

# Escaping Hostile Networks Nicely

linux.conf.au 2008, Melbourne

Dafydd Harries

Collabora Ltd.

Alice



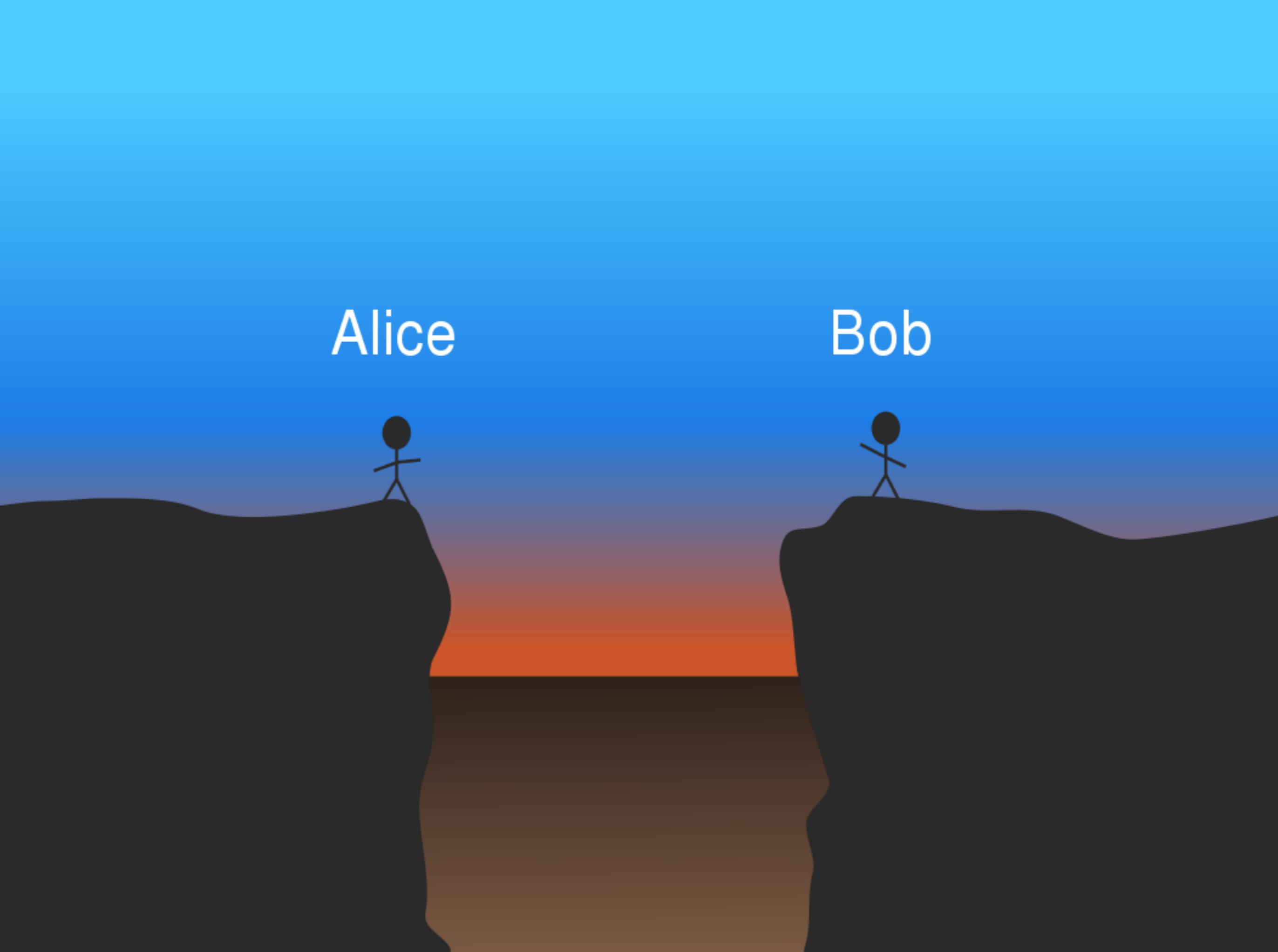
Bob



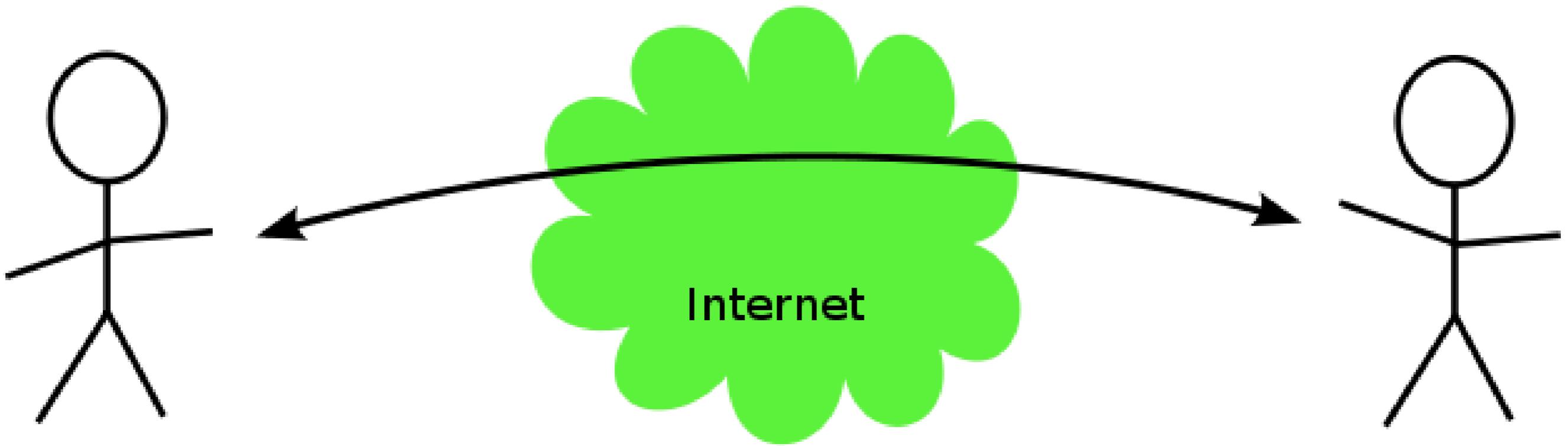
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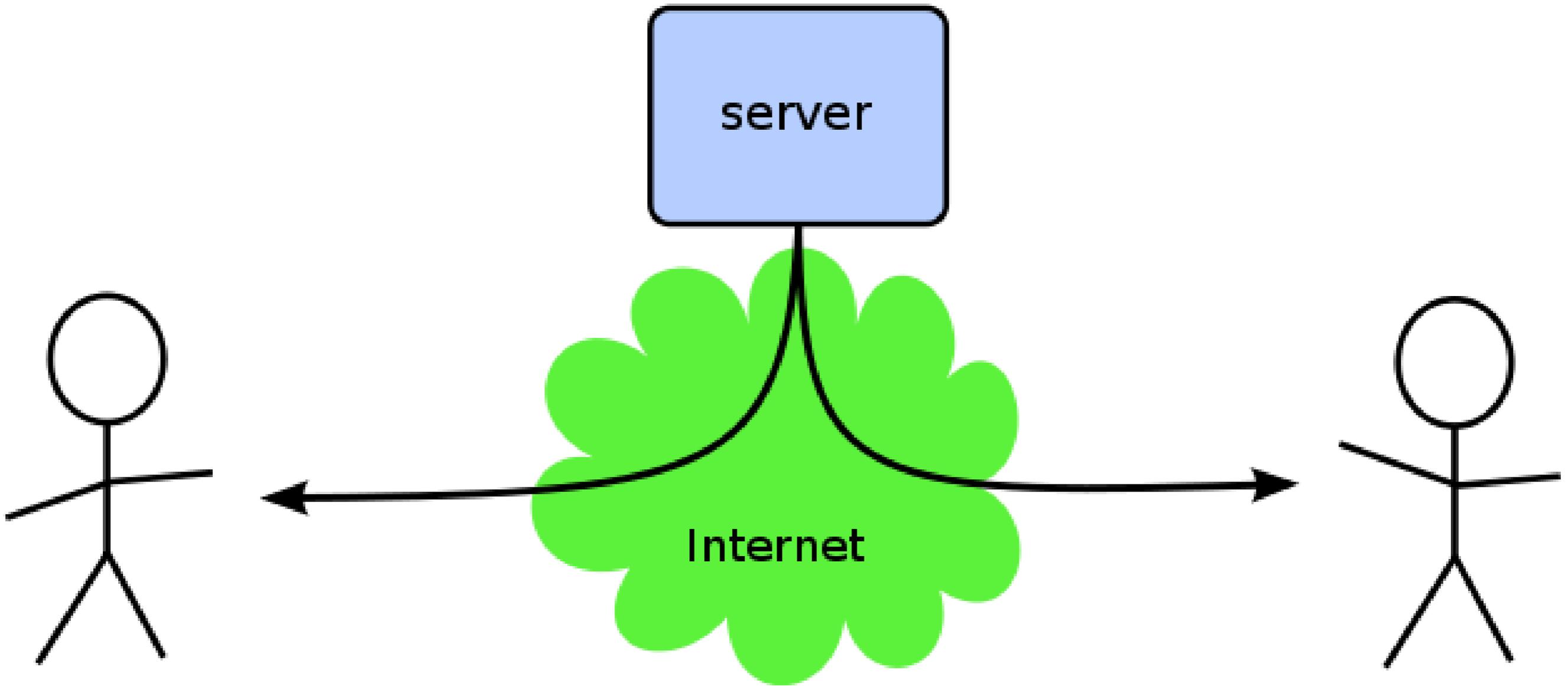


