IP-Adressen und Netzwerksimulation

Rechner haben Nummern! → IP-Adressen

IPv4
→ **32Bit** Adressraum,
→ Definition **1981** (!)

→ Zahl der theoretisch möglichen Adressen?

Adressen sehen so aus:

212.227.222.8

Vier „Oktette“, je 8Bit, Dezimalschreibweise, durch Punkte getrennt

IPv6
→ **128Bit** Adressraum
→ Definition 1998

→ Zahl der theoretisch möglichen Adressen?

Adressen sehen so aus:

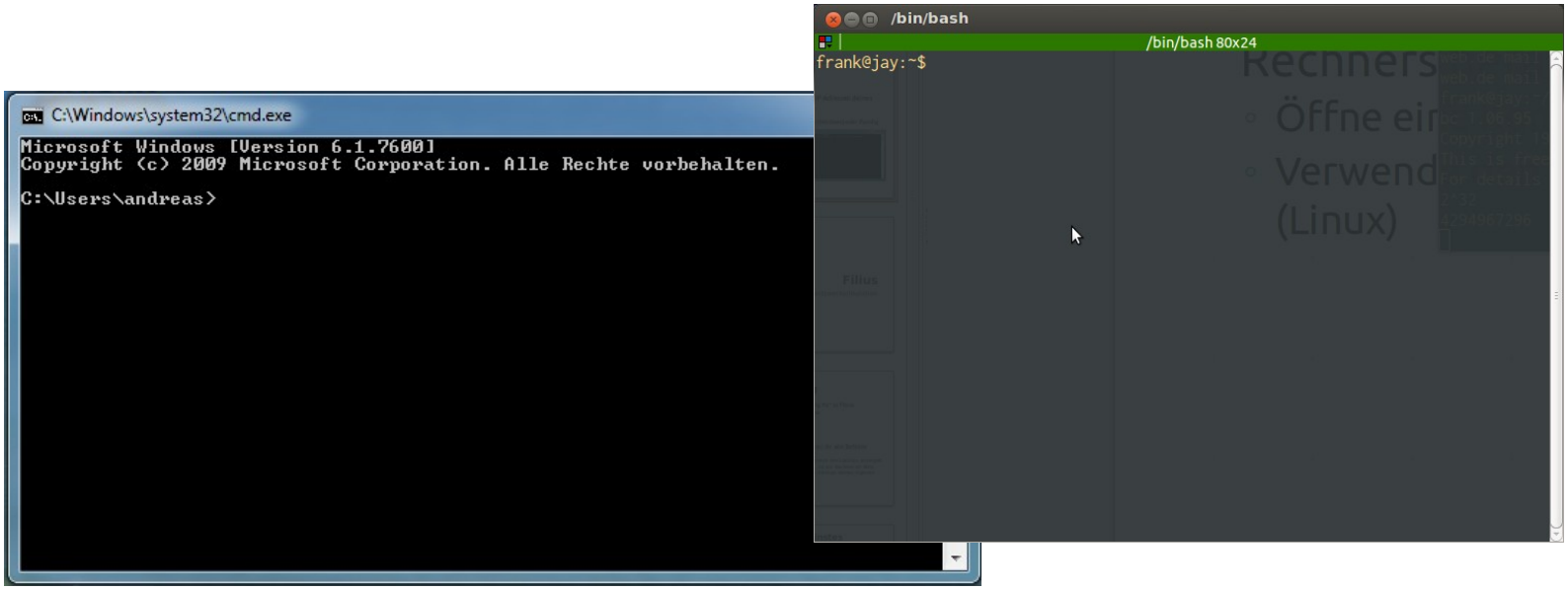
2001:0db8:85a3:08d3:1319:8a2e:0370:7344

Acht 16Bit-Blöcke, Hexadezimalschreibweise, durch Doppelpunkte getrennt, Abkürzungsregeln

Zwischenübung...

Finde die IP-Adresse(n) deines Rechners heraus:

- Öffne eine Komandozeile (Terminal/CMD)
- Verwende den Befehl `ipconfig` (Windows) oder `ip addr show` (Linux)



Beispiel

```
~ ip a s
                          Di 26 Okt 2021 18:43:34 CEST
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: enp0s31f6: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc fq_codel state DOWN group default qlen 1000
    link/ether a4:4c:c8:4a:49:c5 brd ff:ff:ff:ff:ff:ff
3: wlp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether b0:35:9f:b9:4a:ba brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.141/24 brd 192.168.1.255 scope global dynamic noprefixroute wlp2s0
       valid_lft 864000sec preferred_lft 864000sec
    inet6 fe80::d5c:8fb4:b314:70fd/64 scope link tentative noprefixroute
       valid_lft forever preferred_lft forever
4: enp0s20f0u6u2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether a4:4c:c8:e8:a6:48 brd ff:ff:ff:ff:ff:ff
    inet 10.0.0.55/24 brd 10.0.0.255 scope global dynamic noprefixroute enp0s20f0u6u2
       valid_lft 3530sec preferred_lft 3530sec
    inet6 fe80::b8e4:da6b:7059:a118/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

MAC Adressen

```
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                          Di 26 Okt 2021 18:43:34 CEST
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    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
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       valid_lft forever preferred_lft forever
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       valid_lft forever preferred_lft forever
2: enp0s31f6: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc fq_codel state DOWN group default qlen 1000
    link/ether a4:4c:c8:4a:49:c5 brd ff:ff:ff:ff:ff:ff
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```

Unabhängig von den IP-Adresskonfiguration haben Netzwerkschnittstellen sogenannte **MAC Adressen.**
(**M**edia-**A**ccess-**C**ontrol-Addresse/**M**edia **A**ccess **C**ode)
MAC Adressen sind 48 Bit lang und werden Hexadezimal aufgeschrieben.

