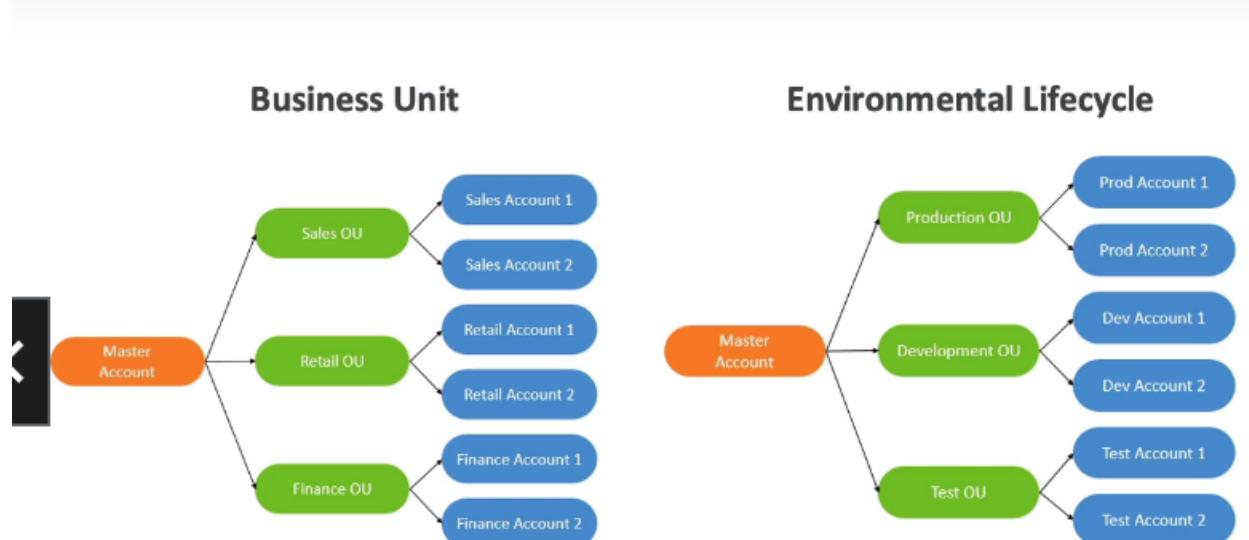


AWS Organizations

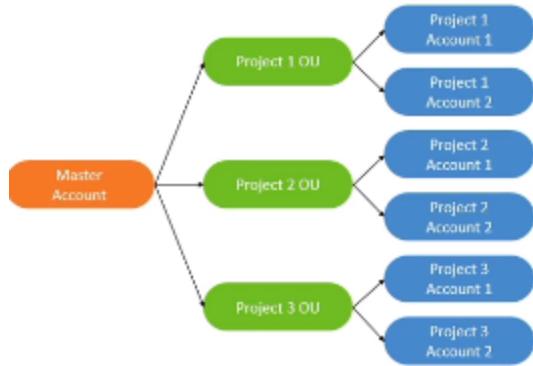
- Global service
 - Allows to manage multiple AWS accounts
 - The main account is the master account
 - Cost Benefits:
 - Consolidated Billing across all accounts - single payment method
 - Pricing benefits from aggregated usage (volume discount for EC2, S3...)
1. So when you use a lot EC2, when you use a lot S3 you get a discounts because you've used that at lots.
 2. And so if you have multiple accounts, you could lose that volume, but with an organization because the billing is consolidated the aggregated usage is as well consolidated And that means that you get more discounts.
- Cost Benefits:
 - Consolidated Billing across all accounts - single payment method
 - Pricing benefits from aggregated usage (volume discount for EC2, S3...)
 - Pooling of Reserved EC2 instances for optimal savings
 - API is available to automate AWS account creation
 - Restrict account privileges using Service Control Policies (SCP)
- 4.
 5. Multi Account Strategies

Multi Account Strategies

- Create accounts per department, per cost center, per dev / test / prod, based on regulatory restrictions (using SCP), for better resource isolation (ex:VPC), to have separate per-account service limits, isolated account for logging
 - Multi Account vs One Account Multi VPC
 - Use tagging standards for billing purposes
 - Enable CloudTrail on all accounts, send logs to central S3 account
 - Send CloudWatch Logs to central logging account
- 6.
7. Organizational Units