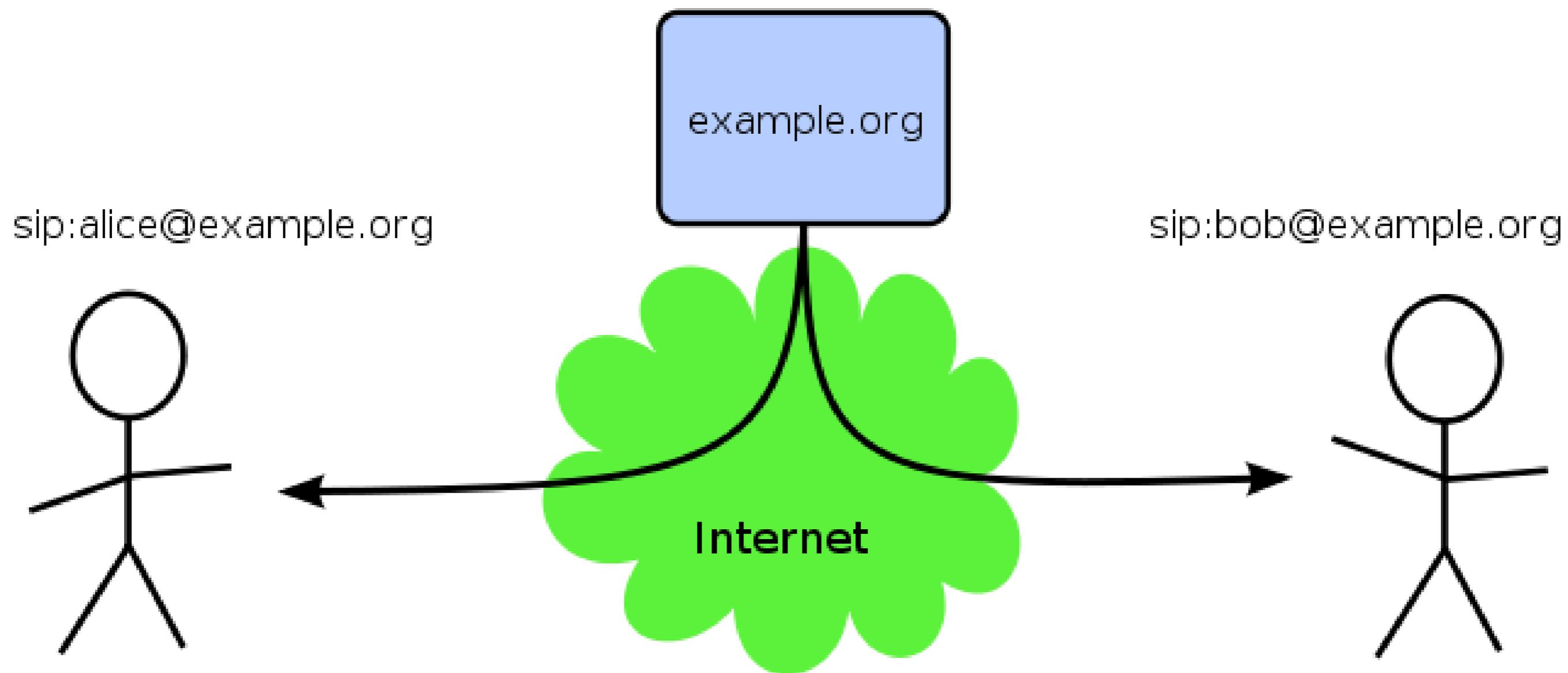
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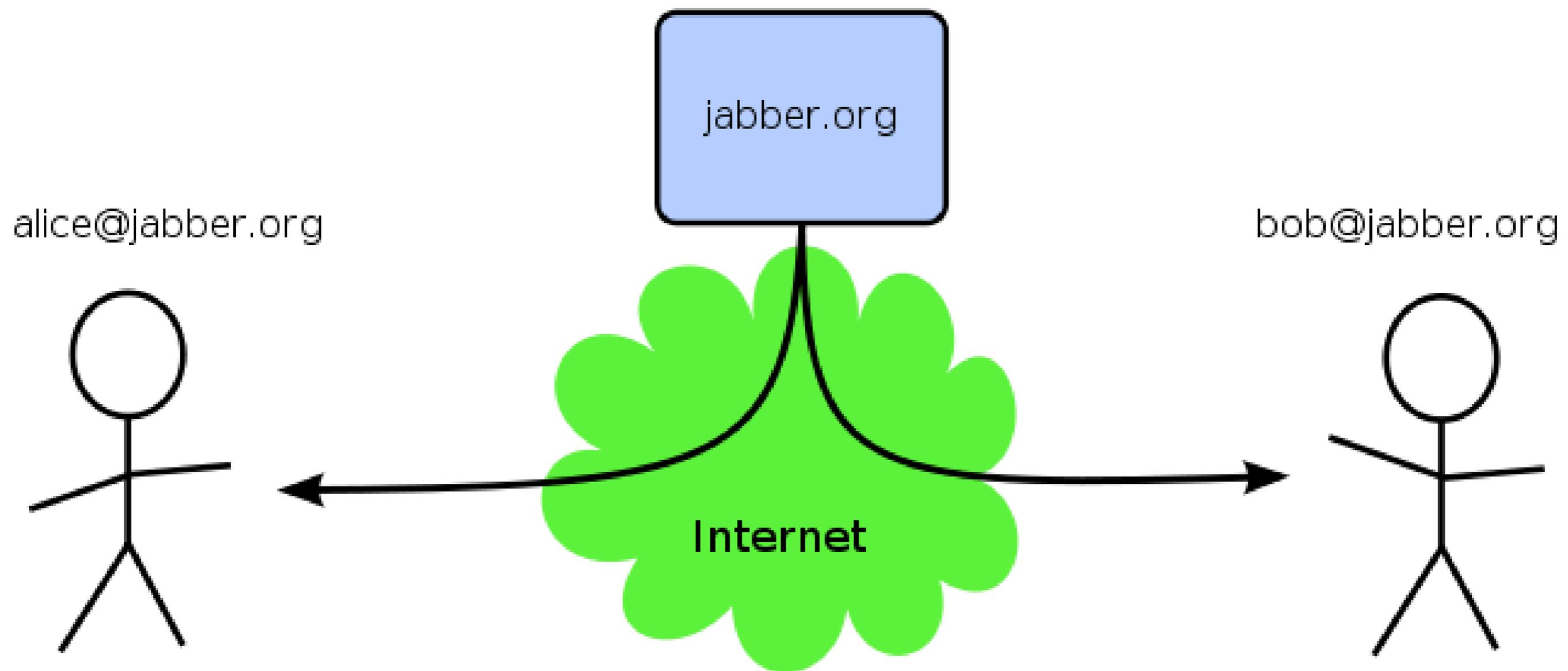