Welche MAC Adressen sind im Screenshot erkennbar?

MAC Adressen

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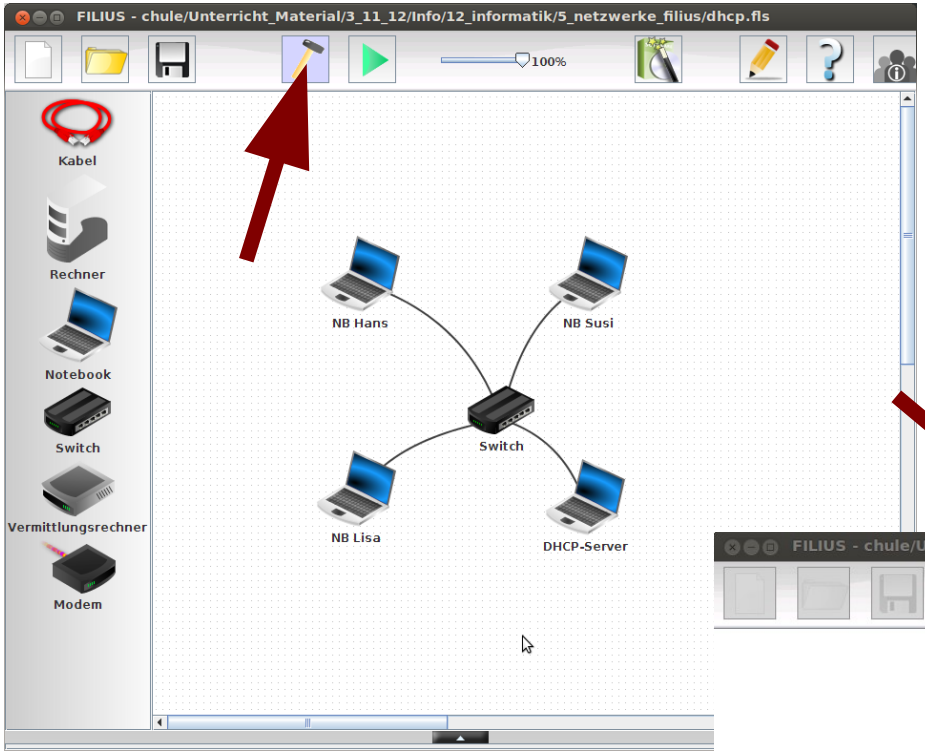
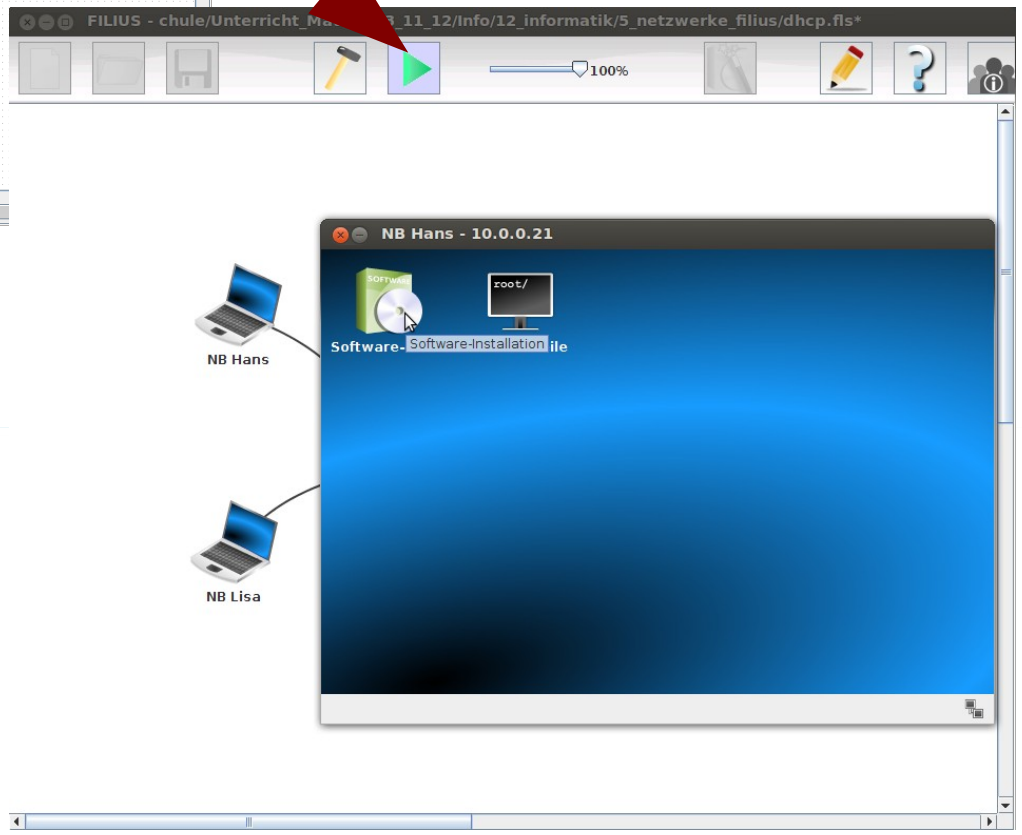
Filius

Netzwerksimulation

http://www.lernsoftware-filius.de/





→ Demo Filius