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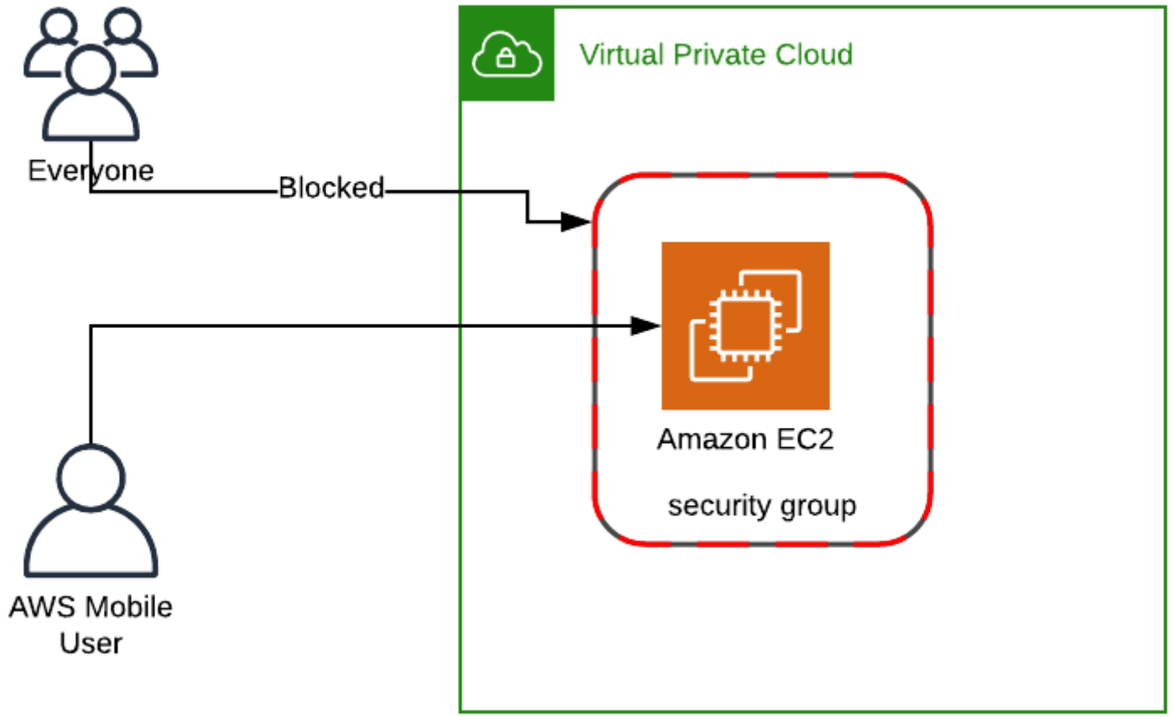
AWS Security Groups

Overview of AWS Security Groups

Definition

AWS Security Groups are virtual firewalls that control incoming and outgoing traffic for EC2 instances. They act as a barrier between a user's instance and the internet, and can be used to filter traffic based on the rules set by the user.