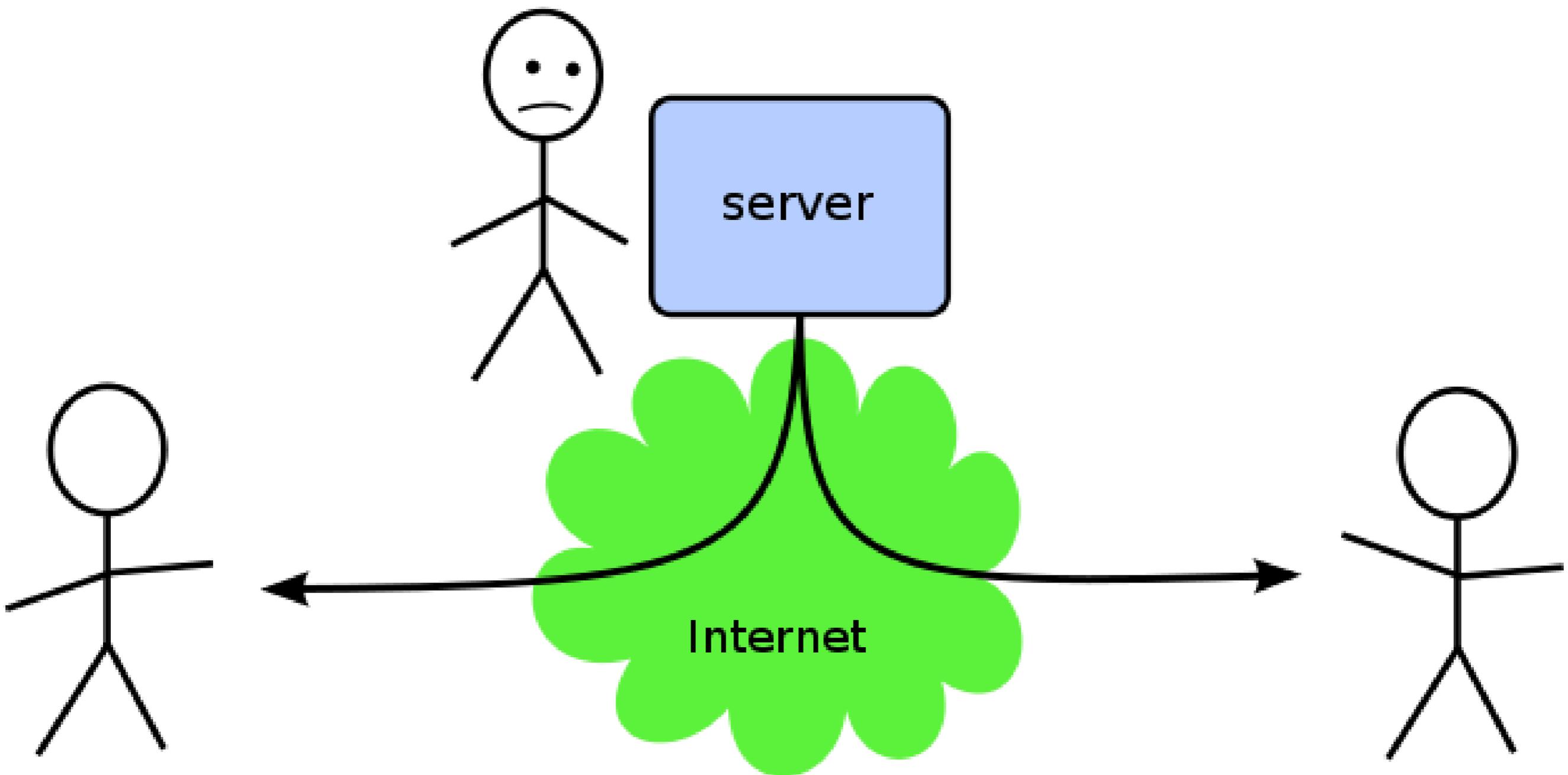


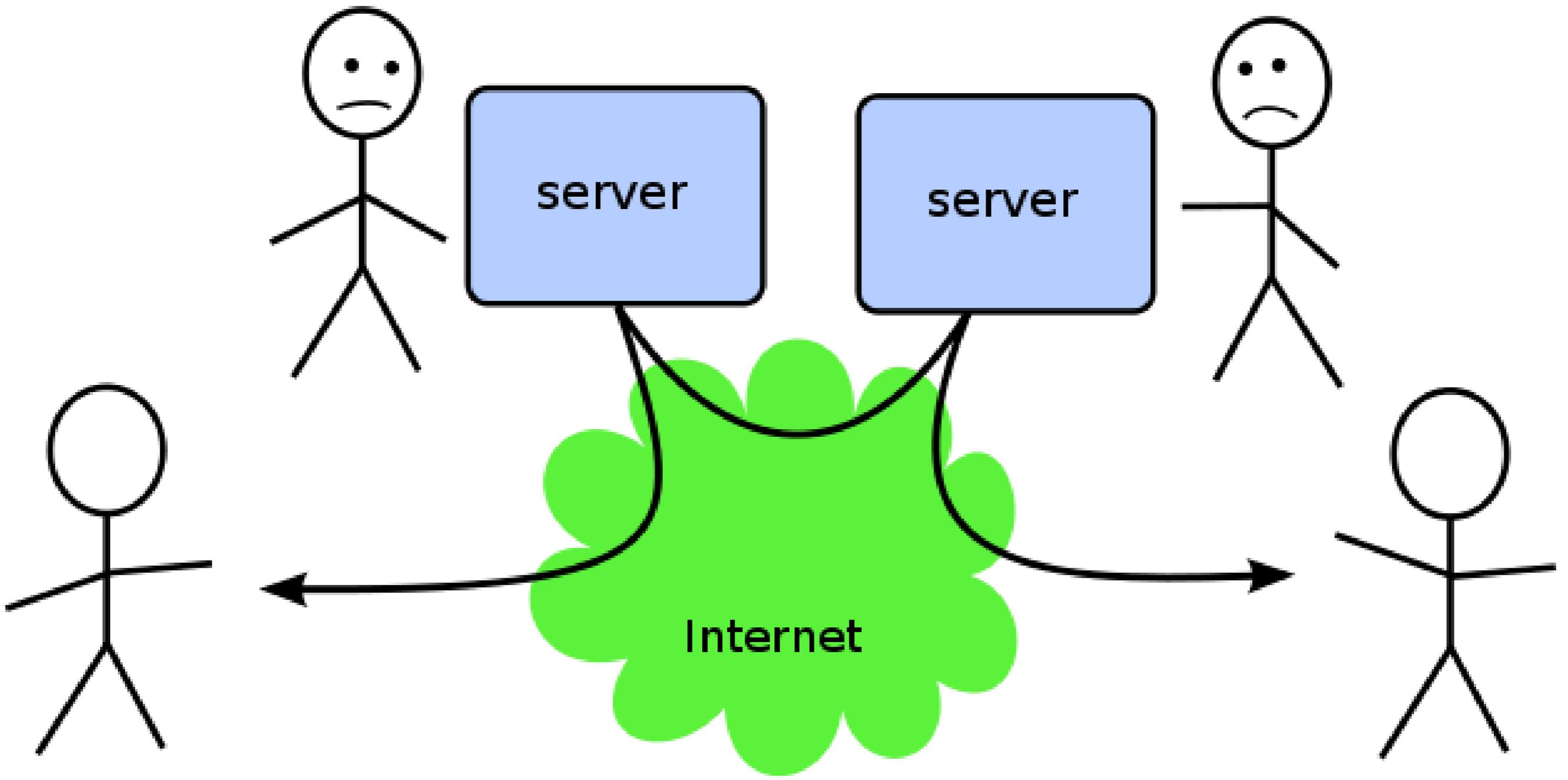


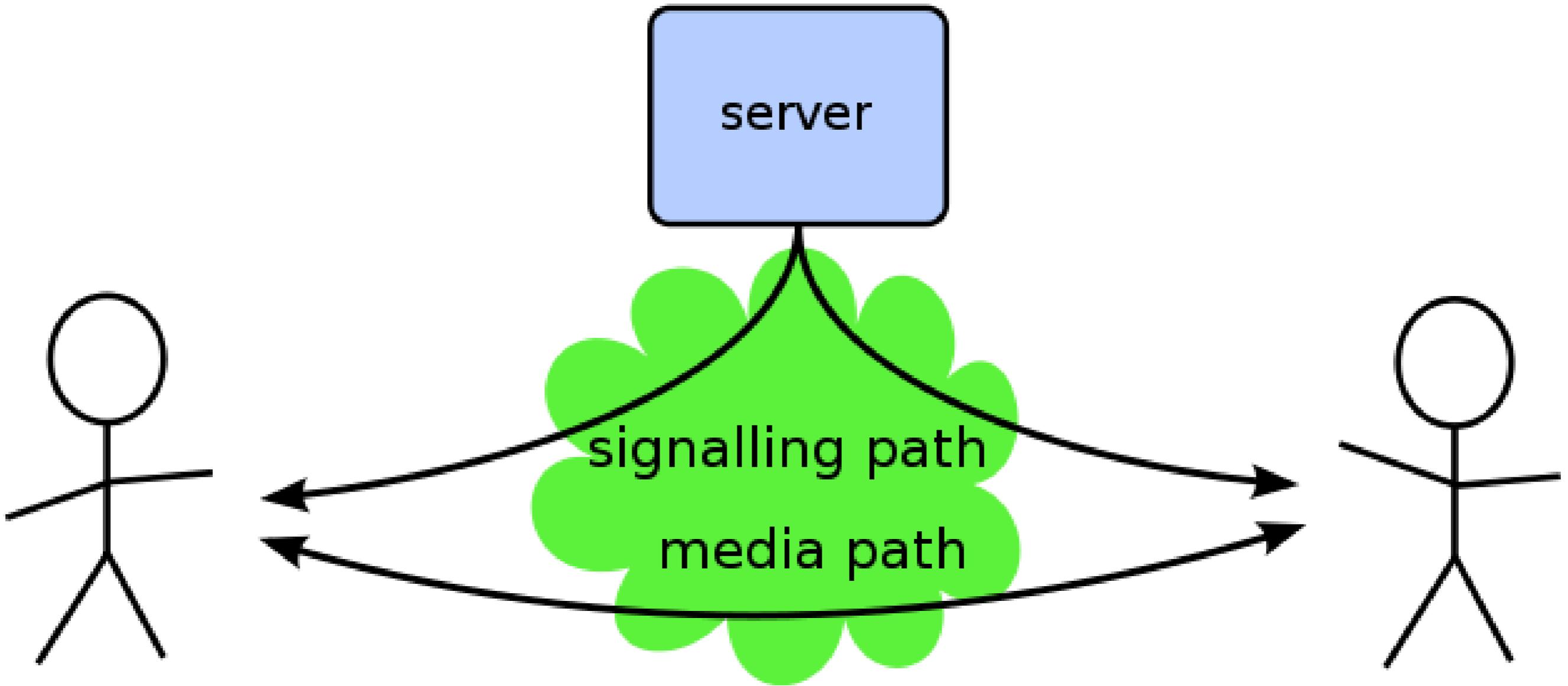












**problem**

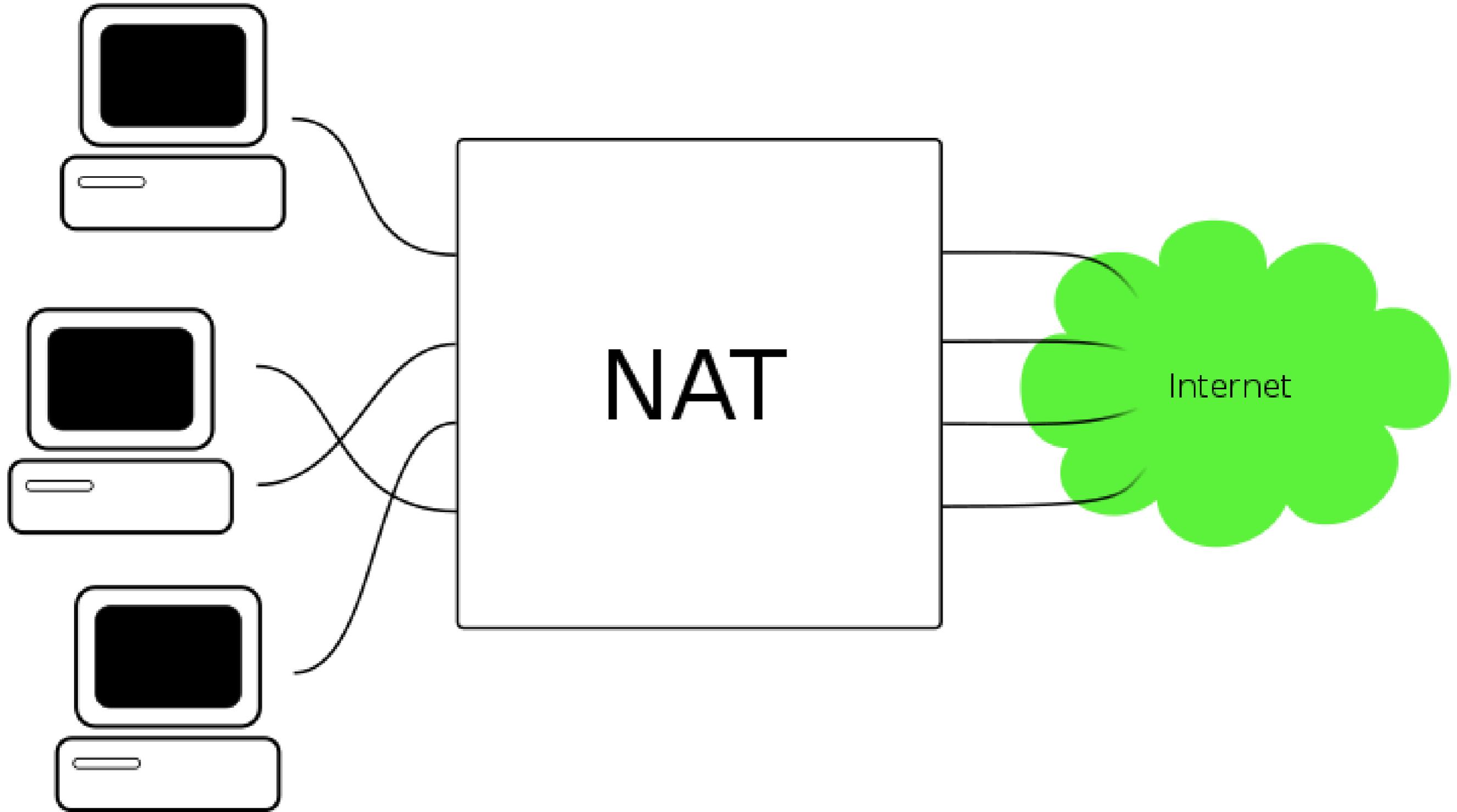
network address translator  
(NAT)

