1. An Internet-facing multi-tier web application must be highly available. An ELB Classic Load Balancer is deployed in front of the web tier. Amazon EC2 instances at the web application tier are deployed evenly across two Availability Zones. The database is deployed using RDS Multi-AZ. A NAT instance is launched for Amazon  
EC2 instances and database resources to access the Internet. These instances are not assigned with public IP addresses.  
Which component poses a potential single point of failure in this architecture?

A. Amazon EC2

B. NAT instance

C. ELB Classic Load Balancer

D. Amazon RDS

Answer : B

Explanation

일반적으로 보면 ELB가 장애가 나면 그 밑에 티어들에 대해 접근이 불가하다. 그러나 문제에서는 Multi-AZ에 구성이 되어있다. Multi-AZ에서 작동하는 ELB가 보기에는 하나로 보이지만, 각 ZONE마다 하나의 ELB들이 논리적으로 구성되어있는 형태를 띈다. 그래서 ELB를 single point of failure라고 언급하지 않는다.(추가 : 알아서 장애 해결일 경우는 위에 해당하지 않는다.)

Reference

[stackoverflow.com/questions/46698011/are-amazon-elastic-load-balancer-elb-failure-proof](https://stackoverflow.com/questions/46698011/are-amazon-elastic-load-balancer-elb-failure-proof)

2. A call center application consists of a three-tier application using Auto Scaling groups to automatically scale resources as needed. Users report that every morning at 9:00 AM the system becomes very slow for about 15 minutes. A Solution Architect determines that a large percentage of the call center staff starts work at 9:00  
AM, so Auto Scaling does not have enough time to scale out to meet demand.  
How can the Architect fix the problem?

A. Change the Auto Scaling group’s scale out event to scale based on network utilization.

B. Create an Auto Scaling scheduled action to scale out the necessary resources at 8:30AM every morning.

C. Use Reserved Instance to ensure the system has reserved the right amount of capacity for the scale-up events.

D. Permanently keep a steady state of instances that is needed at 9:00AM to guarantee available resources, but leverage Spot Instance

Answer : B

Explanation

대부분의 콜센터 직원이 9:00시에 일을 시작하면서 시스템이 매우 느려진다고 한다. 이 경우 Auto Scaling을 통해 문제를 해결 할 수 있다. 이 점에서 답이 A와 B가 될 수 있지만, 현재 이 문제에서는 Network Traffic으로 인해 발생되는 문제인지 알 수 없다. 그러므로 보다 정확한 B가 적절하다.

3. An e-commerce application is hosted in AWS. The last time a new product was launched, the application experienced a performance issue due to an enormous spike in traffic. Management decided that capacity must be doubled the week after the product is launched.  
Which is the MOST efficient way for management to ensure that capacity requirements are met?

A. Add a Step Scaling policy.

B. Add a Dynamic Scaling policy.

C. Add a Scheduled action.

D. Add Amazon Ec2 Spot Instance.

Answer : B

Explanation

Traffic이 급증하여 제품을 출시하고 그 다음주 까지 용량을 2배로 늘리겠다고 Management가 결정했다. “그 다음주”라는 키워드 때문에 C라고 생각 할 수도 있지만, Dynamic Scaling Policy를 통해 최소 용량을 선택 할 수 있기 때문에 2배로 늘리는 것도 만족 할 수 있고 2배의 용량을 뛰어넘는 traffic상황에서도 대처할 수 있기 때문에 B가 적절하다.

Reference : docs.aws.amazon.com/ko\_kr/autoscaling/ec2/userguide/as-scale-based-on-demand.html

4. A customer owns a simple API for their website that receives about 1,000 requests each day and has an average response time of 50 ms. It is currently hosted on one c4.large instance.  
Which changes to the architecture will provide high availability at the LOWEST cost?

A. Create an Auto Scaling group with a minimum of one instane and a maximum of two instances, then use an Application Load Balancer to balance the traffic.

B. Recreate API using Amazon API Gateway and use AWS Lambda as the service backend.

C. Create an Auto Scaling group ith a maximum of two instances,then use an Application Load Balancer to balance the traffic

D. Recreate the API using Amaozn API Gateway and integrate the new with the existing backend service.

Answer : B

Explanation

위 질문 리스트 중 고가용성을 보장하는 것은 serverless 한 lambda와 api를 통해 요청을 처리하는 것이다.

