

AWS Cloud Security Foundations (AWS-CSF)

Lecture 1

Cloud Concepts and Pricing

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Topics

- Introduction to cloud computing
- Advantages of cloud computing
- Introduction to Amazon Web Services (AWS)
- Fundamentals of pricing
- Total Cost of Ownership
- AWS Organizations
- AWS Billing and Cost Management
- Technical Support

Introduction to Cloud Computing

What is cloud computing?

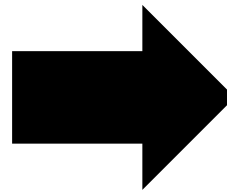
Cloud computing is the **on-demand** delivery of compute power, database, storage, applications, and other IT resources **via the internet** with **pay-as-you-go** pricing.



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Infrastructure as software

Cloud computing enables you to **stop thinking of your infrastructure as hardware**, and instead **think of (and use) it as software**.



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Traditional computing model

- Infrastructure as hardware
- Hardware solutions:
 - Require space, staff, physical security, planning, capital expenditure
 - Have a long hardware procurement cycle
 - Require you to provision capacity by guessing theoretical maximum peaks

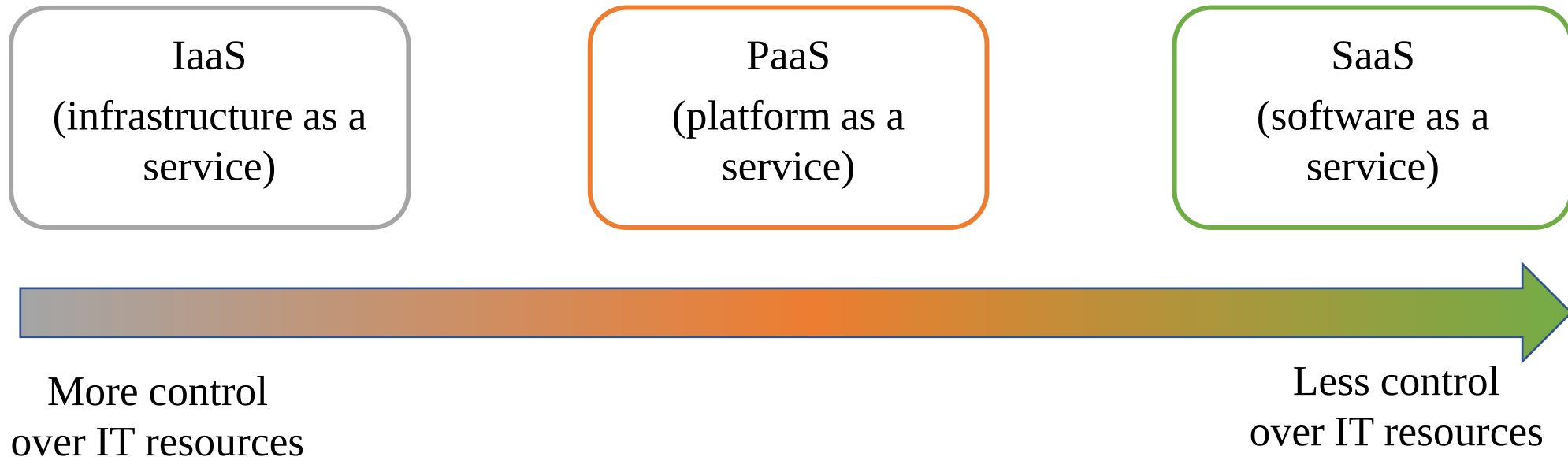


Cloud computing model

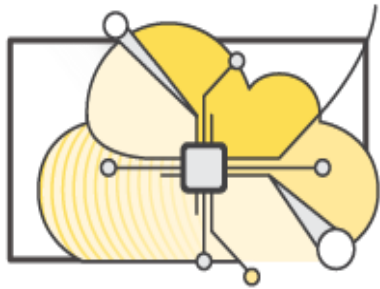
- Infrastructure as software
- Software solutions:
 - Are flexible
 - Can change more quickly, easily, and cost-effectively than hardware solutions
 - Eliminate the undifferentiated heavy-lifting tasks



Cloud service models

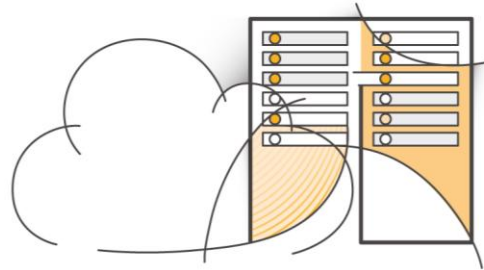


Cloud computing deployment models



Cloud

A cloud-based application is fully deployed in the cloud, and all parts of the application run in the cloud



Hybrid

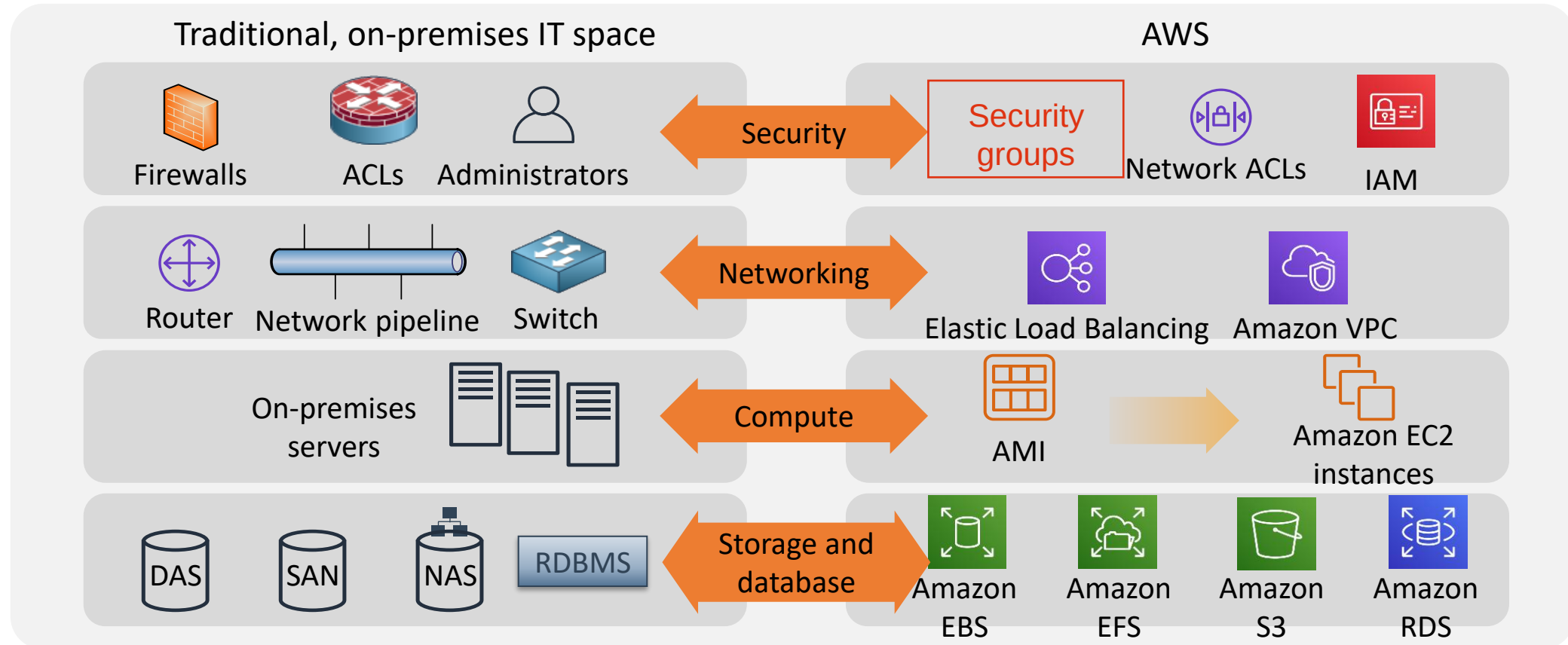
A hybrid deployment is a way to connect infrastructure and applications between cloud-based resources and existing resources that are not located in the cloud