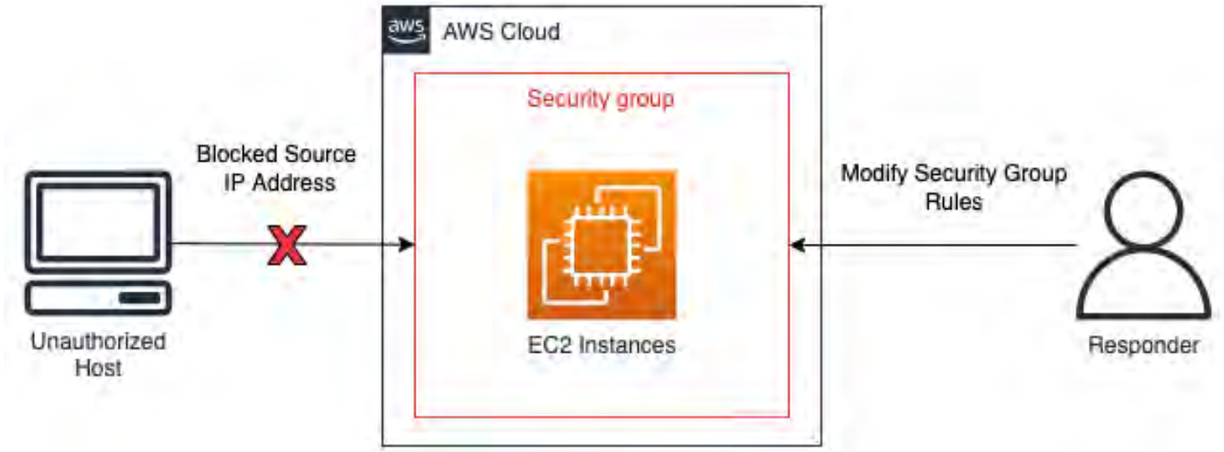
Overview of AWS Security Groups

Scope

- Security Groups operate at the instance level, not the subnet level.
- This means that each instance in a VPC can have its own Security Group, and that Security Groups cannot be shared across instances or subnets.

Security Group Types

- There are two types of Security Groups: default and custom.
- Default Security Groups are created automatically and are associated with every instance launched in a VPC.
- Custom Security Groups are created by the user and can be associated with one or more instances in the VPC.

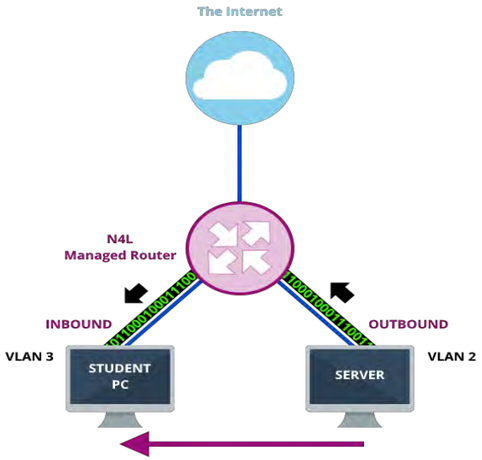


How Security Groups Work

- Security Groups evaluate the traffic based on incoming and outgoing rules.
- Instances associate with Security Groups, and the rules apply to specific IP addresses.

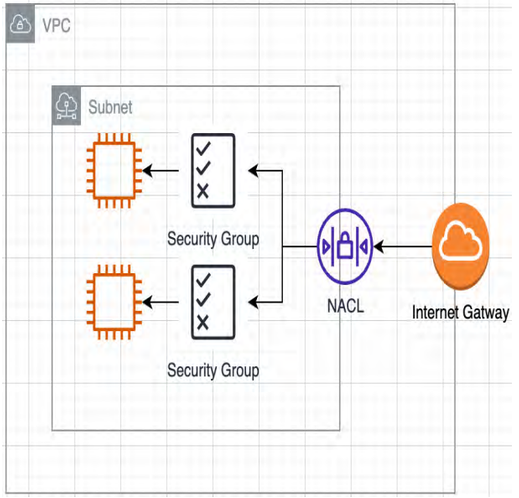
Virtual Firewall

Security Groups act as a virtual firewall for instances, protecting them from malicious activity.



Inbound and Outbound Rules

Security Groups use inbound and outbound rules to define the traffic that is allowed to go in and out of an instance.



Architecture

Security Groups are part of the network architecture, allowing granular security management for your EC2 resources.

Inbound and Outbound Rules

1

Inbound Rules

Inbound rules define the traffic allowed into an instance. They are stateful, meaning any outgoing traffic from the instance is automatically allowed, regardless of the Security Group outbound rules.

2

Outbound Rules

Outbound rules control the traffic allowed out of the instance. When you add a rule, add the destination IP address and port number that the instance wants to connect to.

Creating and Configuring Security Groups

Creating a Security Group

To create a Security Group, you need to understand your network requirements, instances, and protocols you use.

Configuring Rules

To configure Security Group rules, you select the instance, protocol, port range, and IP address range.

Launching Instances Using a Security Group

When launching an instance, you can associate it with one or more Security Groups. This allows for multiple firewalls to be applied to separate groups of instances.

Best Practices for Using Security Groups

- Create separate Security Groups for different types of instances.
- Minimize the number of ports open to reduce the attack surface.
- Use a single Security Group for simplicity and manageability.

Optimization

Optimize your Security Group rules by reviewing and modifying them periodically as your security needs evolve.

Block All Traffic

Consider setting a default rule to block all traffic, and then open only the ports that you need.