Reference : docs.aws.amazon.com/ko\_kr/lambda/latest/dg/welcome.html

5. A Solution Architect is designing an application that uses Amazon EBS volumes. The volumes must be backed up to a different region.  
How should the Architect meet this requirement?

A. Create EBS snapshots directly from one region to another.

B. Move the data to an Amazon Se bucket and enable cross-region replication.

C. Create EBS snapshots and then copy them to the desired region.

D. Use a script to copy data from the current Amazon EBS volume to the destination Amazon EBS volume.

Answer : B

Explanation

스냅샷을 다른 region에서 쓰게 하기 위해서는 해당 instance에서 스냅샷을 생성한 다음, 그 스냅샷을 다른 region으로 복사하여야 한다. S3는 단순 AMI(Amazon Machine Image)를 저장 할 수 있고, instance의 상태까지 복사 할 수 있는 snapshot는 지원하지 않는다. 그러므로 위 문제에서 요구한 Volume이 backup되어야하는 부분을 만족하는 것은 C이다.

Reference

docs.aws.amazon.com/ko\_kr/AWSEC2/latest/UserGuide/ebs-modifying-snapshot-permissions.html

6. A company is using an Amazon S3 bucket located in us-west-2 to serve videos to their customers. Their customers are located all around the world and the videos are requested a lot during peak hours. Customers in Europe complain about experiencing slow downloaded speeds, and during peak hours, customers in all locations report experiencing HTTP 500 errors.  
What can a Solutions Architect do to address these issues?

A. Place an elastic load balancer in front of the Amazon S3 bucket to distribute the load during peak hours

B. Cache the web content with Amazon CloudFront and use all Edge locations for content delivery.

C. Replicate the bucket in EU-west-1 and sue an Amazon Route 53 failover routing policy to determine which bucket it should serve the request to.

D. Use an Amazon Route 53 weighted routing policy for the CloudFront domain name to distribute the GET request between CloudFront and the Amazon S3 bucket directly.

Answer : B

Explanation

전 세계의 사용자가 비디오를 us-west-2에 위치한 S3 bucket에서 다운받고있다. 한 자원을 다양한 region의 사람들이 접근하므로 그만큼 부하가 걸릴 수 밖에 없다. 이를 CloudFront를 사용하여 캐싱서버를 구현하게 되면, 각 사용자들의 가까운 Edge-Location에서 요청을 처리 할 수 있기 때문에 위의 error 상황을 해결 할 수 있다.

Reference : docs.aws.amazon.com/ko\_kr/AmazonCloudFront/latest/DeveloperGuide/Introduction.html

7. A Solutions Architect is designing a solution that includes a managed VPN connection.  
To monitor whether the VPN connection is up or down, the Architect should use:

A. an external service to ping the VPN end point from outside the VPC

B. AWS CloudTrail to monitor the endpoint

C. the CloudWatch TunnelState Metric.

D. an AWS Lambda function that parses the VPN connection logs.

Answer : C

Explanation

A같은 경우, VPN은 public과 단절이기 때문에 ping을 보내든 안보내든 무응답이다. Cloudtrail는 api 호출 관련 이벤트를 처리하는 서비스이고, lambda는 지원하지 않는다.

Reference : docs.aws.amazon.com/ko\_kr/vpn/latest/clientvpn-admin/monitoring-overview.html

8. A social networking portal experiences latency and throughput issues due to an increased number of users. Application servers use very large datasets from an  
Amazon RDS database, which creates a performance bottleneck on the database.  
Which AWS service should be used to improve performance?

A. Auto Scaling

B. Amazon SQS

C. Amaozn ElastiCache

D. ELB Application Load Balancer

Answer : C

Explanation

Auto Scaling은 퍼포먼스 이슈보다는 고가용성을 해결하는 솔루션이다. SQS는 요청의 내구성과 안정성을 보장하는 서비스이며, ELB도 고가용성을 위한 솔루션이다. ElastiCache를 이용하여 In-memory cache환경을 구축하여 자주 사용하는 요청에 대해 캐시응답을 제공함으로써 퍼포먼스를 향상 시킬 수 있다.

Reference : docs.aws.amazon.com/AmazonElastiCache/latest/mem-ug/elasticache-use-cases.html

9. A Solutions Architect is designing network architecture for an application that has compliance requirements. The application will be hosted on Amazon EC2 instances in a private subnet and will be using Amazon S3 for storing data. The compliance requirements mandate that the data cannot traverse the public Internet.  
What is the MOST secure way to satisfy this requirement?