On-premises (private cloud)

Deploying resources on-premises, using virtualization and resource management tools, is sometimes called private cloud

Similarities between AWS and traditional IT

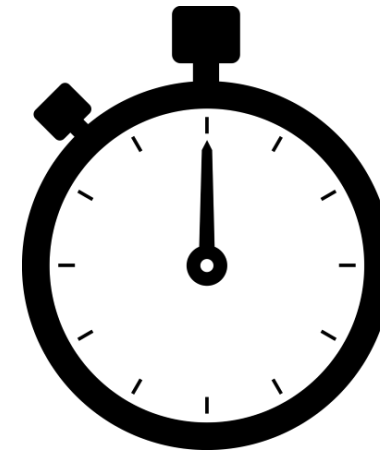


Advantages of Cloud Computing

Trade capital expense for variable expense

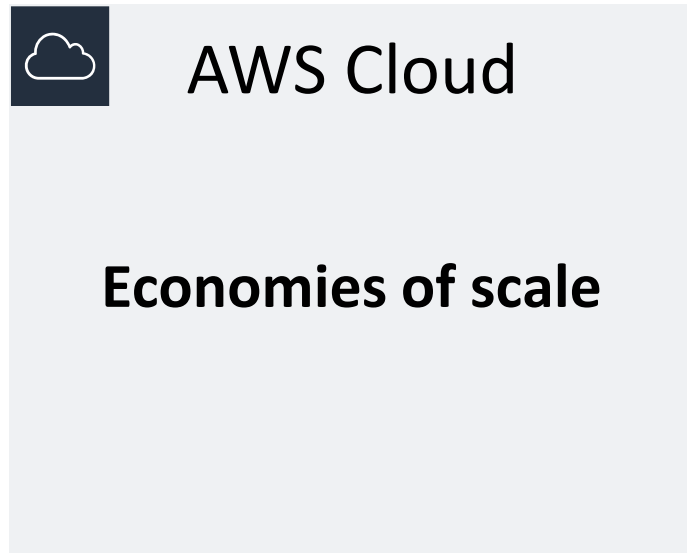


Data center investment
based on forecast

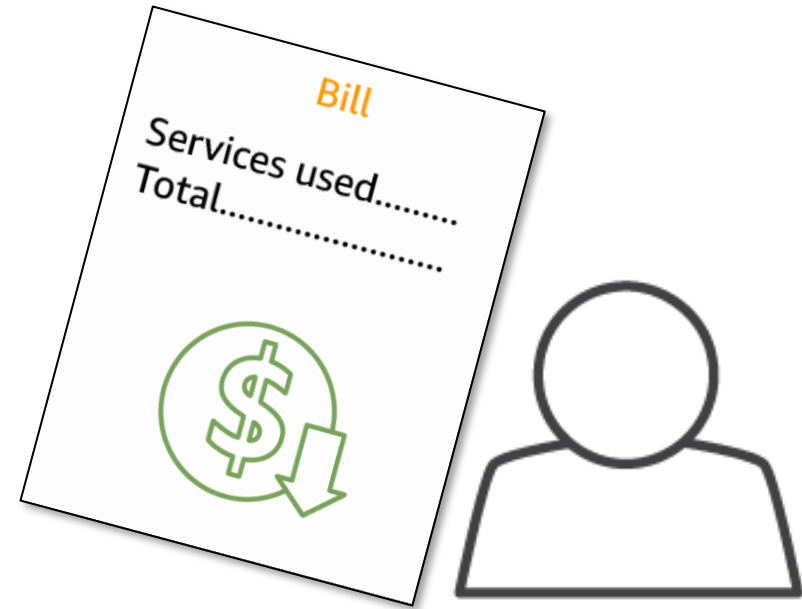


Pay only for the amount
you consume

Massive economies of scale



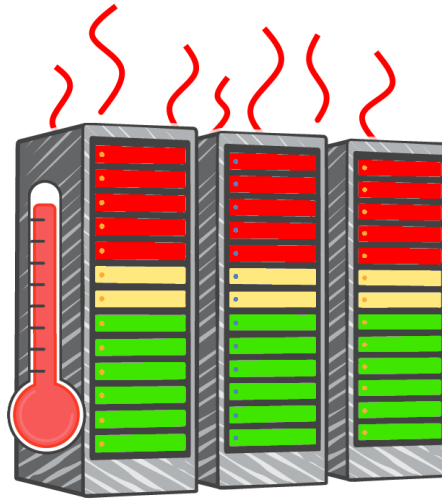
Savings →



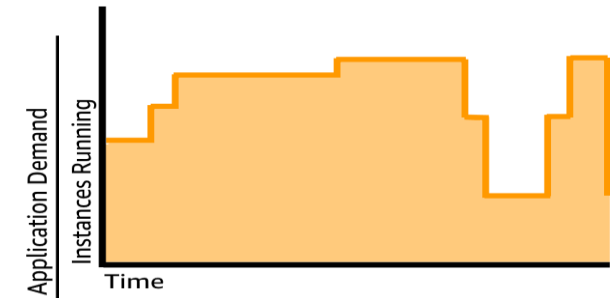
Stop guessing capacity



Overestimated
server capacity



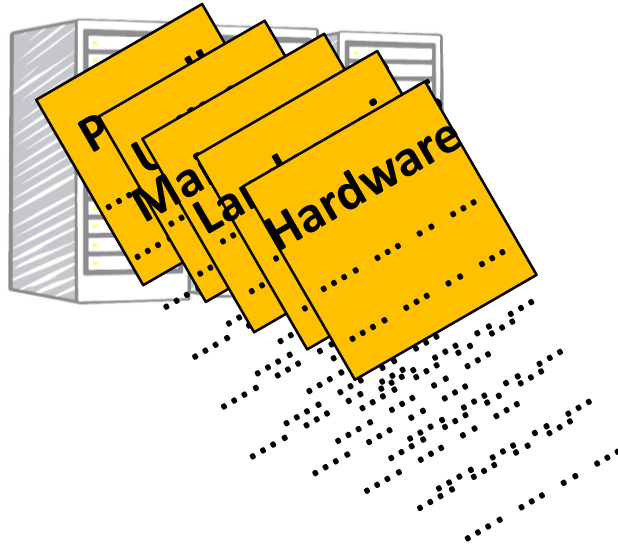
Underestimated
server capacity



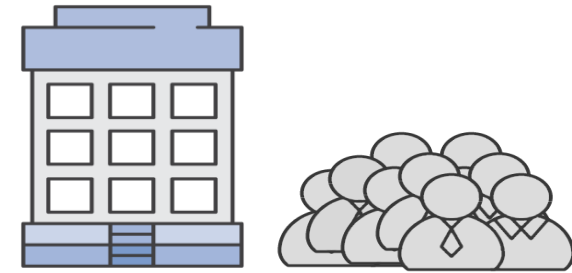
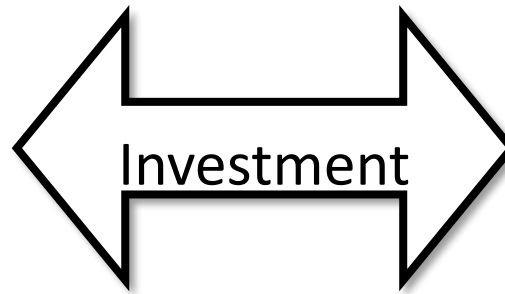
Scaling on demand

