

Notes part 2

Module 1: Introduction to AWS

- What is cloud computing?
 - Access services on demand
 - Avoid large upfront investments
 - Provision computing resources as needed
 - Pay for only what you use
- Cloud based deployment
 - Run all parts of app in the cloud
 - Migrate existing applications to the cloud
 - Design and build new applications in the cloud
- On premises deployment
 - Use virtualization and resource management tools to deploy resources
 - Use application management and virtualization technologies to increase resource usage
 - Also known as private cloud deployment
- Hybrid deployment
 - Connect cloud-based resources to on-premises infrastructure
 - Integrate cloud-based resources with legacy IT applications
- Cloud computing benefits
 - Variable expenses
 - Pay only for what you use
 - Capacity
 - Economies of scale
 - Pay higher prices based on only your own usage
 - Benefit from customers aggregated usage
 - Speed and agility
 - Minutes between wanting resources and having resources
 - Global in minutes
 - Quickly deploy apps worldwide
 - AWS global infrastructure
- Core services
 - Compute networking and content delivery
 - Storage
 - Database
 - Security, identity and compliance
 - Management and governance

Module 2: Compute in the cloud

- How EC2 works
 - Launch an instance
 - Connect to the instance
 - Use the instance
- AMI
 - Amazon machine image
- EC2 Instance types - <https://aws.amazon.com/ec2/instance-types/>
 - General purpose
 - Balances compute, memory, and networking resources
 - Suitable for a broad range of workloads
 - Compute optimized
 - Offers high-performance processors
 - Ideal for compute-intensive applications and batch processing workloads
 - Memory optimized
 - Delivers fast performance for memory-intensive workloads
 - Well suited for high-performance databases
 - Accelerated computing
 - Uses hardware accelerators to expedite data processing
 - Ideal for application streaming and graphics workloads
 - Storage optimized
 - Offers low latency and high i/o operations per second (IOPS)
 - Suitable for workloads such as distributed file systems and data warehousing applications
- EC2 pricing options - <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/instance-purchasing-options.html>
 - On-demand
 - No upfront costs or minimum contracts
 - Ideal for short-term irregular workloads
 - Testing/development
 - Better for no interruptions
 - Spot
 - Ideal for workloads with flexible start and end times
 - Offers savings over On-demand prices
 - Better for interruptions
 - Up to 90% off
 - Reserved
 - Provides a billing discount over on-demand pricing
 - Requires a 1-year or 3-year term commitment
 - Up to 75% off
 - Upfront
 - Partial
 - No upfront
 - Compute savings plan


- Offers up to 66% savings over On-demand costs for a consistent amount of compute usage
 - Require 1-year or 3-year commitment
- EC2 dedicated computing: <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/dedicated-instance.html>
 - Dedicated instance
 - An ec2 instance that runs in a VPC on hardware for a single customer
 - Higher cost compared to standard EC2 instances
 - Dedicated host
 - A physical server with EC2 instance capacity for a single customer
 - Most expensive ec2 option
- EC2 auto scaling
 - Scale capacity as computing requirements change
 - Use dynamic scaling and predictive scaling
 - Also has schedule scaling
 - Auto scaling group
 - 3 parameters: minimum, maximum, and desired
- Elastic load balancing: <https://aws.amazon.com/autoscaling/>
 - Automatically distributes traffic across multiple resources
 - Provides a single point of contact for your auto scaling group
- Amazon Simple notification service
 - Messages are published to topics
 - Subscribers immediately receive messages for their topics
- Amazon simple queue service
 - Send, store, and receive messages
 - Queue messages without require other services to be available
- AWS Lambda
 - Run code without provisioning or managing servers
 - Pay only for compute time while code is running
 - Use other AWS services to automatically trigger code
 - How does it work
 - Upload code to lambda
 - Set code to trigger from an event source
 - Code runs only when triggered
 - Pay only for the compute time you use
- AWS container orchestration services
 - ECS
 - Run and scale containerized applications
 - Use simple api calls to control docker-enabled applications
 - EKS
 - Run and scale kubernetes applications
 - Readily update applications with new features
 - AWS Fargate
 - Run serverless containers with Amazon ECS or EKS

- Pay only for resources you use

Module 3: Global infrastructure and reliability

- Every region has min of 3 AZ
- Points of presence used by content delivery network
 - Points of presence is also known as edge location
- Edge locations
 - Have caches that store temp data that will be used the customers request data
- Selecting a region
 - Compliance with data governance and legal requirements
 - Proximity to customers
 - Available services within a region
 - Pricing
- Availability zones are 10s of miles apart


Perform actions through API requests
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Order a cup of coffee.