A. Use a NAT Instance

B. Use a NAT Gateway

C. Use a VPC endpoint

D. Use a Virtual Private Gateway.

Answer : C

Explanation

통상적으로 내부 자원을 보호하기 위해서 모두 퍼블릭으로 처리하는 것이 아니라 VPC를 구성하여 보호해야 할 자원들은 private subnet을 구성하여 보안을 향상시킨다. 이 private subnet과 안전하게 외부 자원에 대해 통신을 할 때 vpc endpoint를 이용하면 고가용성과 secure connection을 보장한다.

Reference : aws.amazon.com/ko/blogs/aws/new-vpc-endpoint-for-amazon-s3/

10. A Solutions Architect is designing a photo application on AWS. Every time a user uploads a photo to Amazon S3, the Architect must insert a new item to a DynamoDB table.  
Which AWS-managed service is the BEST fit to insert the item?

A. Lambda@Edge

B. AWS Lambda

C. Amazon API Gateway

D. Amazon Ec2 instance.

Answer : A

Explanation

Lambda@Edge는 lambda를 확장하여 lambda요청을 각 cloudfront상으로 처리 할 수 있게 해주는 서비스이다. Lambda와 기능적으로는 차이가 없지만, cloudfront를 이용하여 빠른 처리를 제공하는데 있어서 더 유리하다.

Reference

aws.amazon.com/ko/lambda/features/

docs.aws.amazon.com/ko\_kr/AmazonCloudFront/latest/DeveloperGuide/lambda-at-the-edge.html

11. An application relies on messages being sent and received in order. The volume will never exceed more than 300 transactions each second.  
Which service should be used?

A. Amazon SQS

B. Amazon SNS

C. Amazon ECS

D. Amazon STS

Answer : A

Explanation

Amazon SQS서비스를 통하여 안정성을 보장한 transaction을 수행할 수 있다. SQS 대기열 방식은 크게 2가지가 있다.

Standard Queue(표준 대기열) : 처리량이 중요한 application에 최적화

* 거의 무제한에 가까운 TPS를 제공
* 메시지가 최소 1번 전달되며, 가금 2개 이상의 메시지 복사본이 전달되는 경우가 있음.
* 메시지 순서와 다르게 전달 될 수 있음.

FIFO Queue : 이벤트 순서가 중요한 application에 최적화

* 일괄 처리를 통해 초당 최대 3000개의 메시지 지원
* 메시지가 한번 전달되고 consumer가 한번 처리할 때 까지 유지된다. 중복항목은 없음.
* 메시지가 전송되고 수신되는 순서가 엄격함.

“Being sent and received in order”의 문구를 참조하면 FIFO Queue를 사용하면 가장 적절할 것이다.

12. A Solutions Architect is designing an application on AWS that uses persistent block storage. Data must be encrypted at rest.  
Which solution meets the requirement?

A. Enable SSL on Amazon EC2 instances.

B. Encrypt Amazon EBS volumes on Amazon EC2 instances.

C. Enable server-side encryption on Amazon S3.

D. Encrypt Amazon EC2 Instance Storage.

Answer : B

Explanation

암호화 되어서 저장되어야 하고 persistent block storage임을 모두 만족하는 것은 B가 유일하다. D의 경우, 휘발성이기 때문에 persistent하지 못하다. SSL과 server-side encryption만으로 데이터가 유휴 상태일 때 암호화 할 수 없다.

Reference : docs.aws.amazon.com/ko\_kr/AWSEC2/latest/UserGuide/EBSEncryption.html

13. A company is launching a static website using the zone apex (mycompany.com). The company wants to use Amazon Route 53 for DNS.  
Which steps should the company perform to implement a scalable and cost-effective solution? (Choose two.)

A. Host the website on an Amazon EC2 instance with ELB and Auto Scaling, and map a Route 53 alias record to the ELB endpoint.