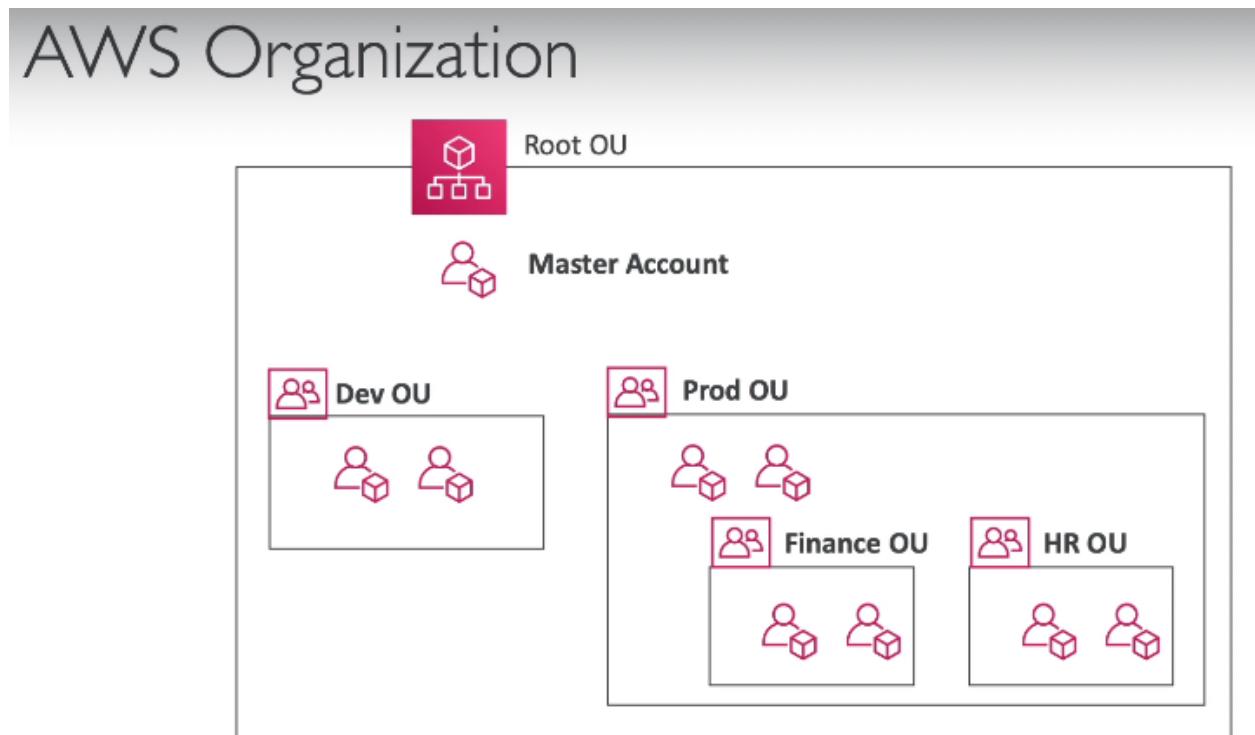


Project-based



9.

10. And within our root OU..we can have multiple OU



11.

Service Control Policies (SCP)

- Whitelist or blacklist IAM actions
 - Applied at the OU or Account level
 - Does not apply to the Master Account
 - SCP is applied to all the Users and Roles of the Account, including Root
- 12.
13. Diff bw Master Account and root account

Let's first understand what Account is under Organization -> An account in Organizations is a standard AWS account that contains your AWS resources and the identities that can access those resources. An **AWS account** isn't the same thing as a **user account**. An AWS user is an identity that you create using AWS Identity and Access Management (IAM) and takes the form of either an IAM user with long-term credentials, or an IAM role with short-term credentials. A single AWS account can, and typically does contain many users and roles. When you create an AWS account, you begin with one sign-in identity that has complete access to all AWS services and resources in the account. This identity is called the AWS account **root user**. (This means that every Account in the organization will have a root user)

There are two types of accounts in an organization: a single account that is designated as the management account, and one or more member accounts.

The **management account/master account** is the account that you use to create the organization

Member accounts make up all of the rest of the accounts in an organization

Now, SCP is a policy that specifies the services and actions that users and roles can use in the **accounts** that the SCP affects. When you attach an SCP to your organization root or an OU, the SCP limits permissions for entities in **member accounts**. As, SCP limits permissions in **member accounts** then the **root user** of these accounts will also be affected.

The lecture mentions that SCP is not applied on **management account/master account**

14. therefore the root user of that account is also not affected.

15. What is master Account?

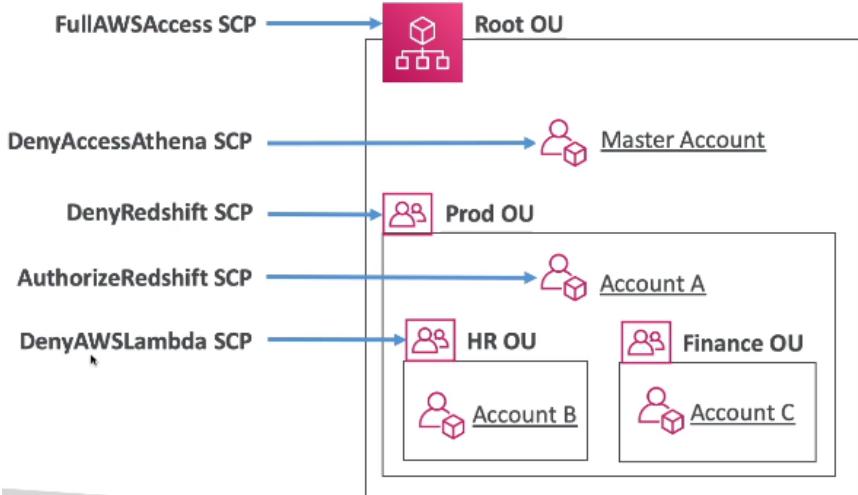
A master account, also known as a management account, is the account that you use to create and manage your organization in AWS Organizations. The management account has full control over all of the accounts in your organization, including the ability to create and delete accounts, attach policies, and manage billing.

For example, if you have a company with multiple departments, you could create a master account for the company and then create separate accounts for each department. The management account would have full control over all of the departmental accounts, and the departmental accounts would have limited control over their own resources.

Here are some of the things that you can do with a master account:

- Create and delete accounts in your organization.
 - Attach policies to accounts in your organization.
 - Manage billing for your organization.
 - Invite other accounts to join your organization.
 - Manage organizational units (OUs) in your organization.
 - Configure settings for your organization.
16. • The SCP does not affect service-linked roles
 - Service-linked roles enable other AWS services to integrate with AWS Organizations and can't be restricted by SCPs.
- SCP must have an explicit Allow (does not allow anything by default)
- Use cases:
 - Restrict access to certain services (for example: can't use EMR)
 - Enforce PCI compliance by explicitly disabling services
- 17.

SCP Hierarchy



- Master Account
 - Can do anything
 - (no SCP apply)
- Account A
 - Can do anything
 - EXCEPT access Redshift (explicit Deny from OU)
- Account B
 - Can do anything
 - EXCEPT access Redshift (explicit Deny from Prod OU)
 - EXCEPT access Lambda (explicit Deny from HR OU)
- Account C
 - Can do anything
 - EXCEPT access Redshift (explicit Deny from Prod OU)

18.