Backup

Backup your Security Group configuration regularly. You may need to restore it in the event of a disaster.

Troubleshooting Security Group Issues

Verify Security Group Rules

Ensure your Security Group has the correct rules in place, and that you're not blocking necessary traffic.

Check Network Configuration Issues

Review your network configuration and make sure that your Security Group is associated with the right instances.

Review Instance Log Files

Check instance log files and see if there are any errors or exceptions related to Security Group rules.

Importance of Security Groups

Cloud Security

As technology evolves, cloud security is becoming increasingly important for businesses to maintain their security posture. Utilizing AWS Security Groups is a crucial step towards ensuring your data center is secure.

Don't Leave Your Data Unprotected

By leaving your data unprotected, you are putting your business and your customers at risk. Be proactive and start securing your AWS instances with Security Groups today!

Secure Your Success

By following best practices and configuring your security groups on AWS correctly, you can ensure the success of your business by protecting your data from potential cyber threats.

Conclusion and Next Steps

- AWS Security Groups provide a powerful way to manage network security for your EC2 instances.
- By understanding the rules and configurations, and following best practices, you can ensure that your network is safe and secure.
- Next steps include reviewing your Security Group configuration, optimizing and backing up your rules regularly, and staying up-to-date with the latest AWS security features.

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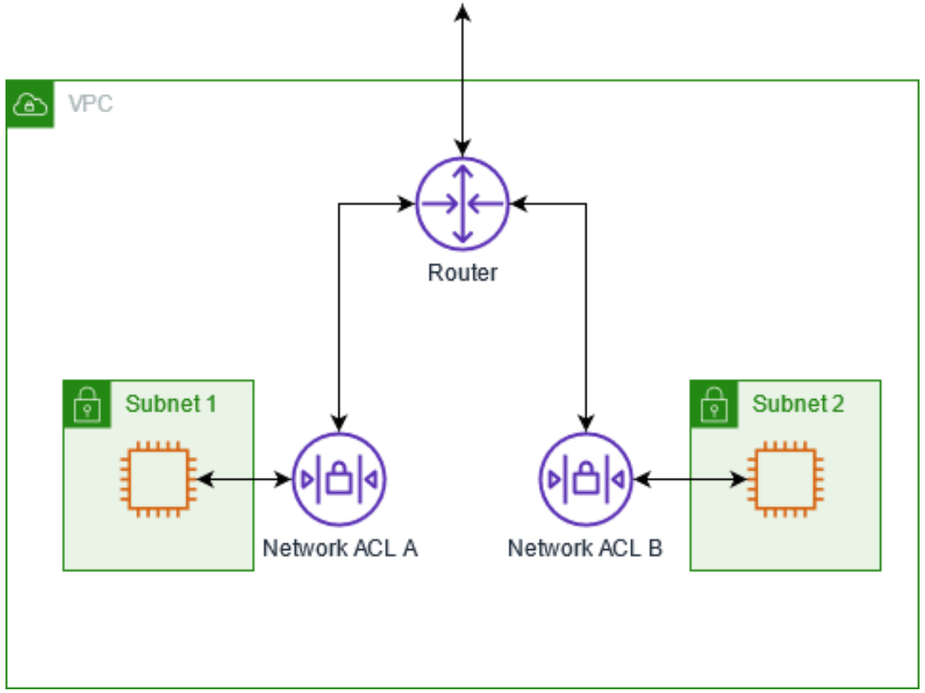
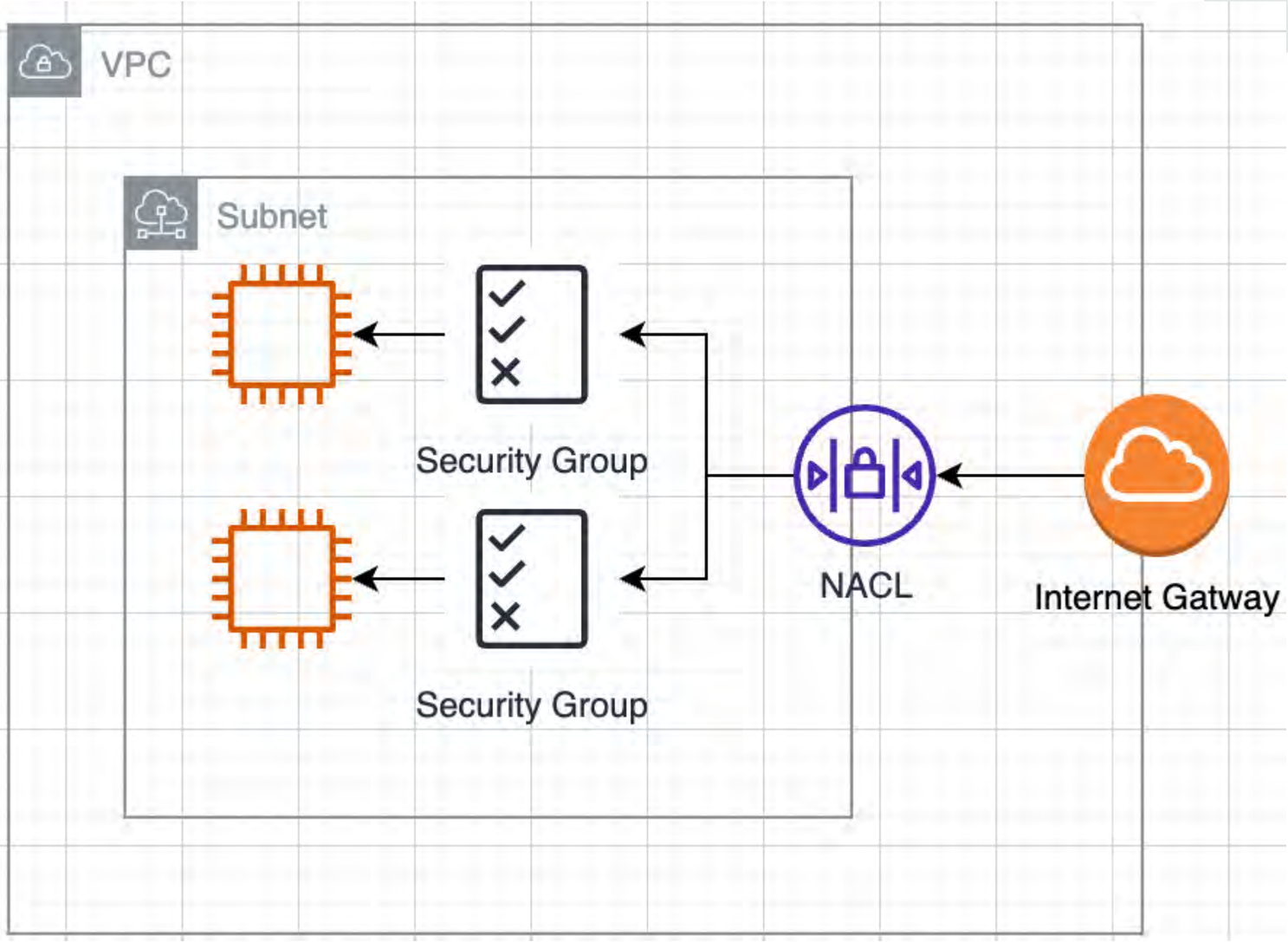


