



# Module 2: Cloud Economics and Billing

AWS Academy Cloud Foundations

# AWS pricing model

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## Three fundamental drivers of cost with AWS

### Compute

- Charged per hour/second\*
- Varies by instance type

\*Linux only

### Storage

- Charged typically per GB

### Data transfer

- Outbound is aggregated and charged
- Inbound has no charge (with some exceptions)
- Charged typically per GB

# How do you pay for AWS?

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Pay for what you use



Pay less when you reserve

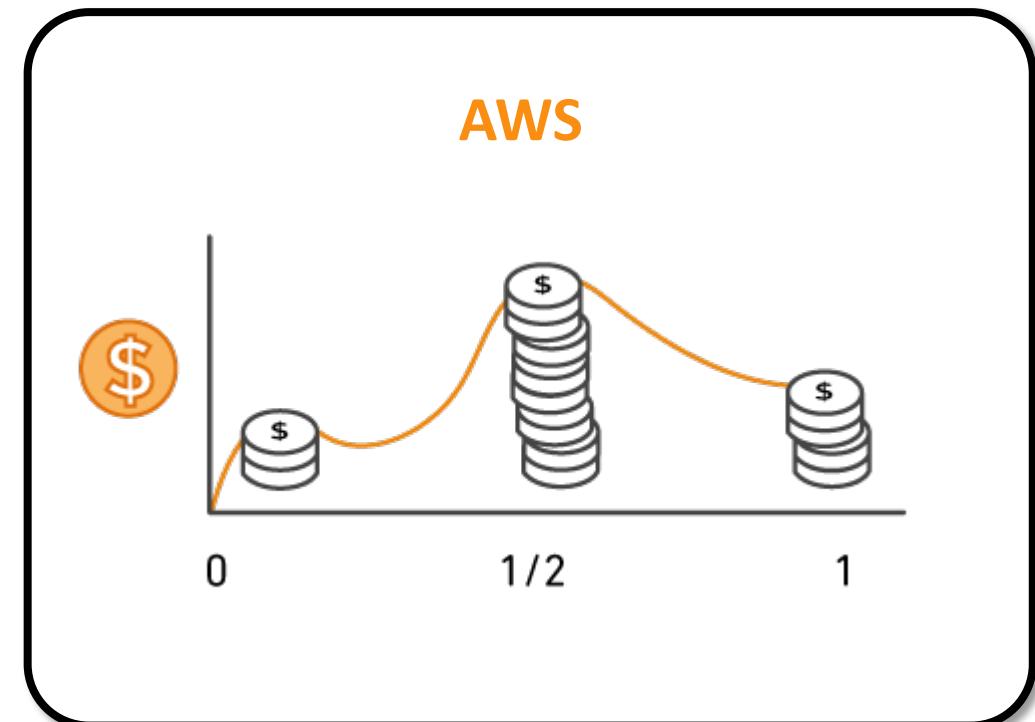
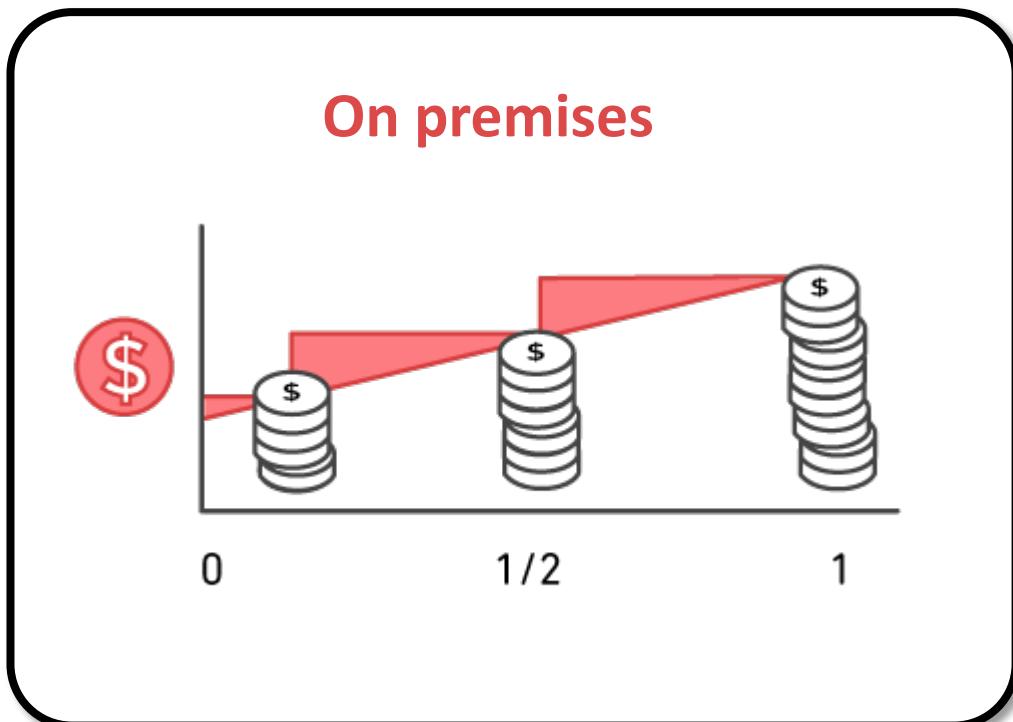


