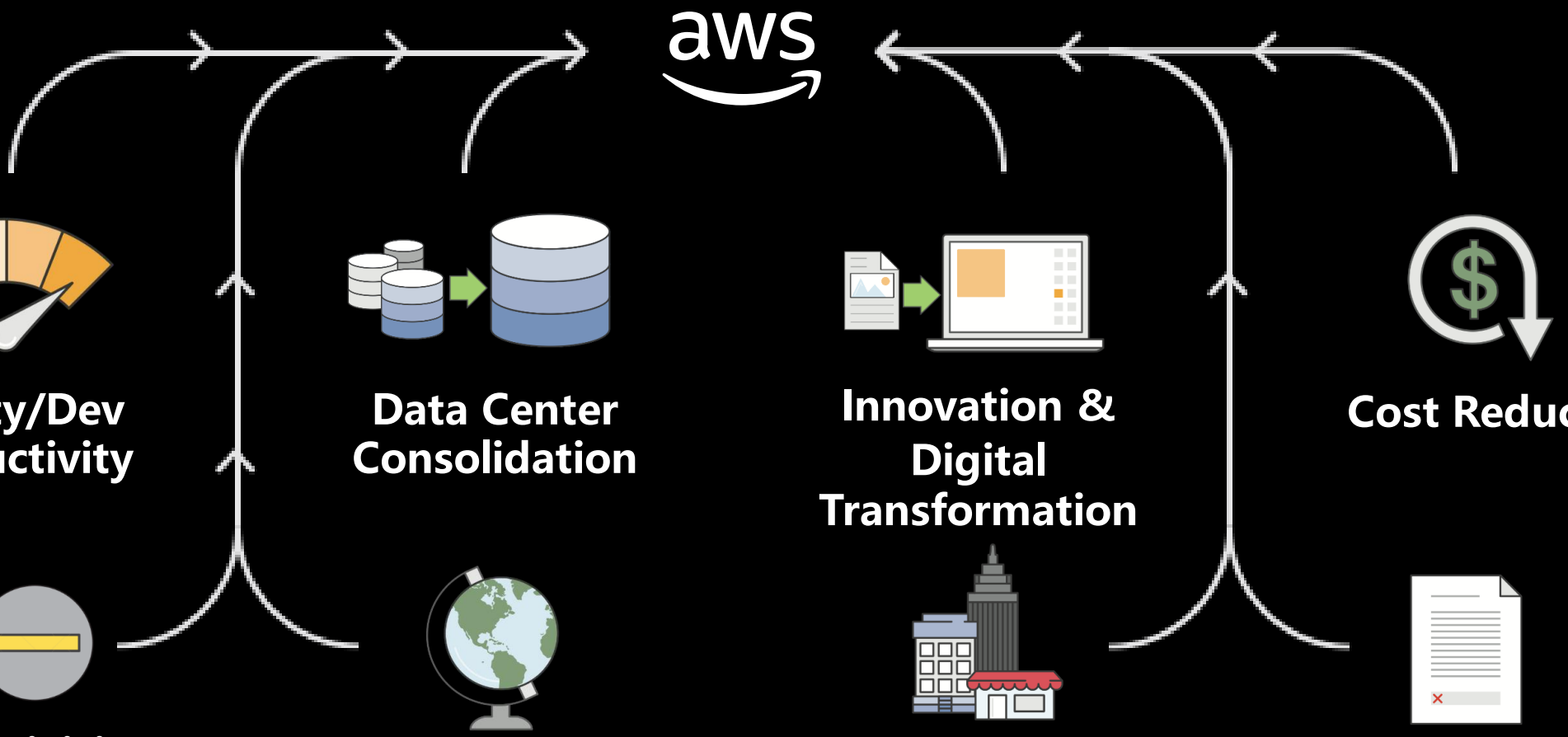
Cloud Revolution



Shift to on-demand computing

aws

Customers are adopting AWS at a rapid pace



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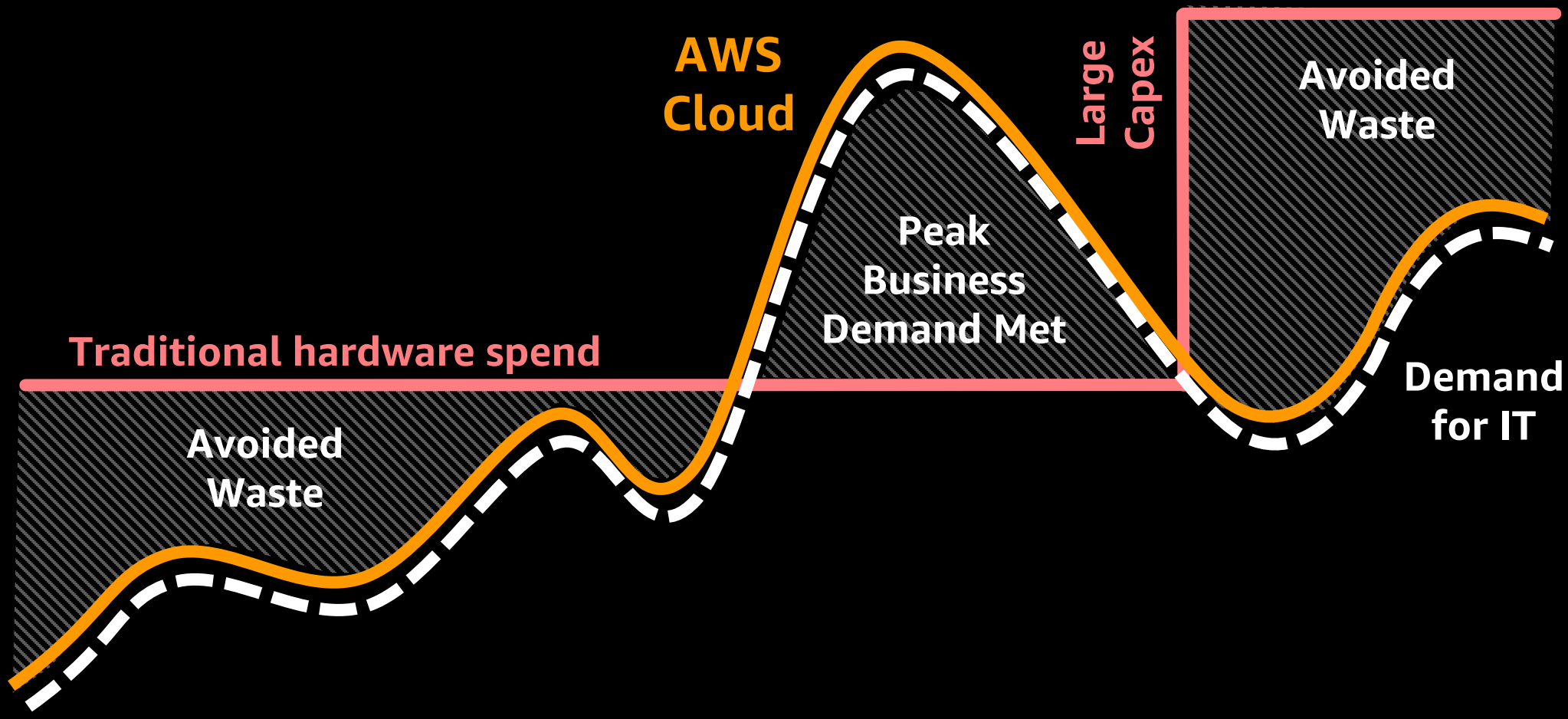
AWS allows you to eliminate waste and meet peak business demand



