AWS DATA MIGRATION SERVICES

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1. Data Migration Challenges:
    - Data migration into and out of AWS presents challenges such as speed, security, and practicality, especially for large datasets.
2. Overview of Snow Family:
    - The Snow Family comprises secure appliances for petabyte-scale data collection, processing, and migration.
    - Members include Snowcone, Snowball Edge, and Snowmobile, offering varying storage capacities and computing capabilities.
3. Snowcone:
    - Provides 8 TB storage, 4 GB memory, and 2 vCPUs.
    - Designed for edge computing environments with space and power constraints.
    - Ideal for IoT sensor integration and processing data onsite before shipping back to AWS.
4. Snowball Edge:
    - Offers between 48 TB and 81 TB storage.
    - Viable for applications requiring more storage and compute power than Snowcone.
    - Suitable for one-time migrations, edge computing scenarios, and environments with limited connectivity.
5. Snowmobile:
    - A semi-truck-sized device offering 100 PB storage.
    - Designed for exabyte-scale data center migrations.
    - Rarely needed for the exam but good to know about.
6. Exam Tips:
    - Understand the use cases and capabilities of each Snow Family member.
    - Snowball Edge is commonly used for data migrations.
    - Snowcone is suitable for edge computing and constrained environments.
    - Snowmobile is for extremely large-scale data migrations.
    - All Snow Family devices work bidirectionally, enabling data transfer into and out of AWS.
    - Shipping time for Snow devices typically takes about a week, depending on usage and data transfer.
7. Additional Note:
    - General tips for exam preparation include understanding the need for physical data transfer, considering restrictions like slow internet or encryption requirements, and being familiar with the typical storage capacities and use cases of Snow devices.

1. Introduction to Storage Gateway:
    - Hybrid cloud storage service merging on-prem resources with AWS.
    - Useful for lift and shift migrations or long-term architecture pairings.
2. Flavors of Storage Gateway:
    - File Gateway:
        - Provides NFS or SMB mount for network file shares.
        - Data backed up to S3, with options for caching recently used files.
        - Common solution for extending on-prem storage into the cloud.
    - Volume Gateway:
        - iSCSI mount for backing up VM disks to S3.
        - Allows easy migration of on-prem volumes to AWS EBS volumes.
    - Tape Gateway:
        - Eliminates physical tape backups by simulating tape storage on-prem.

    - Data stored in AWS, compatible with existing backup workflows.
3. Exam Tips:
    - Understand the hybrid nature and migration capabilities of Storage Gateway.
    - Identify scenarios where each version of Storage Gateway is appropriate.
    - Focus primarily on File Gateway and Volume Gateway for exam preparation.
    - High-level understanding of use cases is sufficient; detailed configuration not required.
4. General Considerations:
    - Storage Gateway helps bridge the gap between on-premises and cloud storage.
    - Choose the appropriate solution based on storage needs and migration requirements.
    - File Gateway commonly used for extending on-prem storage into AWS.
    - Volume Gateway facilitates easy migration of on-prem VM volumes to AWS EBS.
    - Tape Gateway eliminates physical tape backups, integrating seamlessly with existing workflows.
5. Additional Note:
    - Mention of nitrogen filling car tires as a side tip, unrelated to Storage Gateway.

1. Introduction to DataSync:
    - DataSync is an agent-based solution for migrating on-premises storage to AWS.
    - It facilitates easy movement of data between NFS and SMB shares into the cloud.
    - Primarily used for one-time migrations from on-premises storage to AWS.
2. Configuration and Setup:
    - Install and set up the DataSync agent on the on-prem server.
    - Configure DataSync to specify the destination for the data transfer, which can be S3, EFS, or FSx.
    - The data transfer is encrypted for secure transmission over the internet.
3. Exam Tips:
    - Understand the distinction between DataSync and Storage Gateway.
    - DataSync is suitable for one-time migrations, while Storage Gateway is better for continuous setups or hybrid architectures.
    - Recognize that DataSync requires installation of an agent and supports transfer to S3, EFS, and FSx.
    - Focus on high-level understanding for the exam; detailed configuration and troubleshooting are unlikely to be tested.