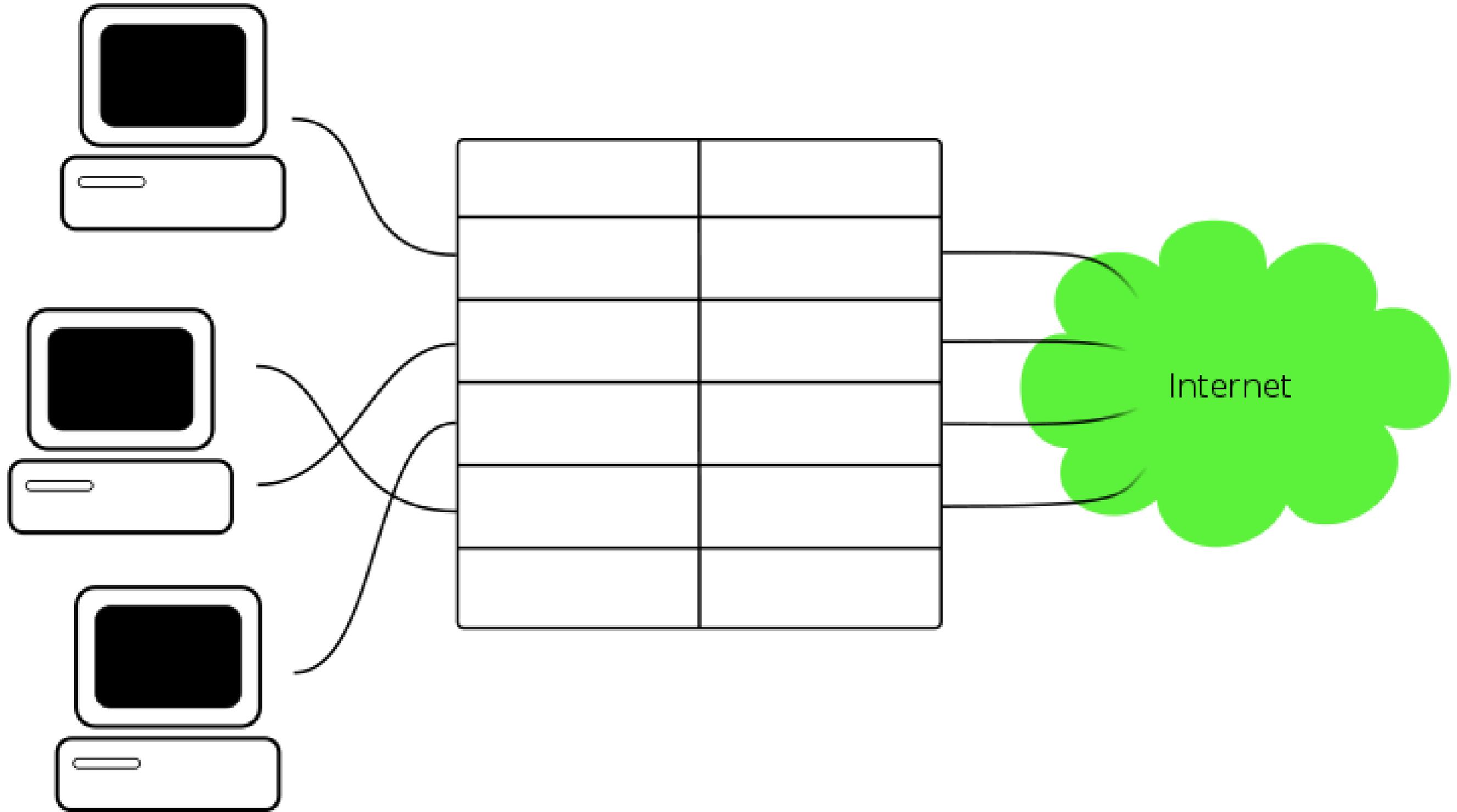
**source NAT**

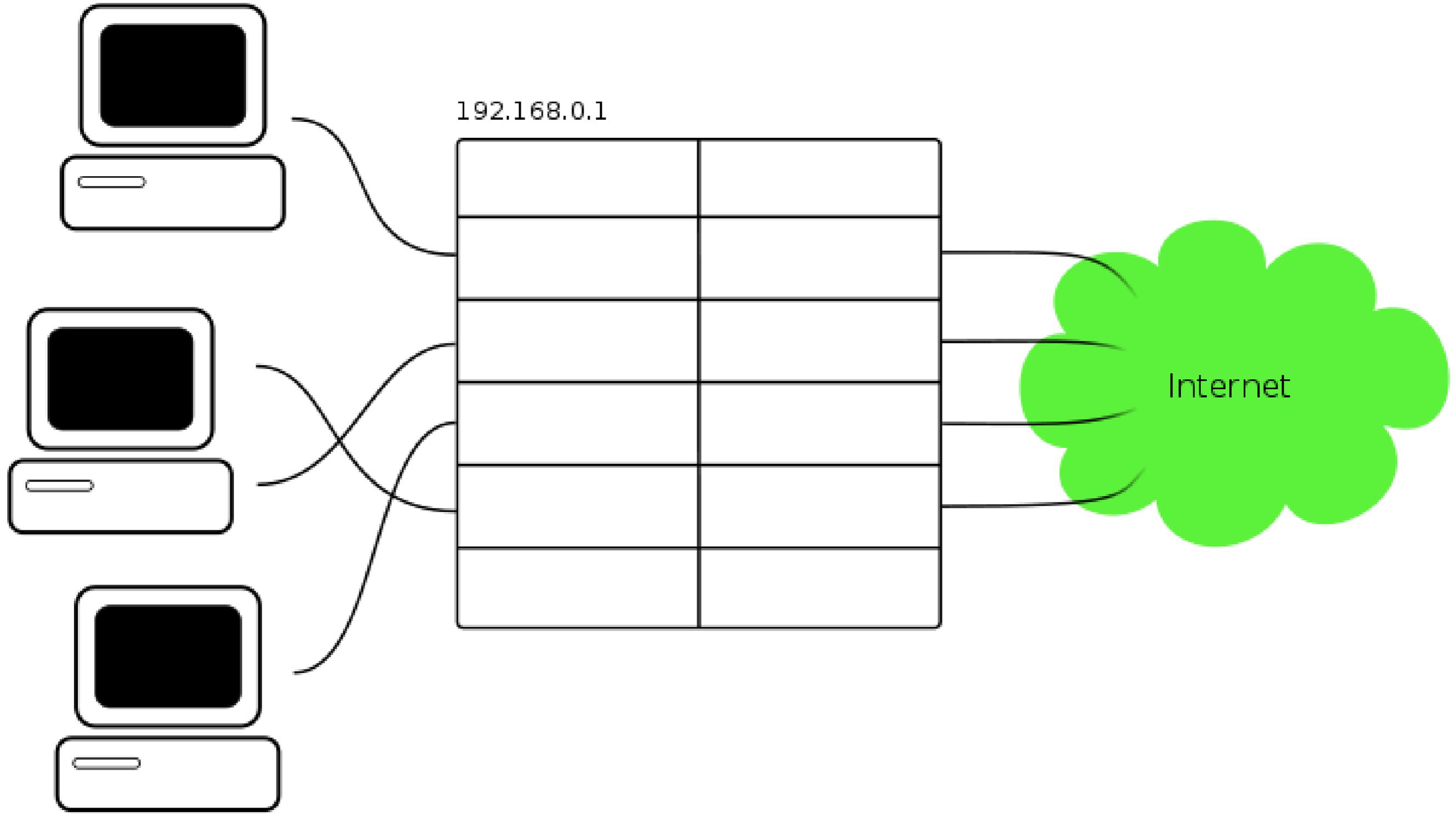
# **NAT traversal**

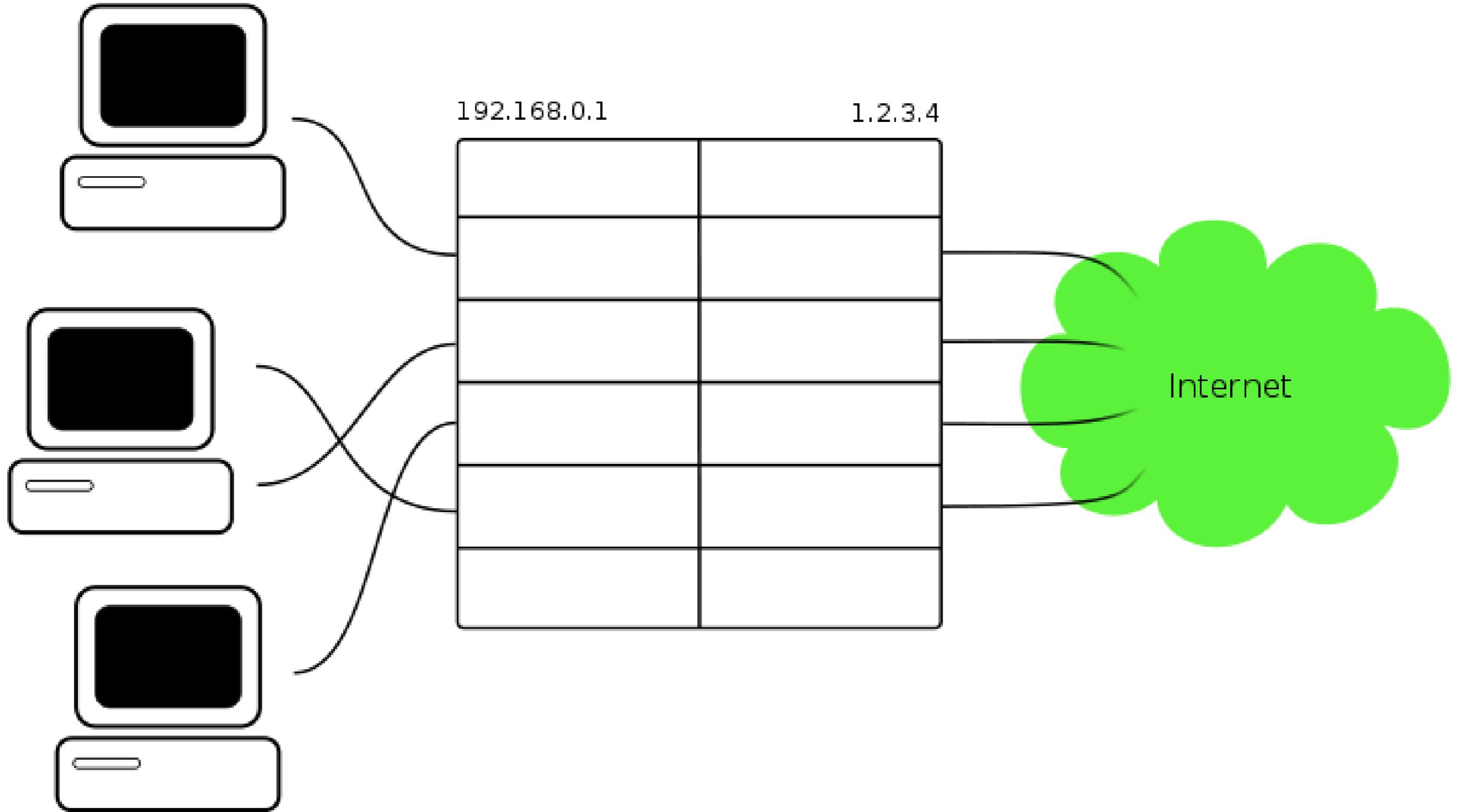
a.k.a. NAT penetration

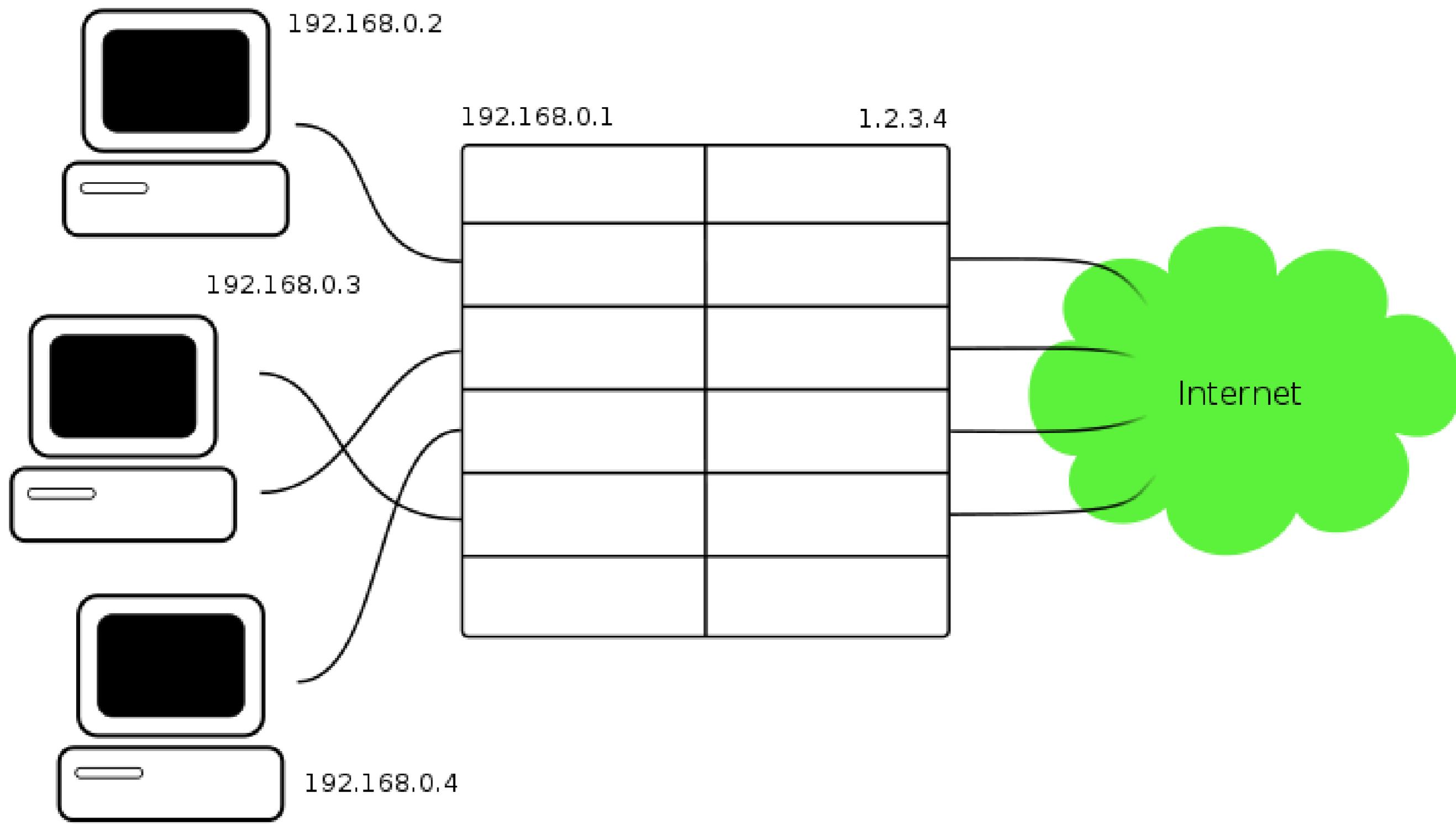
