

# Virtuelles Netzwerken für den Heimgebrauch





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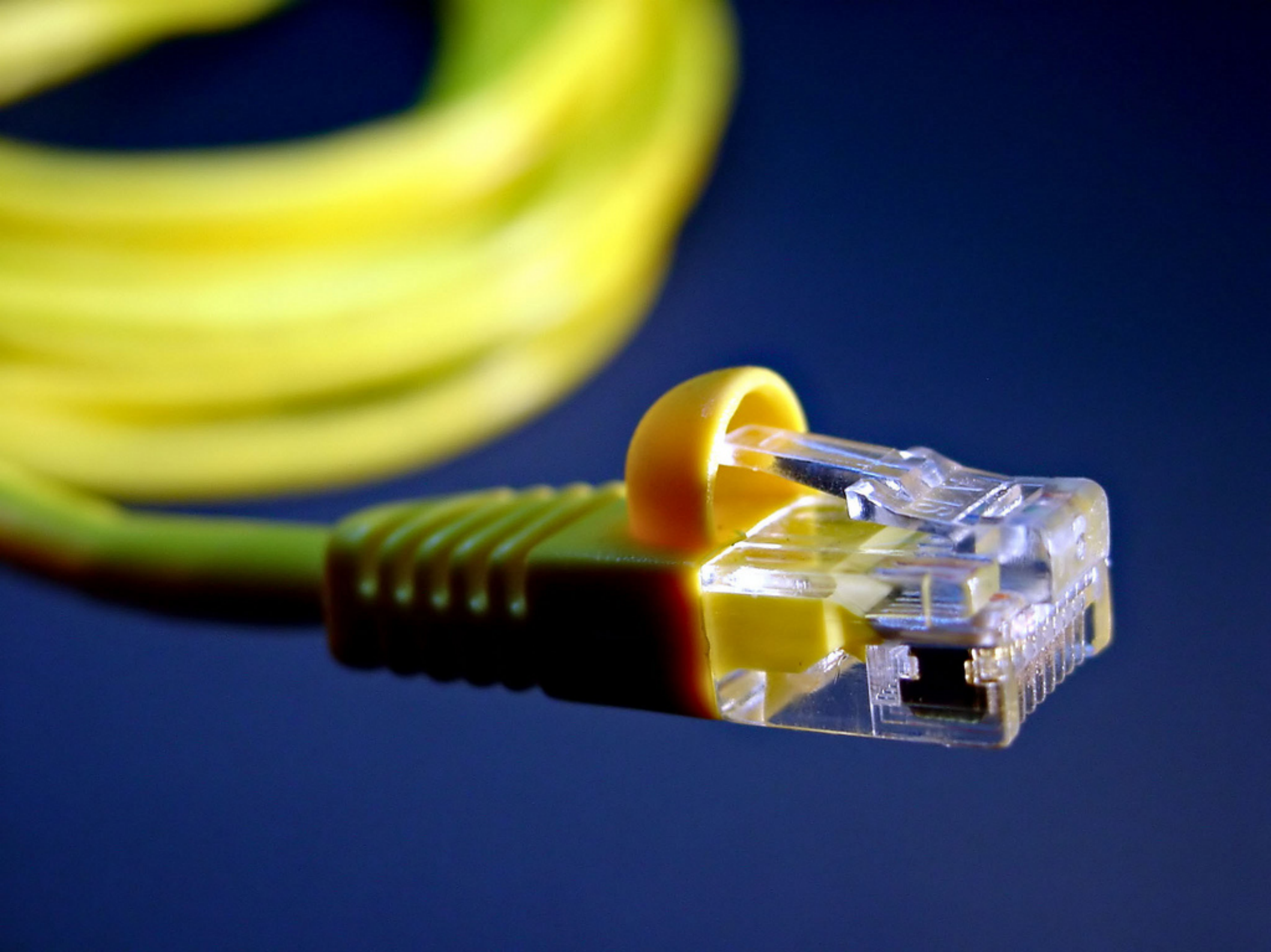


@mru



@mr\_ud

~~Virtualisierung~~



**TUN**

**TAP**

**Übersicht**

**VDE**

**libvirt**

**Bridge**

# Netzwerk im Userspace

Applikation

Transport

Internet

**TUN**

Link

Applikation

Transport

Internet

Link

**TAP**



```
# tuncctl -u uli -t tap0
```

```
# ip address add \  
192.168.42.1/24 dev tap0
```

```
# ip link set tap0 up
```

```
$ kvm \
```

```
-net nic,vlan=1 \
```

```
-net tap,vlan=1,ifname=tap0,script=no
```



```
graph TD; BRIDGE[BRIDGE] --- TAP0[TAP0]; BRIDGE --- TAP1[TAP1];
```

BRIDGE

TAP0

TAP1

```
# openvpn --mktun --user uli \  
  --dev tap1
```

```
# ip link set tap1 up
```



```
# brctl addbr br0
```

```
# brctl addif br0 tap{0,1}
```

```
# ip addr add 192.168.23.1/24 dev br0
```

```
# ip link set br0 up
```



```
# sysctl -w net.ipv4.ip_forward=1
```

```
# iptables -t nat -A POSTROUTING \  
    -o eth0 -j MASQUARADE
```

DHCP/DNS, Firewall...

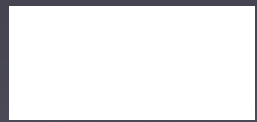






**libvirt** VIRTUALIZATION API

```
<network>
  <name>example</name>
  <forward dev='eth0' mode='nat' />
  <bridge name='br0' />
  <ip address='192.168.42.1'
    netmask='255.255.255.0'>
    <dhcp>
      <range start='192.168.42.128'
        end='192.168.42.254' />
    </dhcp>
  </ip>
</network>
```

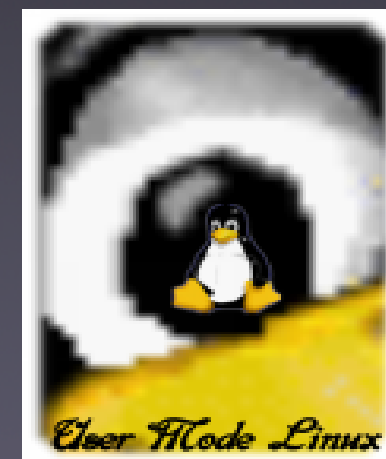








**QEMU**  
open source processor emulator



```
$ vde_switch -s /tmp/vde1ctl
```



```
$ kvm \  
-net nic,vlan=1 \  
-net vde,vlan=1,sock=/tmp/vde1ctl
```



INTERNET



```
$ slirpvde -s /tmp/vde1ctl -dhcp
```



vde\_plug2tap - verbindet vde mit  
Tap devices

wirefilter - simuliert Netzwerk  
Probleme

vde\_cryptcab - Verbindet vde switche  
per udp







# Attribution

- Noplace is like 127.0.0.1 – thinkgeek
- Cat 5 - Darren Hester
- WWW - crystaljingsr
- Easy button - Jason Gullede
- Cables - phrenologist
- Internet - transCam
- Questionmarks - makeitgreat