Advantages of Cloud Computing

Stop spending money on
running and maintaining data centers

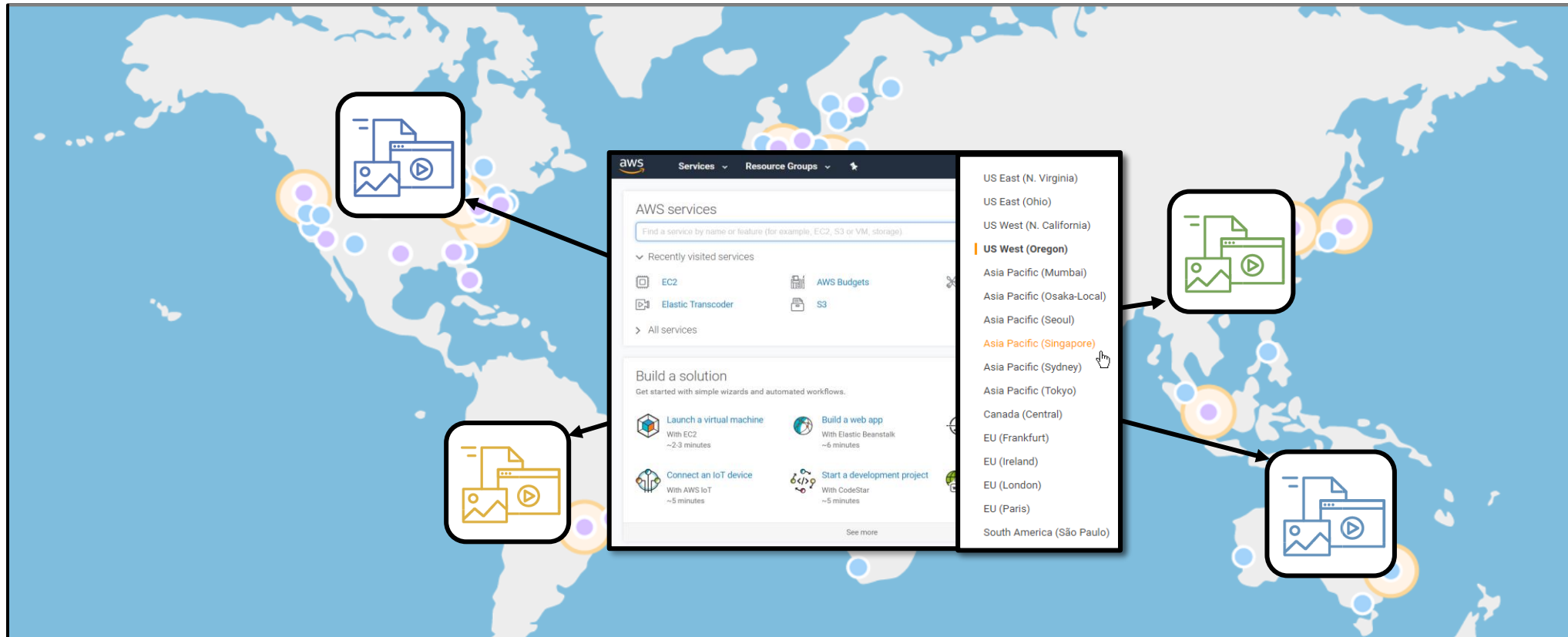


Running data
centers



Business and
customers

Go global in minutes



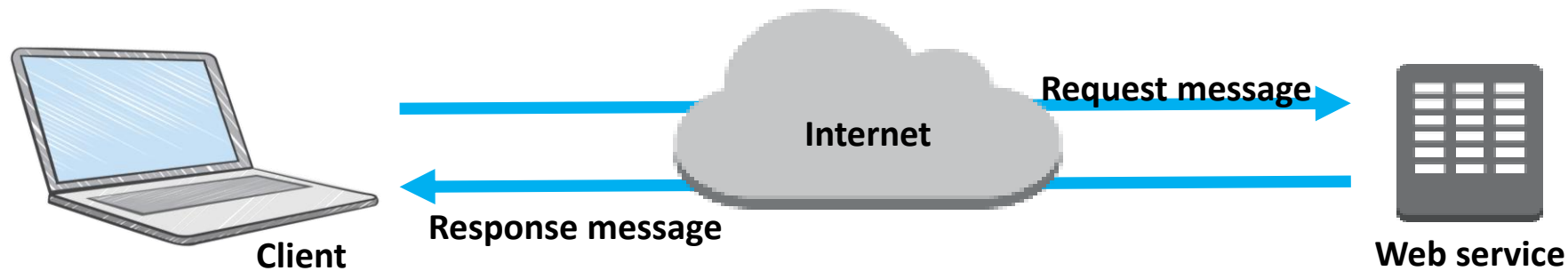
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Introduction to Amazon Web Services (AWS)

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What are web services?

A **web service** is any piece of software that makes itself available over the internet and uses a **standardized format**—such as Extensible Markup Language (XML) or JavaScript Object Notation (JSON)—for the request and the response of an **application programming interface (API) interaction**.



Introduction to Amazon Web Services (AWS)

What is AWS?

- AWS is a **secure cloud platform** that offers a **broad set of global cloud-based products**.
- AWS provides you with **on-demand access** to compute, storage, network, database, and other IT resources and management tools.
- AWS offers **flexibility**.
- You **pay only for the individual services you need**, for **as long as you use them**.
- AWS services **work together** like building blocks.

Introduction to Amazon Web Services (AWS)

Categories of AWS services



Analytics



Application
Integration



AR and VR



Blockchain