19. SCP looks like this

SCP Examples

Blacklist and Whitelist strategies

```
Version": "2012-10-17",
"Statement": [
  {
    "Sid": "AllowsAllActions",
    "Effect": "Allow",
    "Action": "*",
    "Resource": "*"
  },
  {
    "Sid": "DenyDynamoDB",
    "Effect": "Deny",
    "Action": "dynamodb:*",
    "Resource": "*"
  }
]
```

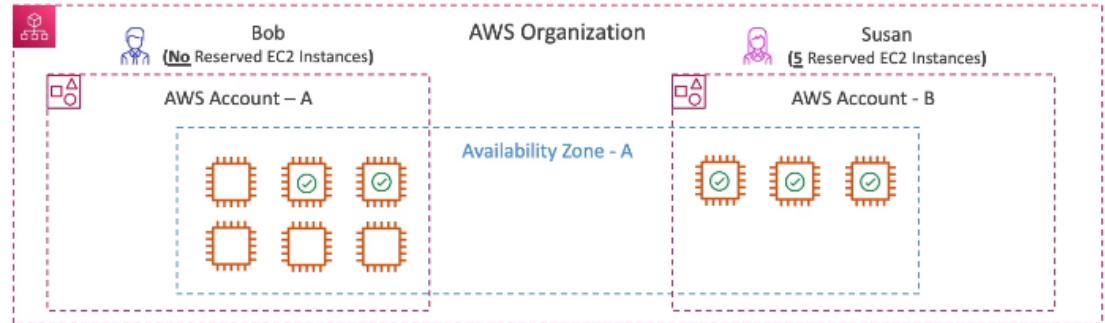
```
Version": "2012-10-17",
"Statement": [
  {
    "Effect": "Allow",
    "Action": [
      "ec2:*",
      "cloudwatch:*
```

20. For aws organizations hands on..refer online

AWS Org Consolidated Billing

AWS Organization – Consolidated Billing

- When enabled, provides you with:
 - Combined Usage – combine the usage across all AWS accounts in the AWS Organization to share the volume pricing, Reserved Instances and Savings Plans discounts
 - One Bill – get one bill for all AWS Accounts in the AWS Organization
- The management account can turn off Reserved Instances discount sharing for any account in the AWS Organization, including itself



1.

It displays Reserved Instance sharing feature. With account B consuming only 3 out of 5, Account A also gets all the benefit of reserved sharing.

1. Thanks
2. TA

AWS Control Tower

AWS Control Tower

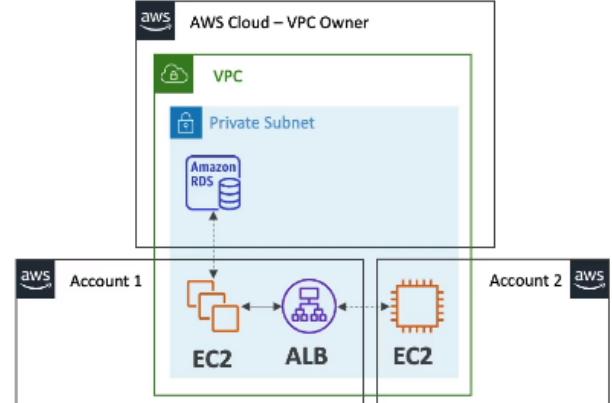


- Easy way to set up and govern a secure and compliant multi-account AWS environment based on best practices
 - Benefits:
 - Automate the set up of your environment in a few clicks
 - Automate ongoing policy management using guardrails
 - Detect policy violations and remediate them
 - Monitor compliance through an interactive dashboard
 - AWS Control Tower runs on top of AWS Organizations:
 - It automatically sets up AWS Organizations to organize accounts and implement SCPs (Service Control Policies)
1. For hands on refer online

AWS Resource Access Manager

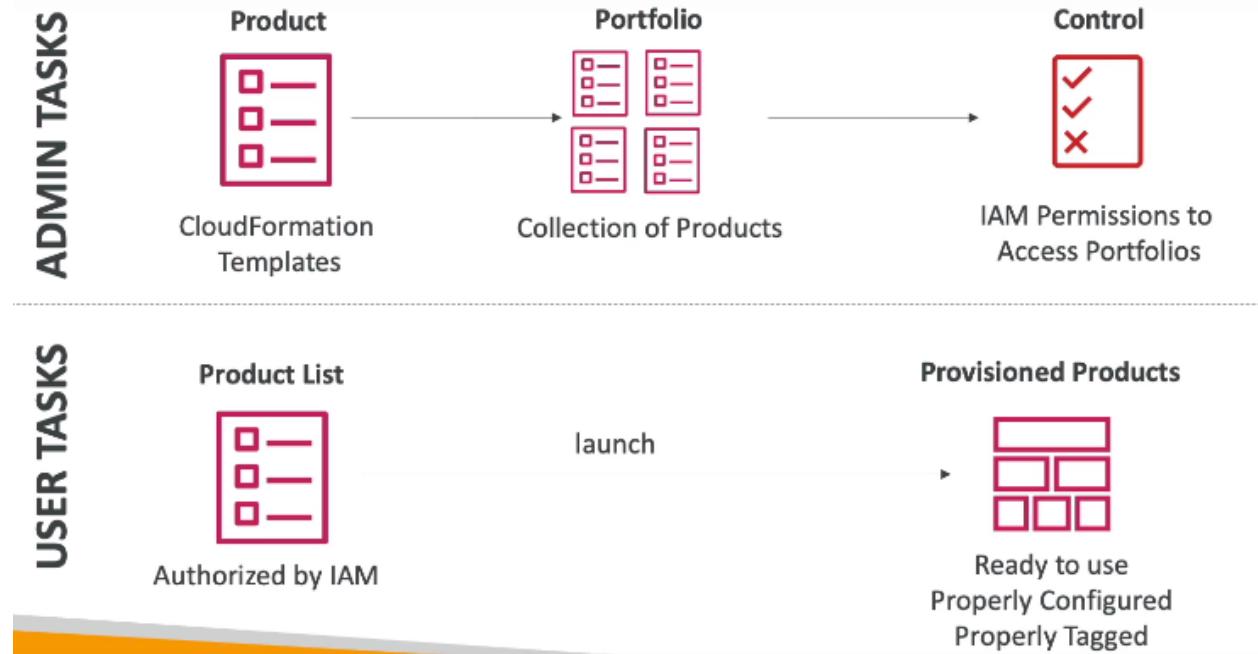
AWS Resource Access Manager (AWS RAM)

1.
 - Share AWS resources that you own with other AWS accounts
 - Share with any account or within your Organization
 - Avoid resource duplication!
 - Supported resources include Aurora, VPC Subnets, Transit Gateway, Route 53, EC2 Dedicated Hosts, License Manager Configurations...



