16. DMZ

16.1 Firewall

Definition

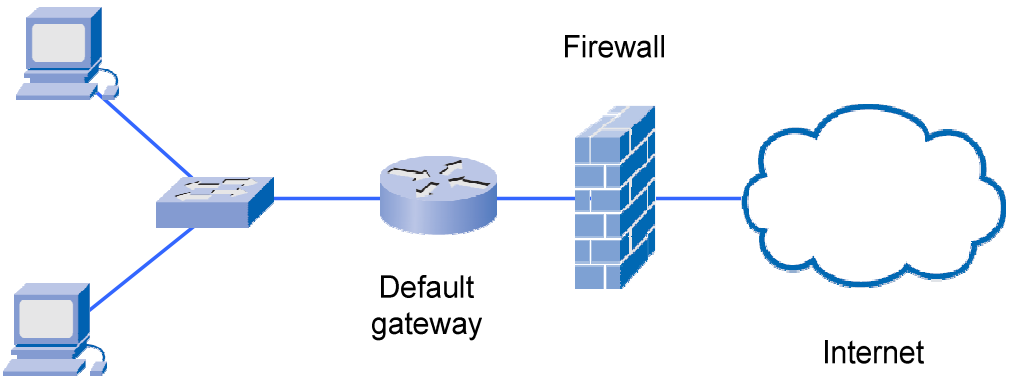
> **A firewall is a network security system that can block the incoming and the outgoing network traffic based on rules set within the firewall.**

We can classify all firewalls into two types:

1. External firewalls
2. Personal firewalls

External firewall:

An external firewall is a hardware component switched between the router and the internet. The external firewall analyzes traffic to and from a whole network.



Personal firewall:

A personal firewall is a software installed on a host. The personal firewall analyzes the traffic to and from the host it is installed on. This software can be part of the operating system.

Functionalities

Simple firewalls operate on the transport layer (layer 4).

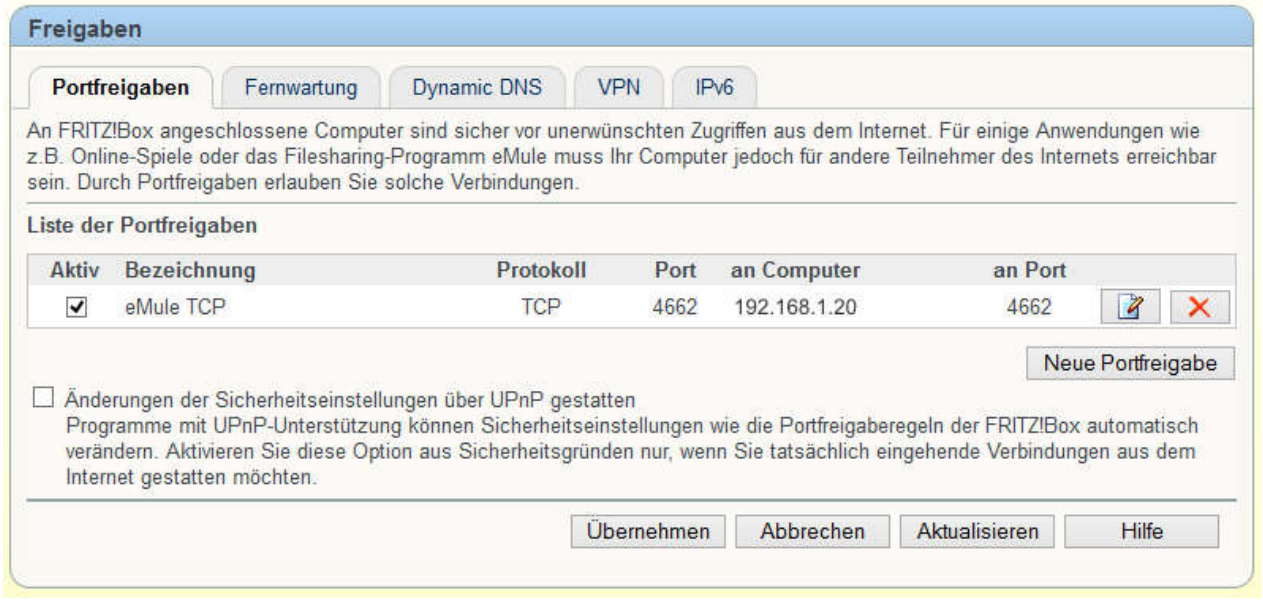
This fact tells us that a firewall is able to analyze from which or to which software / port number a frame is sent to. Thus all firewalls are able to distinguish between incoming and outgoing traffic. Under *outgoing traffic* we understand a request going out of our network including the incoming answer to the request.