Ask for a refill.

Check your rewards balance.

API


Launch an Amazon EC2 instance.

Create a load balancer.

Invoke an AWS Lambda function.

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- Interacting with AWS services
 - Aws management console
 - Aws cli
 - SDKs
- Amazon cloud front
 - A global content delivery service
 - Using a network of edge locations to cache and delivery to customers
- AWS outposts

Extend AWS infrastructure and services to your on-premises data center (correct)

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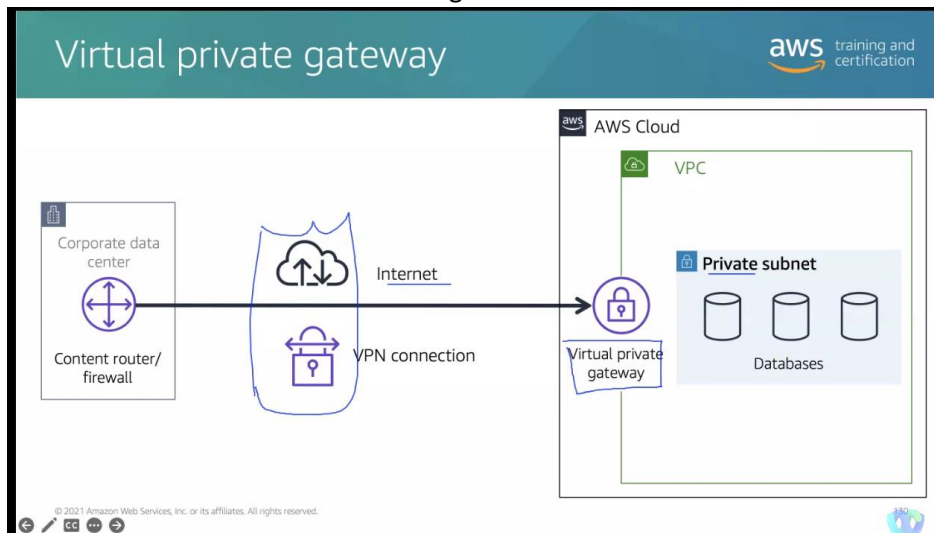
Module 4: Networking

- Amazon VPC
 - Amazon virtual private cloud enables you to launch resources in a virtual network that you define
- Subnet
 - A subnet is a section in a VPC in which you can place groups of isolated resources
 - Subnet can be public or private



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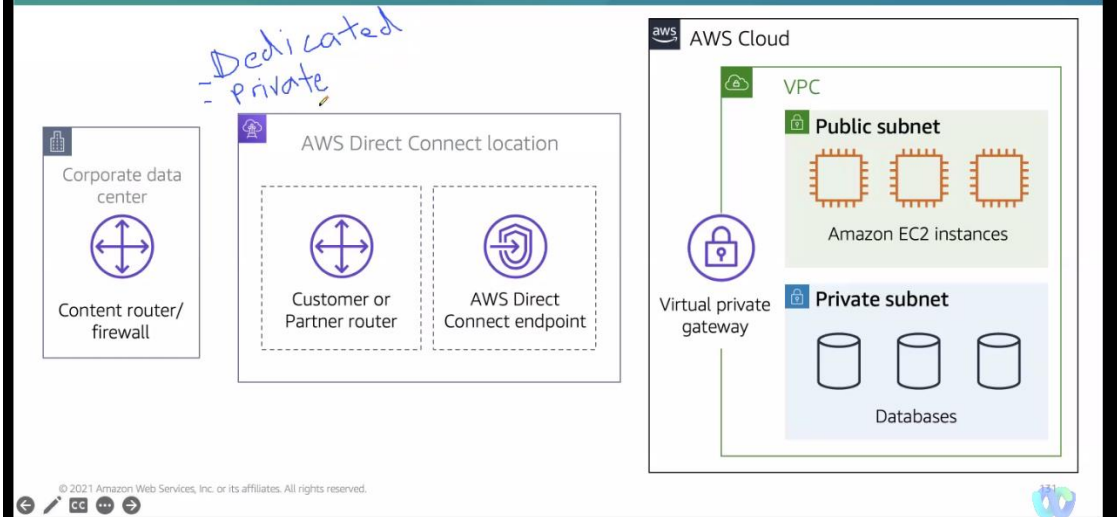
- Subnets can communicate together within a VPC