AWS service Catalog

Service Catalog diagram



Pricing Models in AWS

Pricing Models in AWS

- AWS has 4 pricing models:
- **Pay as you go:** pay for what you use, remain agile, responsive, meet scale demands
- **Save when you reserve:** minimize risks, predictably manage budgets, comply with long-terms requirements
 - Reservations are available for EC2 Reserved Instances, DynamoDB Reserved Capacity, ElastiCache Reserved Nodes, RDS Reserved Instance, Redshift Reserved Nodes
- **Pay less by using more:** volume-based discounts
- **Pay less as AWS grows**

1. —

3. So AWS is very famous for doing cost reductions every month or every year, which is really good, because as their infrastructure grows, and more people use AWS, they have volume and scale, and therefore, they will pass on that economy of scale onto you to get discounts.

Free services & free tier in AWS

- IAM
 - VPC
 - Consolidated Billing
 - Elastic Beanstalk
 - CloudFormation
 - Auto Scaling Groups
 - Free Tier: <https://aws.amazon.com/free/>
 - EC2 t2.micro instance for a year
 - S3, EBS, ELB, AWS Data transfer
- ⚠ You do pay for the resources created**

4.

Free Tier details

Filter by:
[Clear all filters](#)

Tier Type

- Featured
- 12 Months Free
- Always Free
- Trials

Product Categories

- Analytics

Search free tier products

MACHINE LEARNING	COMPUTE	SECURITY, IDENTITY, & COMPLIANCE
Free Tier <small>FREE TRIAL</small> Amazon SageMaker 250 Hours per month of t2.medium notebook usage for the first two months Fully managed platform to build, train, and deploy machine learning models.	Free Tier <small>FREE TRIAL</small> Amazon Lightsail 750 Hours 1 Month Free Trial Virtual Private Servers made easy! Everything you need to jumpstart your project on AWS with compute, storage, and	Free Tier <small>FREE TRIAL</small> Amazon GuardDuty 30 Days Free Trial Intelligent threat detection and continuous monitoring to protect your AWS accounts and workloads.

5.

Compute Pricing – EC2

- Only charged for what you use
 - Number of instances
 - Instance configuration:
 - Physical capacity
 - Region
 - OS and software
 - Instance type
 - Instance size
 - ELB running time and amount of data processed
 - Detailed monitoring
- 6.
 7. We can get detailed monitoring from cloudwatch monitor and we have to pay for that service as well
 8. Diff models of pricing in ec2

Compute Pricing – EC2

- On-demand instances:
 - Minimum of 60s
 - Pay per second (Linux/Windows) or per hour (other)
- Reserved instances:
 - Up to 75% discount compared to On-demand on hourly rate
 - 1- or 3-years commitment
 - All upfront, partial upfront, no upfront
- Spot instances:
 - Up to 90% discount compared to On-demand on hourly rate
 - Bid for unused capacity
- Dedicated Host:
 - On-demand
 - Reservation for 1 year or 3 years commitment
- Savings plans as an alternative to save on sustained usage

9.

10. Lambda and ECS pricing

Compute Pricing – Lambda & ECS

- Lambda:
 - Pay per call
 - Pay per duration
- ECS:
 - EC2 Launch Type Model: No additional fees, you pay for AWS resources stored and created in your application
- Fargate:
 - Fargate Launch Type Model: Pay for vCPU and memory resources allocated to your applications in your containers



11.

Storage Pricing – S3



- Storage class: S3 Standard, S3 Infrequent Access, S3 One-Zone IA, S3 Intelligent Tiering, S3 Glacier and S3 Glacier Deep Archive
 - Number and size of objects: Price can be tiered (based on volume)
 - Number and type of requests
 - Data transfer OUT of the S3 region
 - S3 Transfer Acceleration
 - Lifecycle transitions
- 12.
- Similar service: EFS (pay per use, has infrequent access & lifecycle rules)

Storage Pricing - EBS

- Volume type (based on performance)
 - Storage volume in GB per month provisionned
- 13.

14. Here we have to pay for the volume..If you need 100gb you have to pay for that regardless of the usage

15. Its the volume which comes with the ec2 instance

Storage Pricing - EBS

- Volume type (based on performance)
- Storage volume in GB per month provisionned
- IOPS:
 - General Purpose SSD: Included
 - Provisioned IOPS SSD: Provisionned amount in IOPS
 - Magnetic: Number of requests
- Snapshots:
 - Added data cost per GB per month
- Data transfer:
 - Outbound data transfer are tiered for volume discounts
 - Inbound is free

16.

Database Pricing - RDS



- Per hour billing
- Database characteristics:
 - Engine
 - Size
 - Memory class
- Purchase type:
 - On-demand
 - Reserved instances (1 or 3 years) with required up-front
- Backup Storage: There is no additional charge for backup storage up to 100% of your total database storage for a region.

17.

Database Pricing - RDS

- Additional storage (per GB per month)
 - Number of input and output requests per month
 - Deployment type (storage and I/O are variable):
 - Single AZ
 - Multiple AZs
 - Data transfer:
 - Outbound data transfer are tiered for volume discounts
 - Inbound is free
- 18.

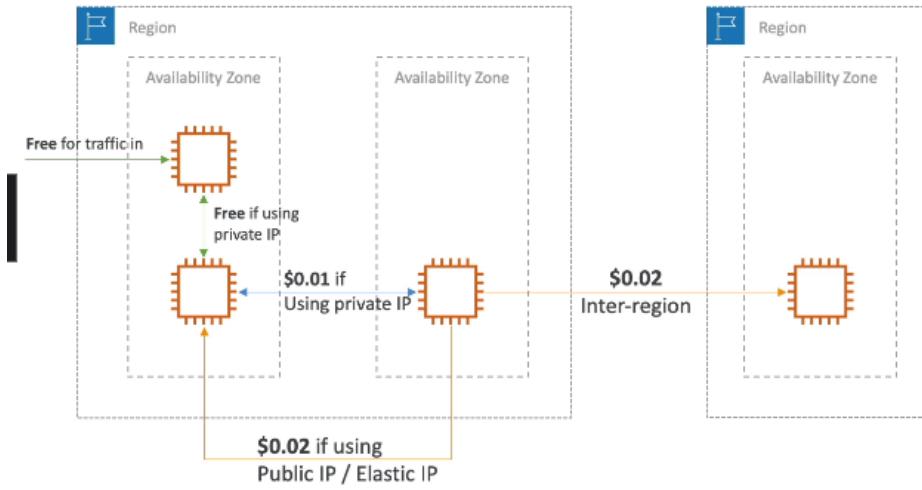
Content Delivery – CloudFront

- Pricing is different across different geographic regions
- Aggregated for each edge location, then applied to your bill
- Data Transfer Out (volume discount)
- Number of HTTP/HTTPS requests

Per Month	United States & Canada	Europe & Israel	South Africa, Kenya, & Middle East	South America	Japan	Australia	Singapore, South Korea, Taiwan, Hong Kong, & Philippines	India
First 10TB	\$0.085	\$0.085	\$0.110	\$0.110	\$0.114	\$0.114	\$0.140	\$0.170
Next 40TB	\$0.080	\$0.080	\$0.105	\$0.105	\$0.089	\$0.098	\$0.135	\$0.130
Next 100TB	\$0.060	\$0.060	\$0.090	\$0.090	\$0.086	\$0.094	\$0.120	\$0.110

19.