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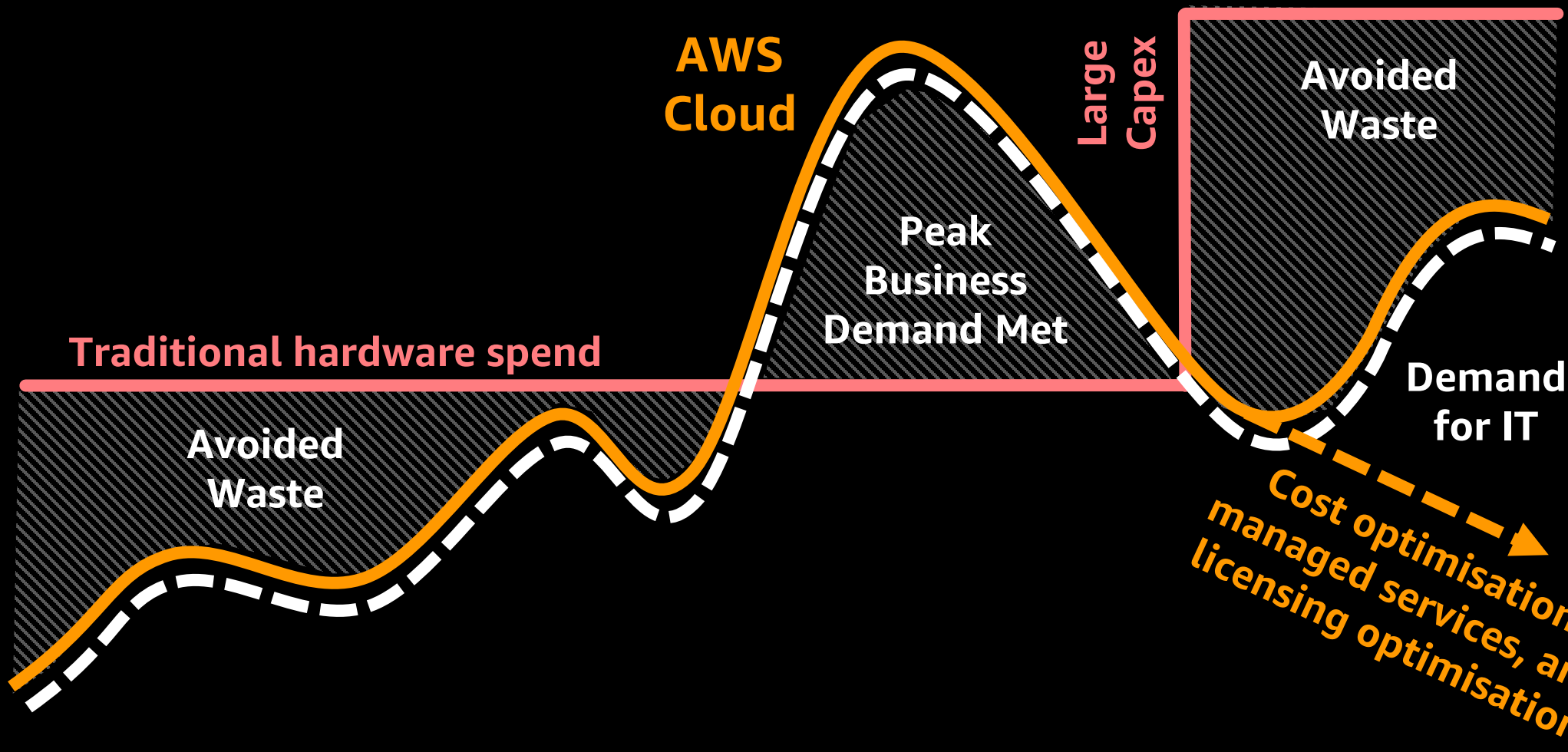

Customers have gained value beyond cost

	Cost Savings (TCO)	Staff Productivity	Operational Resilience	Business Agility
What is it?	Savings on infrastructure, on licensing, and from managed services	Efficiency improvement, reduced wait times and downtime	Better SLAs, reduced outages and MTTR, and security	Faster application deployment, global reach, and lower cost of experimentation
Examples	30% reduction in total cost of ownership (Globe)	Deploys SAP 93% faster (Visy)	60% reduction in downtime (Trainline)	Scaled by 1000 percent in 1 year and reduced dev project time by months (iTrueMart)

Typical Focus

Most Compelling Cloud Benefits

aws

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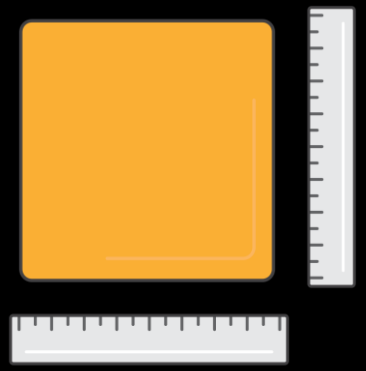
The economics of AWS

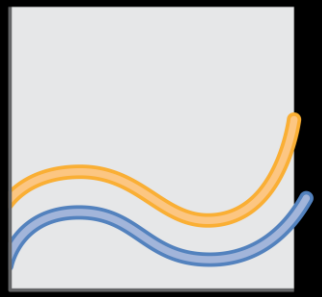
Using AWS in a cost efficient way

How to manage your spend on AWS

The Technical Pillars of Optimisation



Right Size & Decommission unused Resources



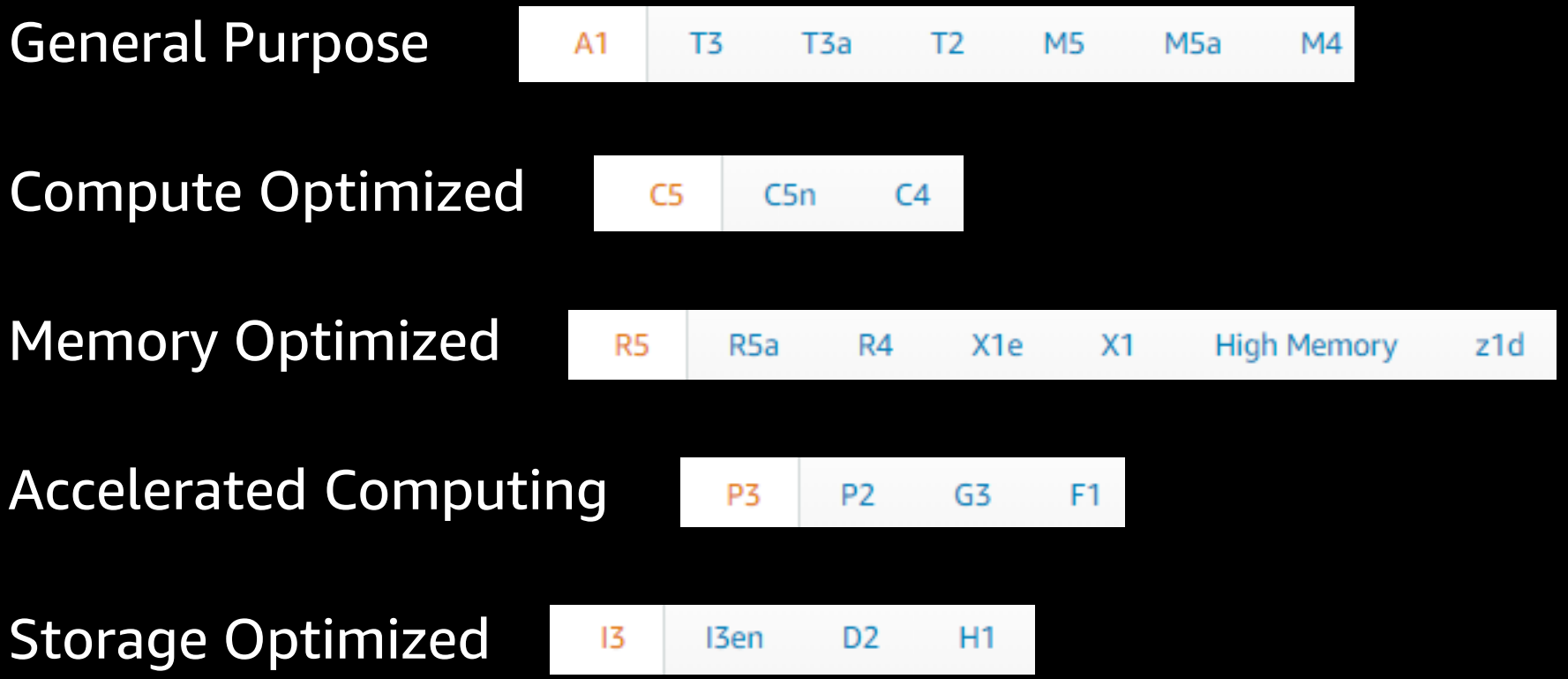
Turn off resources outside of work hours