Pay less when you use more and as AWS grows



# Pay for what you use

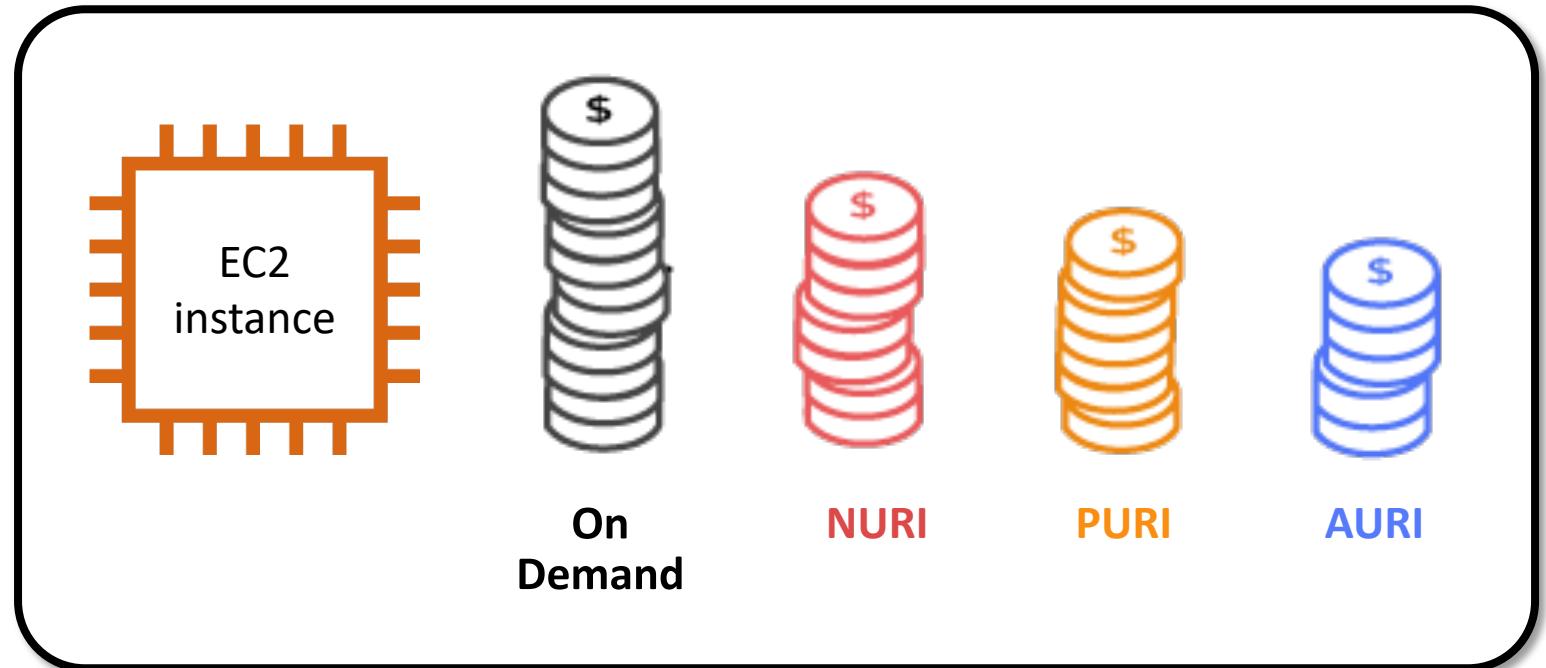
Pay only for the services that you consume, with no large upfront expenses.