a.k.a. NAT punching

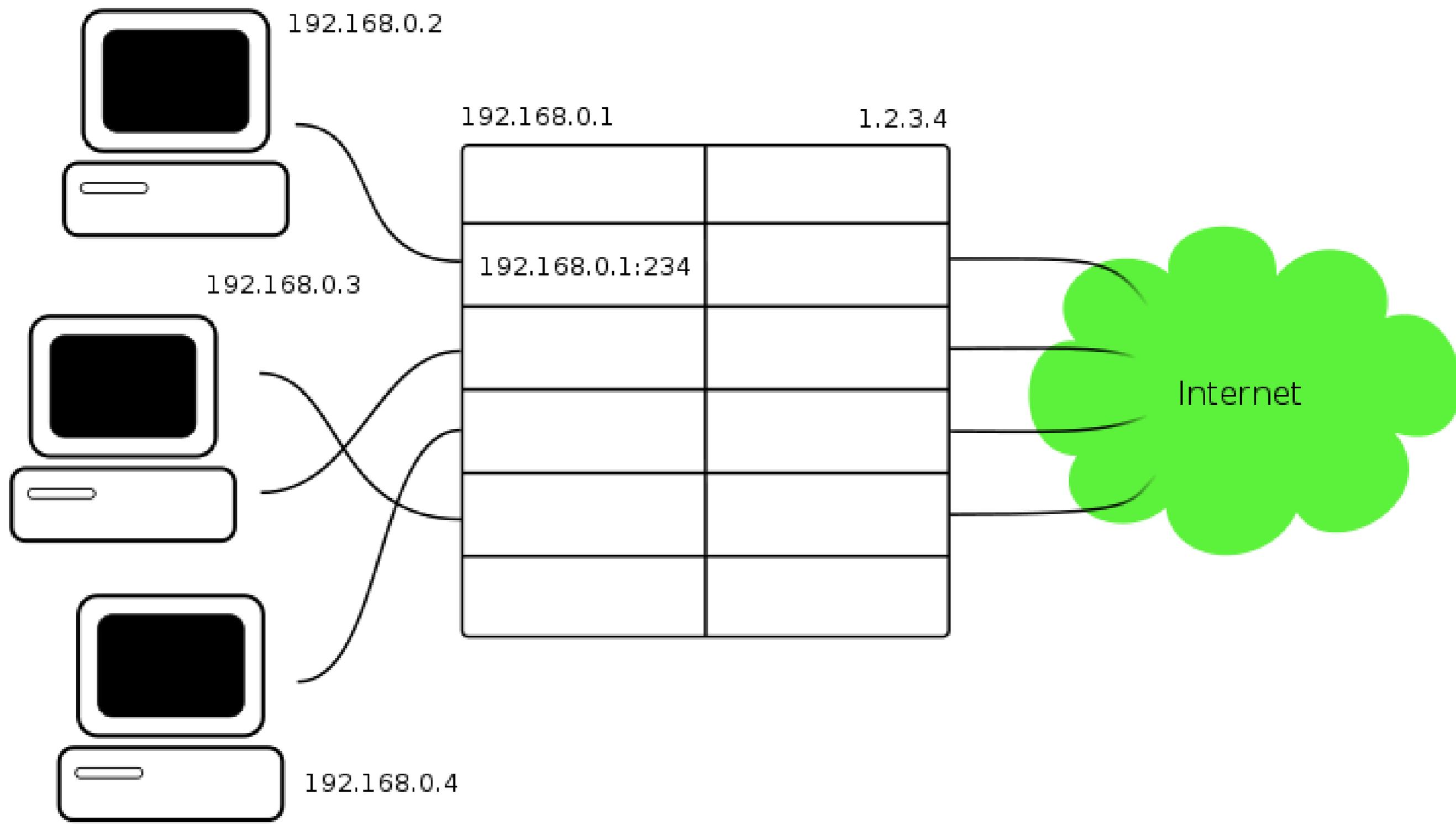


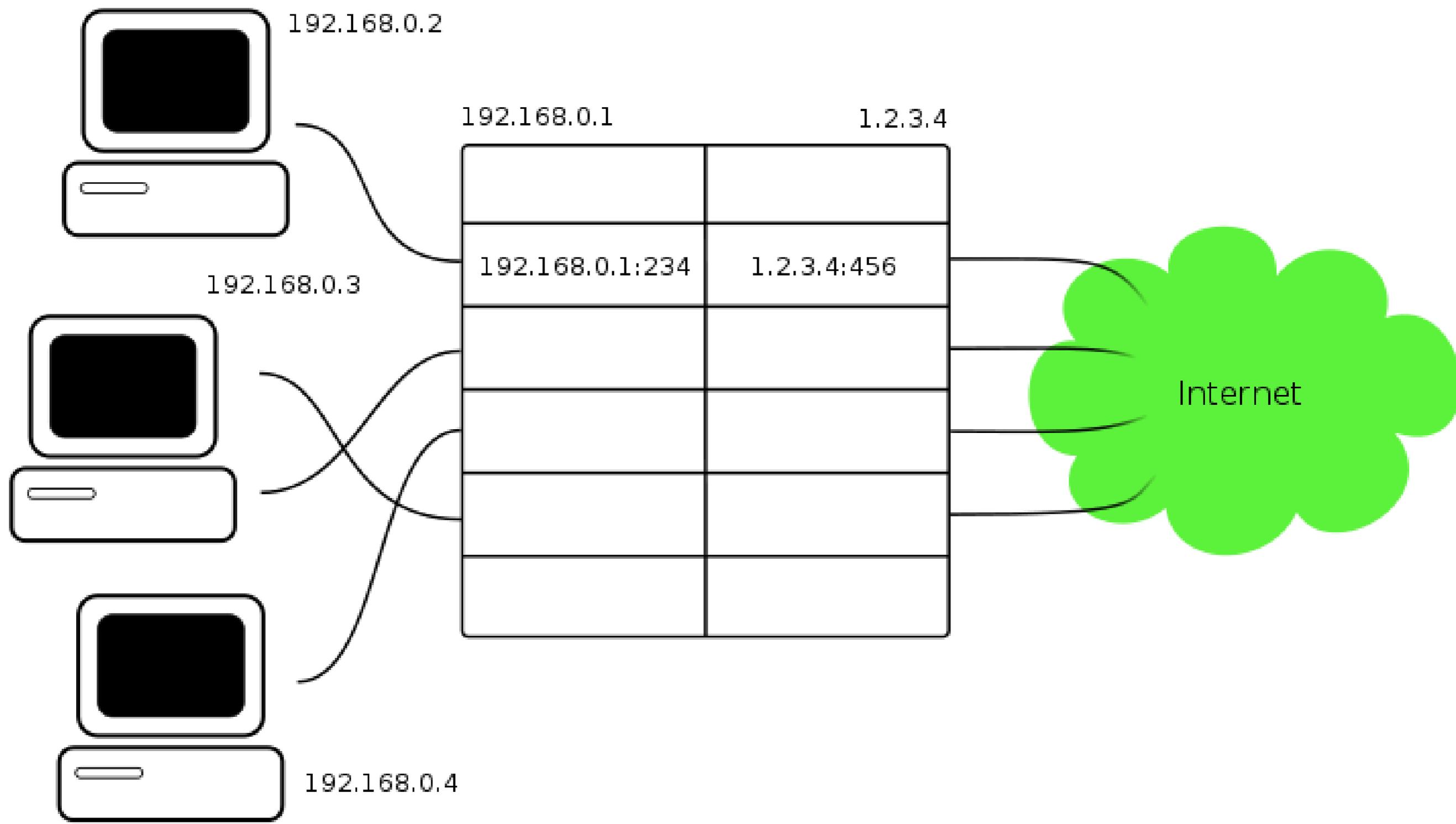


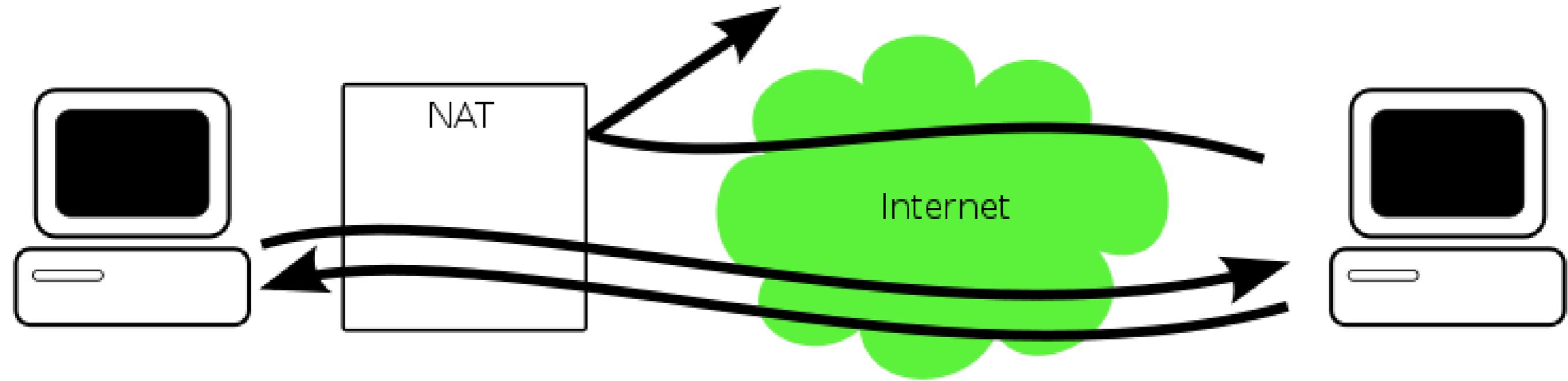


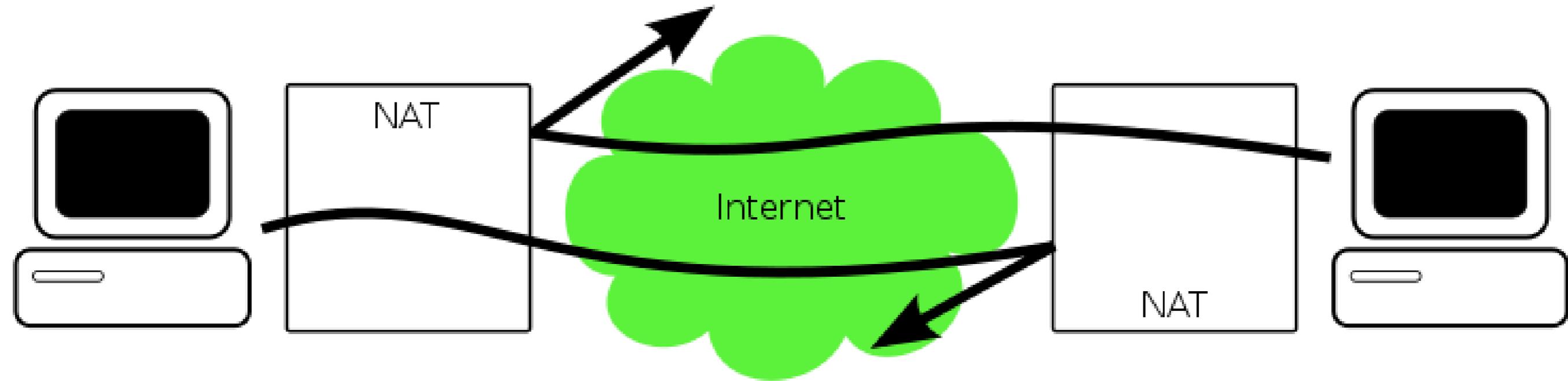


