AWS networking interview questions

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1. **What is Amazon VPC and why is it important?**
    - Amazon VPC (Virtual Private Cloud) allows you to create isolated networks within the AWS cloud.
    - It provides control over network configuration, security, and routing.
    - VPC enables you to launch AWS resources in a virtual network that you define.

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2. **Explain the difference between public and private subnets in VPC.**
    - Public subnets have direct access to the internet via an Internet Gateway.
    - Private subnets do not have direct access to the internet and are used for internal resources.
    - Public subnets are typically used for resources that need to be accessible from the internet.

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3. **How does a NAT Gateway work and when would you use it?**
    - NAT Gateway enables instances in a private subnet to connect to the internet or other AWS services without exposing them directly.
    - It is used for outbound internet traffic from private subnets.
    - NAT Gateway helps maintain security by preventing inbound traffic from the internet.

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4. **What is AWS Transit Gateway and what are its benefits?**
    - AWS Transit Gateway connects multiple VPCs and on-premises networks through a central hub.
    - It simplifies network management and reduces complexity.
    - Transit Gateway allows you to scale your network easily as your workloads grow.

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5. **Describe the purpose of Amazon EC2 in networking.**
    - Amazon EC2 provides scalable computing capacity in the cloud.
    - It is used for running applications and services within a VPC.
    - EC2 instances can be configured with various networking options, including public and private IP addresses.

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6. **How do you configure security groups and network ACLs in VPC?**
    - Security groups act as virtual firewalls for instances, controlling inbound and outbound traffic.
    - Network ACLs provide an additional layer of security at the subnet level.

- Security groups are stateful, while network ACLs are stateless.

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7. **What is the difference between security groups and network ACLs?**
    - Security groups are stateful, meaning they remember previous traffic.
    - Network ACLs are stateless, meaning they evaluate each packet independently.
    - Security groups apply at the instance level, while network ACLs apply at the subnet level.

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8. **Explain the concept of VPC peering.**
    - VPC peering allows you to connect two VPCs privately using private IP addresses.
    - It enables resources in different VPCs to communicate with each other.
    - VPC peering does not require an Internet Gateway, VPN connection, or AWS Direct Connect.

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9. **How does AWS Direct Connect enhance network performance?**
    - AWS Direct Connect provides dedicated network connections from your premises to AWS.
    - It offers lower latency, higher bandwidth, and more consistent performance compared to internet-based connections.
    - Direct Connect can reduce your network costs by providing a more predictable data transfer rate.

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10. **What is AWS CloudFront and how does it work?**
    - AWS CloudFront is a content delivery network (CDN) service that speeds up the delivery of web content.
    - It caches content at edge locations around the world for faster access.
    - CloudFront integrates with other AWS services like S3, EC2, and Lambda.

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11. **Describe the role of AWS Route 53 in networking.**
    - AWS Route 53 is a scalable DNS and domain name registration service.
    - It routes end-user requests to infrastructure running in AWS.
    - Route 53 supports health checks to ensure that traffic is routed to healthy endpoints.

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12. **How do you set up a VPN connection in AWS?**
    - You can set up a VPN connection using AWS Site-to-Site VPN or AWS Client VPN.
    - Site-to-Site VPN connects your on-premises network to your VPC.

- Client VPN allows remote users to securely access your AWS resources.

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13. **What is Elastic Load Balancing and why is it used?**

    - Elastic Load Balancing distributes incoming application traffic across multiple targets, such as EC2 instances.
    - It improves application availability and fault tolerance.
    - ELB supports different types of load balancers: Application Load Balancer, Network Load Balancer, and Classic Load Balancer.

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14. **Explain the difference between Application Load Balancer and Network Load Balancer.**

    - Application Load Balancer operates at the application layer (HTTP/HTTPS) and provides advanced routing features.
    - Network Load Balancer operates at the transport layer (TCP/UDP) and handles high-throughput, low-latency traffic.
    - Application Load Balancer supports content-based routing, while Network Load Balancer supports connection-based routing.

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15. **How do you monitor and troubleshoot network issues in AWS?**

    - You can use AWS CloudWatch for monitoring metrics and logs.
    - VPC Flow Logs capture information about IP traffic going to and from network interfaces in your VPC.
    - AWS X-Ray helps analyze and debug distributed applications.

