Certification Enablement Workshop -AWS Cloud Practitioner

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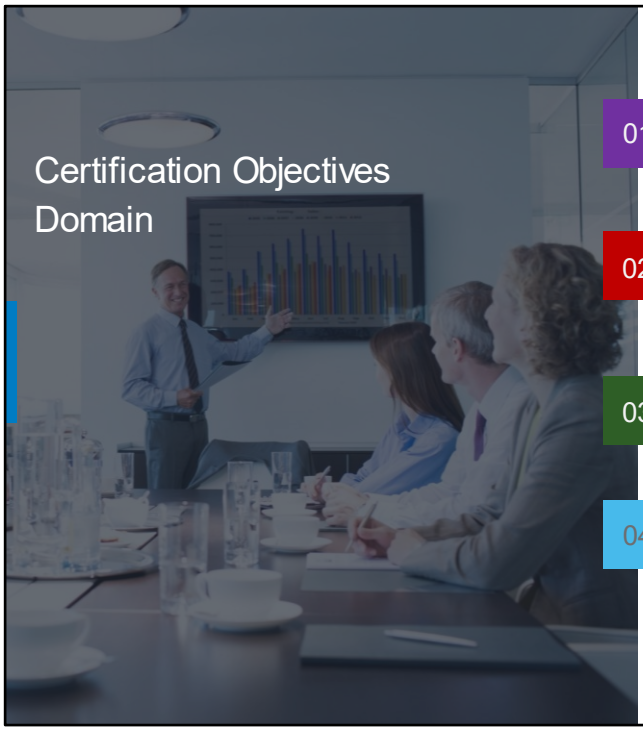
Pre-read and Objectives for the Workshop

Pre-read

- An understanding of AWS Cloud Concepts
- Basic understanding of security and compliance within AWS Cloud
- Ability to distinguish AWS Core Services.
- Knowledge of economics of AWS Cloud

Objectives for the Workshop

- Ability to understand value of AWS Cloud
- Knowledge of AWS Shared Responsibility Model
- An understanding of best practices related to security
- Ability to identify AWS services for common use cases
- An understanding of AWS core services including compute, database, network and storage
- Knowledge on AWS economics, cloud costs and billing practices.



Certification Objectives Domain

01

Cloud Concepts-26%

Defining the AWS Cloud and its value proposition, identifying aspects of AWS Cloud Economics, understanding different cloud architecture design principle

02

Security and Compliance-25%

Defining AWS Shared Responsibility model, defining AWS cloud security and compliance concepts, identifying AWS access management capabilities, identifying different resources for security support

03

Technology-33%

Defining methods of deploying and operating in AWS Cloud, defining the AWS global infrastructure, identifying core AWS services, identifying resources for technology support

04

Billing and pricing-16%

Comparing various pricing model for AWS, recognizing various account structures in relation to AWS billing and pricing, identifying resources available for billing support

4. Billing and Pricing

4.1 Compare and contrast the various pricing models for AWS (for example, On-Demand Instances, Reserved Instances, and Spot Instance pricing)

4.2 Recognize the various account structures in relation to AWS billing and pricing

4.3 Identify resources available for billing support

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4.1 Compare and contrast the various pricing models

for AWS (for example, On-Demand Instances, Reserved Instances, and Spot Instance pricing)

- Identify scenarios/best fit for On-Demand Instance pricing
- Identify scenarios/best fit for Reserved-Instance pricing
- Identify scenarios/best fit for Spot Instance pricing

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AWS Pricing Models

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Welcome to the Video on AWS Pricing Models.
In this module, you will learn about various pricing options made available for Customers to consume service offerings from AWS

AWS Pricing Models

Pay as you go

Save when you reserve

Pay less by using more

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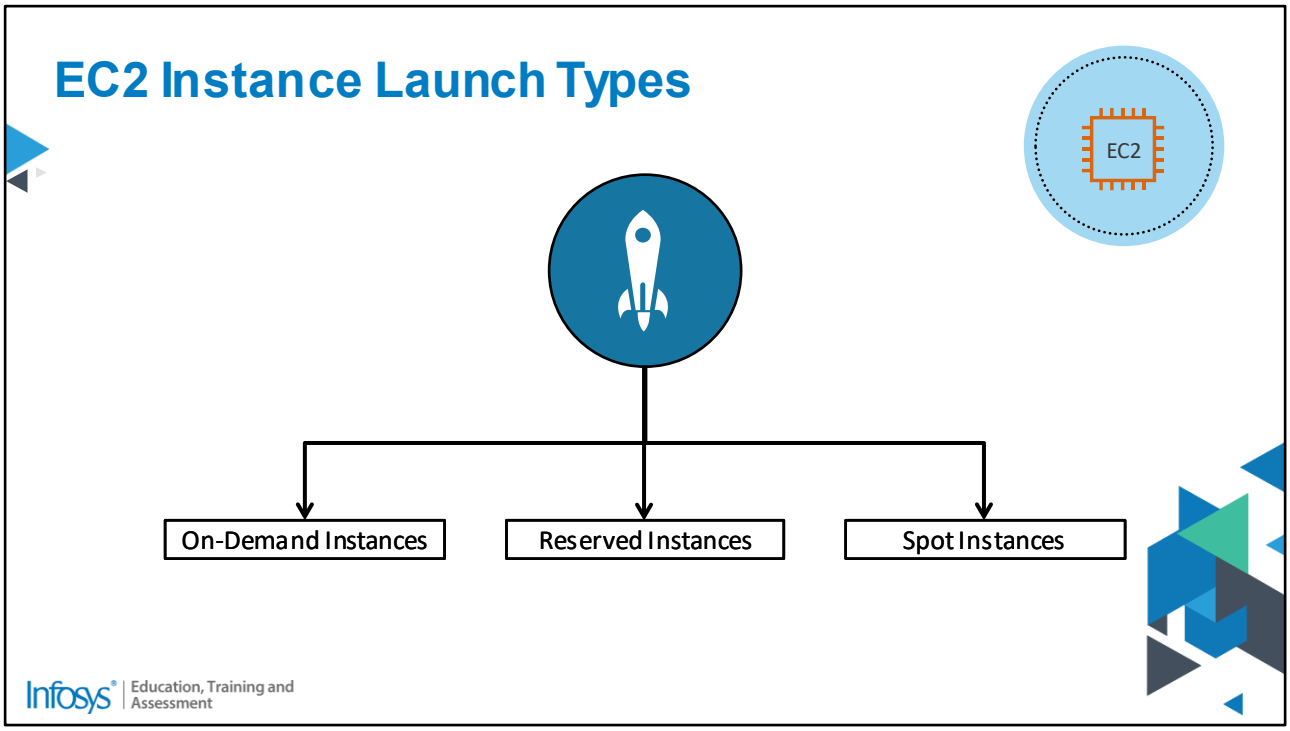
Pay-as-you-go model enables you for a changing business need and it does not need require any long-term commitment from Customers. AWS saves Customer from the risks of over/Under provisioning capacity of IT resources.