Use Reserved Instances

Design for Cost

aws

Right size by picking the right family from the start



For migrations, consider using a tool like TSO Logic

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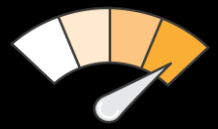
Sizing resources to fit to usage example

1. Use Cost Explorer: Resource Optimization Recommendations to find underutilised EC2 resources and understand savings potential

2. Agree when to resize, how many to resize, and understand any other constraints

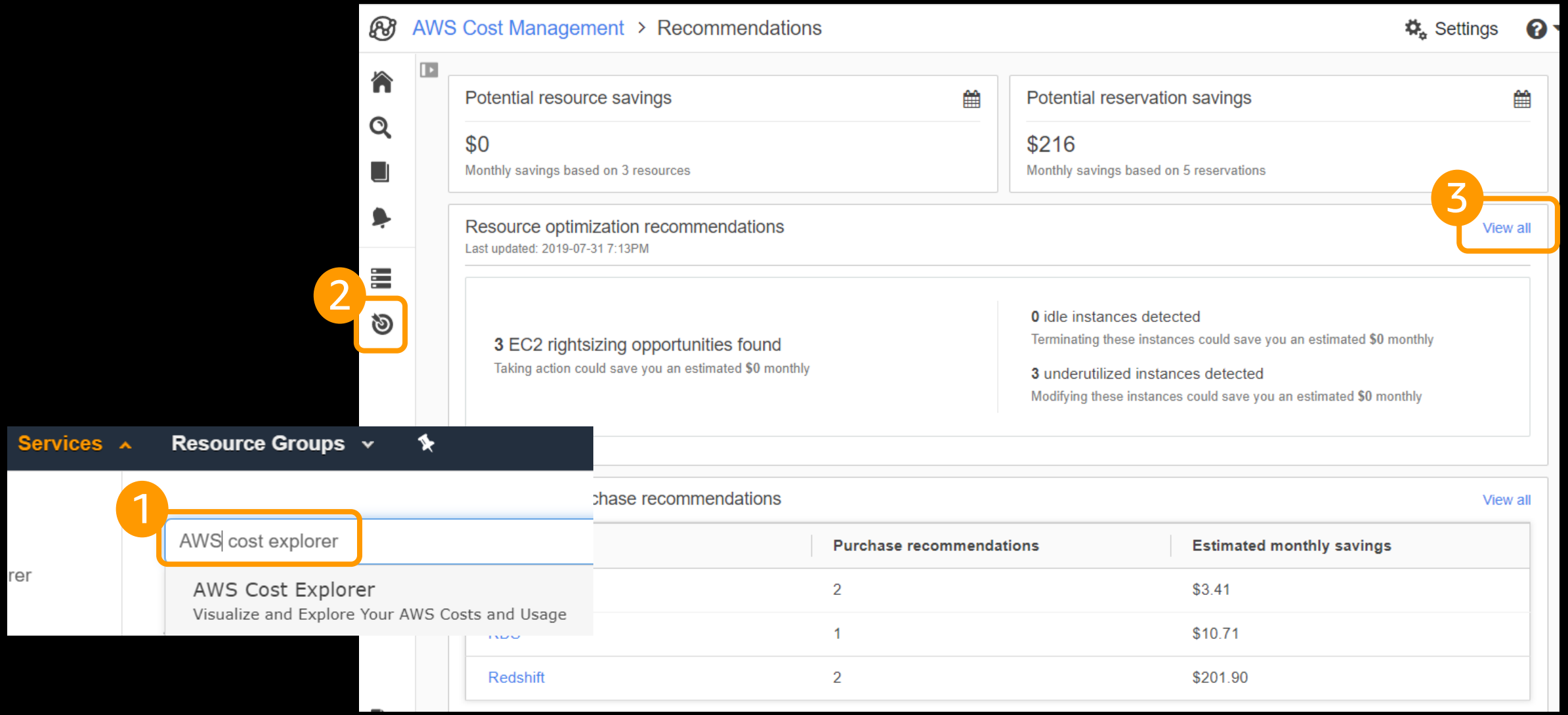
3. Size to what's needed (m4.4xlarge -> m4.xlarge saves 87%)