Business
Applications



Compute



Cost
Management



Customer
Engagement



Database



Developer Tools



End User
Computing



Security, Identity, and
Compliance



Internet
of Things



Machine
Learning



Management and
Governance



Media Services



Migration and
Transfer



Networking and
Content Delivery



Mobile



Robotics



Game Tech



Satellite

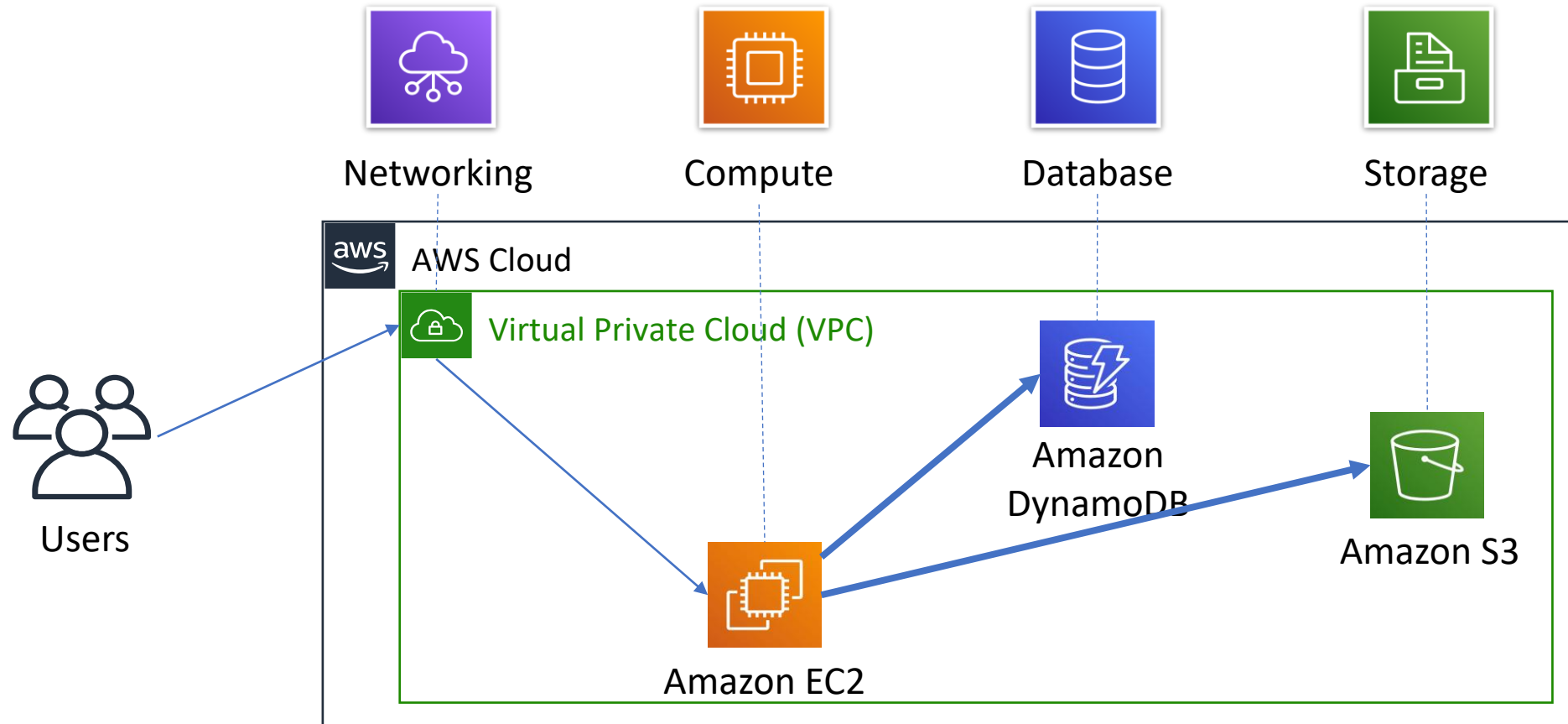


Storage

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Introduction to Amazon Web Services (AWS)

Simple solution example



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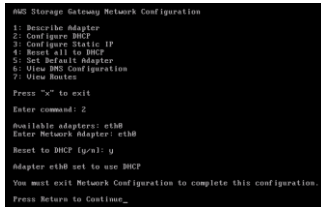
Introduction to Amazon Web Services (AWS)

Three ways to interact with AWS



AWS Management Console

Easy-to-use graphical interface



Command Line Interface (AWS CLI)

Access to services by discrete commands or scripts



Software Development Kits (SDKs)

Access services directly from your code (such as Java, Python, and others)

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Fundamentals of pricing

AWS pricing model

Three fundamental drivers of cost with AWS

Compute

- Charged per hour/second
- Varies by instance type

Storage

- Charged typically per GB

Data transfer

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

Fundamentals of pricing

How do you pay for AWS?