When a Customer commit the usage of Cloud Resources such as Ec2 for stated duration of usage like, one year or three-year, five-year period , AWS offers better savings option for the services Provisioned.

AWS provides volume-based discounts, and they understand the importance of savings for a user as they increase the usage. For example, if we talk about S3, its pricing is based on tiers, which means that the more you use, the less you must pay for per GB.



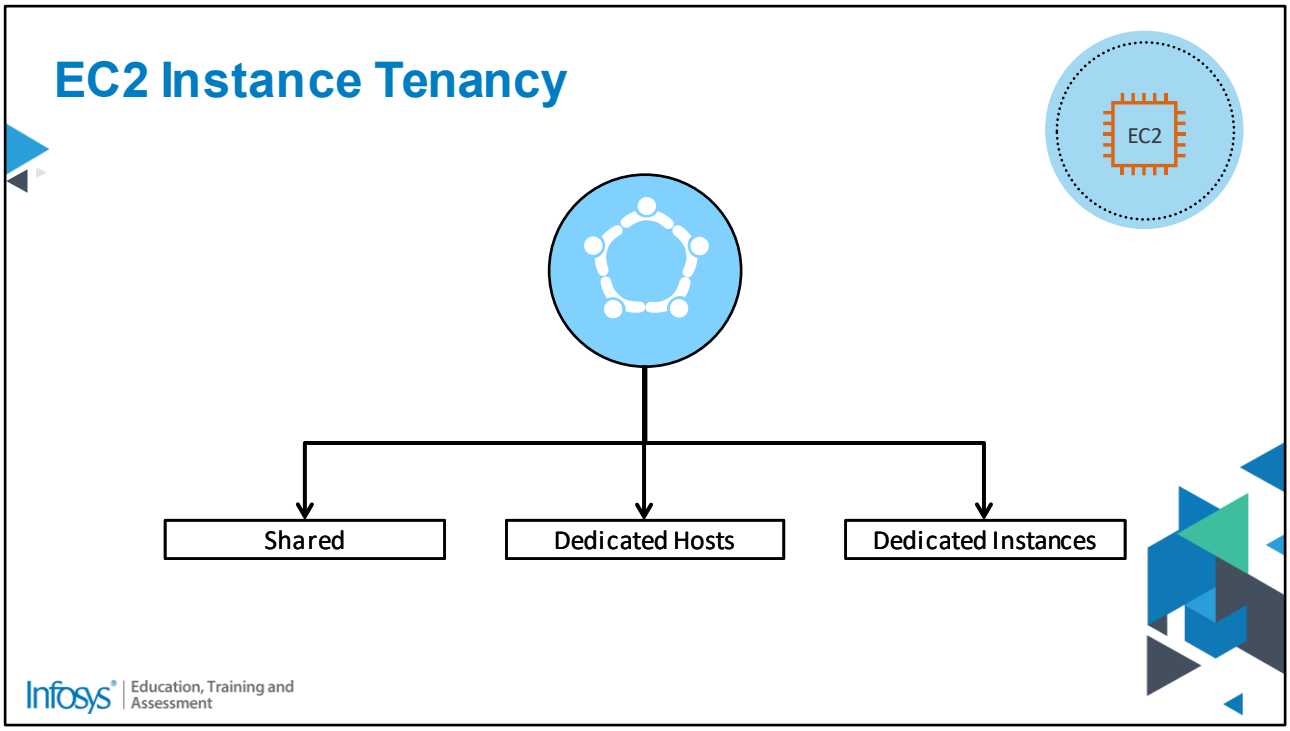
Based on how you want to pay for the EC2 Instances, there are different EC2 Instance Launch types which are –

On-Demand Instances: In On-Demand instances you only **pay for the compute capacity used by the duration**, and there are **no long-term commitments**.

Reserved Instances : Reserved Instances are meant for **predictable** and **long running workloads which span** typically greater than a year.

Spot Instances : spot instances, AWS allows unused EC2 instances in an availability zone, to be purchased at a price much lower than the On-demand pricing. With Spot Instances you can get

a **discount of up-to 90%** as compared to On-Demand pricing.



Based on the tenancy of the underlying hardware where the EC2 instances will be launched, there are 3 different launch types.

Shared: This is the default tenancy launch type. In this launch type the underlying physical hardware of the EC2 instances is shared with other AWS customers, but your EC2 instances run in full isolation with other EC2 instances.

Dedicated Hosts: In Dedicated Host, you get an entire physical server for use to launch EC2 instances. Instances placement on the physical server can be controlled and the user gets full visibility into the sockets and physical cores of the server.

Dedicated Instances: They are like dedicated hosts and instances will run on physical hardware devoted to a single AWS customer. The underlying physical server is not shared with other AWS users but may be shared with instances within same AWS account.

Pricing- On Demand EC2 instances

On Demand Instances

Scenario and Best fit for On Demand instances.