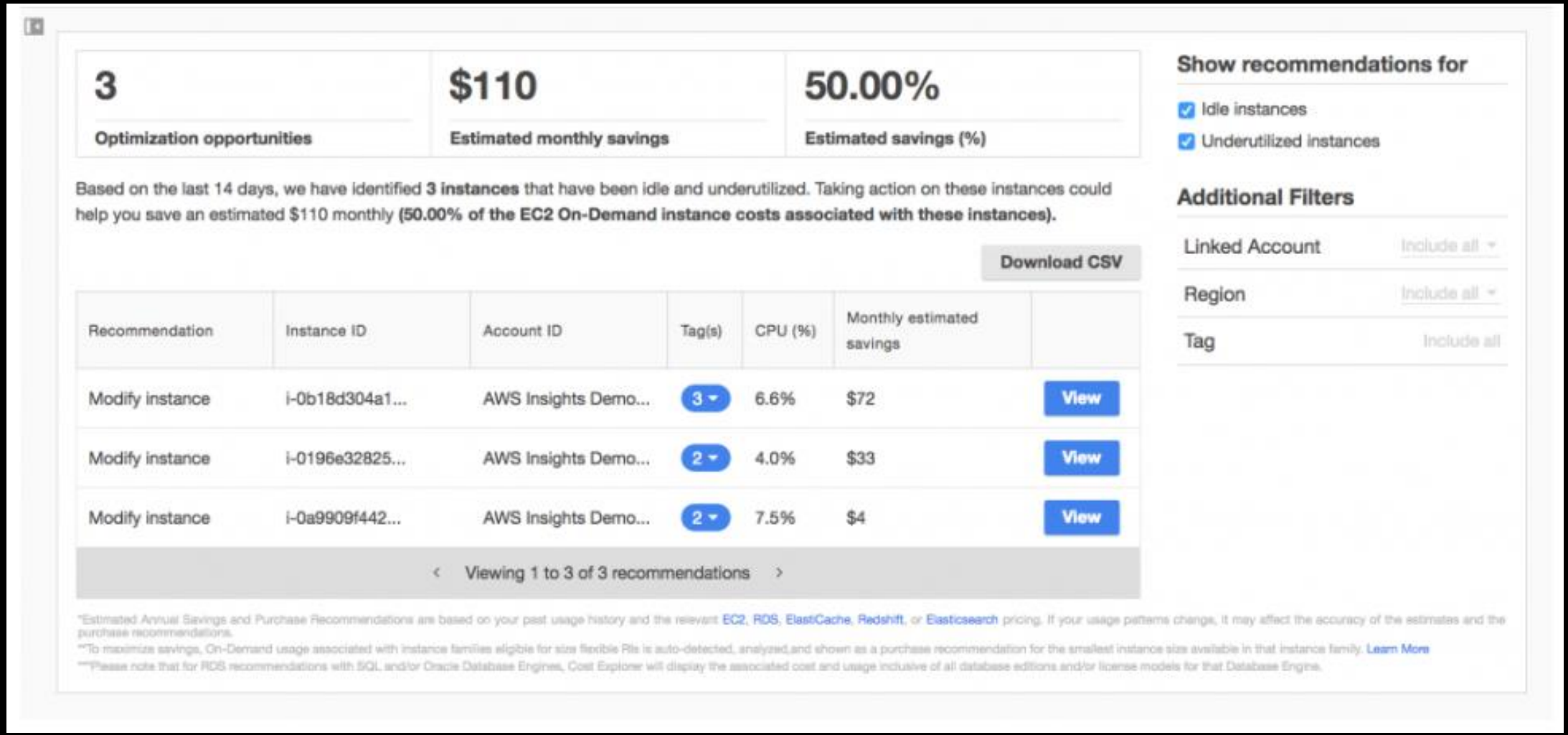
4. Review application Performance

5. Celebrate the savings win

Cost Explorer: Resource Optimization recommendations



Cost Explorer: Resource Optimization recommendations



3	$110	50.00%
Optimization opportunities	Estimated monthly savings	Estimated savings (%)

Based on the last 14 days, we have identified **3 instances** that have been idle and underutilized. Taking action on these instances could help you save an estimated $110 monthly **(50.00% of the EC2 On-Demand instance costs associated with these instances).**

Download CSV

Recommendation	Instance ID	Account ID	Tag(s)	CPU (%)	Monthly estimated savings	
Modify instance	i-0b18d304a1...	AWS Insights Demo...	3	6.6%	$72	View
Modify instance	i-0196e32825...	AWS Insights Demo...	2	4.0%	$33	View
Modify instance	i-0a9909f442...	AWS Insights Demo...	2	7.5%	$4	View

‹ Viewing 1 to 3 of 3 recommendations ›

Show recommendations for

- Idle instances
- Underutilized instances

Additional Filters

- Linked Account — Include all
- Region — Include all
- Tag — Include all

*Estimated Annual Savings and Purchase Recommendations are based on your past usage history and the relevant EC2, RDS, ElastiCache, Redshift, or Elasticsearch pricing. If your usage patterns change, it may affect the accuracy of the estimates and the purchase recommendations.
**To maximize savings, On-Demand usage associated with instance families eligible for size flexible RIs is auto-detected, analyzed,and shown as a purchase recommendation for the smallest instance size available in that instance family. Learn More
***Please note that for RDS recommendations with SQL and/or Oracle Database Engines, Cost Explorer will display the associated cost and usage inclusive of all database editions and/or license models for that Database Engine.

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Find unused resources using tools like AWS Trusted Advisor (available via business support)

AWS Trusted Advisor

Old snapshots

Unattached Elastic IPs

Idle EC2, RDS instances

Unattached EBS

Idle or unattached load balancers

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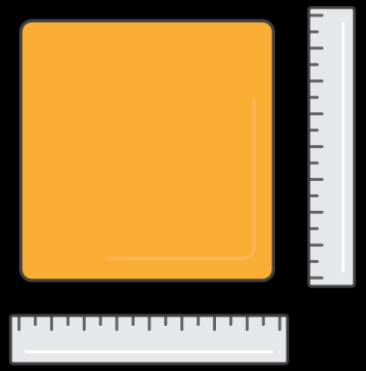
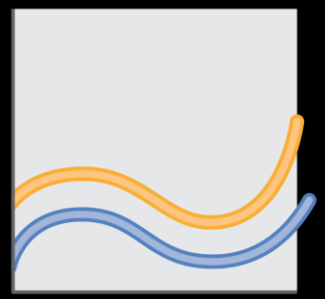
The Technical Pillars of Optimisation



Right Size & Decommission unused Resources



Turn off resources outside of work hours

Use Reserved Instances

Design for Cost

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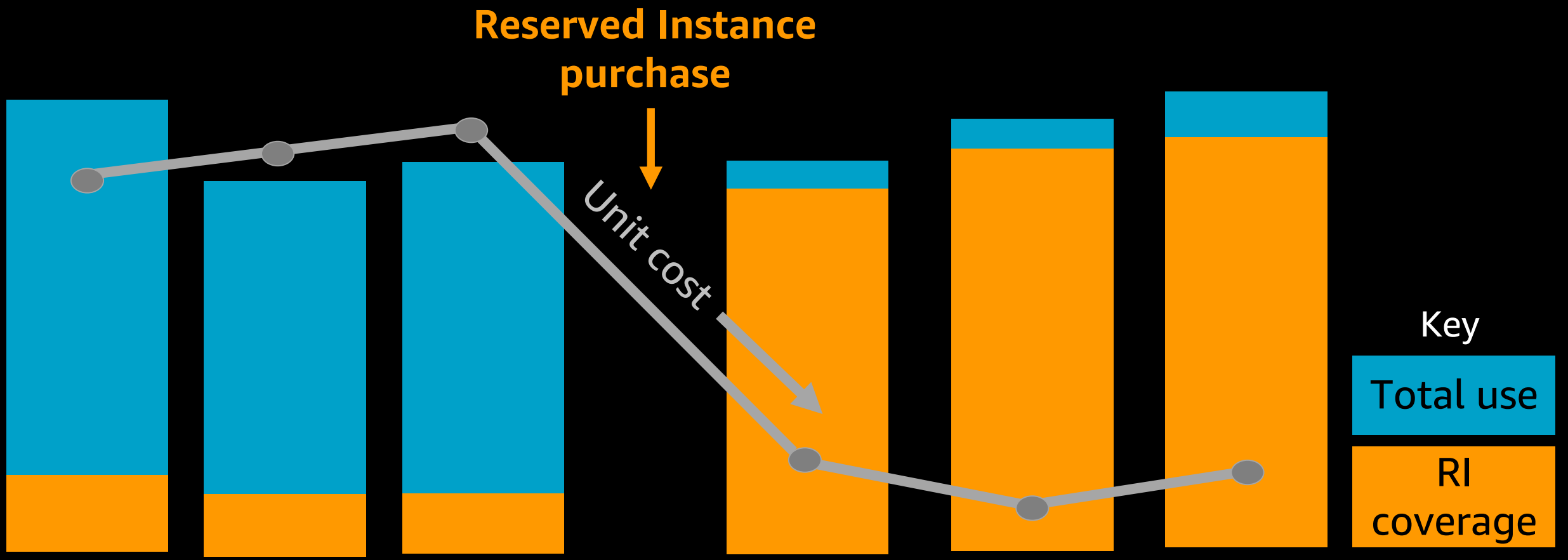
Turning off non-production resources outside of work hours saved $800 per day on weekends and $400 per day on weekdays for this customer = $15,600 per month saving

Tools for turning off resources outside of work hours

- AWS Instance Scheduler
  https://aws.amazon.com/answers/infrastructure-management/instance-scheduler/
- 3rd party paid tools (including but not limited to)

Reserved Instances (RIs) for one customer resulted in a 39% decrease in unit cost



What are Reserved Instances (RIs)?