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16. **What are the best practices for securing your VPC?**

    - Use security groups and network ACLs to control access.
    - Enable VPC Flow Logs for monitoring.
    - Use IAM roles for permissions management.
    - Implement encryption for data at rest and in transit.

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17. **How do you implement high availability in AWS networking?**

    - Use multiple Availability Zones for redundancy.
    - Implement Elastic Load Balancing for distributing traffic.
    - Use Auto Scaling for automatic resource scaling.
    - Design your architecture with fault tolerance in mind.

18. **What is the purpose of an Internet Gateway in VPC?**

- An Internet Gateway allows instances in your VPC to communicate with the internet.
- It provides a target for route tables to direct internet-bound traffic.
- Internet Gateway is horizontally scaled, redundant, and highly available.

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19. **How do you use AWS IAM roles for network security?**

- IAM roles provide temporary security credentials for accessing AWS resources.
- They enable fine-grained access control without sharing long-term credentials.
- IAM roles can be assigned to EC2 instances, Lambda functions, and other AWS services.

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20. **Explain the concept of VPC Flow Logs.**

- VPC Flow Logs capture information about IP traffic going to and from network interfaces in your VPC.
- They help with monitoring, troubleshooting, and security analysis.
- Flow logs can be published to CloudWatch Logs or S3 for storage and analysis.

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21. **What is AWS Global Accelerator and how does it improve performance?**

- AWS Global Accelerator improves application availability and performance by directing traffic to optimal endpoints based on health, geography, and routing policies.
- Global Accelerator provides static IP addresses that act as a fixed entry point to your applications.
- It uses Anycast routing to direct user traffic to the nearest edge location.

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22. **How do you manage DNS records in Route 53?**

- You can create, update, and delete DNS records using Route 53's management console or API.
- Route 53 supports various record types such as A, CNAME, MX, TXT, etc.
- Route 53 also supports routing policies like weighted routing, latency-based routing, and failover routing.

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23. **What is the difference between AWS Direct Connect and VPN?**

- AWS Direct Connect provides dedicated network connections with lower latency and higher bandwidth.

- VPN uses internet-based connections with higher latency but offers flexibility for remote access.
- Direct Connect is ideal for consistent, high-volume data transfer, while VPN is suitable for secure remote access.

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24. **How do you configure multi-region architectures in AWS?**
    - Use services like Route 53 for DNS routing across regions.
    - Implement replication strategies for data consistency across regions.
    - Use Global Accelerator for optimal routing of user traffic.

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25. **What are the benefits of using AWS PrivateLink?**
    - AWS PrivateLink enables private connectivity between VPCs, AWS services, and on-premises networks without exposing data to the internet.
    - It simplifies network architecture by eliminating the need for public IP addresses.
    - PrivateLink enhances security by keeping traffic within the AWS network.

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26. **How do you set up and manage VPC endpoints?**
    - VPC endpoints allow private connections between your VPC and supported AWS services without requiring an Internet Gateway or NAT device.
    - You can create VPC endpoints using the AWS Management Console, CLI, or SDKs.
    - Endpoints can be configured for services like S3, DynamoDB, and more.

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27. **Explain the concept of AWS Network Firewall.**
    - AWS Network Firewall provides stateful inspection, intrusion prevention, and web filtering capabilities to protect your VPCs from common threats.
    - It integrates with AWS Firewall Manager for centralized management.
    - Network Firewall supports custom rule sets and threat intelligence feeds.

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28. **How do you use AWS Systems Manager for network management?**
    - AWS Systems Manager provides operational insights, automation, patching, configuration management, and compliance monitoring for your network resources.
    - It helps manage instances, applications, and infrastructure across AWS and on-premises environments.
    - Systems Manager includes tools like Run Command, State Manager, and Patch Manager.

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  - AWS Shield provides DDoS protection for your applications running on AWS
  - It offers Standard protection by default and Advanced protection with additional features.
  - Shield Advanced includes real-time attack visibility and cost protection.

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30. **How do you integrate on-premises networks with AWS?**

  - You can integrate on-premises networks with AWS using Direct Connect or Site-to-Site VPN.
  - Implement hybrid architectures using services like Transit Gateway for seamless connectivity.
  - Use AWS Storage Gateway for integrating on-premises storage with cloud storage.