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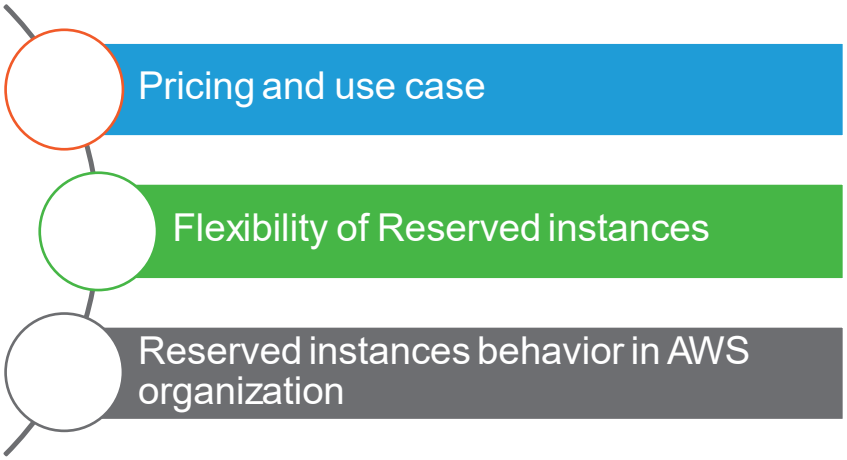
For On-demand instances, you have to pay for computing capacity based on number of seconds or hours you run the instances. No upfront payment or any long-term commitment is needed under this pricing model. The compute capacity can be increased or decreased based on the requirement of our application.

On demand instances are best suited for :

1. Applications which are developed or tested for the first time on amazon ec2 instances.
2. Applications with spiky, temporary or changeable workloads which can not be stopped or interrupted.
3. Applications which have low cost and are not ready for any up-front payment or long duration commitment.

Pricing - Reserved EC2 instances



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Reserved instances offer up to 72% discount compared to on demand instances pricing. When you have reserved the instances in a specific AZ, ,it gives you an extra confidence level for launching the instances whenever you need them.

The main use case for this instance type is when you are designing a cost-effective application. It supports all upfront, partial upfront and no upfront payment options.

Reserved instances offers flexibility in terms of purchasing options. They support standard and convertible reserved instance pricing. Standard reserved instances offers a discount up to 72% compared to on demand instance pricing.

Customers gets the privilege of changing AZ, networking type and instance size for their Standard reserved instances. Convertible reserved instances provide additional flexibility and allow customers to change OS, tenancies and instance families .

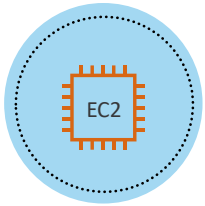
The discount associated with it is up to 66% compared to on demand instance pricing. This can be also purchased for a minimum of 1- or 3-year period.

Pricing - Spot EC2 instances

AWS EC2 spot instances leverage on unused EC2 capacity of AWS cloud. These instances offers up-to 90% discount compared to on demand instance pricing.

This instance can be used mainly for fault-tolerant and stateless systems. Other flexible applications like big data, containerized workload, applications with CI/CD, applications with web servers, application requiring high-performance computing and applications with test and development workloads uses spot instances frequently.

EC2 Instance Launch Types



Pricing Comparison
Example – Instance m4.large, Region – ap-south-1

Launch Type	Price (per hour)
On-Demand	$0.105
Spot Instance	$0.0273 (discount can reach up-to 90%)
Standard Reserved 1-year term no upfront	$0.065 (discount of up-to 38%)
Standard Reserved 3-year term no upfront	$0.044 (discount of up-to 58%)
Standard Reserved 1-year term all upfront	$0.061 (discount of up-to 42%)
Standard Reserved 3-year term all upfront	$0.039 (discount of up-to 63%)

- Pricing data as on March 2022 and are subject to change in the future.
- Discount as compared with On-demand hourly pricing.
- Spot Pricing discount of up-to 90% dependent on instance type, region and AZ.
- Effective and Indicative Hourly rates for Reserved Instances are shown.
- Prices sourced from - https://aws.amazon.com/ec2/pricing/

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Here, you will learn about pricing comparison between different launch types by taking the example of a m4.large instance in the region ap-south-1.

You can compare the pricing difference between each launch type.

It can be observed that Spot Instances and Reserved instances offer significant discount over On-demand Hourly rate.

So based on workloads, the appropriate launch type can be chosen to maximize cost savings.

4.2 Recognize the various account structures in relation to AWS billing and pricing

- Recognize that consolidated billing is a feature of AWS Organizations
- Identify how multiple accounts aid in allocating costs across departments

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AWS Organization

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Welcome to video on AWS Organization

AWS Organization

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AWS Organization helps you centrally manage and govern your environment as you grow and scale your AWS resources

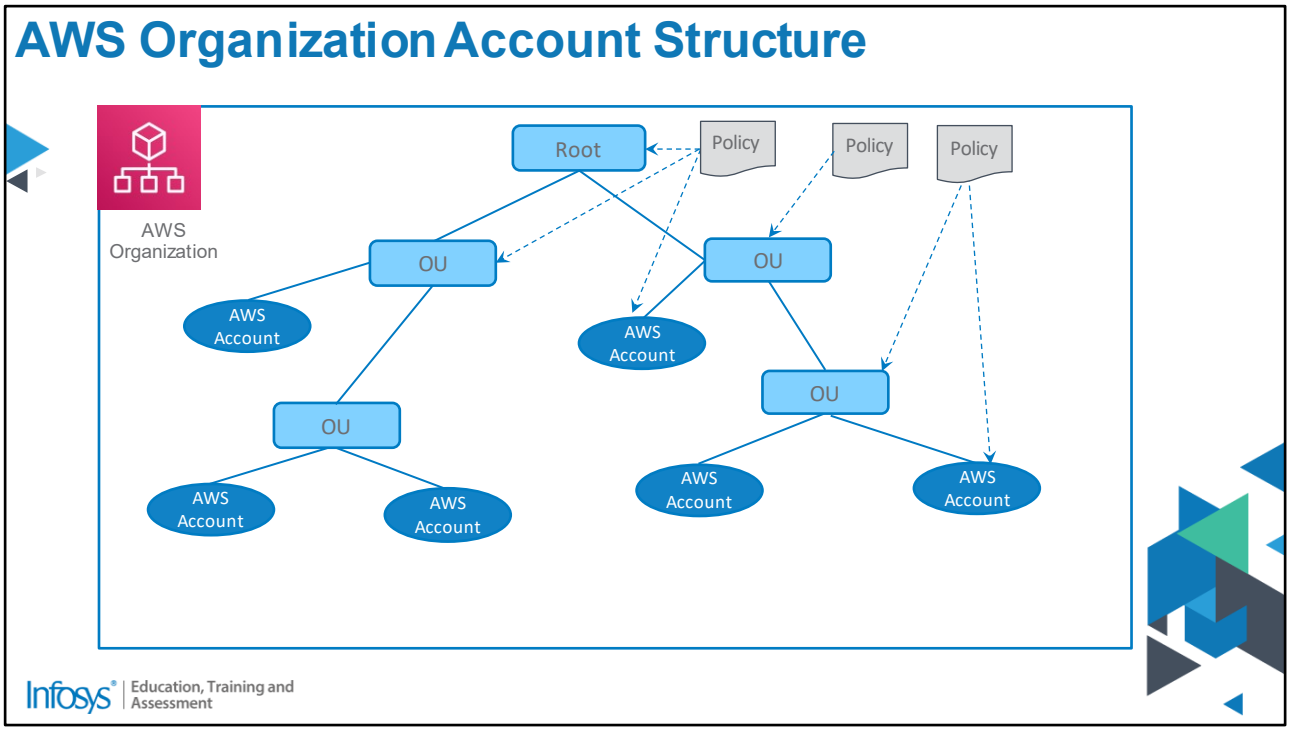
It enables you to simplify costs and take advantage of quantity discounts with a single bill.