# Pay less when you reserve

Invest in Reserved Instances (RIs):

- Save up to 75 percent
- Options:
  - All Upfront Reserved Instance (**AURI**) → largest discount
  - Partial Upfront Reserved Instance (**PURI**) → lower discounts
  - No Upfront Payments Reserved Instance (**NURI**) → smaller discount

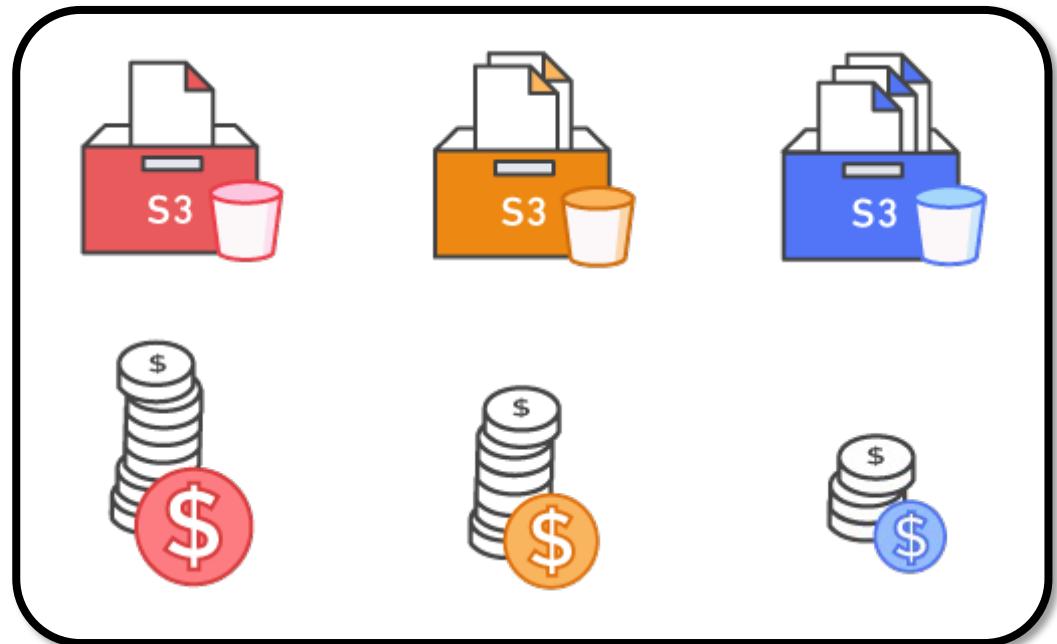


# Pay less by using more

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Realize volume-based discounts:

- **Savings** as usage increases.
- **Tiered pricing** for services like Amazon Simple Storage Service (Amazon S3), Amazon Elastic Block Store (Amazon EBS), or Amazon Elastic File System (Amazon EFS) → the more you use, the less you pay per GB.
- Multiple storage services deliver **lower** storage costs based on needs.