1. Introduction to Transfer Family:
    - The Transfer Family enables easy file movement to and from S3 or EFS using SFTP, FTPS, or FTP protocols.
    - Designed for legacy applications still using these protocols, which are aging out of common use.
2. Implementation Example:
    - Transfer Family is beneficial for scenarios where legacy applications, such as those in hospitals, utilize SFTP to upload data.
    - Allows migration to AWS without altering the existing code or applications.
    - Endpoints can be swapped to trick applications into reading and writing data from S3 or EFS while maintaining the same legacy endpoint.
3. Exam Tips:
    - Transfer Family is ideal for scenarios involving legacy applications and FTP-related protocols.
    - Supports SFTP and FTPS from outside of AWS into S3 and EFS, and FTP internally within the VPC for security reasons.
    - DNS entries remain the same, with the technology behind the endpoint being

swapped to S3 or EFS using Transfer Family.
- Focus on high-level understanding for the exam, as detailed configuration and troubleshooting are less likely to be tested.
- Recognize that Transfer Family may appear as a distractor on the exam, so understanding its use case is important.

1. AWS Migration Hub Overview:
   - AWS Migration Hub provides a centralized platform to track the progress of application migrations to AWS.
   - It integrates with services like Server Migration Service (SMS) and Database Migration Service (DMS) to manage and monitor migrations efficiently.
   - Helps organize, schedule, and record migrations.
2. Server Migration Service (SMS):
   - SMS facilitates migrating on-premises VMware architecture to AWS.
   - It schedules snapshots of vSphere volumes, converts them to EBS snapshots, and creates AMIs, allowing VMware architectures to become AMIs in AWS.
   - Enables seamless migration without rebuilding from scratch.
3. Database Migration Service (DMS):
   - DMS migrates databases to AWS, including Oracle and SQL Server databases to Amazon Aurora.
   - Utilizes the Schema Conversion Tool to convert database schemas.
   - Supports migration from various sources like on-premises, RDS, or EC2 instances.
4. AWS Migration Hub Console:
   - Offers a step-by-step process including discovery, migration, and tracking of migration status.
   - Features tools like the Discovery Agent and Discovery Connector to collect data from VMs and VMware vCenter.
   - Integrates with SMS and DMS for migration tasks.
5. Exam Tips:
   - Understand the high-level purpose of Migration Hub, SMS, and DMS for migration scenarios.
   - DMS is essential for database migrations, especially from Oracle and SQL Server to Aurora.
   - SMS is useful for migrating VMware architectures to AWS without rebuilding.
   - Consider isolating IoT devices on a separate network for security reasons.
6. General Advice:
   - Recognize that on the exam, these services might seem simpler than real-world implementations.
   - Focus on understanding the overview and use cases rather than detailed configurations.
   - Prepare to favor scenarios where everything migrates to AWS for the exam context.

   Overall, AWS Migration Hub and its associated services offer powerful tools for efficiently managing and executing migrations to AWS, simplifying the process for organizations transitioning to the cloud.

1. AWS Application Discovery Service (ADS):
   - ADS helps plan migrations to AWS by collecting usage and configuration data about on-premises servers.
   - Integrates with AWS Migration Hub for simplified migration tracking and management.
   - Allows tracking of discovered servers, grouping by application, and monitoring migration progress.
2. Discovery Types in ADS:

- Agentless Discovery: Utilizes an OVA file deployed in VMware vCenter to collect data about hosts and VMs, including IP addresses, resource allocations, and utilization metrics.
- Agent-Based Discovery: Requires installing an agent on each VM and physical server to collect static config data, performance information, network connections, and OS processes.

3. AWS Application Migration Service (MGN):
   - Also known as AWS MGN, it offers an automated lift-and-shift service for migrating applications to AWS.
   - Replicates source servers (VMs, physical servers, or cloud servers) into AWS for seamless migration without disruptions.
   - Key features include Recovery Time Objective (RTO) and Recovery Point Objective (RPO), with RTO measured in minutes (dependent on OS boot time) and RPO measured in sub-seconds.
4. Exam Tips:
   - Understand the purpose of ADS for planning migrations and its integration with Migration Hub.
   - Know the two types of discovery in ADS: Agentless and Agent-Based, and their respective capabilities.
   - Recognize AWS MGN as an automated lift-and-shift service for migrating infrastructure to AWS.
   - Remember the key features of MGN: replication of source servers and the importance of RTO and RPO in migration scenarios.