It enables you to create and manages accounts Manually or Programmatically using APIs

It enables you to centrally applies budgetary, security, and compliance polices to account or group for better governance.

It integrates with other services to define central configurations, security mechanisms, audit requirements, and resource sharing across

accounts



AWS Organization Account Structure

Here, you will learn about different terms in AWS Organization.

Organization

- The parent container for all the accounts for your organization.
- If you apply a policy to the root, it applies to all organizational units (OUs) and accounts in the organization.

Root

- An entity to consolidate your AWS account to administer various accounts as a single unit.

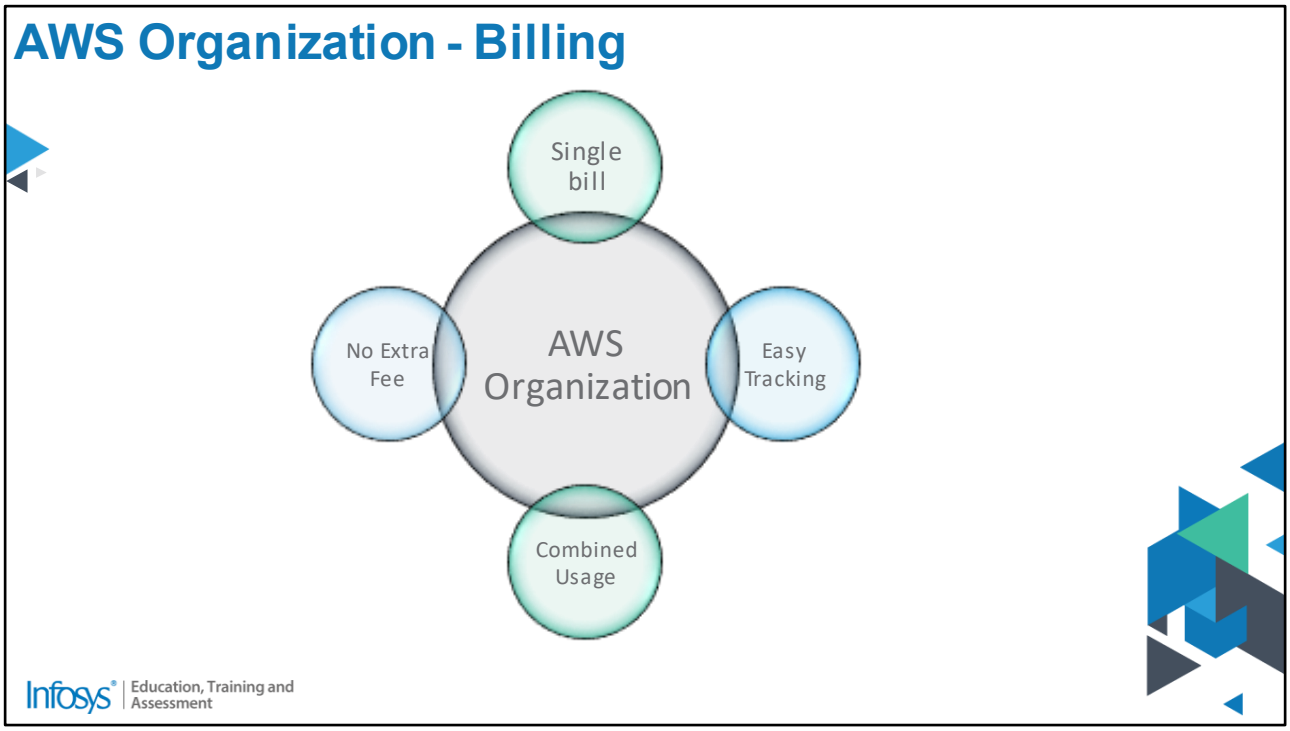
- Use AWS Organization Console to centrally manage all your account in organization

OU (Organization Unit)

- It is a container for accounts within a root.
- An OU can contain other OUs this feature enables the user to create a hierarchy like an upside-down tree.
- When you attach a policy to one of the nodes in the hierarchy, it flows down and affects all the branches

Account

- An account in Organizations is a standard AWS account that contains your AWS resources and the identities that can access those resources.
- There are two type of Accounts Management account and Member Account
- Management account – is the account is used to create Organization is called management account or master account
- Member Account – The rest of the account other than Management account in organization are knows as Member account.



AWS Organization and Its Billing.

Consolidated billing in AWS Organizations helps to combine the payment for multiple AWS accounts.

Benefits of Consolidate Billing

Single bill - You get single payment bill for multiple accounts.
Easy tracking – You can track the charges across multiple accounts and download the combined cost and usage data.
Combined usage – You can consolidate the usage

across all accounts to share the volume pricing discounts, Reserved Instance discounts, and Savings Plans. This helps reduce the charges for your project, department, or enterprise with standalone accounts.

No extra fee – Consolidated billing is offered with no additional cost.