Pay for what you use



Pay less when you reserve



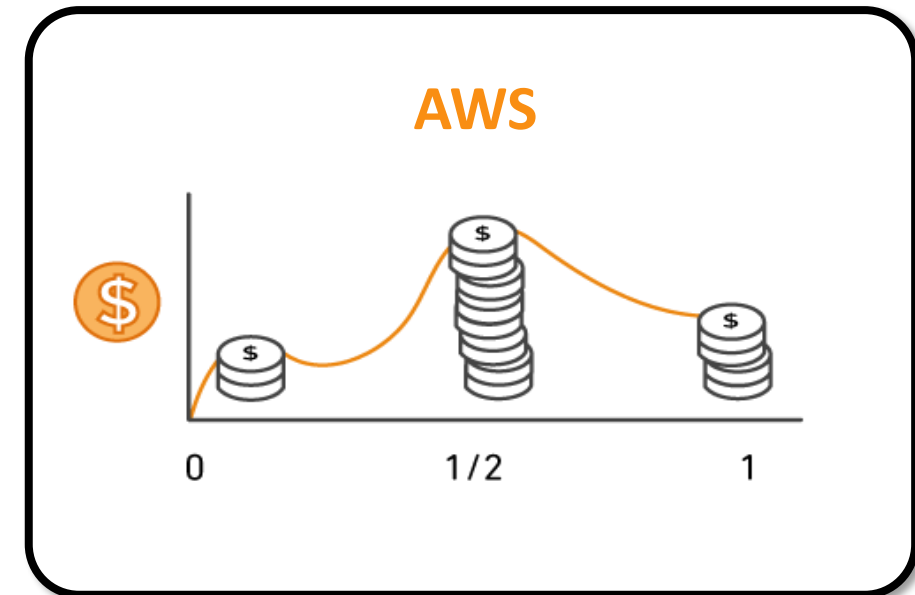
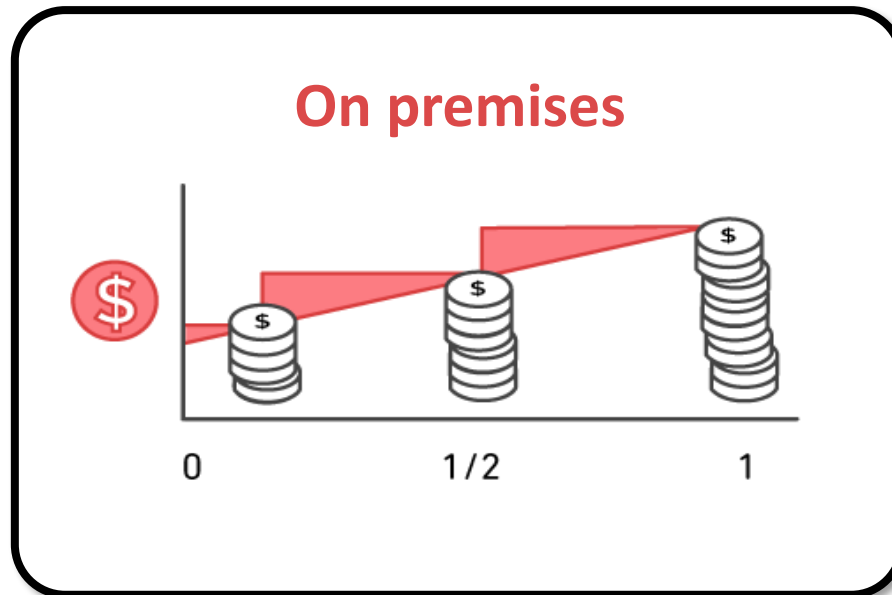
Pay less when you use more and as AWS grows



Fundamentals of pricing

Pay for what you use

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

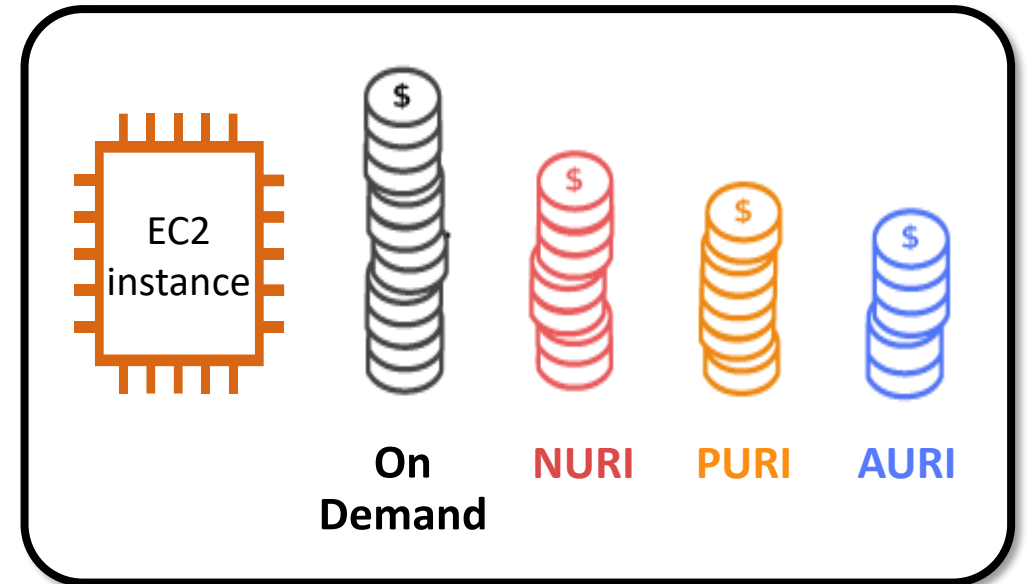


Fundamentals of pricing

Pay less when you reserve

Invest in Reserved Instances (RIs):

- Save up to 75 percent over equivalent on-demand capacity
- RIs Options:
 - All Upfront Reserved Instance **(AURI)** → **largest discount**
 - Partial Upfront Reserved Instance **(PURI)** → **lower discounts**
 - No Upfront Reserved Instance **(NURI)** → **smaller discount**