Networking Costs in AWS per GB - Simplified



20.

21. Its always recommended to use private ip..if the traffic is going to another instance which

- Use Private IP instead of Public IP for good savings and better network performance
- Use same AZ for maximum savings (at the cost of high availability)

is in the same region but in diff AZ

Savings Plan Overview

Savings Plan

- Commit a certain \$ amount per hour for 1 or 3 years
 - Easiest way to setup long-term commitments on AWS
 - EC2 Savings Plan
 - Up to 72% discount compared to On-Demand
 - Commit to usage of individual instance families in a region (e.g. C5 or M5)
- 1.
 2. For example, you say, "Hey, I'm willing to spend \$10 per hour for the next three years on the C5 type of instances."

Here is an example of how a Savings Plan can save you money:

Let's say you use 1000 hours of EC2 compute hours per month. If you were to pay the On-Demand rate for this usage, you would pay \$0.056 per hour. However, if you commit to using 1000 hours of EC2 compute hours per month for 1 year, you could get a Savings Plan discount of 50%. This would mean that you would pay \$0.028 per hour for your EC2 compute hours, which would save you \$0.028 per hour * 1000 hours per month = \$280 per month.

- 3.
 - 4.
- EC2 Savings Plan
 - Up to 72% discount compared to On-Demand
 - Commit to usage of individual instance families in a region (e.g. C5 or M5)
 - Regardless of AZ, size (m5.xl to m5.4xl), OS (Linux/Windows) or tenancy
 - All upfront, partial upfront, no upfront
 - Compute Savings Plan
 - Up to 66% discount compared to On-Demand
 - Regardless of Family, Region, size, OS, tenancy, compute options
 - Compute Options: EC2, Fargate, Lambda
 - Machine Learning Savings Plan: SageMaker...
 - Setup from the AWS Cost Explorer console
 - Estimate pricing at <https://aws.amazon.com/savingsplans/pricing/>

5.

	Instance type	Unit	Savings Plans rate	Savings over On-Demand	On-Demand rate	Region
ml.t3.2xlarge-Notebook	Hrs	\$0.28788	28%	\$0.399	US East (N. Virginia)	
ml.t3.large-Notebook	Hrs	\$0.072	28%	\$0.10	US East (N. Virginia)	
ml.t3.medium-Notebook	Hrs	\$0.036	28%	\$0.05	US East (N. Virginia)	
ml.t3.xlarge-Notebook	Hrs	\$0.144	28%	\$0.20	US East (N. Virginia)	
ml.m5.2xlarge-Notebook	Hrs	\$0.3384	27%	\$0.461	US East (N. Virginia)	
ml.m5.4xlarge-Notebook	Hrs	\$0.6768	27%	\$0.922	US East (N. Virginia)	

AWS compute optimizer

AWS Compute Optimizer

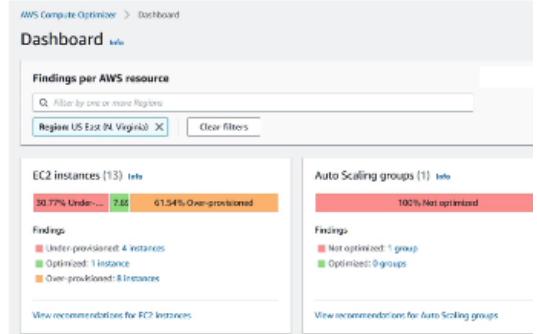


- Reduce costs and improve performance by recommending optimal AWS resources for your workloads
- Helps you choose optimal configurations and right-size your workloads (over/under provisioned)
- Uses Machine Learning to analyze your resources' configurations and their utilization CloudWatch metrics
- Supported resources
 - EC2 instances
 - EC2 Auto Scaling Groups
 - EBS volumes
 - Lambda functions

1.

- Lower your costs by up to 25%
- Recommendations can be exported to S3

2.



Billing and Costing tools

Billing and Costing Tools

- Estimating costs in the cloud:
 - Pricing Calculator
- Tracking costs in the cloud:
 - Billing Dashboard
 - Cost Allocation Tags
 - Cost and Usage Reports
 - Cost Explorer
- Monitoring against costs plans:
 - Billing Alarms
 - Budgets