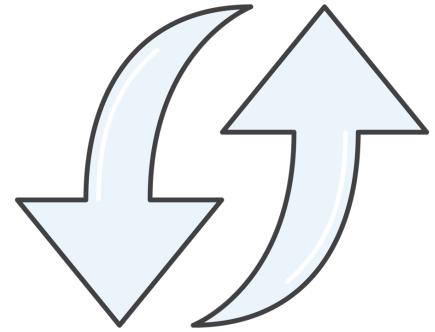


# Pay even less as AWS grows

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As AWS grows:

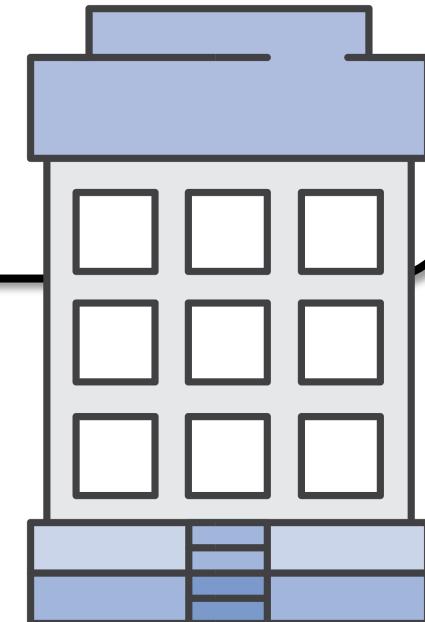
- AWS focuses on lowering cost of doing business.
- This practice results in AWS passing savings from economies of scale to you.
- Since 2006, AWS has **lowered pricing 75 times** (as of September 2019).
- Future higher-performing resources replace current resources for no extra charge.



# Custom pricing

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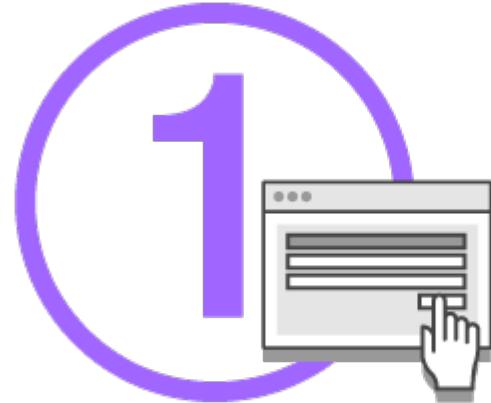
- Meet varying needs through custom pricing.
- Available for high-volume projects with unique requirements.



# AWS Free Tier

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Enables you to gain free hands-on experience with the AWS platform, products, and services. Free for 1 year for new customers.



**Sign up for an AWS account**



**Learn with 10-minute tutorials**



**Start building with AWS**

# Services with no charge



Amazon VPC



Elastic Beanstalk\*\*



Auto Scaling\*\*



AWS CloudFormation\*\*



AWS Identity and Access Management (IAM)