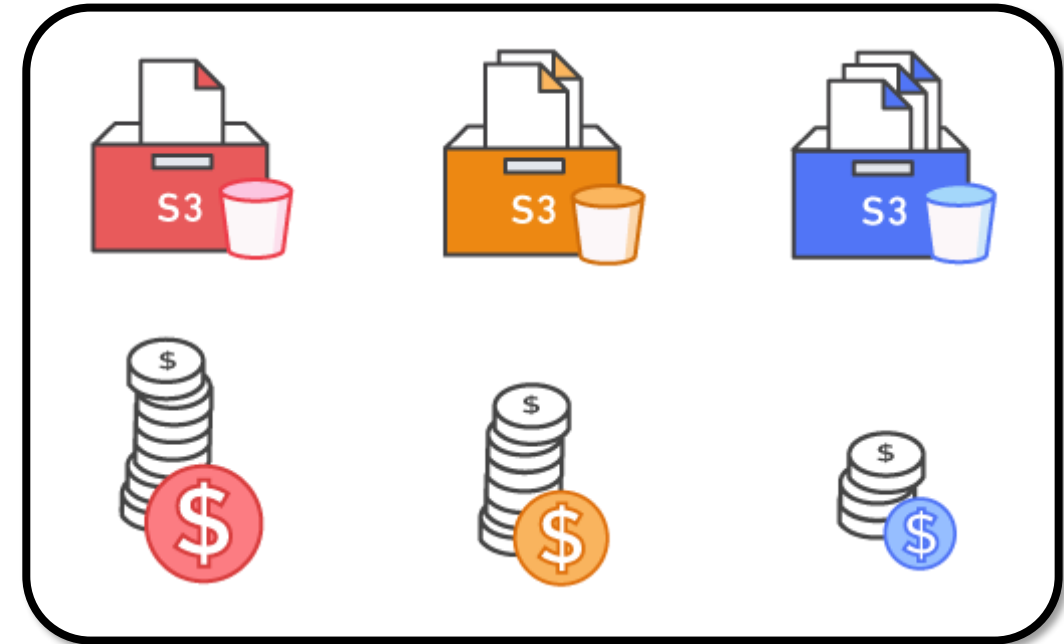
Fundamentals of pricing

Pay less by using more

Realize volume-based discounts:

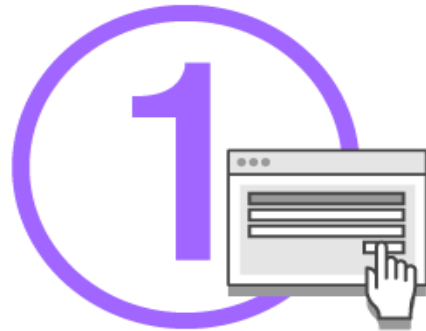
- **Savings** as usage increases.
- **Tiered pricing** for services like Amazon Simple Storage Service (Amazon S3), Amazon Elastic Block Store (Amazon EBS), or Amazon Elastic File System (Amazon EFS) → **the more you use, the less you pay per GB.**
- Multiple storage services deliver **lower** storage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

the AWS storage services portfolio offers options to help you lower pricing based on how frequently you access data and the performance that you need to retrieve it



AWS Free Tier

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

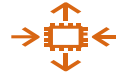
****Note:** There might be charges associated with other AWS services that are used with these services.



Amazon VPC



Elastic Beanstalk**



Auto Scaling**



AWS CloudFormation**



AWS Identity and Access Management (IAM)

Total Cost of Ownership

Total Cost of Ownership

On-premises versus cloud

Traditional Infrastructure



Equipment



Resources and
administration



Contracts



Cost



AWS Cloud



No upfront
expense—pay for
what you use



Improve time to
market and
agility



Scale up
and down



Self-service
infrastructure

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Total Cost of Ownership

What is Total Cost of Ownership (TCO)?

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



Total Cost of Ownership

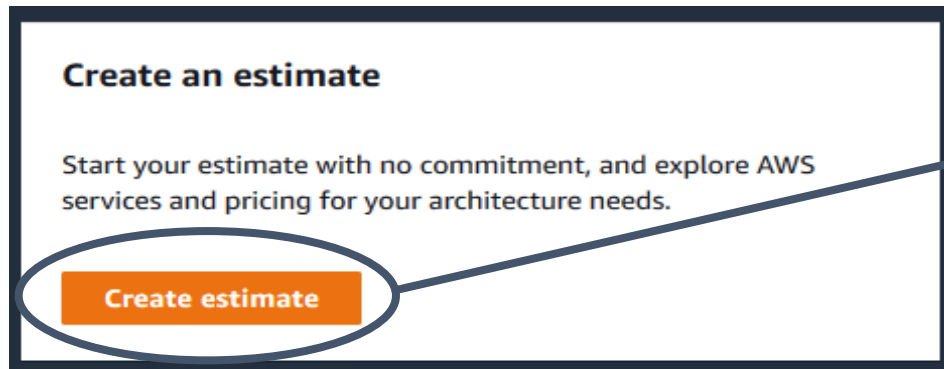
TCO Considerations

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				

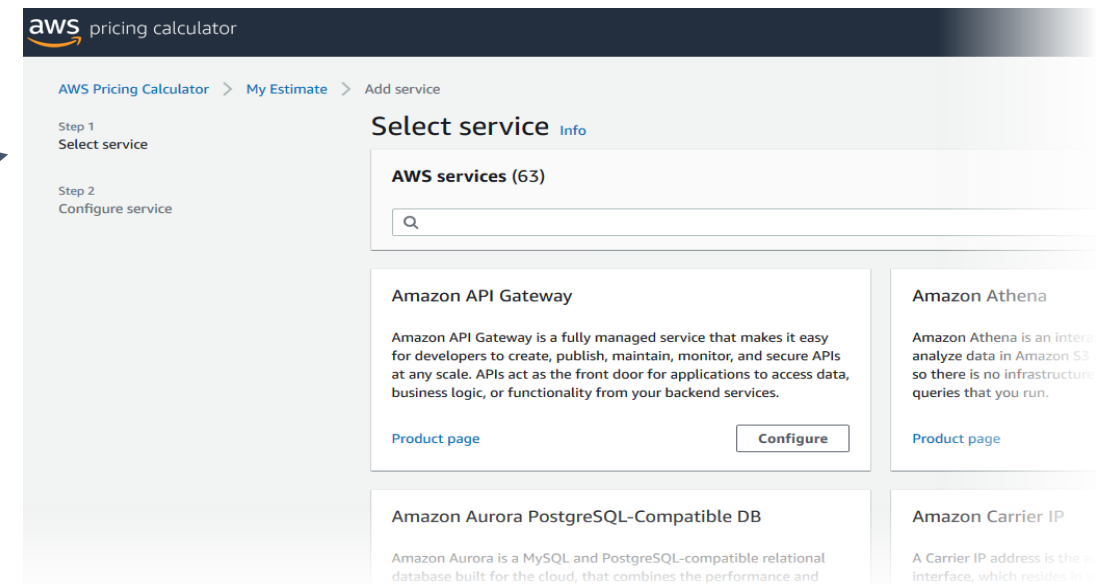
Total Cost of Ownership

Activity: AWS Pricing Calculator activity

- Break up into groups of four or five and use the [AWS Pricing Calculator](#) and specifications provided to develop a cost estimate.
- Be prepared to report your findings back to the class.



