Network Firewalls & AWS Security Groups

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What is Firewall?

- A firewall is a network security system that monitors and controls the incoming and outgoing network traffic based on predetermined security rules.
- A firewall typically establishes a barrier between a trusted, secure internal network and another outside network, such as the Internet, that is assumed not to be secure or trusted.

Firewall Categories

Firewalls are often categorized as either network firewalls or host-based firewalls.

1. Network firewalls filter traffic between two or more networks; they are either software appliances running on general purpose hardware, or hardware-based firewall computer appliances.
2. Host-based firewalls provide a layer of software on one host that controls network traffic in and out of that single machine.

Types of Firewall

- Firewalls also vary in type depending on where communication originates, where it is intercepted, and the state of communication being traced.
- The two types of firewall are
  1. packet filtering firewalls
  2. application-level firewalls

Packet Filtering Firewalls

Packet filtering firewalls operate at a relatively low level of the TCP/IP protocol stack, not allowing packets to pass through the firewall unless they match the established rule set.

Application Level Firewalls

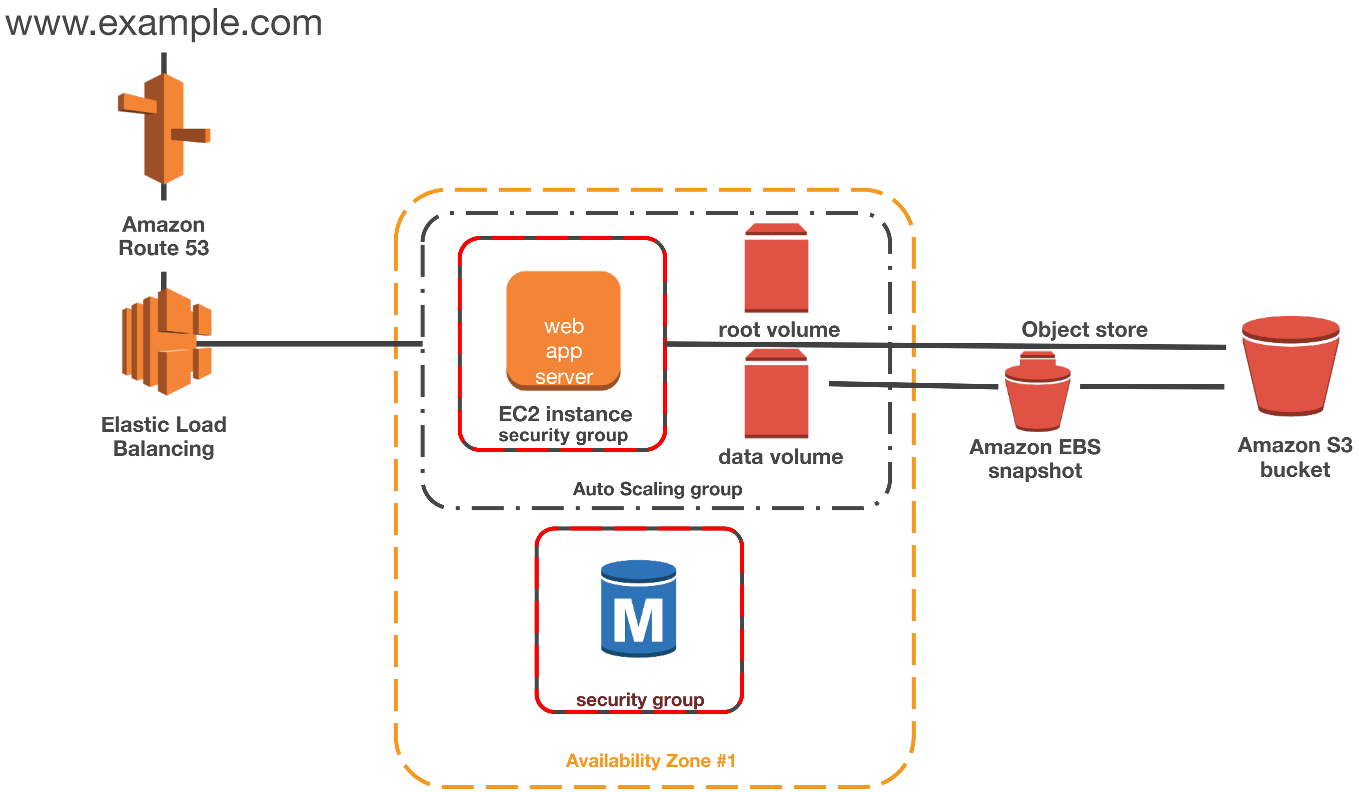
- Application-layer firewalls work on the application level of the TCP/IP stack (i.e., all browser traffic, or all telnet or FTP traffic), and may intercept all packets traveling to or from an application.
- Application firewalls function by determining whether a process should accept any given connection.
- Application firewalls accomplish their function by hooking into socket calls to filter the connections between the application layer and the lower layers of the OSI model.
- Application firewalls work much like a packet filter but application filters apply filtering rules (allow/block) on a per process basis instead of filtering connections on a per port basis.

AWS EC2 Security Groups

- A EC2 security group acts as a virtual firewall that controls the traffic for one or more instances.
- When you launch an instance, you associate one or more security groups with the instance.
- You add rules to each security group that allow traffic to or from its associated instances.
- You can modify the rules for a security group at any time; the new rules are automatically applied to all instances that are associated with the security group.
- When we decide whether to allow traffic to reach an instance, we evaluate all the rules from all the security groups that are associated with the instance.

AWS RDS Security Groups

- RDS Security groups control the access that traffic has in and out of a DB instance.
- Each DB security group rule enables a specific source to access a DB instance that is associated with that DB security group.
- The source can be a range of addresses (e.g., 203.0.113.0/24), or an EC2 security group.
- When you specify an EC2 security group as the source, you allow incoming traffic from all EC2 instances that use that EC2 security group.
- Note that DB security group rules apply to inbound traffic only; outbound traffic is NOT currently permitted for DB instances.


www.example.com
Amazon Route 53
Elastic Load Balancing
web app server
EC2 instance
security group
root volume
data volume
Auto Scaling group
Object store
Amazon EBS snapshot
Amazon S3 bucket
M
security group
Availability Zone #1

Additional Resources

https://csye6225.cloud/