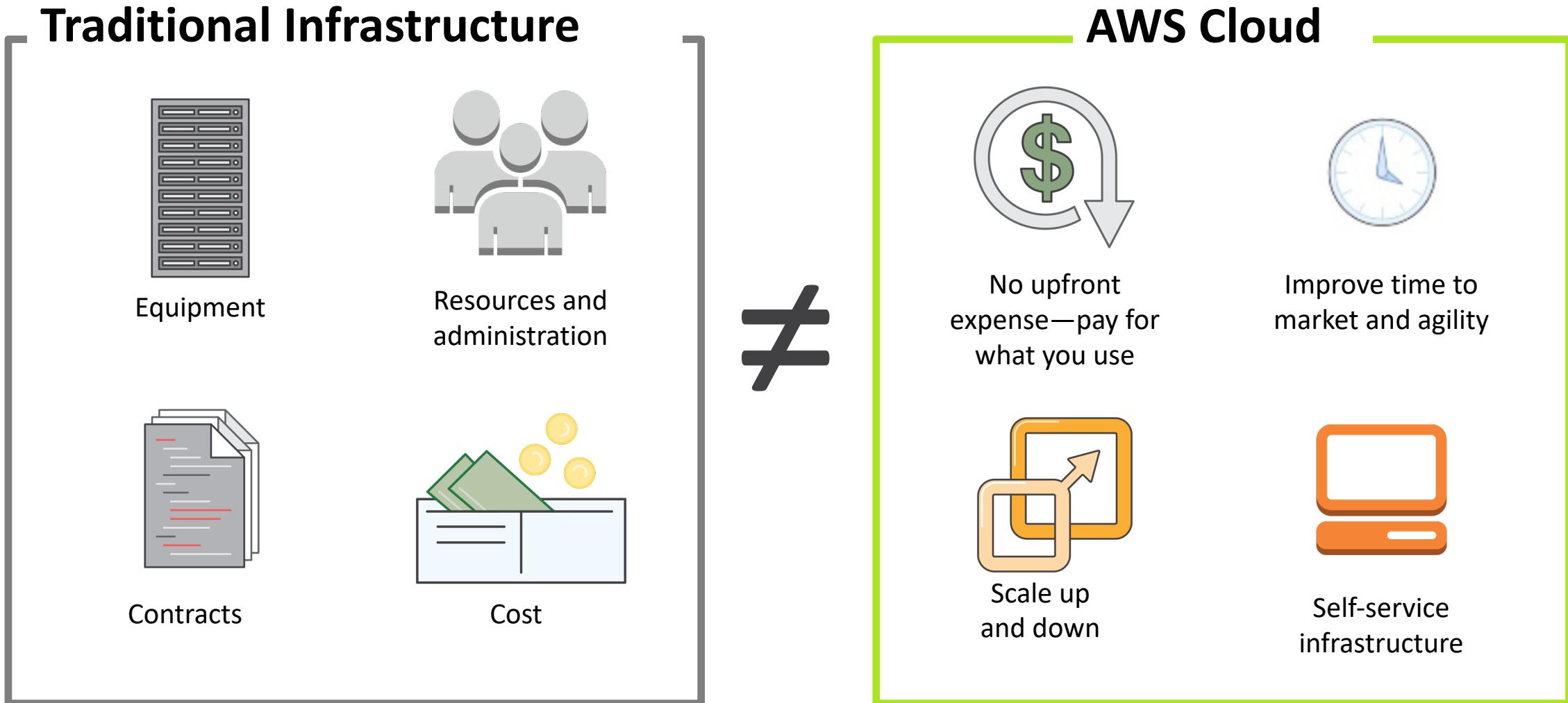
**\*\*Note:** There might be charges associated with other AWS services that are used with these services.

# Section 2: Total Cost of Ownership

Module 2: Cloud Economics and Billing



# On-premises versus cloud



# What is Total cost of Ownership (TCO)?

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**Total Cost of Ownership (TCO)** is the financial estimate to help identify direct and indirect costs of a system.

## Why use TCO?

- To compare the costs of running an **entire infrastructure environment or specific workload** on-premises versus on AWS
- To budget and **build the business case** for moving to the cloud



# TCO considerations

1

Server Costs

Hardware: Server, rack chassis power distribution units (PDUs), top-of-rack (TOR) switches (and maintenance)

Software: Operating system (OS), virtualization licenses (and maintenance)

Facilities cost

Space

Power

Cooling

2

Storage Costs

Hardware: Storage disks, storage area network (SAN) or Fibre Channel (FC) switches

Storage administration costs

Facilities cost

Space

Power

Cooling

3

Network Costs

Network hardware: Local area network (LAN) switches, load balancer bandwidth costs

Network administration costs

Facilities cost

Space

Power

Cooling

4

IT Labor Costs

Server administration costs

# AWS Pricing Calculator

Use the [AWS Pricing Calculator](#) to:

- Estimate monthly costs
- Identify opportunities to reduce monthly costs
- Model your solutions before building them
- Explore price points and calculations behind your estimate
- Find the available instance types and contract terms that meet your needs
- Name your estimate and create and name [groups of services](#)

The screenshot shows the AWS Pricing Calculator homepage. At the top, there's a dark header with the title "AWS Pricing Calculator" and a subtext "Estimate the cost for your architecture solution." Below this, a section titled "How it works" illustrates a four-step process: 1. AWS Pricing Calculator (Estimate the cost of AWS products and services) 2. Add services (Search and add AWS services that you need) 3. Configure service (Enter the details of your usage to see service costs) 4. View estimate totals (See estimated costs per service, service group, and totals). To the right of the calculator, there's a sidebar with sections for "Create an estimate" (with a "Create estimate" button), "Getting started" (links to "What is the AWS Pricing Calculator?", "Getting started", and "Generating estimates"), and "More resources" (links to "User guide", "FAQs", "Pricing assumptions and variations", and "Need help with estimation? Connect with AWS certified expert on AWS IQ").

Access the [AWS Pricing Calculator](#)

# Additional benefit considerations

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## Hard benefits

- Reduced spending on compute, storage, networking, security
- Reductions in hardware and software purchases (capex)
- Reductions in operational costs, backup, and disaster recovery
- Reduction in operations personnel



## Soft Benefits

- Reuse of service and applications that enable you to define (and redefine solutions) by using the same cloud service
- Increased developer productivity
- Improved customer satisfaction
- Agile business processes that can quickly respond to new and emerging opportunities
- Increase in global reach

# Section 4: AWS Billing and Cost Management

Module 2: Cloud Economics and Billing



# AWS Billing Dashboard

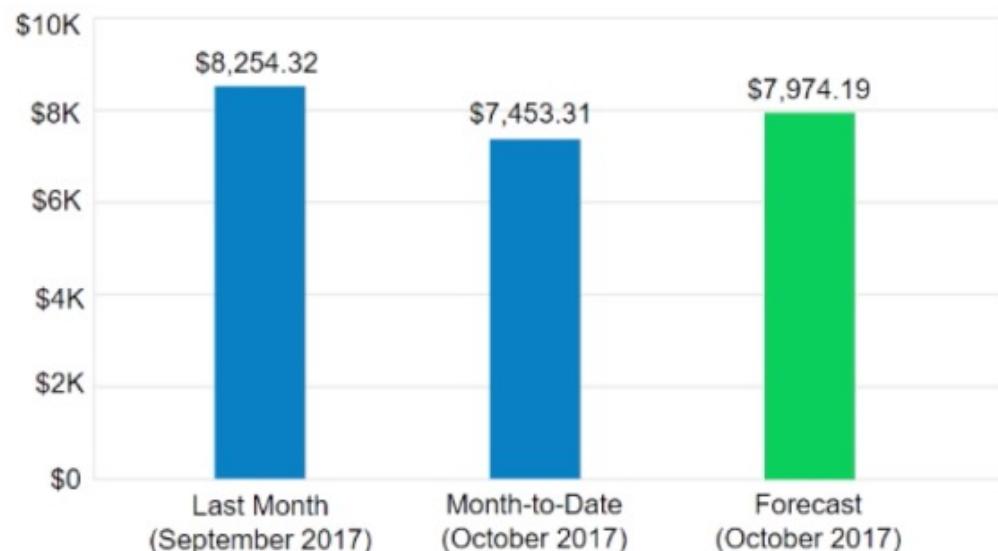
## Billing & Cost Management Dashboard

### Spend Summary

Welcome to the AWS Account Billing console. Your last month, month-to-date, and month-end forecasted costs appear below.