[AWS Pricing calculator website](#)

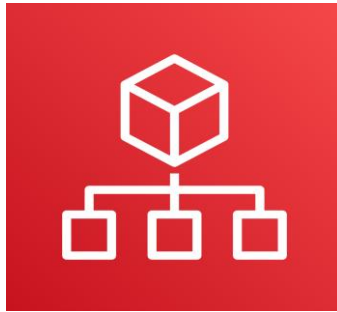


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AWS Organizations

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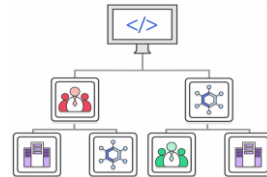
Key features and benefits



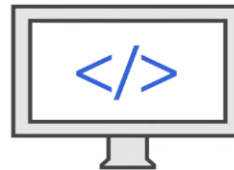
AWS
Organizations



Policy-based account management



Group based account management

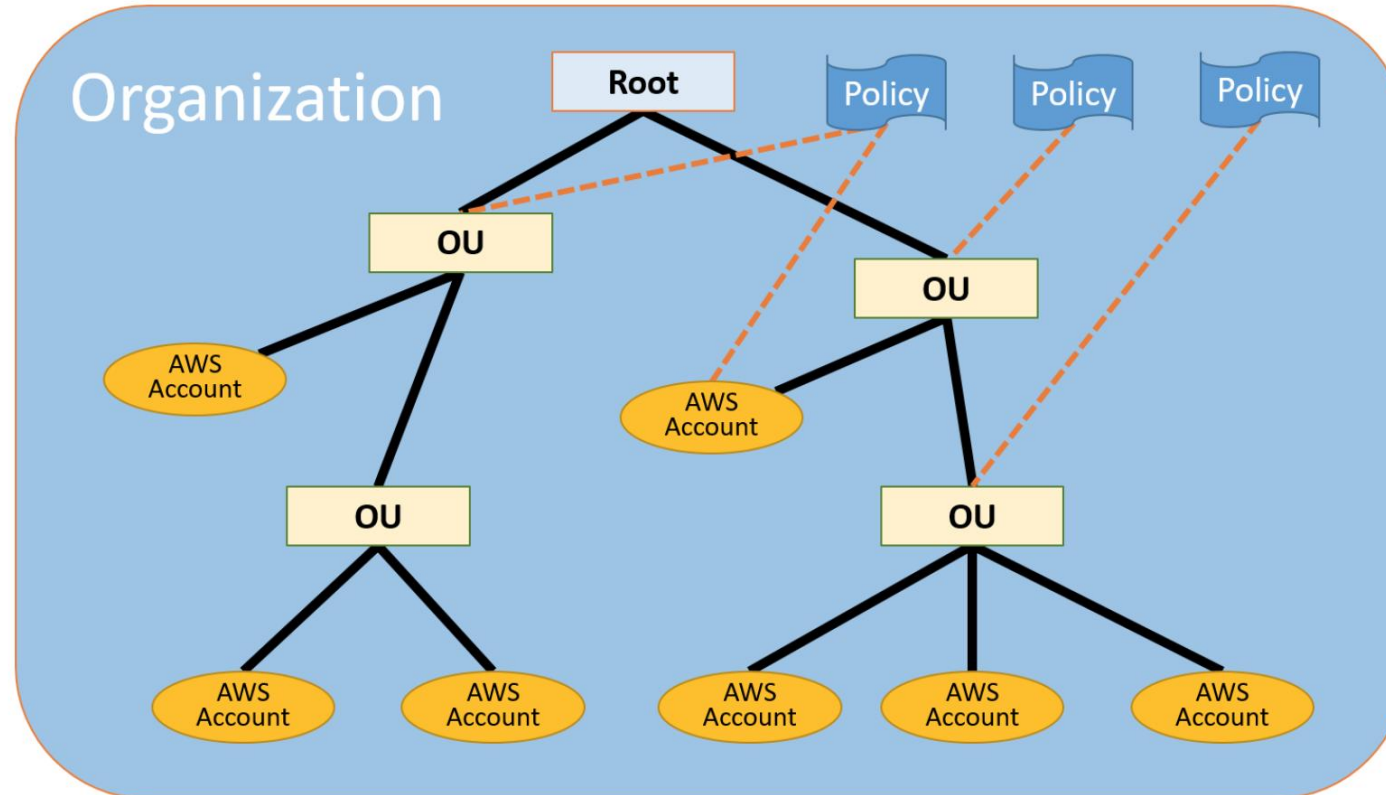


Application programming interfaces (APIs) that automate account management

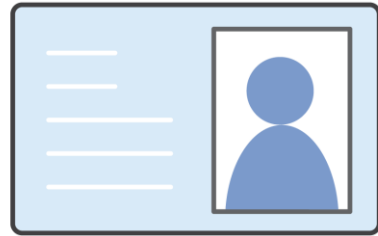


Consolidated billing

AWS Organizations terminology



Security with AWS Organizations



Control access with AWS Identity and Access Management (IAM).

IAM policies enable you to allow or deny access to AWS services for users, groups, and roles.



Service control policies (SCPs) enable you to allow or deny access to AWS services for individuals or group accounts in an organizational unit (OU).

AWS Billing and Cost Management

Introducing AWS Billing and Cost Management

AWS Billing and Cost Management is the service that you use to pay your **AWS bill**, **monitor your usage**, and **budget your costs**.