AWS Network ACLs

Overview of NACL

What are Network ACLs?

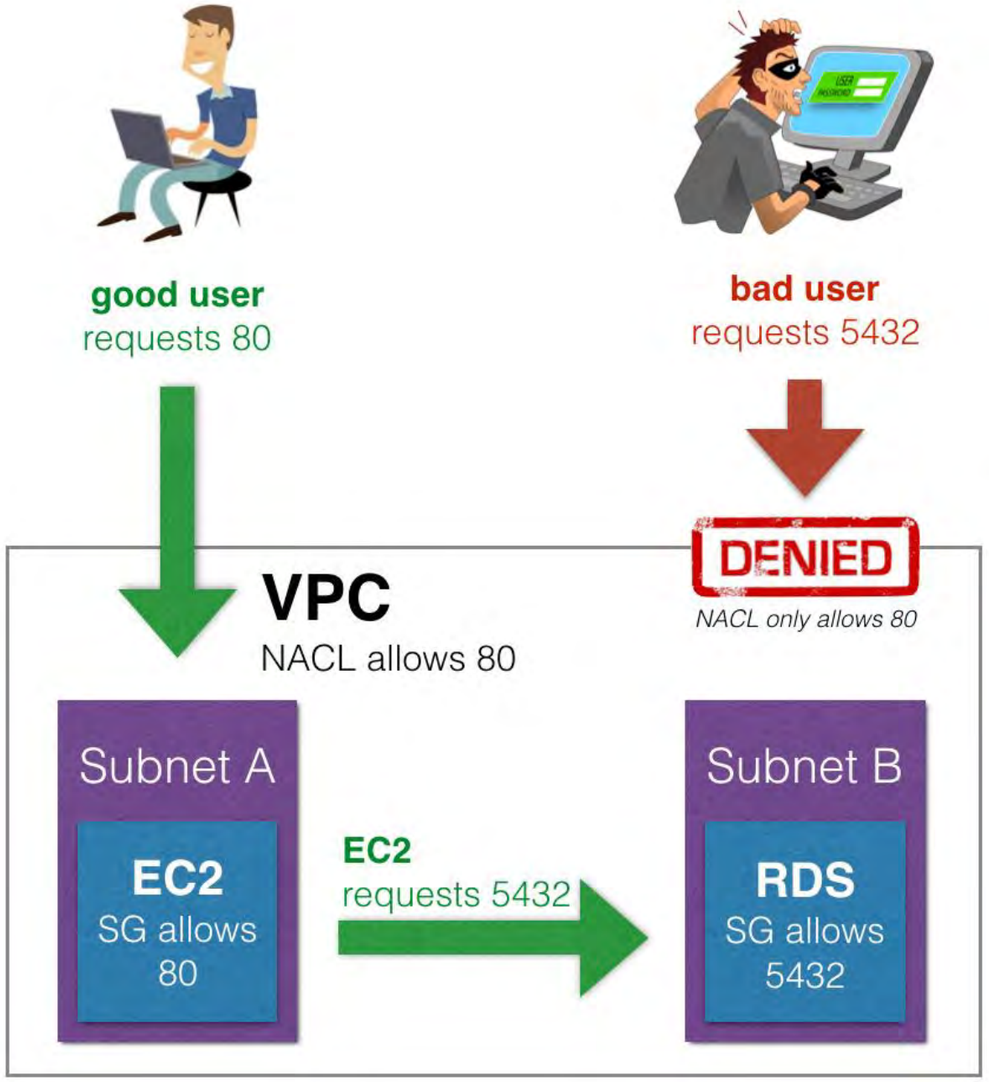
Network ACLs, which stands for "Network Access Control Lists", are a virtual firewall that controls inbound and outbound traffic to and from your VPC subnets. Think of them like a bouncer at a club who only lets in authorized guests.



Usage of NACL

When are NACLs used?

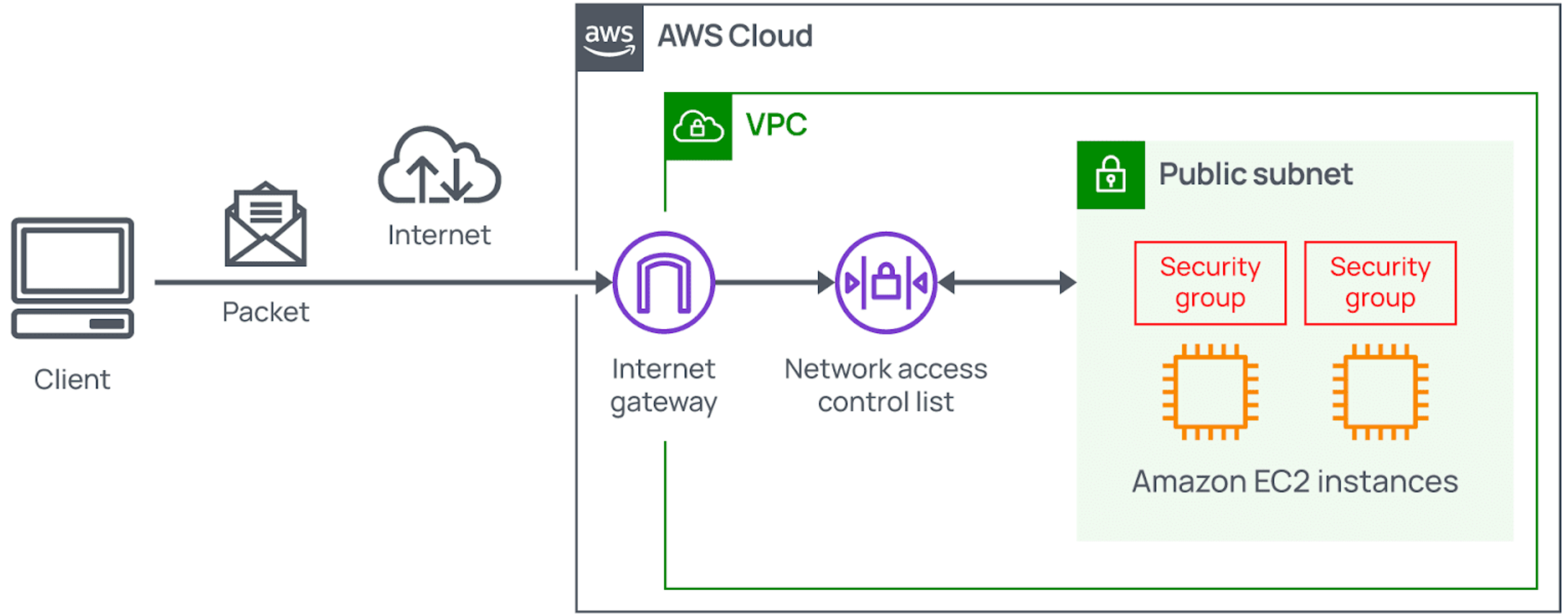
They are used to supplement the security provided by Security Groups and are the first layer of defense to protect your VPC subnets. This is important because you can never be too careful when it comes to security.