   Overall, both AWS ADS and AWS MGN play crucial roles in simplifying and automating the migration process to AWS, offering features that facilitate efficient planning, discovery, and execution of migrations for various types of workloads.

1. Overview of AWS DMS:
   - DMS is a migration tool for easily migrating various types of databases to AWS.
   - It supports relational databases, data warehouses, NoSQL databases, etc.
   - Migration can be one-time or continuous, with ongoing replication to keep source and target databases in sync.
   - At least one endpoint (source or target) must be within AWS.
2. Working of AWS DMS:
   - DMS operates by creating source and target connections and scheduling tasks for data migration.
   - It automatically creates tables and primary keys on the target if they don't exist.
   - The Schema Conversion Tool (SCT) is used to convert schemas from one engine type to another.
3. Important Concepts:
   - Migrations can be within the same engine type or between different engine types.
   - One endpoint must be within AWS for DMS to work.
   - SCT is used to convert schemas for migration between different engine types.
4. AWS Schema Conversion Tool (SCT):
   - SCT converts database schemas from one engine type to another.
   - It supports various relational databases, data warehouses, and targets like Amazon RDS, Aurora, Redshift, etc.
   - Converted schemas can be used with databases on EC2 or data stored in S3.
5. Migration Types:
   - Full Load: Migrates all existing data from source to target.
   - Full Load with Change Data Capture (CDC): Migrates all data and captures ongoing changes.
   - CDC-only: Replicates only data changes occurring in the source database.
6. Migrating Large Data Stores via Snowball:
   - Snowball devices can be used for migrating terabytes or petabytes of data to AWS.
   - AWS DMS can be used with Snowball devices for efficient data migration, including

change data capture.

7. Exam Tips:
    - Understand the purpose and capabilities of AWS DMS.
    - Know the different migration types and when to use each.
    - Recognize the importance of at least one endpoint residing in AWS.
    - Familiarize yourself with the AWS Schema Conversion Tool and its use cases.
    - Consider using Snowball for migrating large data sets efficiently.

Overall, AWS DMS and related tools offer a comprehensive solution for migrating databases to AWS, ensuring data integrity, flexibility, and efficiency throughout the migration process.

Understanding the Migration Scenario:

- Identify the source and destination of the migration (e.g., on-premises to AWS, AWS to on-premises, between cloud vendors, or to a third-party SaaS).
- Determine the migration approach (bulk upload with Snowball, database migration with DMS, incremental migration, or partial migration).

AWS Snow Family:

- Snowball is ideal for moving large amounts of data when internet bandwidth is limited or unreliable.
- Understand the use cases for Snowcone and Snowmobile, although Snowball is likely to be more prominent in the exam.

Storage Gateway:

- Consider the hybrid approach when dealing with on-premises storage.
- File Gateway is suitable for scenarios where on-premises storage is full.
- Storage Gateway runs as a VM on-premises, facilitating integration with local infrastructure.

DataSync and Transfer Family:

- DataSync is suitable for one-time migration of file shares into AWS.
- EFS and FSx are potential destinations for DataSync transfers.
- The Transfer Family enables legacy file transfer protocols (e.g., SFTP) to interact with S3.

Migration Hub:

- Migration Hub provides organizational tools for tracking migration progress but requires other tools to complete the migration.

Database Migration Service (DMS):

- DMS facilitates database migrations, including on-premises to the cloud and migration between RDS databases.
- It includes the AWS Schema Conversion Tool for schema conversion.

Server Migration Service (SMS):

- SMS is used for migrating VMs out of data centers and into AWS.

Application Discovery Service:

- Agentless and agent-based discovery methods are available for collecting detailed information about VMs.

Application Migration Service (AWS MGN):

- AWS MGN automates the lift-and-shift migration process for infrastructure, including VMs and physical servers, with minimal downtime and fast recovery times.

By understanding these migration tools and strategies, you'll be well-prepared to tackle migration-related questions on the exam. Make sure to refer to AWS documentation for more in-depth information on each service. Take a break, refresh, and when you're ready, proceed to the next section of your studies. Good luck!

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