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AWS Direct Connect

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1. Isolate databases containing customers' personal information

2. Create a VPN connection between the VPC and the internal corporate network

3. Support a customer-facing website

4. Establish a dedicated connection between an on-premises data center and the VPC

A. Public subnet

B. Private subnet

C. Virtual private gateway

D. AWS Direct Connect

Network access control lists

- A network ACL is a virtual firewall for a subnet. By default
 - The default network ACL allows all inbound and outbound traffic
 - Custom network ACLs deny all inbound and outbound traffic

Stateless packet filtering

- Network ACLs perform stateless packet filtering
 - Does not remember the packet
- Before a packet can exit a subnet, it must be checked against the outbound rules

Security group

- Is a virtual firewall for an amazon EC2 instance
- By default, will deny all inbound traffic and allows all outbound traffic
- Performs stateful packet filtering
 - Remembers the packet
- They remember previous decisions that were made for incoming packets

Network ACL	Security Group
passport control	door attendant
stateless	stateful
Default: allows all in/out	Default: allows only out
Custom: denies all in/out	Custom: denies all in/out

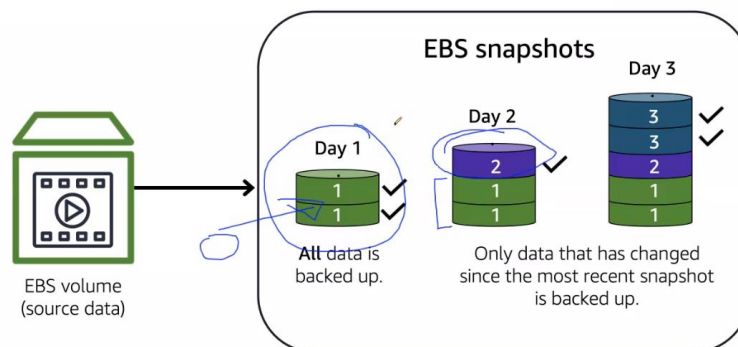
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- Route 53
 - o Route users to internet applications
 - o Connect user requests to infrastructure in AWS and outside of AWS
 - o Manage DNS records for domain names
- Internet gateway allows VPC to connect to the internet
- DNS resolution
 - o Translating domain name to an IP address

Module 5: Storage and databases

- Block storage
 - o Files are separate into equal sized pieces of data
 - o Used for applications that run on EC2 instances
 - o Instance store
 - Provides temp block storage for EC2 instance
 - All data on attached instance store is deleted when EC2 instance is stopped or terminated
 - o Elastic block storage

Amazon EBS snapshots

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- Object storage
 - Each object consists of data, metadata, and a key
 - S3 (simple storage service)
 - Store object in buckets
 - Unlimited storage space
 - Set permissions to control access to objects
 - 1 object must be ≤ 5 TB
 - Choose from a range of storage classes for different use cases
 - S3 standard
 - Designed for frequently accessed data
 - Stores data in a min of 3 availability zones
 - S3 standard – IA
 - Ideal for infrequently accessed data
 - Similar to S3 standard but has lower storage price and higher retrieval price
 - Same level of availability as s3
 - S3 one zone – IA
 - Stores data in a single availability zone
 - Lower storage price than s3 standard – IA
 - S3 intelligent – tiering
 - Ideal for data with unknown or changing access patterns
 - Requires a small monthly monitoring and automation fee per object
 - S3 glacier
 - Low cost storage designed for data archiving
 - Able to retrieve objects within a few mins to hours
 - S3 glacier deep archive
 - Lowest cost object storage class
 - Able to retrieve objects within 12 hours
- File storage
 - In file storage multiple clients can access data that is stored in shared file folders
 - Elastic file system
 - Store data in a scalable file system
 - Provide data to 1000s of EC2 instances concurrently
 - Store data in and across multiple availability zones
- EBS 1 AZ while EFS 3 AZ +