- RIs are a commitment in exchange for discount
- They behave like discount coupon booklets that last for 1-3 years
- Each hourly RI coupon in the booklet tries to match to a running instance, if matched it provides its full discount, if not it expires
- RIs are a financial construct/layer on top of your AWS infrastructure

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RIs are most often used for always-on instances (can still be used to save for non-always on)

Up to 75% savings

Approx. 20-40% savings for 1 year

Commitment level

1 year (approx. payback 7-10 months)

3 year (approx. payback 10-20 months)

AWS services offering RIs

Amazon EC2 & EC2 Hosts

Amazon RDS

Amazon Redshift

Amazon ElastiCache

Amazon Elasticsearch

Amazon DynamoDB*

Amazon CloudFront*

*Discount for commitment, but not an RI

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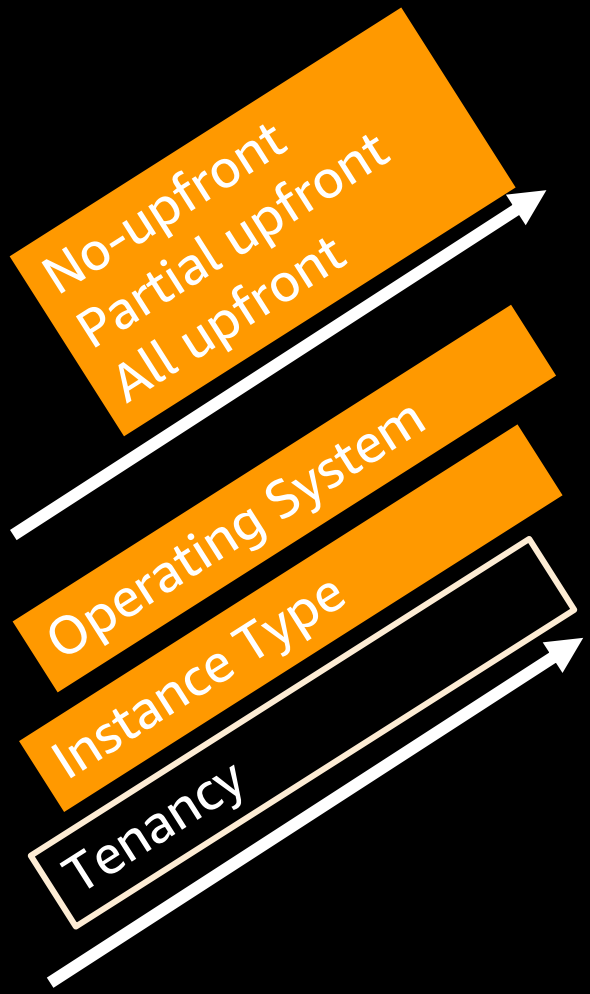
EC2 RI types cater to a range of customer needs

	1 year	3 years
Standard	Regional (e.g. ap-southeast-2)	Regional
	Zonal (e.g. ap-southeast-2a)	Zonal
Convertible	Regional	Regional
	Zonal	Zonal



Note: You can easily switch between Regional and Zonal at no cost

Items shaded in Orange affect pricing

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Which EC2 RIs give greater discount?

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Convertible RIs offer great flexibility as you can:

- ✓ Take advantage of new instance types
- ✓ Adapt your RIs as business needs change
- ✓ Drastically reduce the likelihood of unused RIs
- ✓ Take advantage of price reductions

As Convertible RIs allow changes in:

- ✓ Instance Families (e.g. m4. -> c5.)
- ✓ Instance Sizes (e.g. .large -> .xlarge)
- ✓ Operating System (e.g. Linux -> Windows)
- ✓ Tenancy (e.g. shared -> dedicated)

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The commitment for Convertible RIs includes:

- ✓ 1yr or 3 yrs. (not refreshed on conversion)
- ✓ An AWS Region (e.g. Singapore)
- ✓ EC2 on AWS
- ✓ Spend (convert to equal or greater $)

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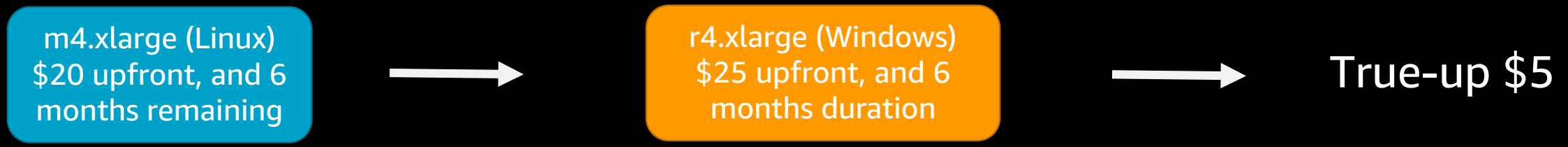
What happens when you Exchange a Convertible RI

