

1. What are NATs? Do they provide some form of security?

NAT (Network address translation) is a method of remapping one IP address space into another by modifying network address information in the IP header of packets while they are in transit across a traffic routing device. I don't think they provide any form of security like a firewall might.

- Wikipedia

2. What are Firewalls?

Firewall (computing), a technological barrier designed to prevent unauthorized or unwanted communications between computer networks or hosts.

In computing, a firewall is a network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. A firewall typically establishes a barrier between a trusted internal network and untrusted external network, such as the Internet.

- Wikipedia

1. Identify three generations of Firewalls

- First Generation: packet filters

The first reported type of network firewall is called a packet filter. Packet filters act by inspecting packets transferred between computers. When a packet does not match the packet filter's set of filtering rules, the packet filter either drops (silently discards) the packet, or rejects the packet (discards it and generates an Internet Control Message Protocol notification for the sender) else it is allowed to pass. Packets may be filtered by source and destination network addresses, protocol, source and destination port numbers.

- Wikipedia

- Second Generation: stateful filters (circuit-level gateways)

Second-generation firewalls perform the work of their first-generation predecessors but also maintain knowledge of specific conversations between endpoints by remembering which port number the two IP addresses are using at layer 4 (transport layer) of the OSI model for their conversation, allowing examination of the overall exchange between the nodes. This type of firewall is potentially vulnerable to denial-of-service attacks that bombard the firewall with fake connections in an attempt to overwhelm the firewall by filling its connection state memory.

- Wikipedia

- Third Generation: application layer

The key benefit of application layer filtering is that it can understand certain applications and protocols (such as File Transfer Protocol (FTP), Domain Name System (DNS), or Hypertext Transfer Protocol (HTTP)). This is useful as it is able to detect if an unwanted application or service is attempting to bypass the firewall using a disallowed protocol on an allowed port, or detect if a protocol is being abused in any harmful way.

- Wikipedia

2. What each generation does more than the previous generation?

- Network layer (stateful and stateless) or packet filters

Network layer firewalls, also called packet filters, operate at a relatively low level of the TCP/IP stack, blocking packets unless they match the established rule set. The firewall administrator may define the rules; or default rules may apply.

Network layer firewalls generally fall into two sub-categories, stateful and stateless.

- Wikipedia

- Application-layer

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.

- Wikipedia

3. Compare the following two leading Firewall vendors, SonicWall and Cisco, including:

- SonicWall -

SonicWall is an internet security software that provides next-generation network security solutions to detect and prevent online threats. Its features include firewalls, cloud security, remote access, analytics, and more.

- <https://fitsmallbusiness.com/sonicwall-reviews-pricing/>

Network Security Firewalls

Comprehensive threat prevention – at multi-gigabit speeds — for networks of every size

- <https://www.sonicwall.com/products/firewalls/>

1. Price

SonicWall pricing is not readily available on the website. Multiple third-party sites said that it costs between \$280 to \$10,000+ (one-time fee). Pricing depends on the hardware unit, company scale, licensing type, length of subscription, extra services, and distributor.

- <https://fitsmallbusiness.com/sonicwall-reviews-pricing/>

2. Features

- NEXT-GENERATION FIREWALLS
- VIRTUAL FIREWALLS
- WIRELESS NETWORK SECURITY
- FIREWALL SECURITY SERVICES
- WAN ACCELERATION
- CAPTURE CLOUD PLATFORM

- <https://www.sonicwall.com/products/firewalls/>

3. Performance

SonicWall next-generation firewalls give you the network security, control and visibility your organization needs to innovate and grow quickly. Our award-winning hardware and virtual firewalls integrate tightly with a broad range of products, services and technologies to create a complete high-performance security solution that scales to fit your needs.

- <https://www.sonicwall.com/products/firewalls/>

- Cisco -

With our integrated portfolio and industry-leading threat intelligence, Cisco gives you the scope, scale, and capabilities to keep up with the complexity and volume of threats. Putting security above everything helps you innovate while keeping your assets safe. Cisco prioritizes security in all that we do. Only with Cisco can you attain effective network security to face tomorrow's evolving threats.

- <https://www.cisco.com/c/en/us/products/security/index.html>

Next-Generation Firewalls

Prevent breaches, get deep visibility to detect and stop threats fast, and automate your network and security operations to save time and work smarter.

- <https://www.cisco.com/c/en/us/products/security/firewalls/index.html>

1. Price

Prices listed on Amazon range from \$930 to \$70 for Cisco Firewall.

- <https://www.amazon.com/slp/cisco-firewall/f6u87ta3gvh28on>
Prices listed on Router-Switch range from \$629,998 to \$30. A 'Quote | Help' selection is listed next to items that do not have a price listed.
- https://www.router-switch.com/Price-cisco-firewalls-security_c3?dir=asc&order=price&p=10
Prices listed on Cisco Price List Weebly have a long list of products, prices and descriptions for Cisco Firewalls.
- <http://ciscopricelist.weebly.com/cisco-firewall-price.html>

2. Features

- FIREPOWER 1000 SERIES
 - FIREPOWER 2100 SERIES
 - FIREPOWER 4100 SERIES
 - FIREPOWER 9000 SERIES
 - CISCO NEXT-GENERATION FIREWALL VIRTUAL (NGFWv)
 - CISCO ADAPTIVE SECURITY VIRTUAL APPLIANCE (ASAv)
 - ASA 5500-X WITH FIREPOWER SERVICES
 - MERAKI MX SERIES
- <https://www.cisco.com/c/en/us/products/security/firewalls/index.html>

3. Performance

- Prevent breaches automatically to keep the business moving
 - Visibility to detect and stop threats fast
 - Automate operations to save time and reduce complexity
- <https://www.cisco.com/c/en/us/products/security/firewalls/index.html>