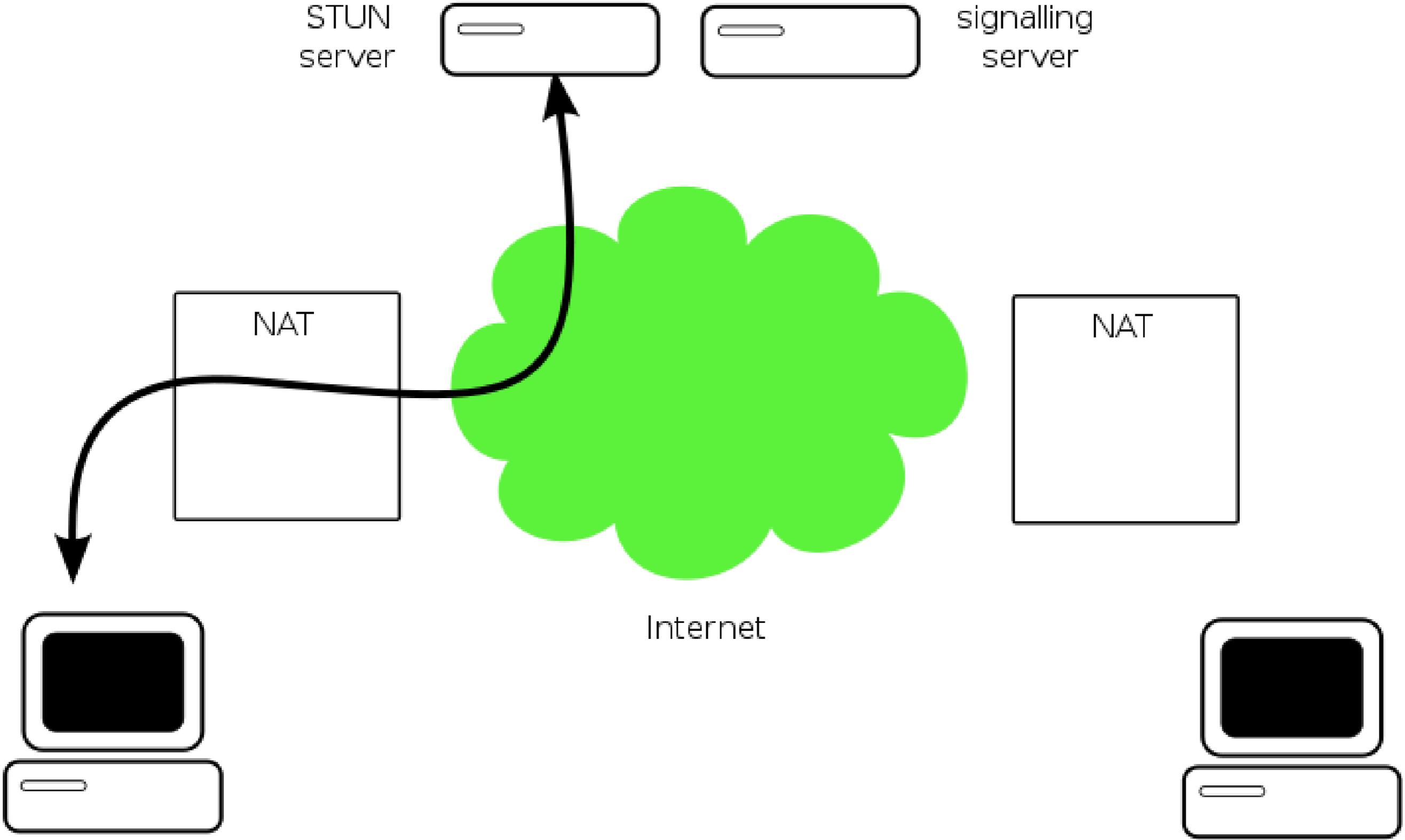


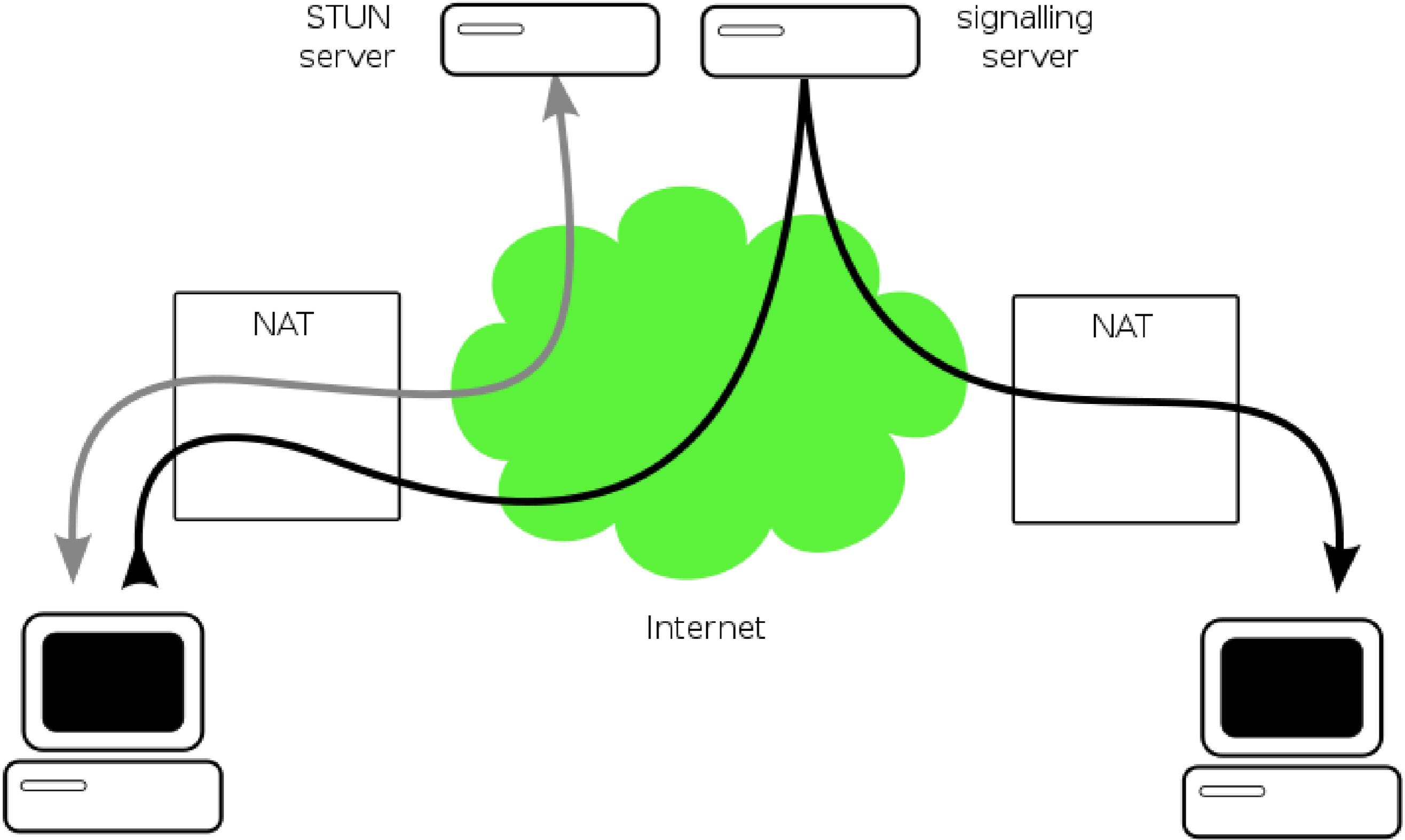


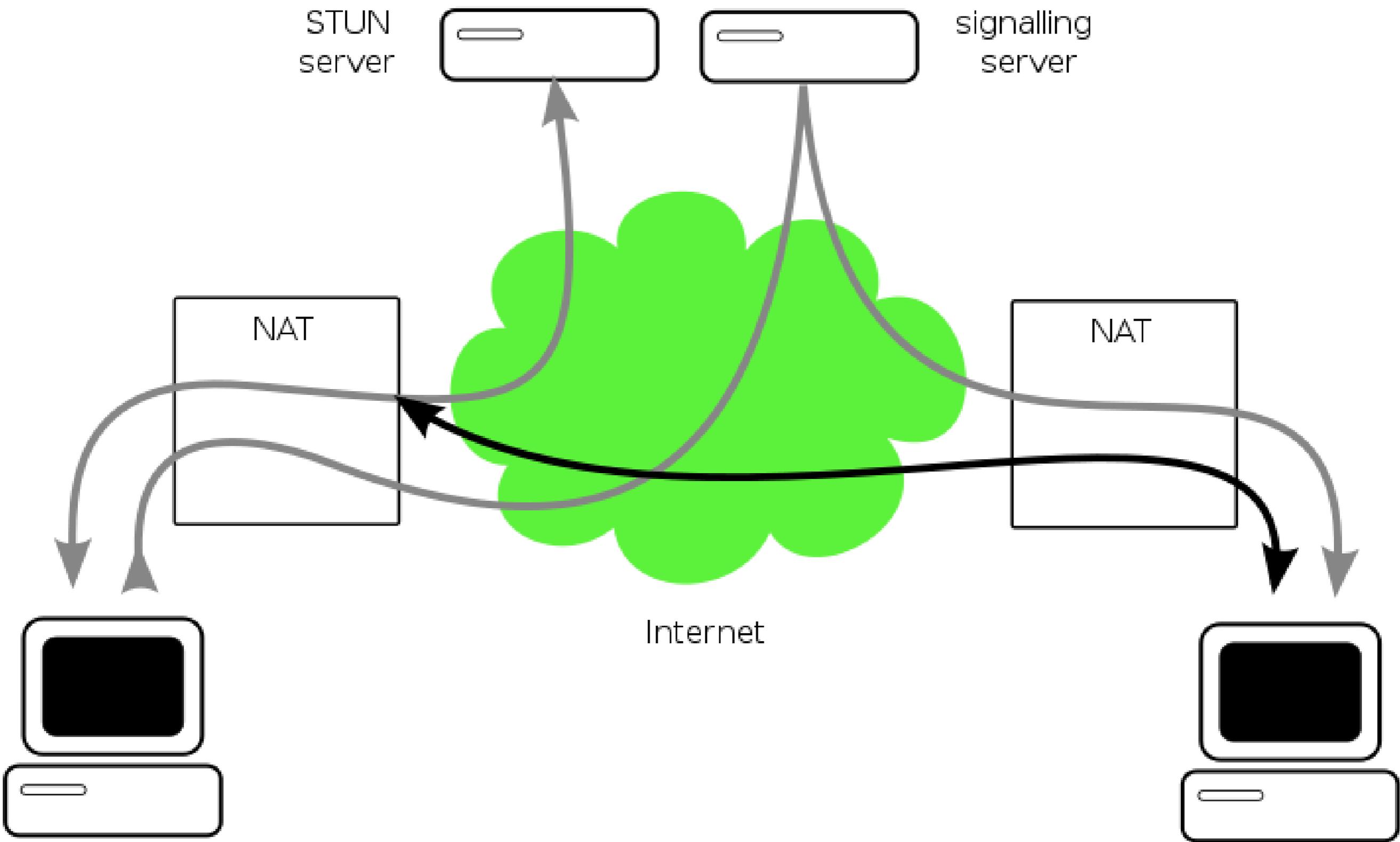




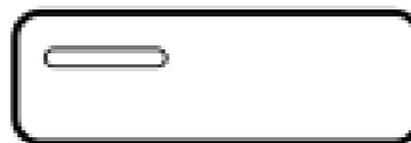
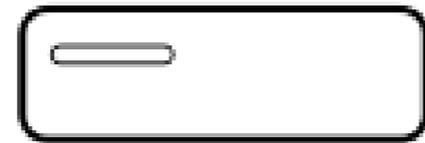