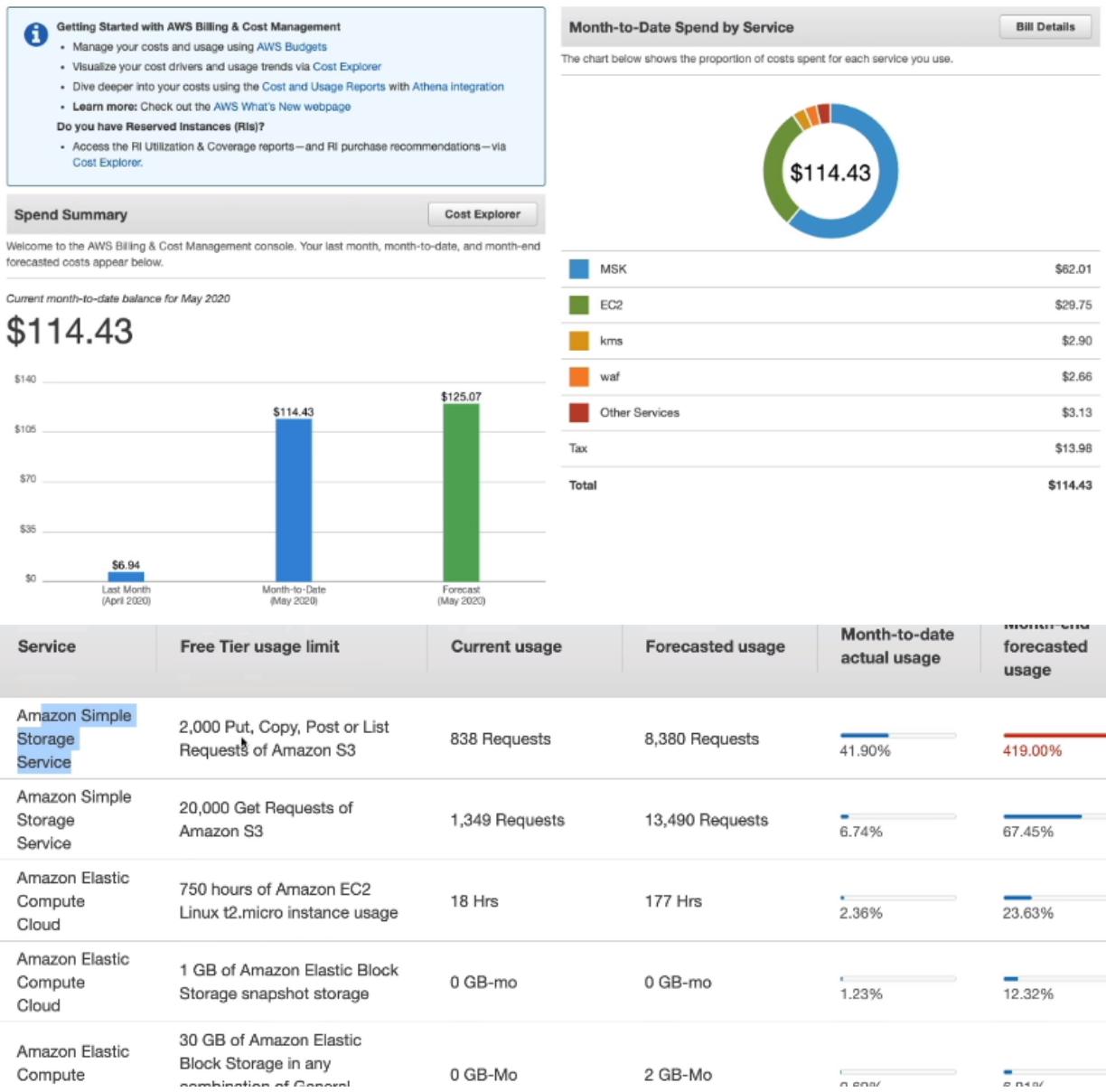
1.

Estimation Costs

1. You can check the estimation by specifying your requirements in aws pricing calculator

AWS Billing Dashboard

Billing & Cost Management Dashboard



Cost Allocation Tags

- Use cost allocation tags to track your AWS costs on a detailed level
- AWS generated tags
 - Automatically applied to the resource you create
 - Starts with Prefix aws: (e.g. aws: createdBy)
- User-defined tags
 - Defined by the user
 - Starts with Prefix user:

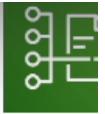
Total Cost	user:Owner	user:Stack	user:Cost Center	user:Application
0.95	DbAdmin	Test	80432	Widget2
0.01	DbAdmin	Test	80432	Widget2
3.84	DbAdmin	Prod	80432	Widget2
6.00	DbAdmin	Test	78925	Widget1
234.63	SysEng	Prod	78925	Widget1
0.73	DbAdmin	Test	78925	Widget1
0.00	DbAdmin	Prod	80432	Portal
2.47	DbAdmin	Prod	78925	Portal

3.

Tagging and Resource Groups

- Tags are used for organizing resources:
 - EC2: instances, images, load balancers, security groups...
 - RDS, VPC resources, Route 53, IAM users, etc...
 - Resources created by CloudFormation are all tagged the same way
 - Free naming, common tags are: Name, Environment, Team ...
 - Tags can be used to create Resource Groups
 - Create, maintain, and view a collection of resources that share common tags
 - Manage these tags using the Tag Editor
- 4.
5. And these tags can be used for cost reasons, obviously, but also to create resource groups to create, maintain, and view a collection of resources that will share the common tags

Cost and Usage Reports



- Dive deeper into your AWS costs and usage
- The AWS Cost & Usage Report contains the most comprehensive set of AWS cost and usage data available, including additional metadata about AWS services, pricing, and reservations (e.g., Amazon EC2 Reserved Instances (RIs)).
- The AWS Cost & Usage Report lists AWS usage for each service category used by an account and its IAM users in hourly or daily line items, as well as any tags that you have activated for cost allocation purposes.
- Can be integrated with Athena, Redshift or QuickSight

6.

Cost Explorer



- Visualize, understand, and manage your AWS costs and usage over time
- Create custom reports that analyze cost and usage data.
- Analyze your data at a high level: total costs and usage across all accounts
- Or Monthly, hourly, resource level granularity
- Choose an optimal Savings Plan (to lower prices on your bill)
- Forecast usage up to 12 months based on previous usage

7.