Optimizing Cost with AWS Organization

Resource Usage

AWS Account

Optimize Cost

Tagging Resources

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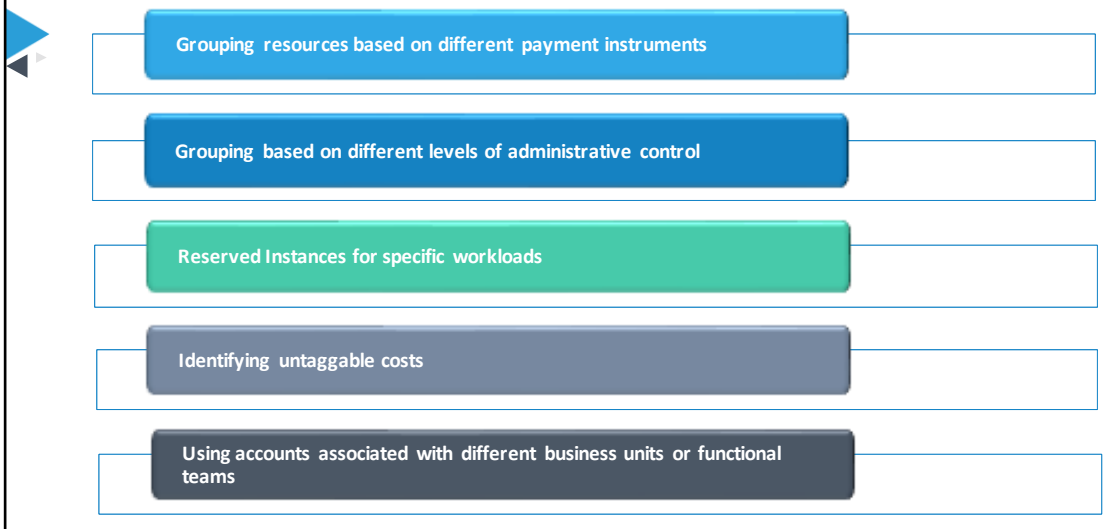
A well-defined AWS account structure will help your teams to understand the resource usage and optimize costs.
AWS customer can implement a deliberate account strategy early on tagging and allow it to evolve in response as per changing needs.

Optimizing Cost with AWS Organization



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A well-defined AWS account structure will help your teams to understand the resource usage and optimize costs. AWS customer can implement a deliberate account strategy early on tagging and allow it to evolve in response as per changing needs.

With multiple accounts, an organization can manage costs by:

Grouping resources with the help of tags that require different payment instruments
Providing groups with different levels of

administrative control over AWS resources
Better management of Reserved Instances for specific workloads
Classifying untaggable costs such as data transfer
Different business units or teams can use separate accounts

4.3 Identify resources available for billing support

- Identify ways to get billing support and information
- Identify where to find pricing information on AWS services
- Recognize that alarms/alerts exist
- Identify how tags are used in cost allocation

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AWS Billing Support

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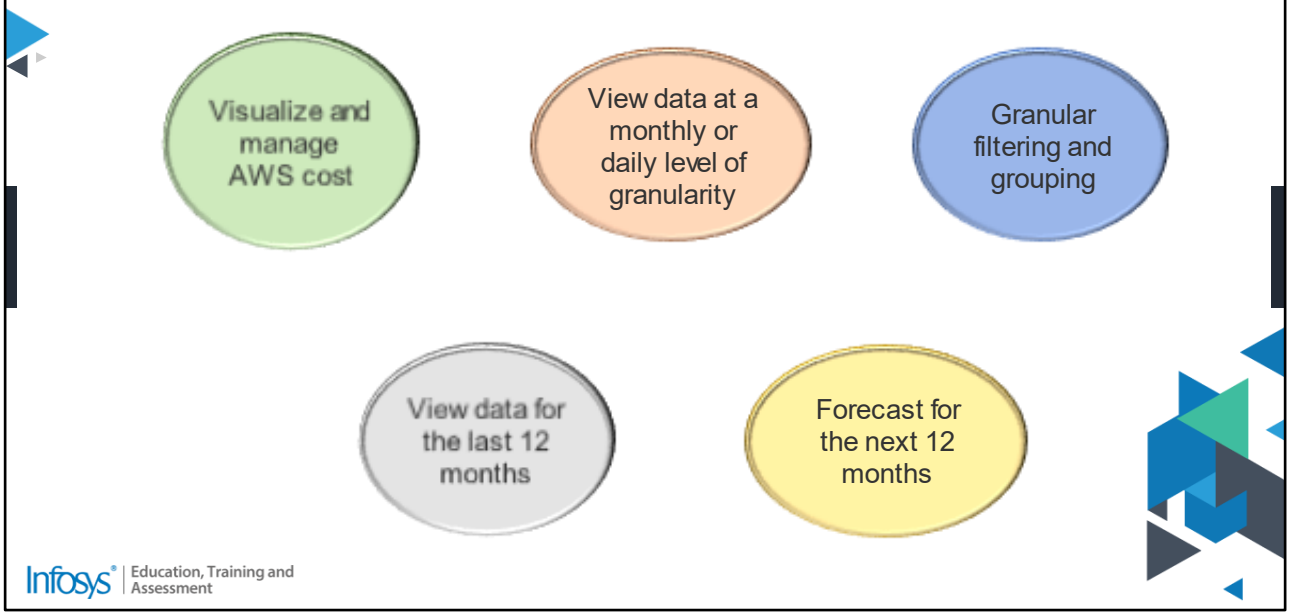
In this module, you will learn about Billing supports offered by AWS Cloud.

AWS Cost Explorer



AWS helps you to understand, visualize the AWS costs associated with your account over a period.

Monthly data or daily data can be viewed based on the choices we opt in Cost explorer.

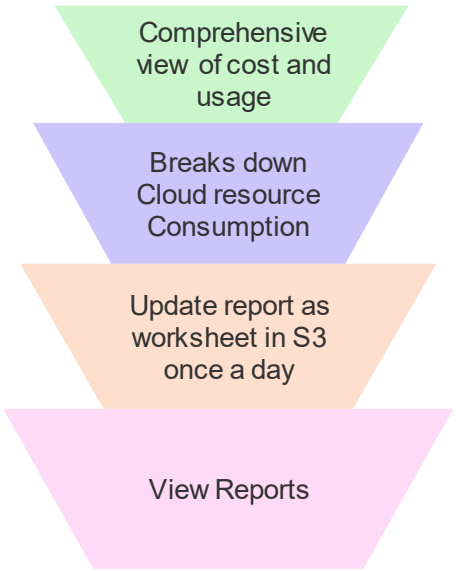
You will be able to dive deeper with the help of granular grouping and filtering based on different dimensions such as tags and usage types.