1) Changing to a more expensive instance type, family, and operating system



2) Sizing to cheaper instance type

*Indicative values only

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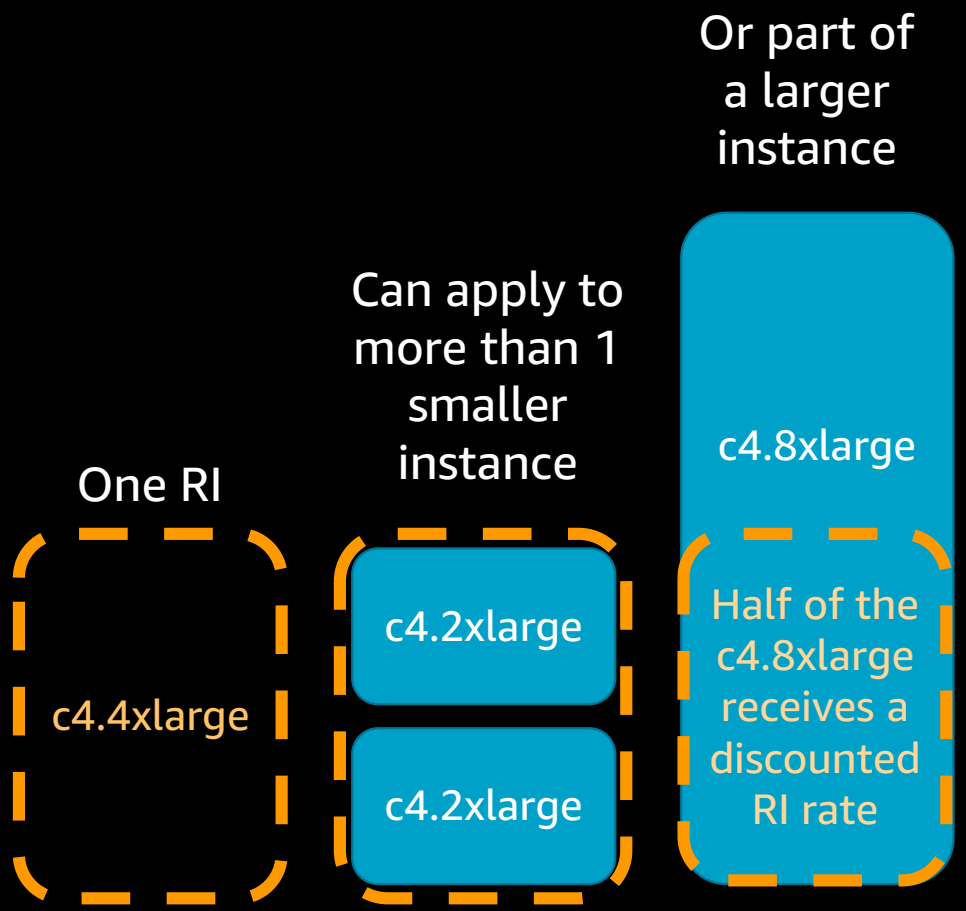
Instance Size Flexibility reduces the need to match RI size to running instance size



Note, this only works if:

- RI is **Regional**
- RIs and instances are of **1 family** (e.g. m4)
- RI and matching instance are **Linux/UNIX** (incl. Amazon Linux, CentOS, Ubuntu) – this does not work for RHEL, SUSE or any other licensed OS, and
- RI and Instance are **Shared** tenancy

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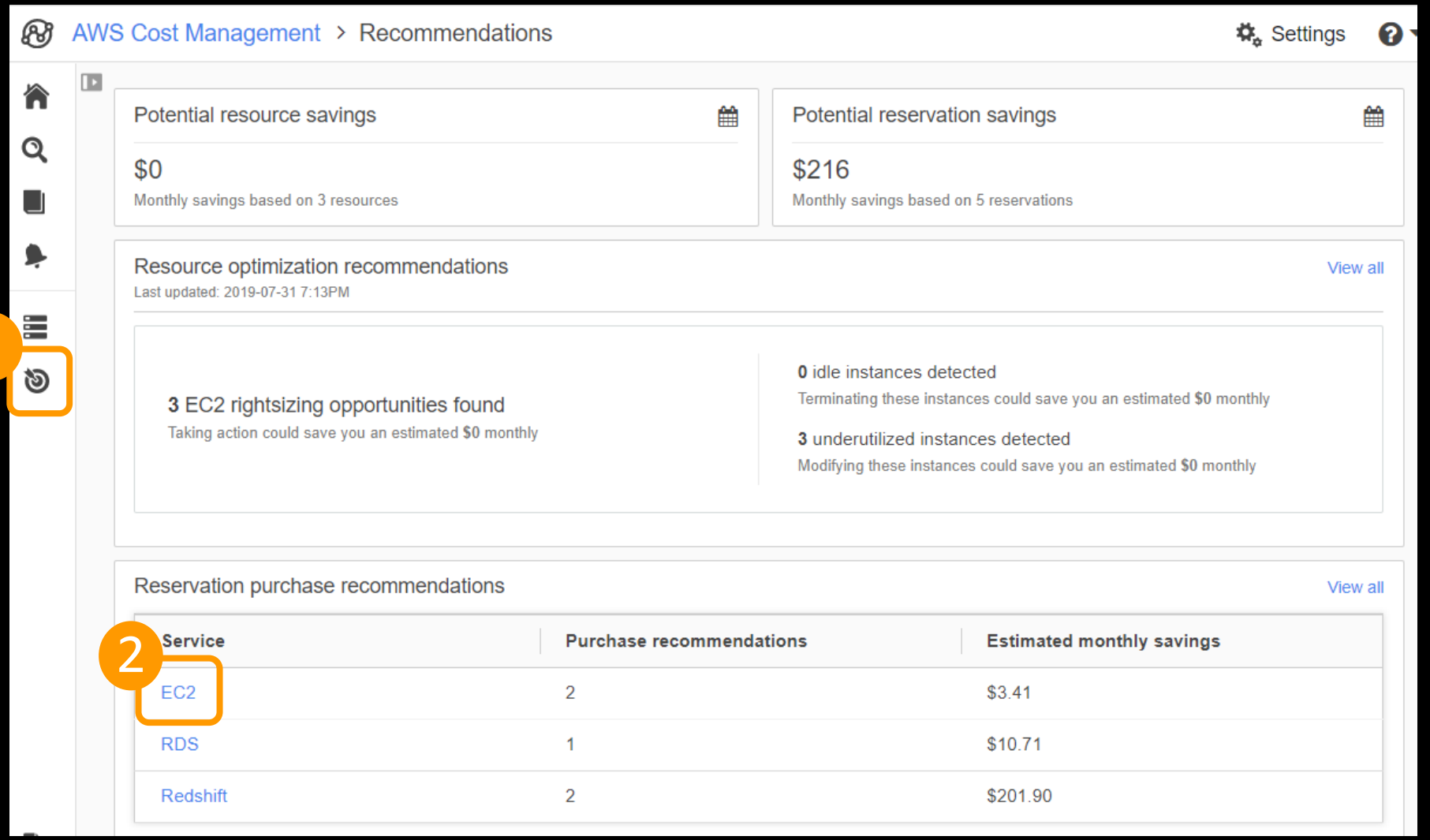
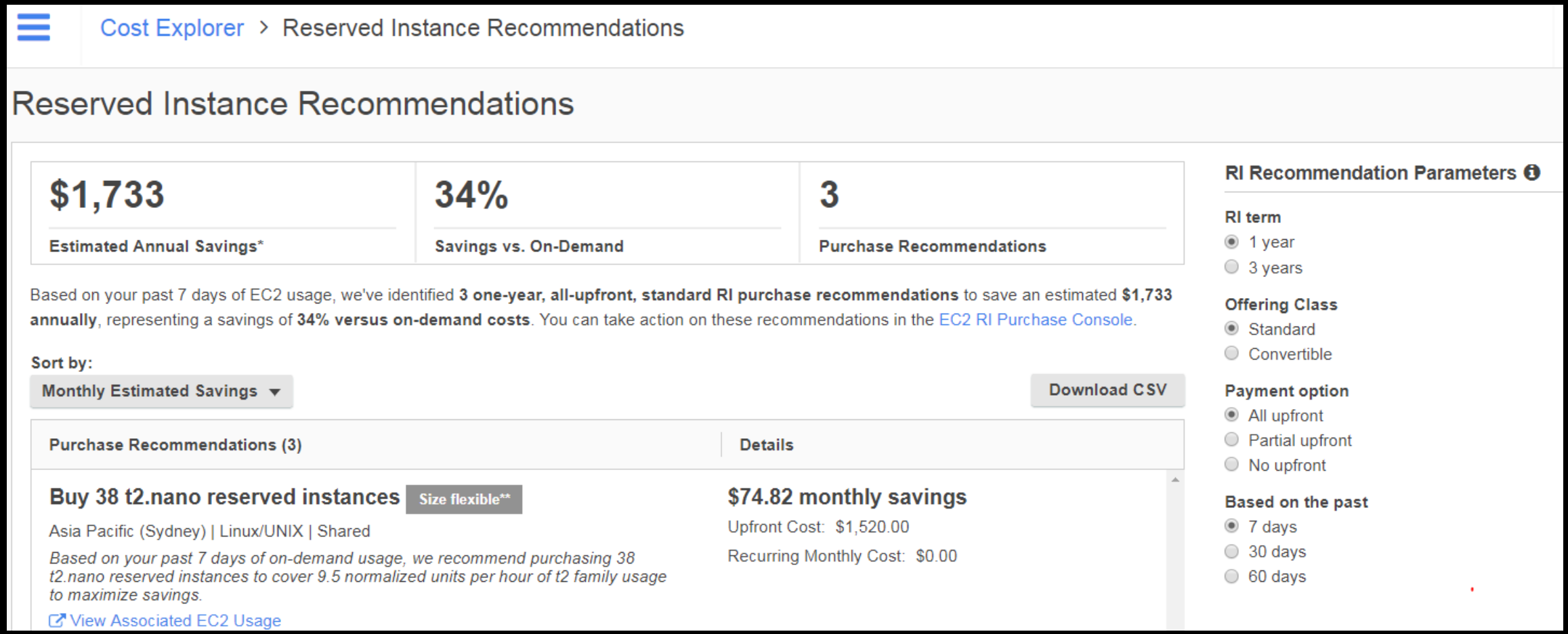
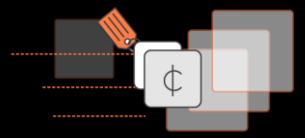
See RI Recommendations and Estimated Savings via Cost Explorer accessed here:



See RI Recommendations and estimated savings via Cost Explorer: RI Recommendations



Designing for Cost



Amazon EC2 Spot

Static Web Hosting on S3 and using S3 Select

Deliver content with AWS CloudFront and Caching (lower compute and data transfer)

AWS CloudFormation (developer time saving)

Running resources in a cheaper region

Serverless & AWS Lambda

ELB to Application Load Balancer

Containerisation (staff productivity and compute utilisation)

Open source platforms & databases (reduced licensing cost)

Auto Scaling up and down to match peak demand

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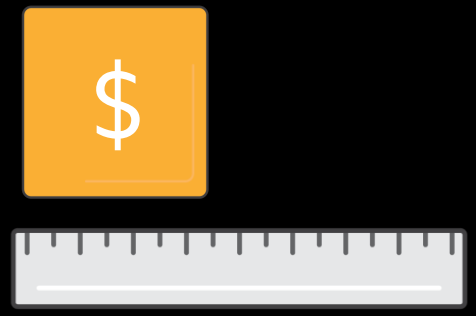
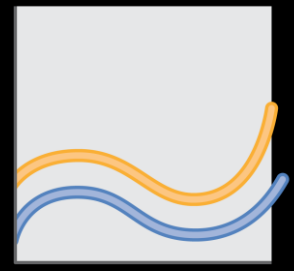
How to manage your spend on AWS

Estimating spend



Measuring & monitoring spend



Metrics to know how efficient your spend is

Consider optimisation when estimating spend

Tips for new workloads

- Design for cost upfront
- Include turn-off time
- Include reserved instances

Tips for migrating workloads

- Understand peak utilisation (i.e. peak CPU and RAM) via tools like hypervisor monitoring or TSO Logic
- Understand usage pattern (e.g. % of time off)

Self-serve tools

1) Simple Monthly Calculator

2) AWS pricing calculator

Supported options

3) Migration Acceleration Program (MAP)

4) Contact AWS Sales (incl. for TSO Logic)

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Cost Savings: Modeling On-Premises Cost

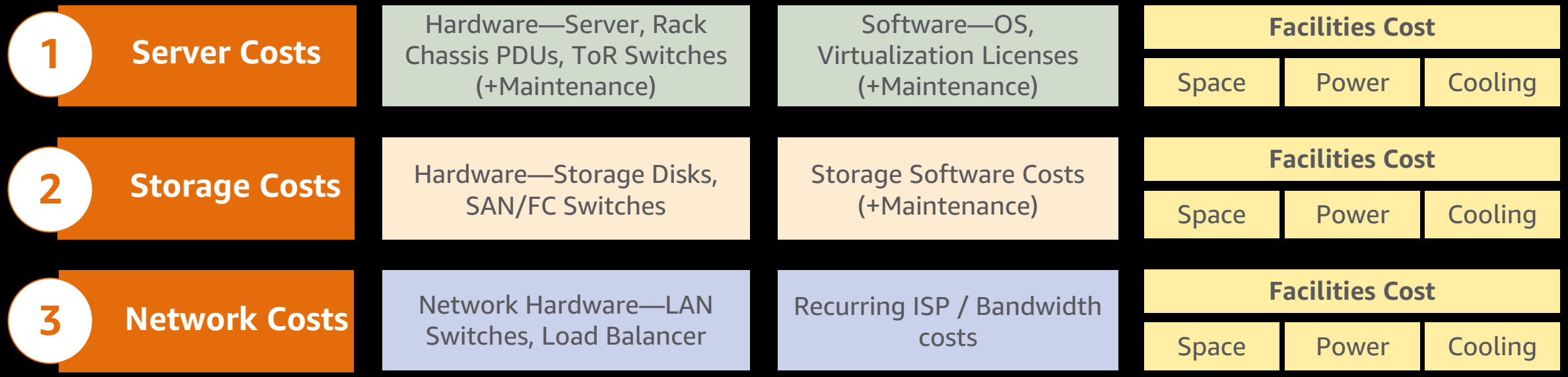

Diagram doesn't include every cost item. For example, software costs can include database, management, middle tier software costs. Facilities cost can include costs associated with upgrades, maintenance, building security, taxes, and others.

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To measure your spend, use AWS Cost Explorer