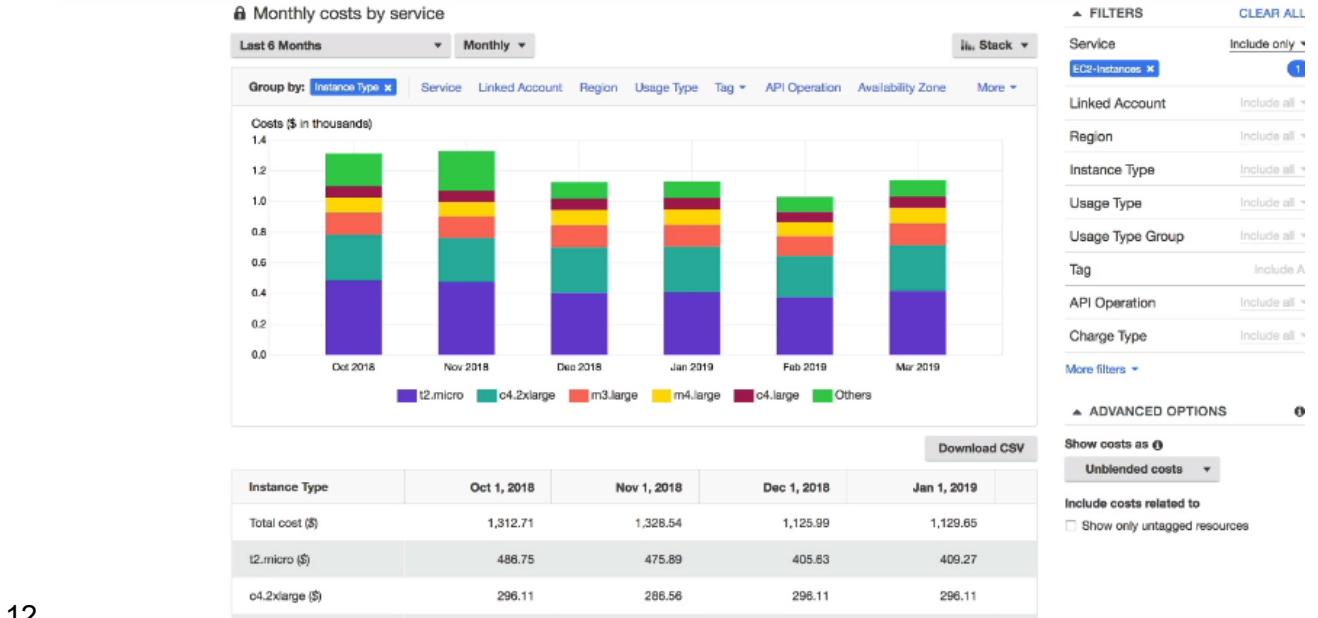
8. exam question.

9. So if you're looking for a tool that will allow you

10. to forecast your bill for 12 months ahead,

11. then it's going to be Cost Explorer.

Cost Explorer – Monthly Cost by AWS Service



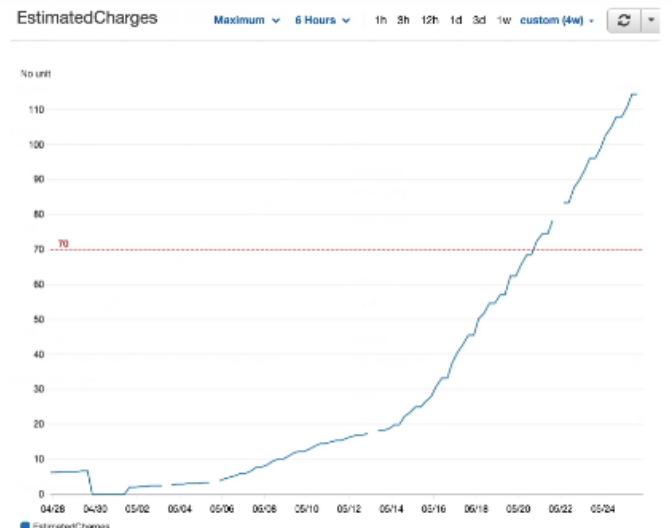
12.

Monitoring Costs in Cloud

1.

Billing Alarms in CloudWatch

- Billing data metric is stored in CloudWatch us-east-1
- Billing data are for overall worldwide AWS costs
- It's for actual cost, not for projected costs
- Intended a simple alarm (not as powerful as AWS Budgets)



AWS Budgets

- Create budget and send alarms when costs exceeds the budget
 - 4 types of budgets: Usage, Cost, Reservation, Savings Plans
 - For Reserved Instances (RI)
 - Track utilization
 - Supports EC2, ElastiCache, RDS, Redshift
 - Up to 5 SNS notifications per budget
 - Can filter by: Service, Linked Account, Tag, Purchase Option, Instance Type, Region, Availability Zone, API Operation, etc...
 - Same options as AWS Cost Explorer!
2.  / 100%

AWS Cost Anomaly

AWS Cost Anomaly Detection

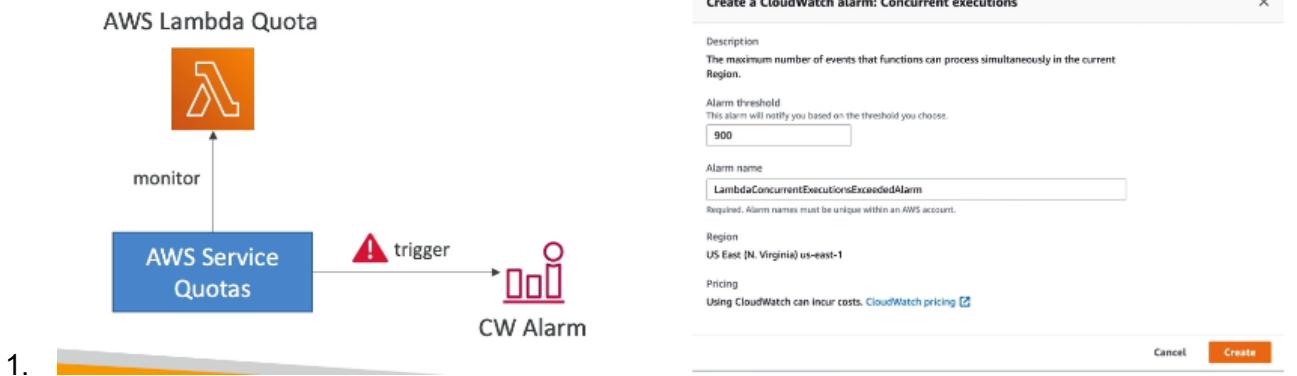
- Continuously monitor your cost and usage using ML to detect unusual spends
- It learns your unique, historic spend patterns to detect one-time cost spike and/or continuous cost increases (you don't need to define thresholds)
- Monitor AWS services, member accounts, cost allocation tags, or cost categories
- Sends you the anomaly detection report with root-cause analysis
- Get notified with individual alerts or daily/weekly summary (using SNS)



AWS Service Quota

AWS Service Quotas

- Notify you when you're close to a service quota value threshold
- Create CloudWatch Alarms on the Service Quotas console
- Example: Lambda concurrent executions
- Request a quota increase from AWS Service Quotas or shutdown resources before limit is reached



AWS Trusted Advisor

1.