The data can be viewed for up to 12 months of your usage.

You can view data for up to the last 12 months of your usage.

Based on the current usage of your resources it can forecast about how much you are going to spend in the next 12 months. It offers an insight about what reserved instances can be purchased.

AWS Cost and Usage Reports



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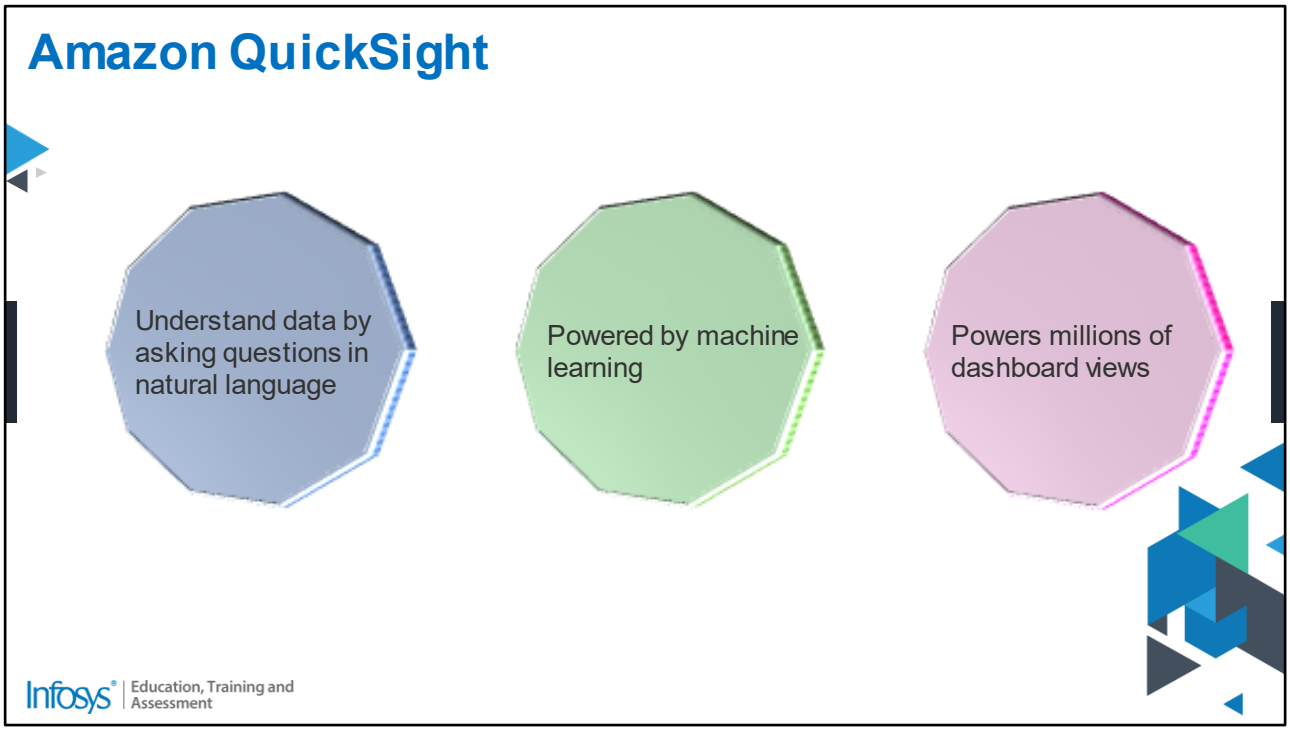
AWS Cost and usage report can be viewed as a spreadsheet. You can use Apache open office or Microsoft excel to view the spreadsheet.

Cost and usage report will be uploaded to your S3 bucket on a day-to-day basis.

Your cost will be broken down based on hours, day and month. You can also filter it using product resources or tags that you define.

This report will have complete data set based on terms and agreements that you have associated with your AWS account.

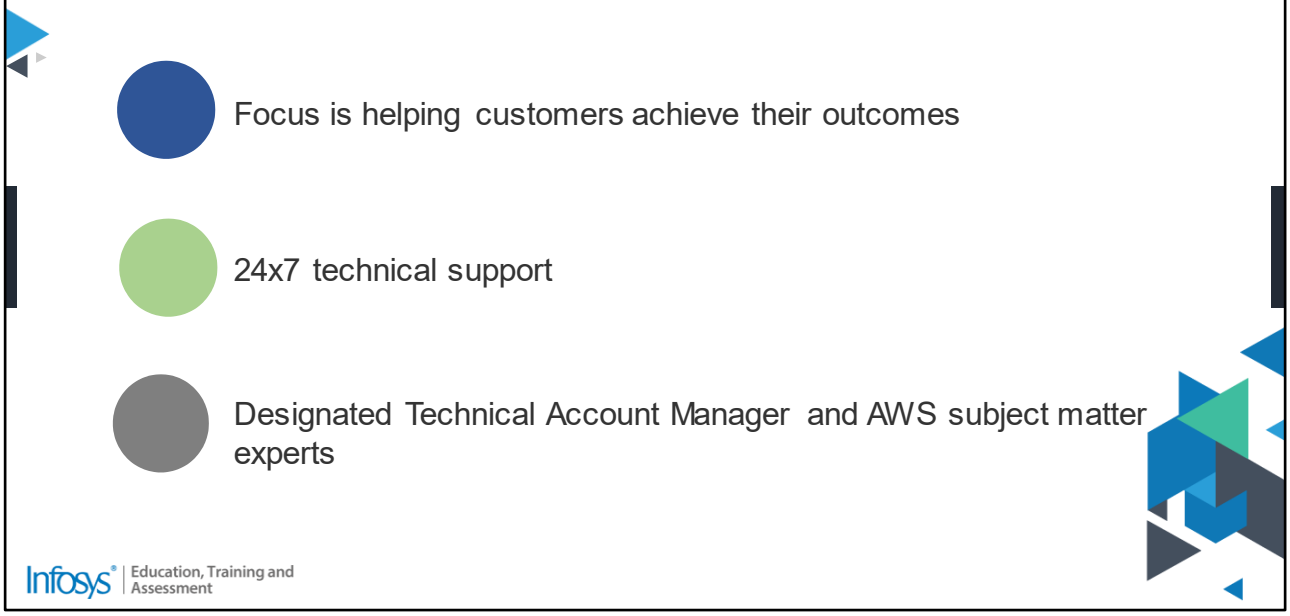


Amazon QuickSight is a business intelligence service based on cloud. It permits everyone to ask questions in natural language for understanding the data of your organization.

