Firewalls and network security measures

In this video, you'll
learn about different types of firewalls.
These include hardware,
software, and cloud-based firewalls.
You'll also learn the difference between
a stateless and stateful firewall and
cover some of the basic operations
that a firewall performs.
Finally, you will explore how
proxy servers are used to
add a layer of security to the network.

A firewall is a network security device that
monitors traffic to and from your network.
It either allows traffic or it blocks
it based on a defined set of security rules.
A firewall can use port filtering,
which blocks or allows
certain port numbers to limit unwanted communication.
For example, it could have a rule
that only allows communications on port
443 for HTTPS or port
25 for email and blocks everything else.
These firewall settings will be determined by
the organization's security policy.

Let's talk about a few different kinds of firewalls.
A hardware firewall is considered the most
basic way to defend against threats to a network.
A hardware firewall inspects
each data packet before it's
allowed to enter the network.
A software firewall performs
the same functions as a hardware firewall,
but it's not a physical device.
Instead, it's a software program
installed on a computer or on a server.
If the software firewall is installed on a computer,
it will analyze all the traffic

received by that computer.
If the software firewall is installed on a server,
it will protect all the devices connected to the server.
A software firewall typically costs
less than purchasing a separate physical device,
and it doesn't take up any extra space.
But because it is a software program,
it will add some processing burden
to the individual devices.

Organizations may choose to use a cloud-based firewall.
Cloud service providers offer firewalls as
a service, or FaaS, for organizations.
Cloud-based firewalls are software firewalls
hosted by a cloud service provider.
Organizations can configure the firewall rules
on the cloud service provider's interface,
and the firewall will perform security operations on
all incoming traffic before
it reaches the organization’s onsite network.
Cloud-based firewalls also protect any assets or
processes that an organization
might be using in the cloud.

All the firewalls we have discussed can be
either stateful or stateless.
The terms "stateful" and "stateless"
refer to how the firewall operates.
Stateful refers to a class
of firewall that keeps track of
information passing through it
and proactively filters out threats.
A stateful firewall analyzes
network traffic for characteristics and
behavior that appear suspicious
and stops them from entering the network.
Stateless refers to a class
of firewall that operates based on
predefined rules and does not
keep track of information from data packets.
A stateless firewall only acts according to
preconfigured rules set by the firewall administrator.
The rules programmed by the firewall administrator tell
the device what to accept and what to reject.
A stateless firewall doesn't store analyzed information.
It also doesn't discover
suspicious trends like a stateful firewall does.

For this reason, stateless firewalls are considered
less secure than stateful firewalls.

A next generation firewall, or NGFW,
provides even more security than a stateful firewall.
Not only does an NGFW provide
stateful inspection of incoming and outgoing traffic,
but it also performs more
in-depth security functions like
deep packet inspection and intrusion protection.
Some NGFWs connect to
cloud-based threat intelligence services
so they can quickly update to
protect against emerging cyber threats.

Now you have a basic understanding
of firewalls and how they work.
We learned that firewalls can be hardware or software.
We also discussed the difference between
a stateless and stateful firewall
and the security benefits of a stateful firewall.
Finally, we discussed next generation firewalls
and the security benefits they provide.
Coming up, we'll learn more about virtual networks.

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