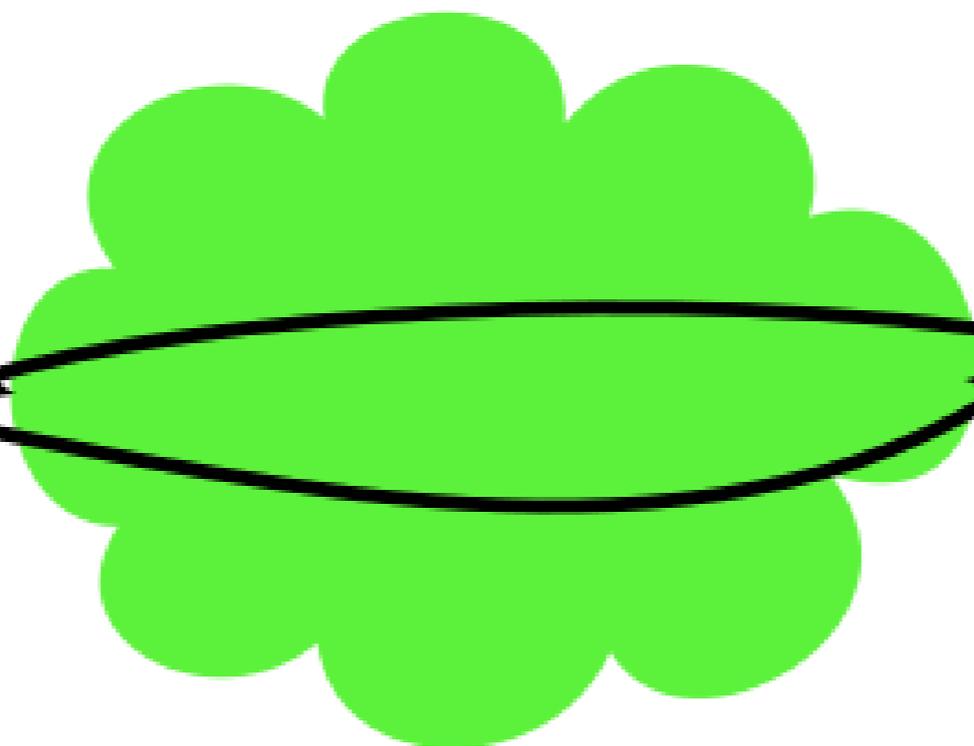
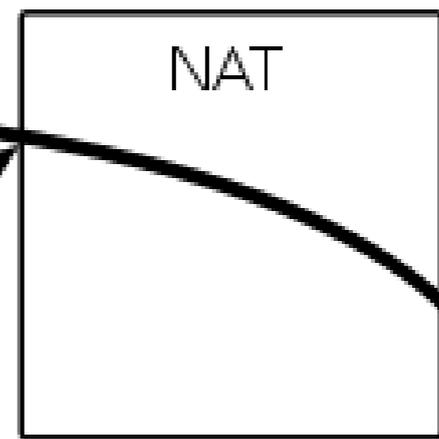
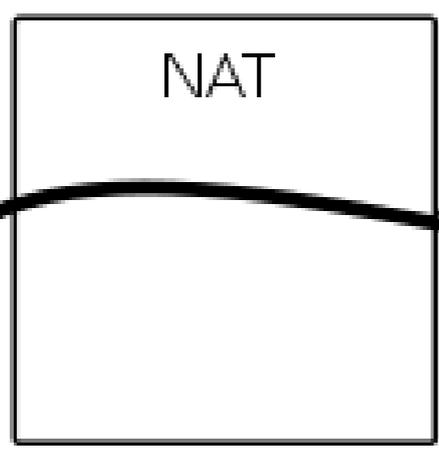




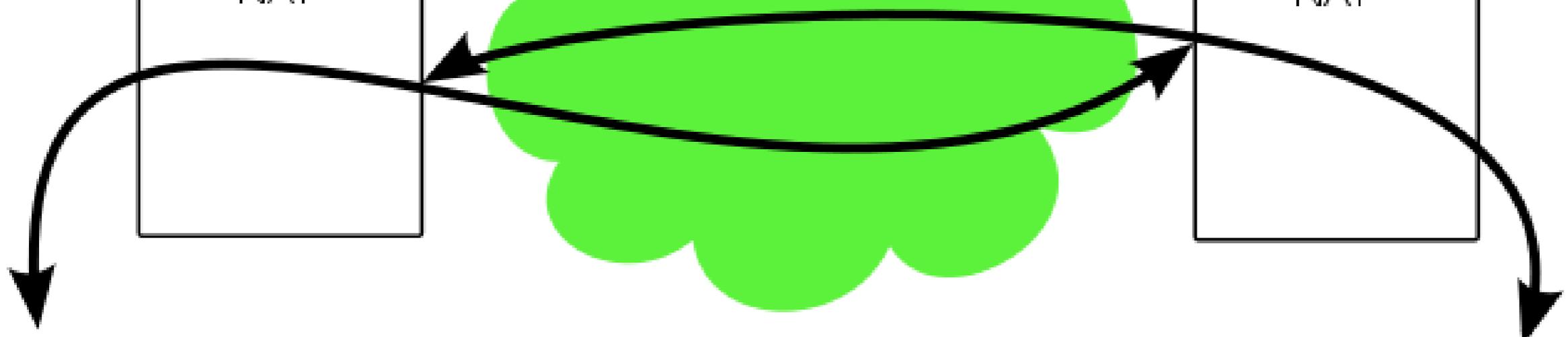
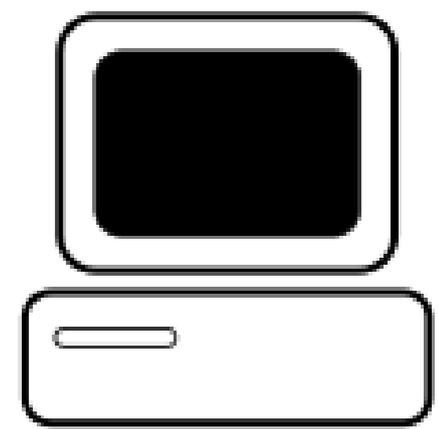
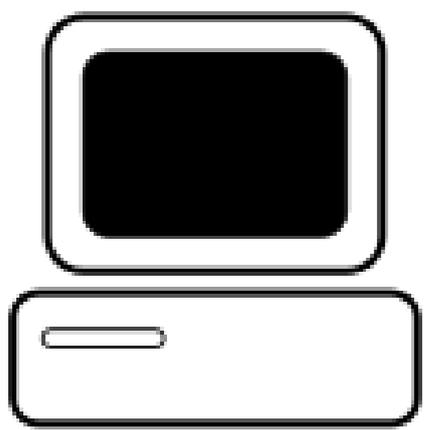
STUN  
server



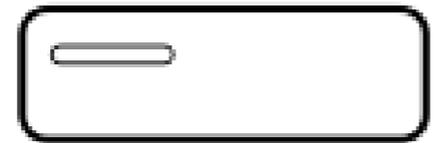
signalling  
server



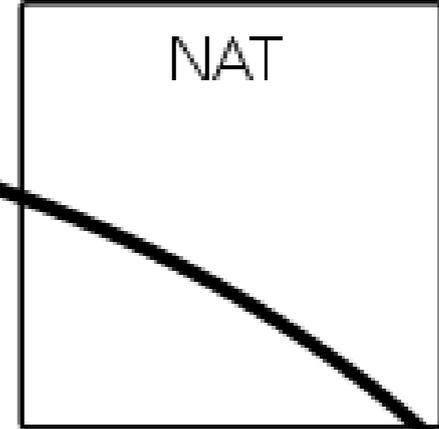
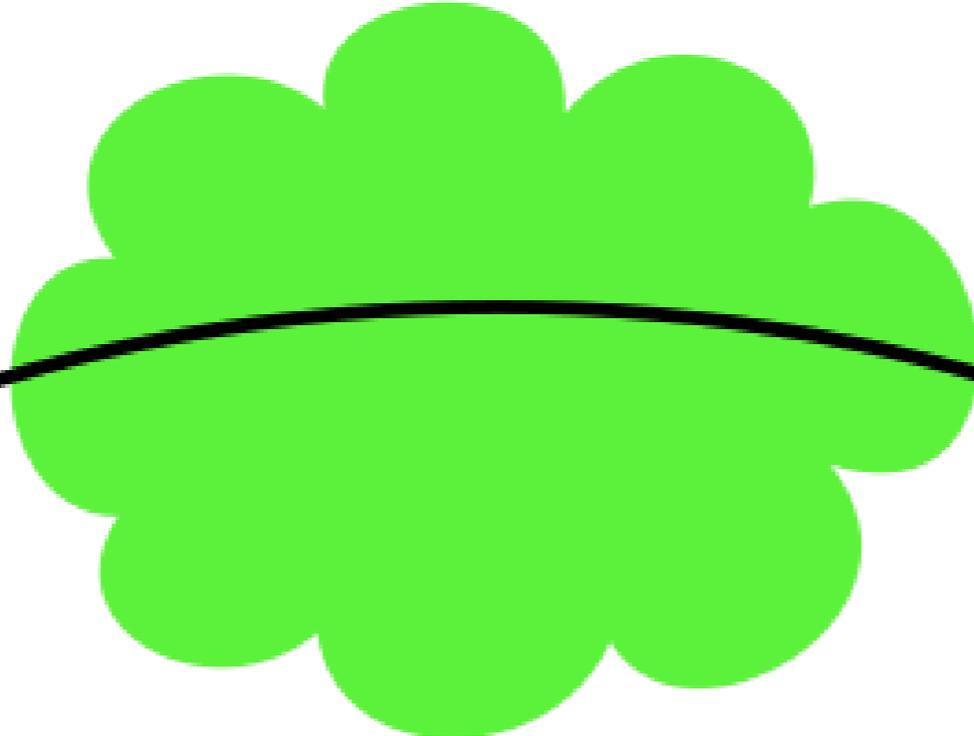
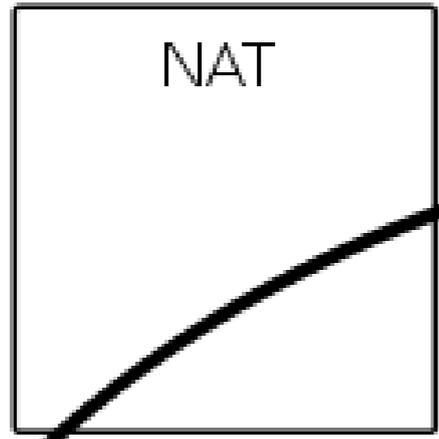
Internet



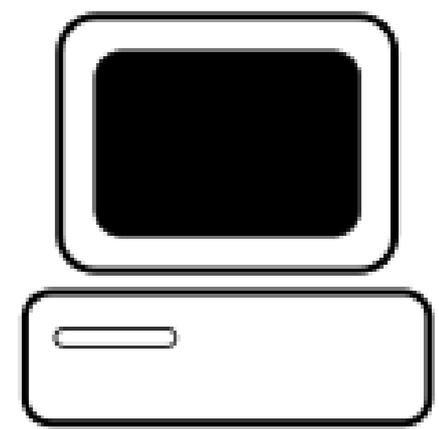
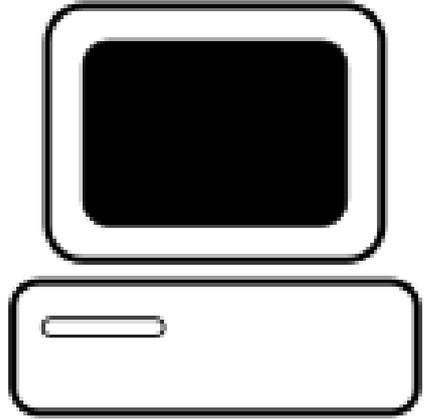
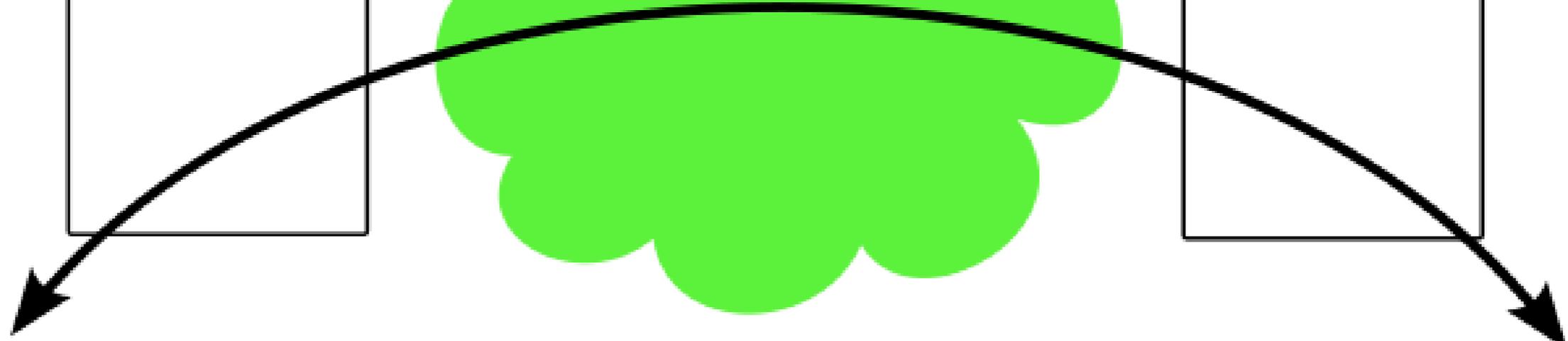
STUN  
server