It uses different machine learning for evaluation of your data. Through machine learning, you would be able to combine insight calculations, images and other conditions that you defined.

A dashboard is created from an analysis. Dashboard can be shared with the other users for reporting purposes. Amazon QuickSight offers millions of dashboard views.

Concierge for AWS Enterprise Support Plan customers

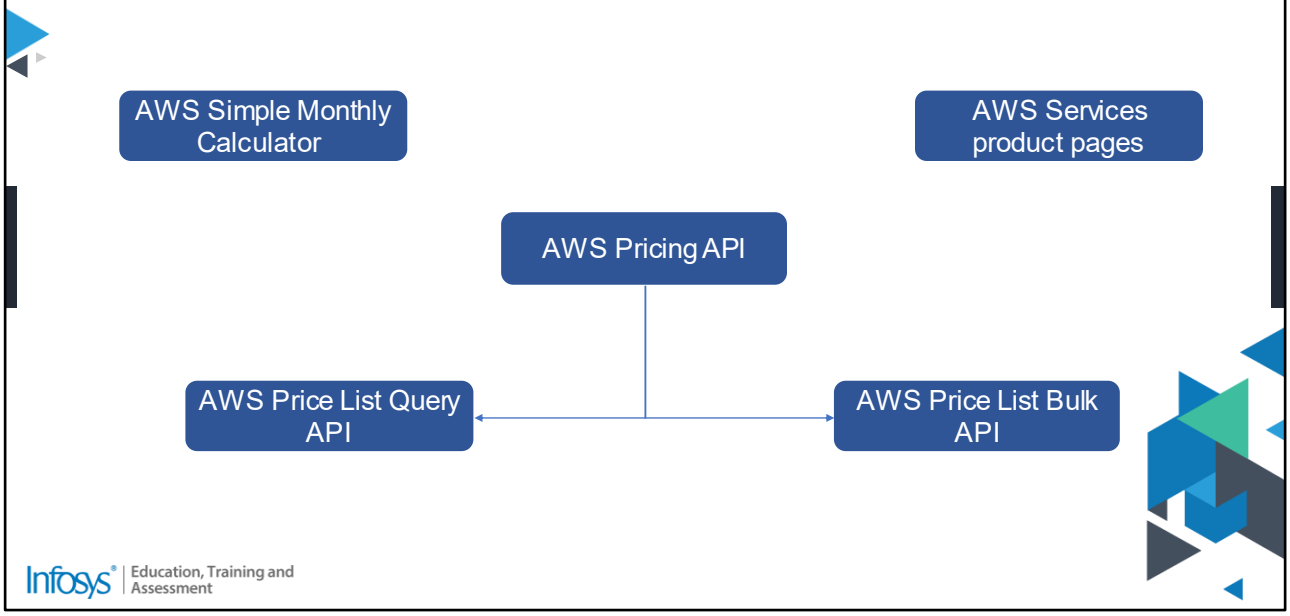


AWS Enterprise Support offers concierge-like service where the focus will be on how you can achieve more success and better outcomes with the help of AWS cloud.

You will get a 24*7 technical support from a group of high-quality engineers. It will be easier to manage health of your environment automatically.

You will be assigned to a dedicated Technical Account Manager (TAM) which will help you to have an organized access of preventative/proactive. AWS Enterprise Support is suggested for mission critical workloads related to your business.

AWS services Pricing



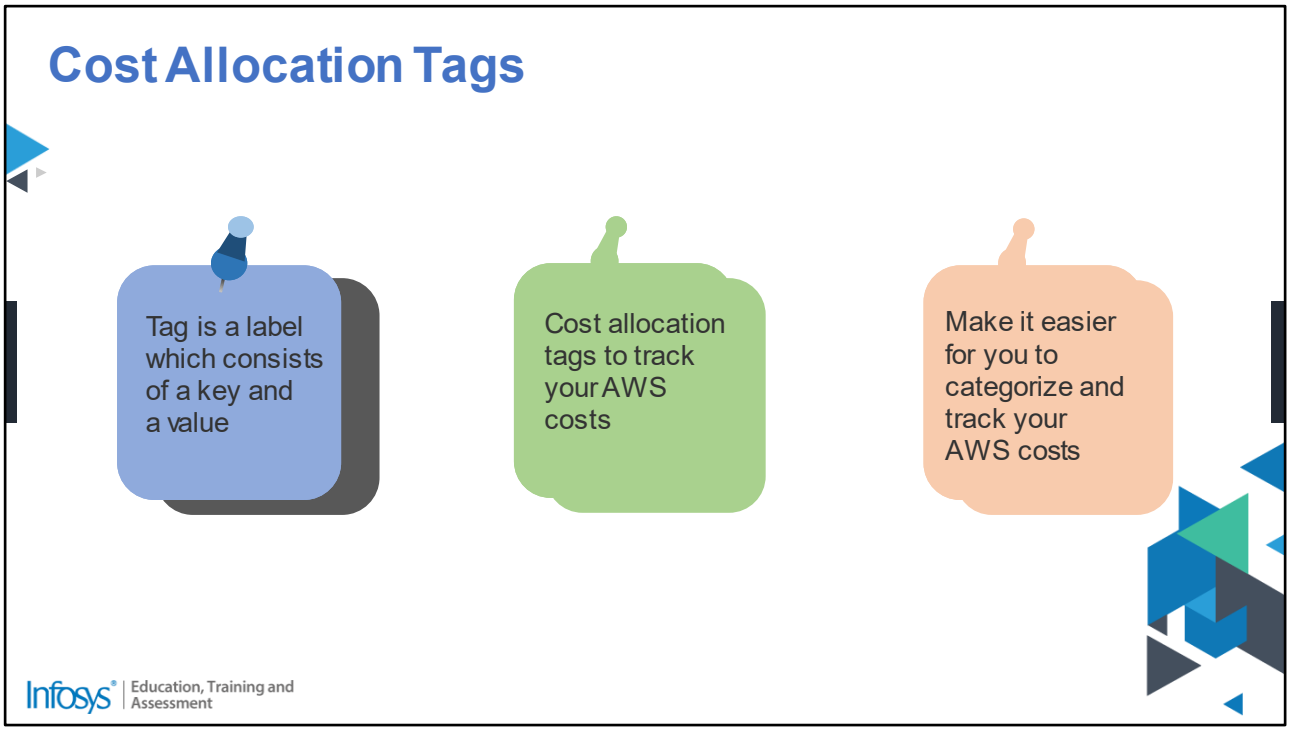
AWS Simple Monthly Calculator an easy tool which is available online. It will evaluate your monthly cost in AWS Cloud based on the expected usage. The AWS Simple Monthly Calculator will have latest price for each service available in all Regions.