B. Host the website using AWS Elastic Beanstalk, and map a Route 53 alias record to the Beanstalk stack.

C. Host the website on an Amazon EC2 instance, and map a Route 53 alias record to the public IP endpoint.

D. Serve the website from an Amazon S3 bucket, and map a Route 53 alias record to the website endpoint.

E. Create a Route 53 hosted zone, and set the NS records of the domain to use Route 53 name servers.

Answer : D, E

Explanation

문제에서 static website를 launching한다고 되어있기 때문에, EC2상에 직접 호스팅 하는 것은 비효율 적이다. S3상에다가 static file들을 업로드 하게 되면 그에 맞는 url이 생성되는데, 이를 Route 53을 통해 record와 website endpoint를 alias시켜주면 된다.

S3를 사용하기 때문에 거의 무한정으로 scalable하고, EC2보다 상대적으로 cost-effective하다.

Reference

docs.aws.amazon.com/Route53/latest/DeveloperGuide/CreatingHostedZone.html

docs.aws.amazon.com/Route53/latest/DeveloperGuide/resource-record-sets-choosing-alias-non-alias.html

14. A manufacturing company captures data from machines running at customer sites. Currently, thousands of machines send data every 5 minutes, and this is expected to grow to hundreds of thousands of machines in the near future. The data is logged with the intent to be analyzed in the future as needed.  
What is the SIMPLEST method to store this streaming data at scale?

A. Create an Amazon Kinesis Firehouse delivery stream to store the data in Amazon S3.

B. Create an Auto Scaling group of Amazon EC2 servers behind ELBs to write the data into Amazon RDS.

C. Create an Amazon SQS queue, and have the machines write to the queue.

D. Create an Amazon EC2 server farm behind an ELB to store the data in Amazon EBS Clod HDD Volumes.

Answer : A

Explanation : 기계에서 나오는 실시간 데이터는 정형화 되지 않았기 때문에 RDS의 경우 변환작업을 거쳐야 한다. 그러나 Amazon Kinesis Firehouse같은 경우 데이터를 바로 저장 할 수 있어 RDS보다 상대적으로 작업량이 적어 B보다는 A에 정답이 가깝다.

Reference : docs.aws.amazon.com/ko\_kr/firehose/latest/dev/what-is-this-service.html

15. A bank is writing new software that is heavily dependent upon the database transactions for write consistency. The application will also occasionally generate reports on data in the database, and will do joins across multiple tables. The database must automatically scale as the amount of data grows.  
Which AWS service should be used to run the database?

A. Amazon S3

B. Amazon Aurora

C. Amazon DynamoDB

D. Amazon Redshift

Answer : B

Explanation

위 제품들 중 “automatically scale as the amount of data grows”를 만족하는 것은 Aurora와 DynamoDB,, redshift밖에 없다. S3는 테이블이 존재하지 않기 때문에 제외한다. 문제의 2번째 조건을 보면 “join across multiple tables”가 등장한다. Nosql기반인 DynamoDB와 Redshift는 join처리 능력에서 RDS보다 떨어진다. 그러므로 유일한 RDS인 Aurora가 정답.

16. A Solutions Architect is designing a new application that needs to access data in a different AWS account located within the same region. The data must not be accessed over the Internet.  
Which solution will meet these requirements with the LOWEST cost?

A. Add rules to the security groups in each account.

B. Establish a VPC Peering connection between accounts

C. Configure Direct Connect in each account

D. Add a NAT Gateway to the data account.

Answer : B

Explanation

보통 app은 여러 티어로 구성되어 있기 때문에 VPC로 구성하는게 일반적이다. VPC는 기본적으로 private이기 때문에 다른 외부와 통신이 되지 않는다. 이를 VPC Peering을 통해 가능케 한다.

Reference : docs.aws.amazon.com/ko\_kr/vpc/latest/peering/what-is-vpc-peering.html

17. A Solutions Architect is designing a mobile application that will capture receipt images to track expenses. The Architect wants to store the images on Amazon S3. However, uploading images through the web server will create too much traffic.  
What is the MOST efficient method to store images from a mobile application on Amazon S3?

A. Upload directly to S3 using pre-signed URL.

B. Upload to a second bucket, and have a Lambda event copy the image to the primary bucket.

C. Upload to a separate Auto Scaling group of servers behind an ELB Classic Load Balancer, and have them write to the Amazon S3 bucket.

D. Expand the web server fleet with Spot instance to provide the resources to handle the images.

Answer : A

Explanation

C와 D는 서버 리소스를 사용하는 방식이고, B는 버킷을 불필요하게 하나 더 만드는 작업이다. A는 instance를 사용하지 않고 바로 S3에 올리기 때문에 보다 빠른 속도를 제공한다.