The Trusted Advisor interface features a header with the title "Trusted Advisor" and a gear icon. Below the header is a "Checks" section containing three items:

- Amazon EBS Public Snapshots**: Checks permission settings for Amazon Elastic Block Store snapshots. 0 EBS snapshots are marked as public.
- Amazon RDS Public Snapshots**: Checks permission settings for Amazon Relational Database Service snapshots. 0 RDS snapshots are marked as public.
- IAM Use**: Checks for root user access. At least one IAM user has been created for this account.

2. Remember these five categories because....In the exam will ask you,

Trusted Advisor – Support Plans

7 CORE CHECKS

Basic & Developer Support plan

- S3 Bucket Permissions
 - Security Groups – Specific Ports
Unrestricted
 - IAM Use (one IAM user minimum)
 - MFA on Root Account
 - EBS Public Snapshots
 - RDS Public Snapshots
 - Service Limits
- 3.
1. **S3 Bucket Public Access:** This check helps you to identify S3 buckets that have public access enabled. This can be a security risk, as it allows anyone to access the contents of your S3 buckets.
 2. **EC2 Security Group Ingress:** This check helps you to identify EC2 security groups that have open ingress rules. This can be a security risk, as it allows anyone to connect to your EC2 instances.
 3. **RDS Public Connectivity:** This check helps you to identify RDS instances that have public connectivity enabled. This can be a security risk, as it allows anyone to connect to your RDS instances.
 4. **EBS Volume Encryption:** This check helps you to identify EBS volumes that are not encrypted. This can be a security risk, as it allows anyone to access the contents of your EBS volumes.
 5. **CloudTrail Logging:** This check helps you to verify that CloudTrail logging is enabled for your AWS account. CloudTrail logging can help you to track API calls made to your AWS account, which can be helpful for troubleshooting and security auditing.
- 4.

6. **IAM Password Policy:** This check helps you to verify that your IAM password policy meets best practices. IAM password policies can help you to create strong passwords and enforce password rotation.
7. **Use of Reserved Instances:** This check helps you to verify that you are using Reserved Instances for your EC2 instances. Reserved Instances can help you to save money on your AWS bill.
- 5.

Trusted Advisor – Support Plans

7 CORE CHECKS

Basic & Developer Support plan

- S3 Bucket Permissions
- Security Groups – Specific Ports Unrestricted
- IAM Use (one IAM user minimum)
- MFA on Root Account
- EBS Public Snapshots
- RDS Public Snapshots
- Service Limits

6.

FULL CHECKS

Business & Enterprise Support plan

- Full Checks available on the 5 categories
- Ability to set CloudWatch alarms when reaching limits
- Programmatic Access using [AWS Support API](#)

Support Plan for AWS

AWS Basic Support Plan

1. • Customer Service & Communities - 24x7 access to customer service, documentation, whitepapers, and support forums.
- AWS Trusted Advisor - Access to the 7 core Trusted Advisor checks and guidance to provision your resources following best practices to increase performance and improve security.
- AWS Personal Health Dashboard - A personalized view of the health of AWS services, and alerts when your resources are impacted.

AWS Developer Support Plan

- All Basic Support Plan +
 - Business hours email access to Cloud Support Associates
 - Unlimited cases / 1 primary contact
- 2.
- Case severity / response times:
 - General guidance: < 24 business hours
 - System impaired: < 12 business hours

AWS Business Support Plan (24/7)

- Intended to be used if you have production workloads
 - Trusted Advisor – Full set of checks + API access
 - 24x7 phone, email, and chat access to Cloud Support Engineers
 - Unlimited cases / unlimited contacts
 - Access to Infrastructure Event Management for additional fee.
 - Case severity / response times:
 - General guidance: < 24 business hours
 - System impaired: < 12 business hours
 - Production system impaired: < 4 hours
 - Production system down: < 1 hour
- 3.

AWS Enterprise On-Ramp Support Plan (24/7)

- Intended to be used if you have production or business critical workloads
 - All of Business Support Plan +
 - Access to a pool of Technical Account Managers (TAM)
 - Concierge Support Team (for billing and account best practices)
 - Infrastructure Event Management, Well-Architected & Operations Reviews
 - Case severity / response times:
 - ...
 - Production system impaired: < 4 hours
 - Production system down: < 1 hour
 - Business-critical system down: < 30 minutes
- 4.

AWS Enterprise Support Plan (24/7)

- Intended to be used if you have mission critical workloads
 - All of Business Support Plan +
 - Access to a **designated** Technical Account Manager (TAM)
 - Concierge Support Team (for billing and account best practices)
 - Infrastructure Event Management, Well-Architected & Operations Reviews
 - Case severity / response times:
 - ...
 - Production system impaired: < 4 hours
 - Production system down: < 1 hour
 - Business-critical system down: < 15 minutes
- 5.

Summary-Accounts

Account Best Practices – Summary

- Operate multiple accounts using [Organizations](#)
 - Use [SCP](#) (service control policies) to restrict account power
 - Easily setup multiple accounts with best-practices with [AWS Control Tower](#)
 - [Use Tags & Cost Allocation Tags](#) for easy management & billing
 - [IAM guidelines](#): MFA, least-privilege, password policy, password rotation
 - [Config](#) to record all resources configurations & compliance over time
 - [CloudFormation](#) to deploy stacks across accounts and regions
 - [Trusted Advisor](#) to get insights, Support Plan adapted to your needs
 - Send Service Logs and Access Logs to S3 or [CloudWatch Logs](#)
 - [CloudTrail](#) to record API calls made within your account
 - If your Account is compromised: change the root password, delete and rotate all passwords / keys, contact the AWS support
1. • Allow users to create pre-defined stacks defined by admins using [AWS Service Catalog](#)

Summary-Billing

Billing and Costing Tools – Summary

- [Compute Optimizer](#): recommends resources' configurations to reduce cost
- [Pricing Calculator](#): cost of services on AWS
- [Billing Dashboard](#): high level overview + free tier dashboard
- [Cost Allocation Tags](#): tag resources to create detailed reports
- [Cost and Usage Reports](#): most comprehensive billing dataset
- [Cost Explorer](#): View current usage (detailed) and forecast usage
- [Billing Alarms](#): in us-east-1 – track overall and per-service billing
- [Budgets](#): more advanced – track usage, costs, RI, and get alerts
- [Savings Plans](#): easy way to save based on long-term usage of AWS
- [Cost Anomaly Detection](#): detect unusual spends using Machine Learning

- 1.