AWS offers two different APIs that can be used for querying the prices :

•AWS Price List Query API will be used for querying specific information about a particular AWS service. This query can be done using AWS SDK or AWS CLI.

•AWS Price List Bulk API can help in querying the prices of different AWS services in bulk . This API will return either a CSV or JSON file. The bulk API holds all historical versions of all the price list.

Products page displays the tools, applications, and different cloud resources has been assigned to you by the administrator. Products page can be used to launch an instance of those applications or cloud resources. By default, the product list will show name, vendor, owner, ID, and its description.

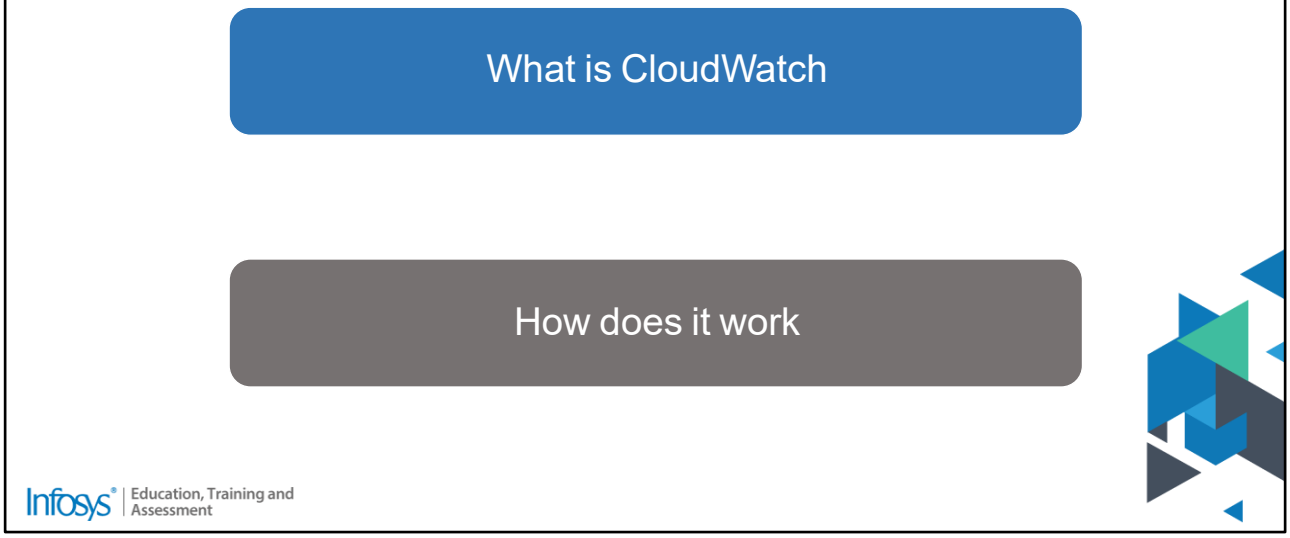


Tag is a label that is assigned by AWS to each AWS resources. Each tag will have a key and value associated with it. For each resource, tag must be distinctive, and its key can have only one value.

Cost allocation tags will help in tracking cost of an AWS resource in a detailed manner.

Tags are helpful while organizing the resources. Once the cost allocation tag is activated, AWS will use it for categorizing and tracking AWS costs associated with your resources.

Amazon CloudWatch Alarm



CloudWatch is another important service offered by AWS which is used for monitoring. It will monitor all the resources and applications that you run in AWS. You can define different metrics and track it.

You can set a custom value for any metrics for a given resources. You can create an alarm when a certain criteria is met. This alarm further can initiate scheduled action on your behalf.

Sample Questions

Question 1

You are a project manager, and the project workload has running time of 6 months. This workload can withstand few interruptions. What would be the most cost-efficient Amazon EC2 purchasing option that you will suggest for the project workload?

A. Spot Instances

B. Reserved Instances

C. Dedicated Instances

D. On demand instances

Question 2

A gaming company fastgames.com has hosted their applications on EC2 instances. They had set their budget cost when the application was hosted on cloud. Now they want to set a budget alarm as soon as the cost exceeds to their pre-set budget. Which AWS service should they use?

A. AWS Compute optimizer

B. AWS Monthly Calculator

C. AWS TCO

D. AWS Budgets

Question 3

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) Cloud. Which Amazon EC2 instance price model offers up to a 90% discount on the standard pricing of EC2 instances?

A. Reserved Instances

B. On-Demand

C. Dedicated Hosts

D. Spot Instances

Question 4

Your organization techfast.com is looking for a solution to estimate overall cost saving and compare the cost of applications in an on-premises environment to AWS.

Which of the following service is appropriate to use in this scenario?

A. AWS Budgets

B. AWS TCO Calculator

C. AWS Compute optimizer

D. AWS Cost explorer

Question 5

You are using AWS trusted advisor for your applications and services running in AWS cloud. Which of the following suggestions you can expect from trusted advisor? (Select two).

A. Auditing

B. Scalability

C. Performance

D. Cost Optimization

E. Information about Software vulnerabilities

Further References

- AWS FAQ's
- Amazon EC2 pricing in detail: Amazon EC2 Pricing - Amazon Web Services
- How does AWS pricing work: Pricing (amazon.com)
- More about AWS support plans: Purchase AWS Premium Customer Support Plans - Amazon Web Services
- More on Consolidated Billing for AWS Organization: Consolidated billing for AWS Organizations - AWS Billing (amazon.com)
- Explore on how much will it cost to move from on premise into AWS Cloud: AWS Pricing Calculator
- Using cost allocation tags in Billing: Using Cost Allocation Tags - AWS Billing (amazon.com)