*Current month-to-date balance for October 2017*

**\$7,453.41**

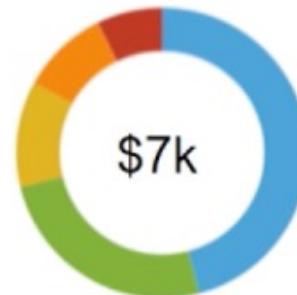


### Cost Explorer

### Monthly-to-Date Spend by Service

### Bill Details

The chart below shows the proportion of costs spent for each service you use.



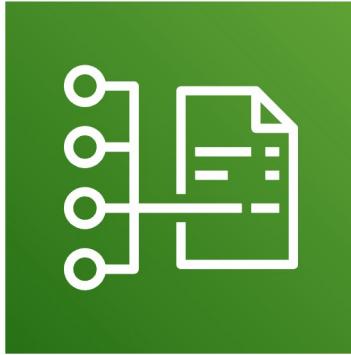
EC2	\$3,700.71
RDS	\$1,876.36
ElastiCache	\$938.18
DynamoDB	\$625.44
Other Services	\$312.57
Tax	\$0.16

# Tools

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AWS Budgets



AWS Cost and Usage Report



AWS Cost Explorer

# Monthly bills

BILLS | COST EXPLORER | BUDGETS | REPORTS

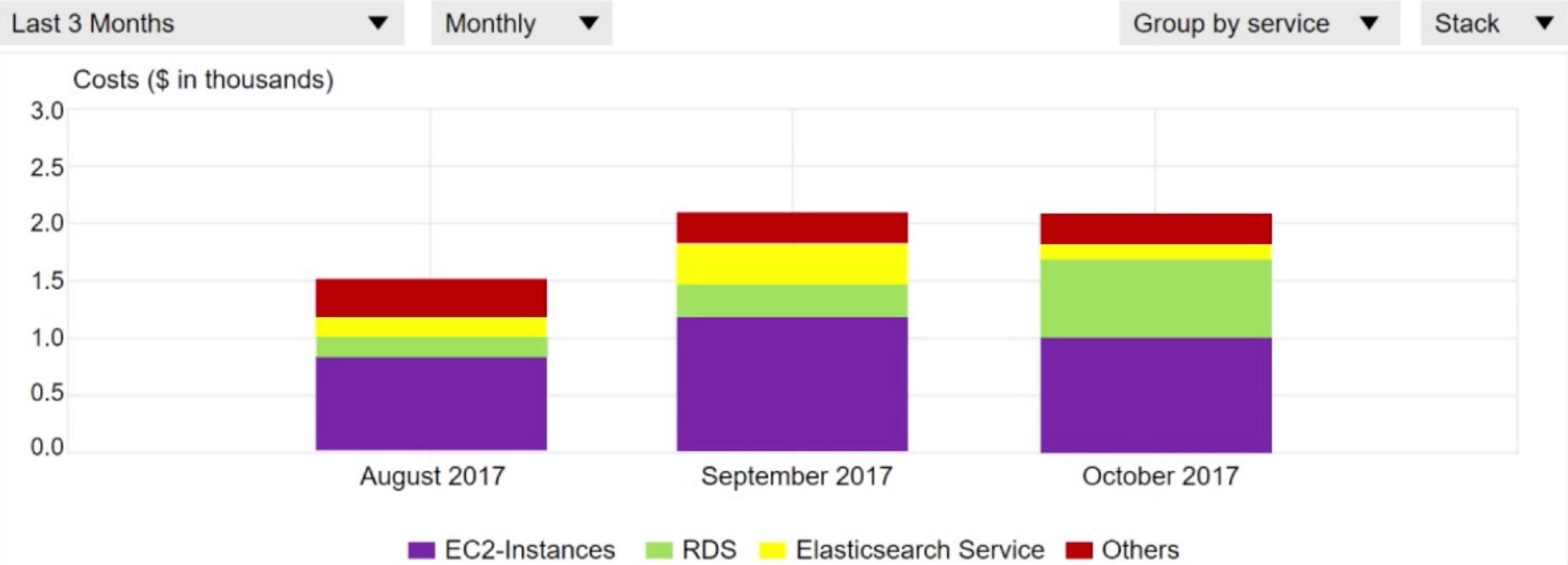
Total	\$7,453.41	USD
<b>AWS Marketplace Charges</b>		\$15.00
▼ Usage Charges and Recurring Fees		\$15.00
Invoice 32342548 – AWS Service Charges: Usage charge for this statement period	2017-10-10	\$15.00
<b>AWS Service Charges</b>		\$7,438.41
▼ Usage Charges and Recurring Fees		\$7,414.41
Invoice 32342513 – AWS Service Charges: Usage charge for this statement period	2017-10-10	\$7,414.41
▼ Usage Charges and Recurring Fees		\$24.00
Invoice 32342507 – AWS Service Charges: Subscription charge	2017-10-10	\$24.00