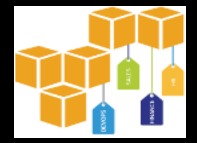
Monthly
AWS invoice

Move towards tools with greater speed to insight

1. AWS Cost Explorer

2. AWS budgets

3. Use Tags



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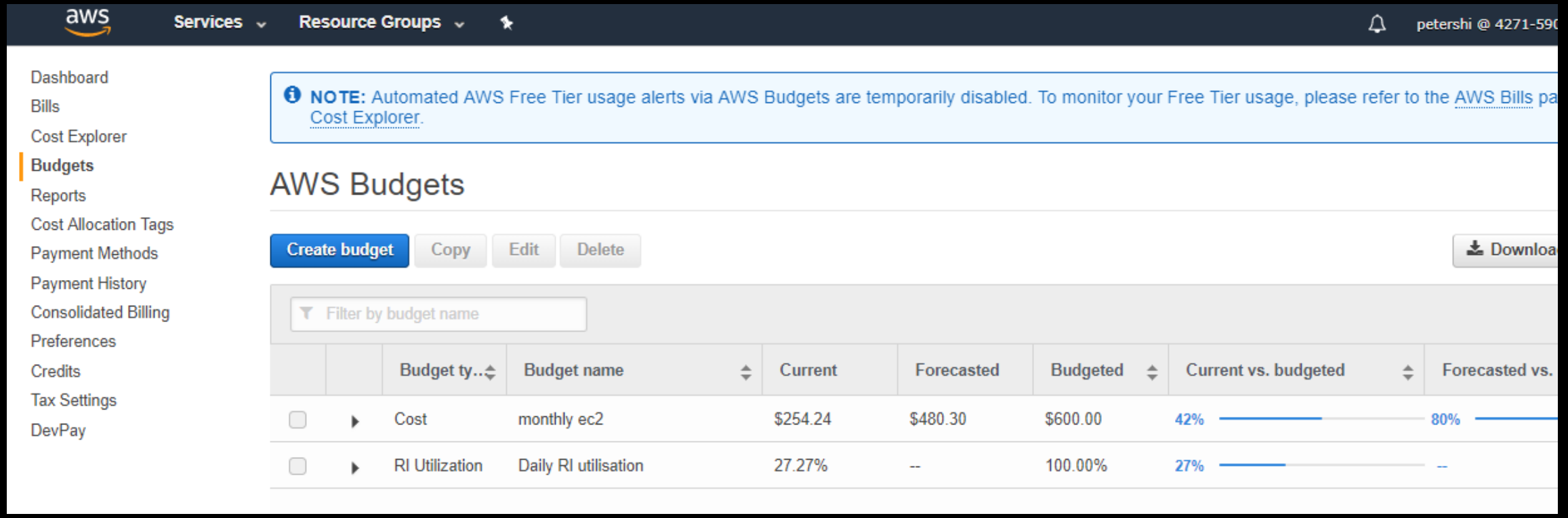
AWS Budgets send you email or SNS notifications when spend thresholds are reached



"Email me if my EC2 spend is expected to reach 105% of forecast"

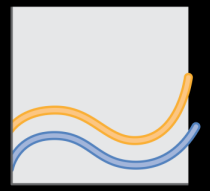
Cost Explorer provides metrics that tell you if you're running efficiently

1) **Spend** against budgets (split by BU, account, service, etc.), and % valid tagging

In which areas am I spending the expected amount?

2) **Rightsizing**: ratio of right sizing savings vs. EC2 total spend via AWS Cost Explorer

Are my resources fit to need?



3) **On-off scheduling**: ratio of weekday vs. weekend average spend for EC2 and RDS instances via AWS Cost Explorer

Are non-production costs turning on-off as expected outside of work hours?

4) **RI Efficiency**: % RI coverage, % RI utilisation, and $ unused RIs

Am I paying less for the same capacity & am I using that capacity I paid for?

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Summary of this session

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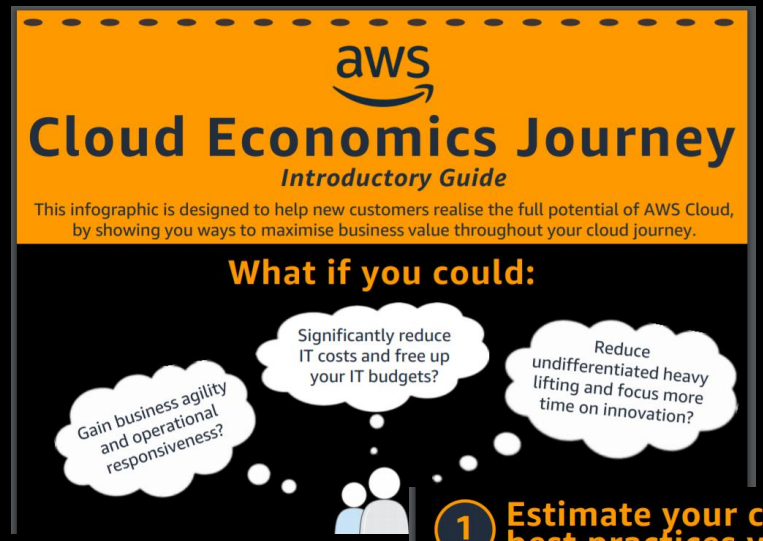
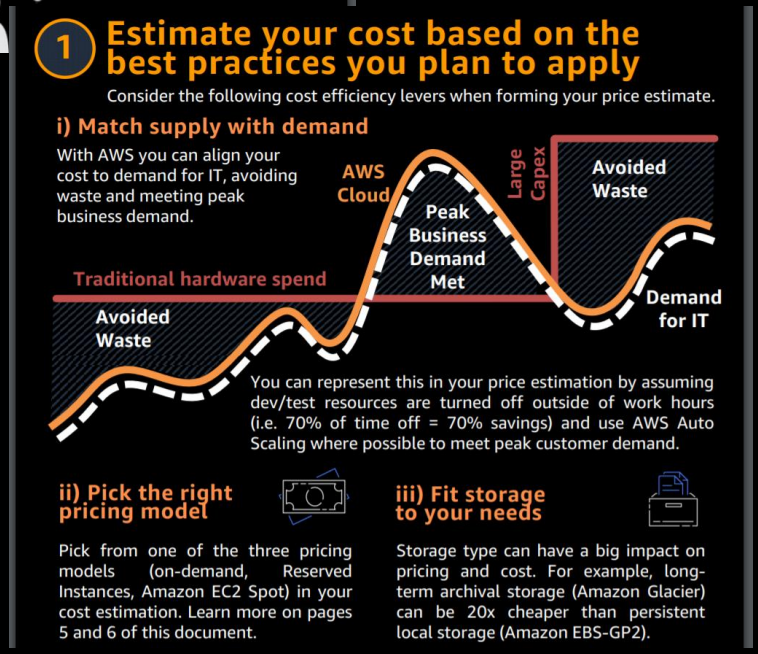
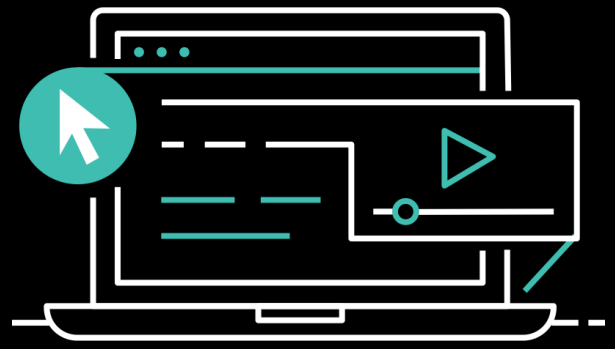




http://bit.ly/cloudeconintro2019

AWS Digital Training



Learn at Your Own Pace

AWS Digital Training offers free on-demand digital courses that help you learn new cloud skills and services when and where it's convenient for you.

Featured Courses

- AWS Cloud Practitioner Essentials (Second Edition)
  Learn the fundamentals of the AWS Cloud and prepare for the AWS Certified Cloud Practitioner exam.
- Amazon DynamoDB for Serverless Architectures
  An introduction to Amazon DynamoDB and how it's leveraged in building a serverless architecture
- AWS Security Fundamentals
  Learn fundamental cloud computing and AWS security concepts, including AWS access control and management, governance, logging, and encryption methods.
- Getting Started with Amazon Simple Storage Service (Amazon S3)
  Learn the knowledge to determine when to use Amazon S3 by reviewing typical use cases and understanding how the service provides object storage for your applications

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We hope you found it interesting! A kind reminder to **complete the survey.**
Let us know what you thought of today's event and how we can improve the event experience for you in the future.


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