18. A company requires that the source, destination, and protocol of all IP packets be recorded when traversing a private subnet.  
What is the MOST secure and reliable method of accomplishing this goal.

A. Create VPC flow logs on the subnet.

B. Enable source destination check on private Amazon EC2 instances.

C. Enable AWS CloudTrail logging and specify an Amazon S3 bucket for storing log files.

D. Create an Amazon CloudWatch log to capture packet information

Answer : A

Explanation

말이 필요없다 Reference를 참곻자.

Reference

docs.aws.amazon.com/vpc/latest/userguide/flow-logs.html

19. A Solutions Architect has a multi-layer application running in Amazon VPC. The application has an ELB Classic Load Balancer as the front end in a public subnet, and an Amazon EC2-based reverse proxy that performs content-based routing to two backend Amazon EC2 instances hosted in a private subnet. The Architect sees tremendous traffic growth and is concerned that the reverse proxy and current backend set up will be insufficient.  
Which actions should the Architect take to achieve a cost-effective solution that ensures the application automatically scales to meet traffic demand? (Select two.)

A. Replace the Amazon EC2 reverse proxy with an ELB internal Classic Load Balancer.

B. Add Auto Scaling to the Amazon EC2 backend fleet.

C. Add Auto Scaling to the Amazon EC2 reverse proxy layer.

D. Use t2 burstable instance types for the backend fleet.

E. Replace both the front-end and reverse proxy layers with an ELB Application Load Balancer.

Answer : B, E

Explanation

Content-based Routing을 제공하는 ELB는 Application Load Balancer밖에 없다. 현재 reverse proxy는 content-based routing을 제공하고 있는데, 이를 auto-scaling하는 방법도 좋지만, 이를 Application Load Balancer로 교체하는 것이 훨씬 더 비용적인 측면에서 좋다. Backend의 성능을 높이기 위해서 Auto-Scaling을 통해 해결한다.

Reference

aws.amazon.com/ko/blogs/korea/new-advanced-request-routing-for-aws-application-load-balancers/

aws.amazon.com/ko/elasticloadbalancing/features/#compare

20. A company is launching a marketing campaign on their website tomorrow and expects a significant increase in traffic. The website is designed as a multi-tiered web architecture, and the increase in traffic could potentially overwhelm the current design.  
What should a Solutions Architect do to minimize the effects from a potential failure in one or more of the tiers?

A. Migrate the database to Amazon RDS.

B. Set up DNS failover to a statistic website.

C. Use Auto Scaling to keep up with demand.

D. Use both a SQL and a NoSQL database in the region.

Answer : C

Explanation

Auso-scaling 을 통해 자동으로 traffic에 따라 용량을 조절 할 수 있다. 말이 필요없음.

21. A web application experiences high compute costs due to serving a high amount of static web content.  
How should the web server architecture be designed to be the MOST cost-efficient?

A. create an Auto Scaling group to scale out based on average CPU usage.

B. Create an Amazon CloudFront distribution to pull static content from an Amazon S3 bucket

C. Leverage Reserved Instances to add additional capacity at a significantly lower price.

D. Create a multi-region deployment using an Amazon Route 53 geolocation routing policy.

Answer : B

Explanation

S3와 CloudFront를 이용하면 빠르면서도 비용적으로 효율적인 웹컨텐츠를 제공 할 수 있다. Auto Scaling과 RI를 이용하면 그만큼의 인스턴스 비용이 나가고, multi-region역시 그러하다.

Reference

docs.aws.amazon.com/ko\_kr/AmazonCloudFront/latest/DeveloperGuide/Introduction.html

aws.amazon.com/ko/premiumsupport/knowledge-center/cloudfront-https-requests-s3/

22. A Solutions Architect plans to migrate NAT instances to NAT gateway. The Architect has NAT instances with scripts to manage high availability.  
What is the MOST efficient method to achieve similar high availability with NAT gateway?

A. Remove source/destination chech on NAT instances.

B. Launch a NAT gateway in each Avilability Zone.

C. Use a mix of NAT instances and NAT gateway.

D. Add an ELB Application Load Balancer in front of NAT gateway.

Answer : B

Explanation

NAT gateway는 각 AZ에다가 하나씩 생성하는 것이 일반적임.

Reference

docs.aws.amazon.com/ko\_kr/vpc/latest/userguide/vpc-nat-comparison.html