Relational database

ID	Product name	Size	Price
1	Medium roast ground coffee	12 oz.	\$5.30
2	Dark roast ground coffee	20 oz.	\$9.27

Nonrelational database

Key	Value
1	Name: John Doe Address: 123 Any Street Favorite drink: Medium latte
2	Name: Mary Major Address: 100 Main Street Birthday: July 5, 1994

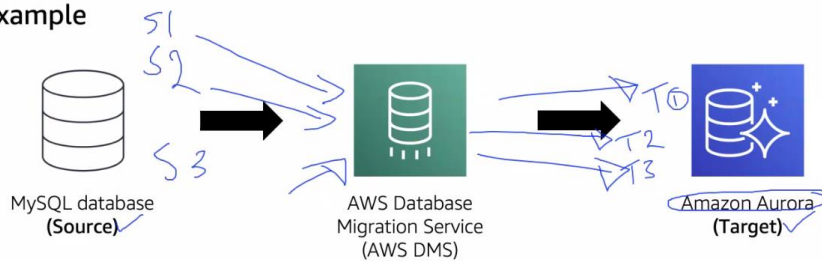
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- Relation databases
 - o Data is stored in a way that relates it to other pieces of data
 - o Uses SQL to store and query data
 - o AWS RDS
 - Operate and scale a relational database in the AWS cloud
 - Automate time-consuming administrative tasks
 - Store and transmit data securely
 - o Aurora
 - Store data in an enterprise class relational database
 - Reduce database costs by eliminating unnecessary I/O operations
 - Replicate 6 copies of data across 3 availability zones
- Non-relational databases
 - o Uses structures other than rows and columns to organize data
 - o With key-value pairs
 - o Data is organized into items (keys), and items have attributes (values)
 - o DynamoDB
 - Serverless key-value database
 - Automatically scales to adjust for capacity changes and maintain consistent performance
 - Designed to handle over 10 trillion requests per day

AWS Database Migration Service






Migrate relational databases, nonrelational databases, and other types of data stores

Example



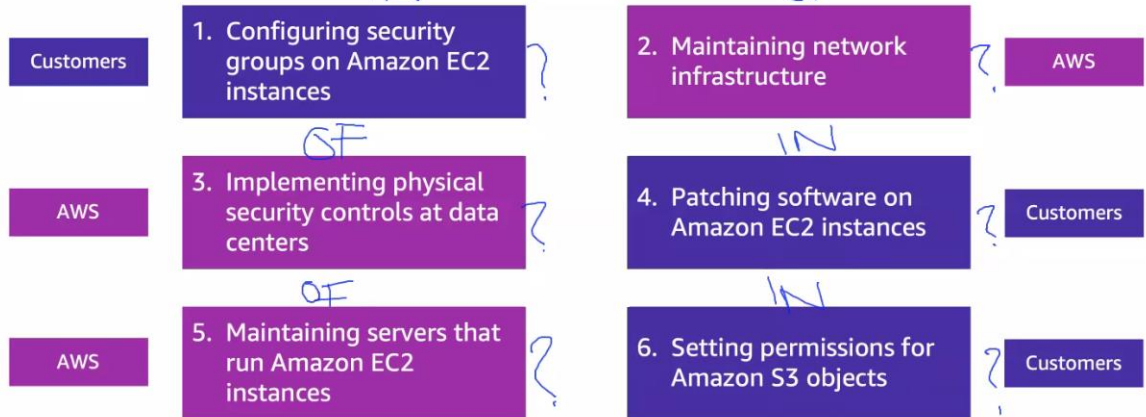
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- Additional database services
 - Redshift
 - Query and analyze data across a data warehouse
 - Used for big data analytics
 - Document DB
 - Run mongo DB workloads in a document database service
 - Neptune
 - Run applications that use highly connected datasets
 - QLDB
 - Review a complete history of changes to your application data
 - Managed blockchain
 - Run a decentralized ledger database
 - ElastiCache
 - Add caching layers to improve database read times
 - DynamoDB accelerator
 - Improve dynamo DB response times from single-digit milliseconds to microseconds

Module 6: Security

Review: Shared responsibility model

Are these tasks the responsibilities of AWS or customers?