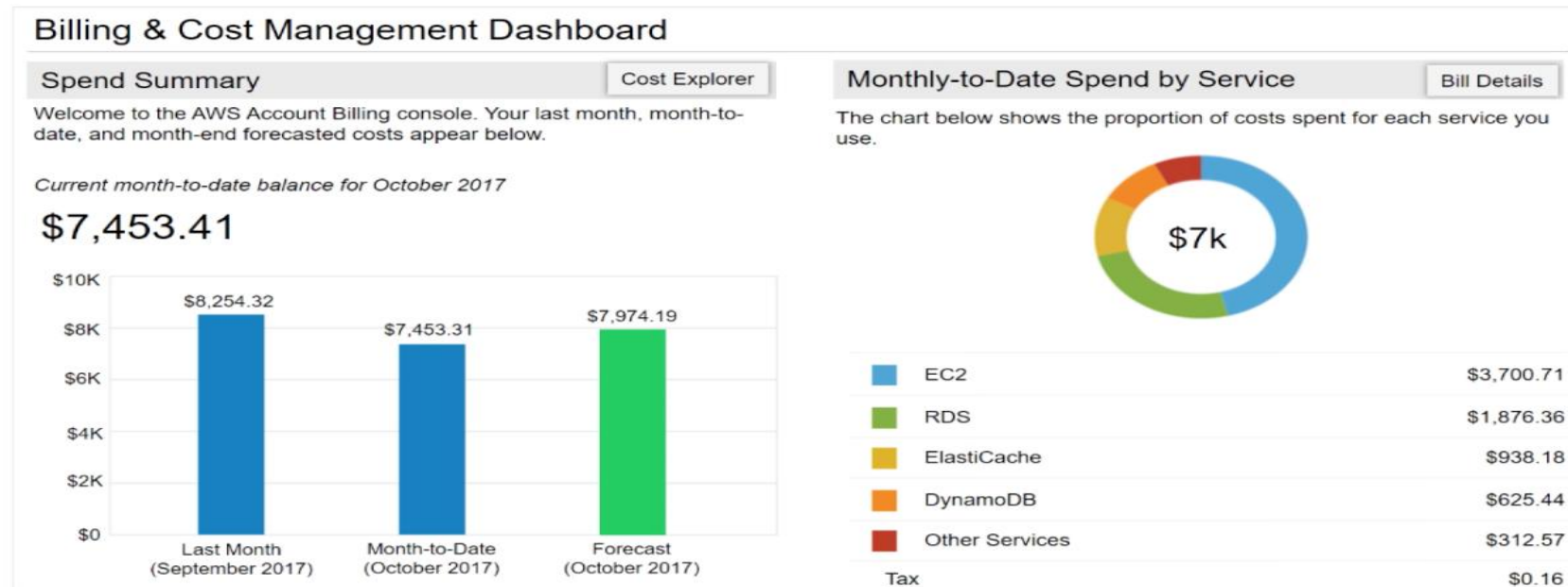
Billing and Cost Management enables you to forecast and obtain a better idea of what your costs and usage might be in the future so that you can plan ahead.

AWS Cost and Usage Report Tool enables you to identify opportunities for optimization by understanding your cost and usage data trends and how you are using your AWS implementation.



AWS Billing Dashboard

The AWS Billing Dashboard lets you view the status of your month-to-date AWS expenditure, identify the services that account for the majority of your overall expenditure, and understand at a high level how costs are trending.

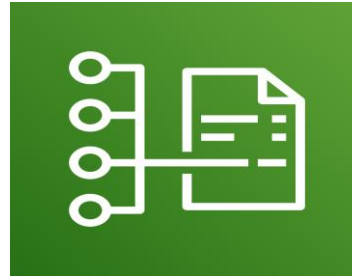


Tools



AWS Budgets

uses the cost visualization that is provided by Cost Explorer to show you the status of your budgets and to provide forecasts of your estimated costs



AWS Cost and Usage Report

enables you to identify opportunities for optimization by understanding your cost and usage data trends and how you are using your AWS implementation.



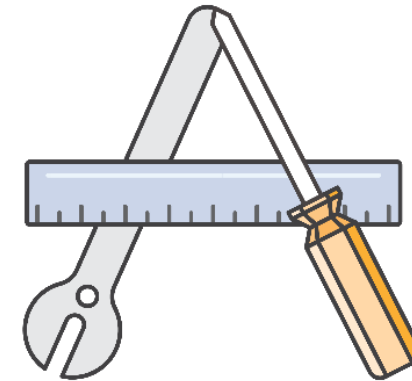
AWS Cost Explorer

includes a default report that visualizes your costs and usage for your top cost-incurring AWS services. The monthly running costs report gives you an overview of all your costs for the past 3 months.

Technical Support

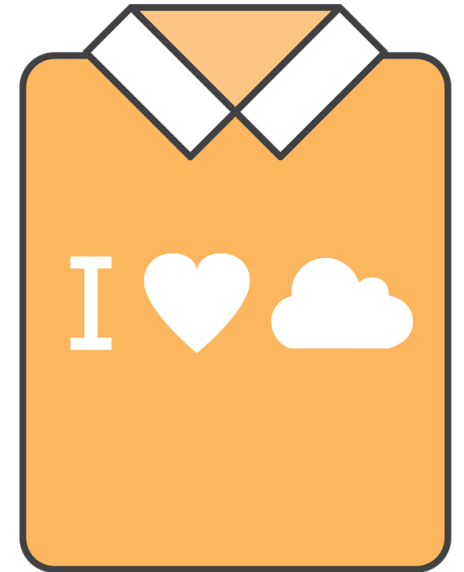
AWS support

- Provide unique combination of tools and expertise:
 - AWS Support
 - AWS Support Plans
- Support is provided for:
 - Experimenting with AWS
 - Production use of AWS
 - Business-critical use of AWS



AWS support

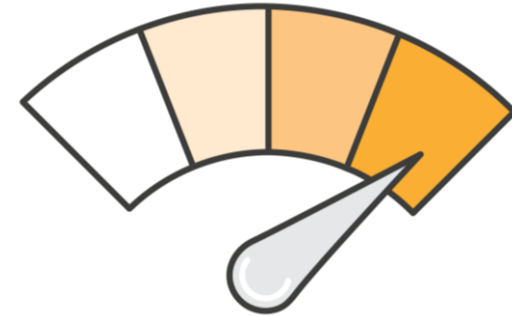
- Proactive guidance :
 - Technical Account Manager (TAM)
provide guidance, architectural review, and continuous ongoing communication to keep you informed and prepared as you plan, deploy, and optimize your solutions.
- Best practices :
 - AWS Trusted Advisor
ensure that you follow best practices to increase performance and fault tolerance in the AWS environment (customized cloud expert)
- Account assistance :
 - AWS Support Concierge
a billing and account expert who will provide quick and efficient analysis on billing and account issues



Support plans

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

	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

Thanks