Consequently under *incoming traffic* we understand a request coming in our network including the outgoing answer to the request.

Most firewalls for private networks are configured by default such that all outgoing traffic is allowed to pass the firewall, but all incoming traffic is blocked. This configuration is fine for most private networks only consisting of hosts requesting information from outside of the network.

If however a *server application within the private network* needs to be accessible for requests coming from the internet, e.g. private web servers or gaming server, then an exception to the general rule for incoming traffic has to be added. We say "*a port has to be opened in the firewall*". This exception rule will allow requests to pass the firewall that are addressed to the port number defined in the rule. The firewall rules can often be manipulated over a web-interface.

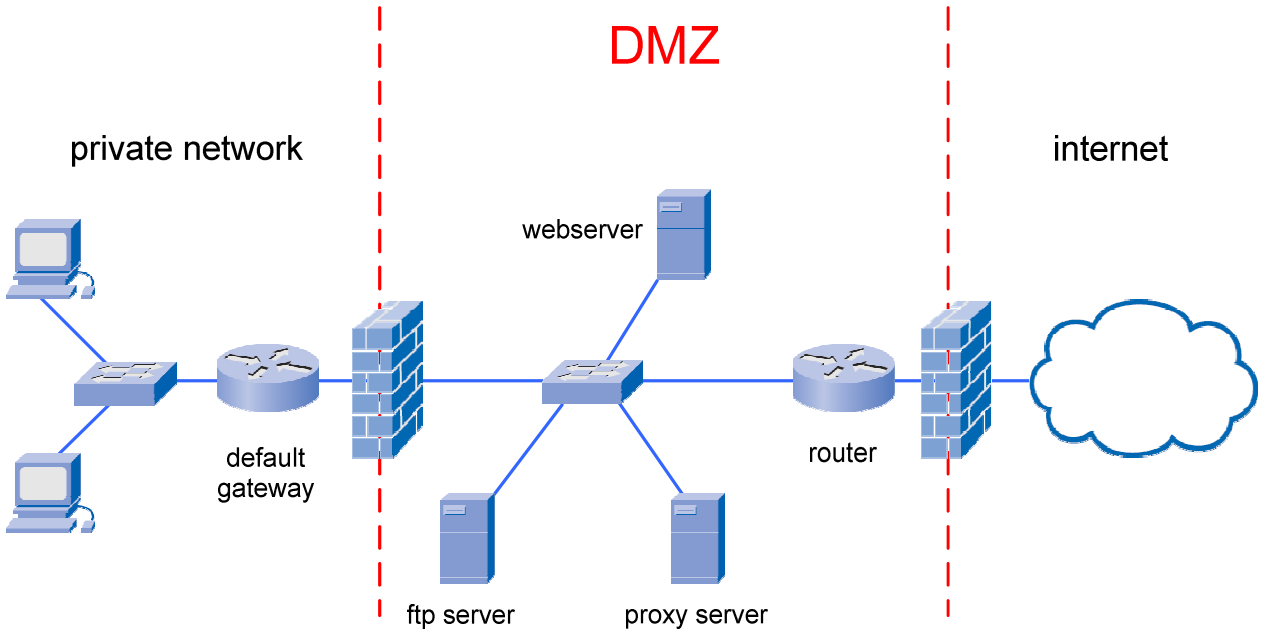
Example:



16.2 DMZ (demilitarized zone)

The weak point of the above shown network configuration is that if hackers detect a vulnerability (deut.: Verwundbarkeit) in the server software behind an open port, then attacks can be made to the whole network behind the firewall.

The current best practice is therefor to install a DMZ, which is a network portion between the private network and usually the internet. The DMZ is secured by two firewalls from the rest and contains the servers that should be accessible from the internet and the private network.



A request from the internet is passed through the first firewall to the servers.

All requests from the private network to the internet are sent first to the proxy server who forwards the requests to the internet.