Network ACL vs Security Group

NACL	SECURITY GROUP
Operates at the subnet level	Operates at the instance level
Supports allow rules and deny rules	Supports allow rules only
Is stateless: Return traffic must be explicitly allowed by rules	Is stateful: Return traffic is automatically allowed, regardless of any rules
Processes rules in number order when deciding whether to allow traffic	Evaluates all rules before deciding whether to allow traffic
Automatically applies to all instances in the subnets it's associated with (not subject to users to specifying the security group)	Applies to an instance only if someone specifies the security group when launching the instance, or associates the security group with the instance later on

An example architecture of Network ACL



Setting Up Network ACLs

1

Create a new Network ACL

To create a new Network ACL, log in to the AWS Management Console and navigate to the VPC service. From there, select the "Network ACLs" option and click "Create Network ACL".

You will have to associate this ACL with a specific VPC subnet or group of subnets, so be sure to select the appropriate one during the creation process.

2

Add inbound and outbound rules

Once you have created your new Network ACL, you will need to add inbound and outbound rules to control traffic flow. This is done by selecting the "Inbound Rules" or "Outbound Rules" tab and clicking "Edit".

From there, you can add rules to allow or deny specific traffic types or port ranges. Be sure to test your rules thoroughly to ensure they are working as expected.

3

Review and save

Before you save your new Network ACL, be sure to double-check your rules for accuracy. Once you're ready, click "Save" to apply your new Network ACL to your VPC subnets.

Best Practices

Tighten Inbound Rules

Block all traffic by default, and only allow specific traffic types and ports that are necessary for your application.

Use Network ACLs in conjunction with Security Groups

While Security Groups are stateful, Network ACLs are stateless. Use them together for added security.

Keep Network ACLs simple

The more rules, the more complex your network becomes. Keep your network ACLs as simple and straightforward as possible.

Common Issues with NACL

1 Overlapping Rules

If rules overlap or conflict with each other, the most permissive rule takes precedence. Make sure your rules don't contradict themselves.

2 Confusing Statelessness

The stateless nature of Network ACLs can be confusing at first. Remember that each rule applies to each packet of traffic that matches, regardless of the traffic's originating connection state.

3 Limitations

Network ACLs can only filter traffic to and from subnet gateways. They cannot filter traffic between instances on the same subnet.

Case Studies of NACL

1

Software as a Service Company

A SaaS company used Network ACLs to maintain compliance with government regulations, blocking traffic from countries deemed high risk.

2

Online Retailer

An online retailer used Network ACLs to restrict access to sensitive data such as customer payment information to specific staff and systems, minimizing their exposure to risk.

3

Research Institution

A research institution used Network ACLs to filter out unwanted traffic to their research networks, using them to enforce policies that restrict access to specific resources such as high-performance computing clusters.

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Thankyou