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<https://docs.aws.amazon.com/IAM/latest/UserGuide/best-practices.html>



Which statement describes an IAM policy?
HR

- A. An authentication process that provides an extra layer of protection for your AWS account
- B. A document that grants or denies permissions to AWS services and resources (correct)

An employee requires temporary access to create several Amazon S3 buckets. Which option should be used for this task?

- A. AWS account root user
- B. IAM group
- C. IAM role (correct)

Which service helps protect your applications against distributed denial of service (DDoS) attacks?

- A. Amazon GuardDuty
- B. Amazon Inspector
- C. AWS Artifact
- D. AWS Shield (correct)

Which task can AWS Key Management Service (AWS KMS) perform?

- A. Configure multi-factor authentication (MFA)
- B. Update the AWS account root user password
- C. Create cryptographic keys (correct)
- D. Assign permissions to users and groups

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Which actions can you perform using Amazon CloudWatch? (Select TWO.)

- A. Monitor your resources' usage and performance (correct)
- B. Receive real-time guidance for improving your AWS environment
- C. Compare your infrastructure to AWS best practices in five categories
- D. Access metrics from a single dashboard (correct)
- E. Automatically detect unusual account activity

Which service can you use to review the security of your Amazon S3 buckets by checking for open access permissions?

- A. Amazon CloudWatch
- B. AWS CloudTrail
- C. **AWS Trusted Advisor (correct)**
- D. Amazon GuardDuty

Which categories are included in the AWS Trusted Advisor dashboard? (Select TWO.)

- A. Reliability
- B. **Performance (correct)**
- C. Scalability
- D. Elasticity
- E. **Fault tolerance (correct)**

Module 8: Pricing and support

- <https://calculator.aws/#/>
- <https://aws.amazon.com/premiumsupport/pricing/>
- <https://aws.amazon.com/marketplace>

Which action can a customer perform with consolidated billing?

- A. Review how much cost predicted AWS usage will incur by the end of the month
- B. Create an estimate for the cost of use cases on AWS
- C. Combine usage across accounts to receive volume pricing discounts (correct)
- D. Visualize and manage AWS costs and usage over time

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Which pricing tool is used to visualize, understand, and manage your AWS costs and usage over time?

- A. AWS Pricing Calculator
- B. AWS Budgets
- C. AWS Cost Explorer (correct)
- D. AWS Free Tier

A company wants to receive support from an AWS Technical Account Manager (TAM). Which support plan should they choose?

- A. Developer
- B. Basic
- C. Enterprise (correct)
- D. Business

Which service or resource is used to find third-party software that runs on AWS?

- A. AWS Marketplace (correct)
- B. AWS Free Tier
- C. AWS Support
- D. Billing dashboard in the AWS Management Console

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Module 9: Migration and Innovation

- <https://aws.amazon.com/professional-services/CAF/>

Which AWS Cloud Adoption Framework perspective helps you structure the selection and implementation of permissions?

- A. Governance perspective
- B. Security perspective (correct)
- C. Operations perspective
- D. Business perspective

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Which strategies are included in the six strategies for application migration? (Select TWO.)

- A. Revisiting
- B. Retaining (correct)
- C. Remembering
- D. Redeveloping
- E. Rehosting (correct)

What is the storage capacity of AWS Snowmobile?

- A. 40 PB
- B. 60 PB
- C. 80 PB
- D. 100 PB (correct)

What is the storage capacity of Snowball Edge Storage Optimized?

- A. 40 TB
- B. 60 TB
- C. 80 TB (correct)
- D. 100 TB

Which AWS Well-Architected Framework pillar includes the ability to recover from infrastructure or service disruptions?

- A. Cost optimization
- B. Operational excellence
- C. Performance efficiency
- D. Reliability (correct)

<i>Domain</i>	<i>% of Exam</i>
Domain 1: Cloud Concepts	26%
Domain 2: Security and Compliance	25%
Domain 3: Technology	33%
Domain 4: Billing and Pricing	16%
Total	100%

- Learn more at: <https://aws.amazon.com/certification/certified-cloud-practitioner>
- Basic understanding of IT services
- At least 6 months experience with the AWS cloud
- 1hr 30mins
- 700/1000 to pass
- Multiple choice and multiple response
- https://aws.amazon.com/certification/policies/before-testing/#Scheduling_Exams
- No penalty for guessing
- https://aws.amazon.com/certification/policies/before-testing/#Scheduling_Exams
-