# Cost Explorer

BILLS | COST EXPLORER | BUDGETS | REPORTS

## Monthly costs by service



# Forecast and track costs

BILLS | COST EXPLORER | **BUDGETS** | REPORTS

Create budget							Copy	Edit	Delete	 Download CSV	
Filter by budget name											
	Budget name	Current	Forecasted	Budgeted	Current vs. budgeted	Forecasted vs. budgeted					
<input type="checkbox"/>	▶ Total Monthly Cost	\$760.27	\$787.44	\$1,000.00							
<input type="checkbox"/>	▼ S3 Usage Bucket	2978.00 Req	3650.16 Req	3000.00 Req							

Budget details

**Start date** 10/01/17

**End date** -

**Budget Period** Monthly

Variance analysis

# Cost and usage reporting

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BILLS | COST EXPLORER | BUDGETS | **REPORTS**

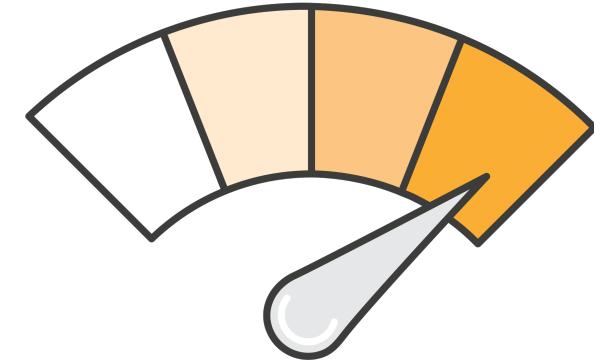
Product Code	Usage Type	Operation	Availability Zone	Usage Amount	Currency Code	Line Item Description
Amazon S3	Requests – Tier 1	ListAllMyBuckets		2	USD	\$0.00 per request – PUT, COPY, POST, LIST under the global free tier
Amazon EC2	USW2-Boxusage:t2.micro	Runinstnaces:0002	us-west-2a	1	USD	\$0.00 per Windows t2.micro instance-hour under monthly free tier
Amazon S3	Requests – Tier 1	ListAllMyBuckets		2	USD	\$0.00 per request – PUT, COPY, POST, LIST under the global free tier
Amazon EC2	USW2-Boxusage:t2.micro	Runinstnaces:0002	us-west-2a	1	USD	\$0.00 per Windows t2.micro instance-hour under monthly free tier
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# Support plans

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AWS Support offers four support plans:

- **Basic Support** – Resource Center access, Service Health Dashboard, product FAQs, discussion forums, and support for health checks
- **Developer Support**: Support for early development on AWS
- **Business Support**: Customers that run production workloads
- **Enterprise Support**: Customers that run business and mission-critical workloads



# Case severity and response times

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	Critical	Urgent	High	Normal	Low
Basic	No Case Support				
Developer Plan (Business hours)				12 hours or less	24 hours or less
Business Plan (24/7)		1 hour or less	4 hours or less	12 hours or less	24 hours or less
Enterprise Plan (24/7)	15 minutes or less	1 hour or less	4 hours or less	12 hours or less	24 hours or less