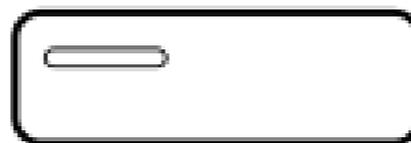
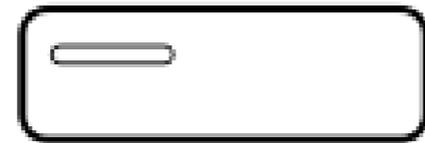
signalling  
server



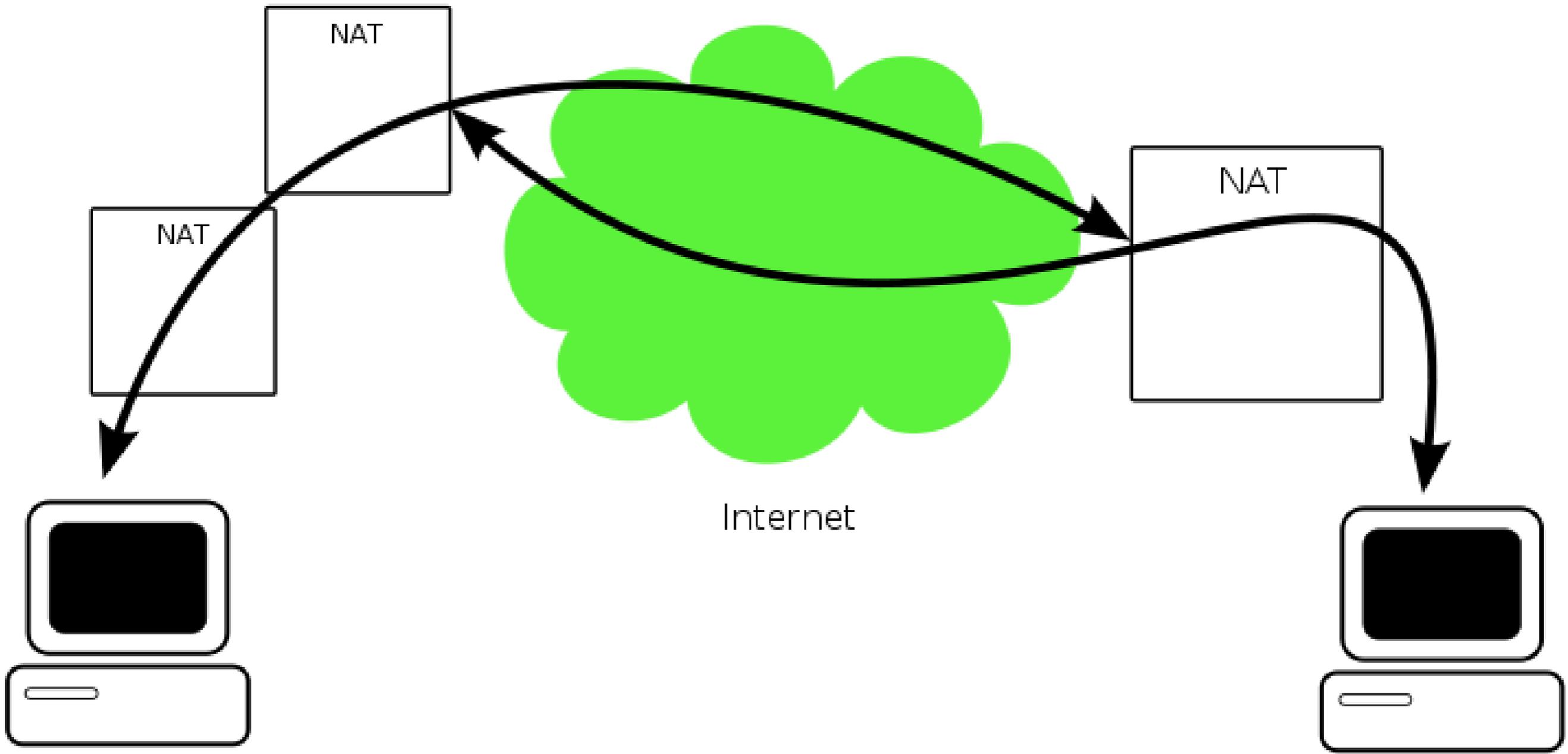
Internet



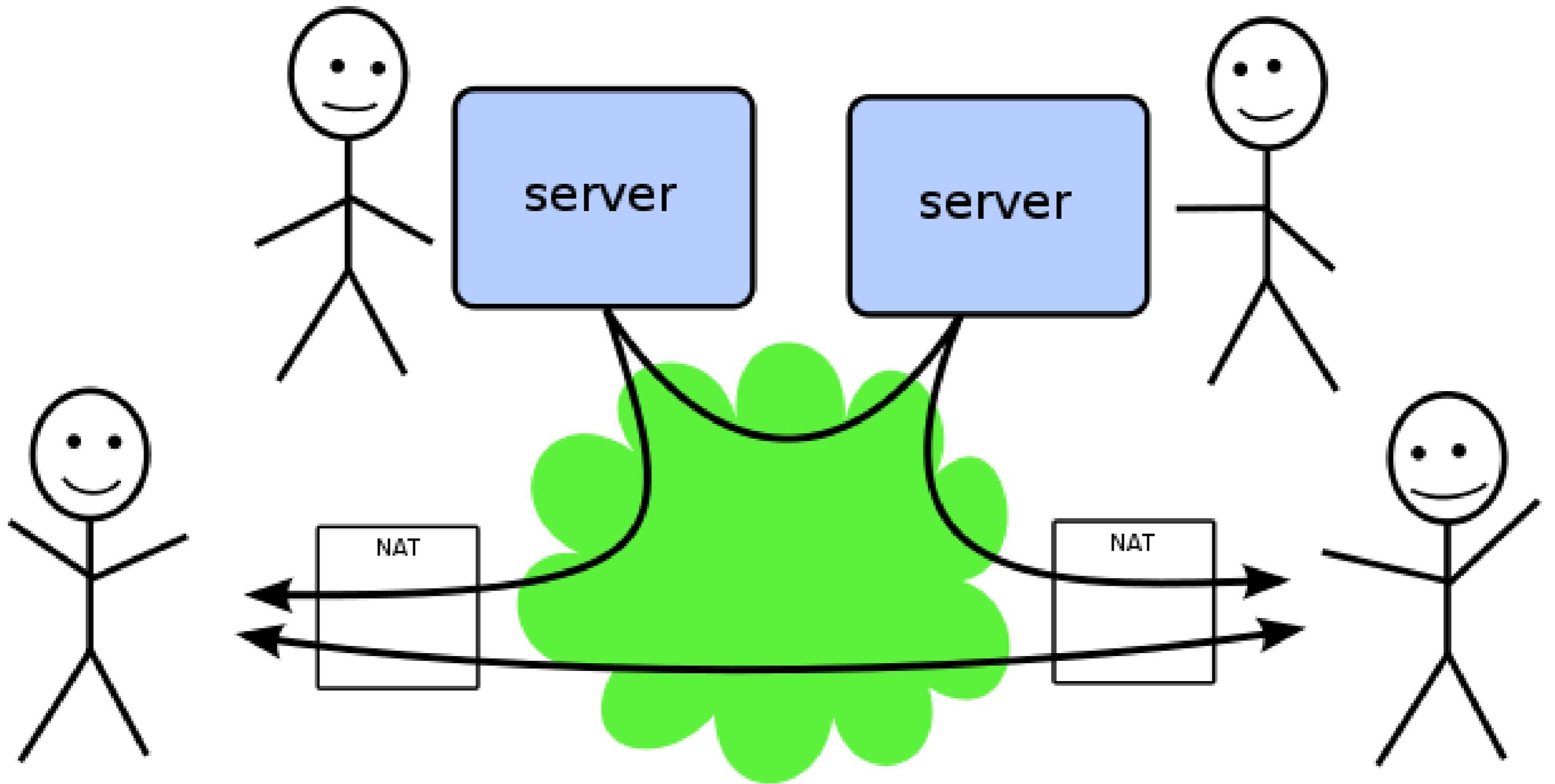
STUN  
server



signalling  
server



Internet



**symmetric NAT**

UPnP Internet Gateway Device (UPnP IGD)

NAT Port Mapping Protocol (NAT-PMP)

Teredo

AYIYA

Realm Specific IP

Media Gateway Control Protocol

Middlebox communication

application level gateways

STUN

# **STUN**

RFC 3489

draft-ietf-behave-rfc3489bis

# ICE

draft-ietf-mmusic-ice

**candidate**

**connectivity check**

v=0  
o=jdoe 2890844526 2890842807 IN IP4 10.0.1.1  
s=  
c=IN IP4 192.0.2.3  
t=0 0  
a=ice-pwd:asd88fgpdd777uzjYhagZg  
a=ice-ufrag:8hhY  
m=audio 45664 RTP/AVP 0  
b=RS:0  
b=RR:0  
a=rtpmap:0 PCMU/8000  
a=candidate:1 1 UDP 2130706431 10.0.1.1 8998 typ host  
a=candidate:2 1 UDP 1694498815 192.0.2.3 45664 typ srflx raddr 10.0.1.1 rport 8998

```
<transport xmlns='urn:xmpp:tmp:jingle:transports:ice-tcp'>
  <candidate component='1'
    foundation='1'
    generation='0'
    ip='192.0.2.3'
    network='1'
    port='45664'
    priority='1678246398'
    protocol='udp'
    pwd='asd88fgpdd777uzjYhagZg'
    type='srflx'
    ufrag='8hhy' />
</transport>
```

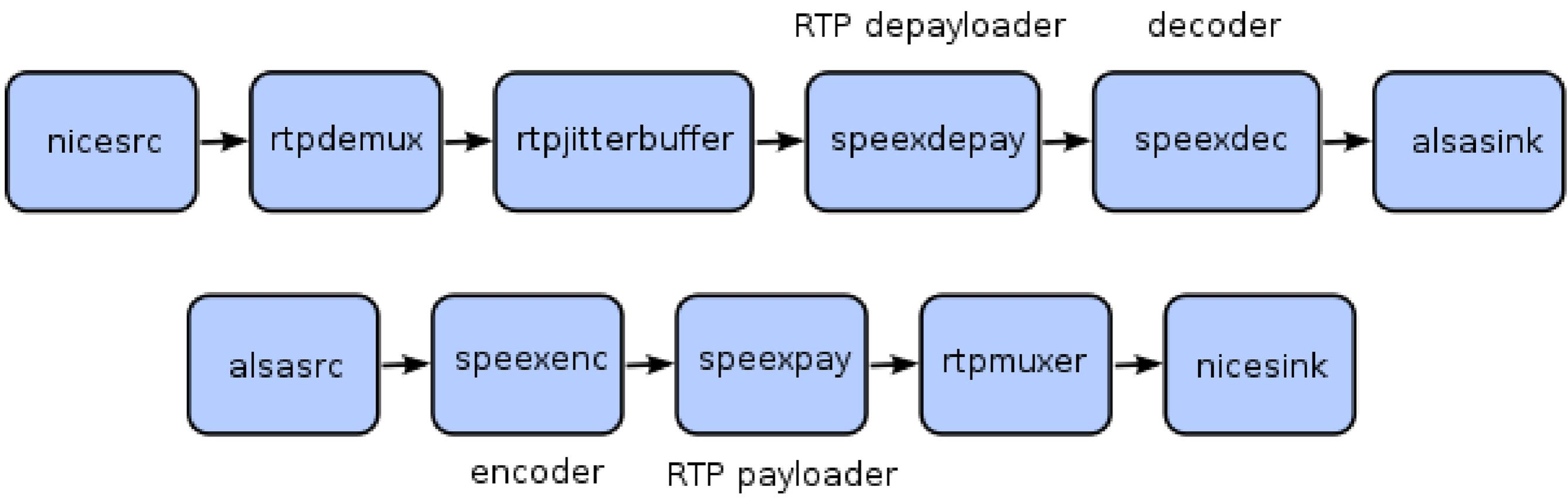
**IPv6**

**voice hammer**

**libnice**

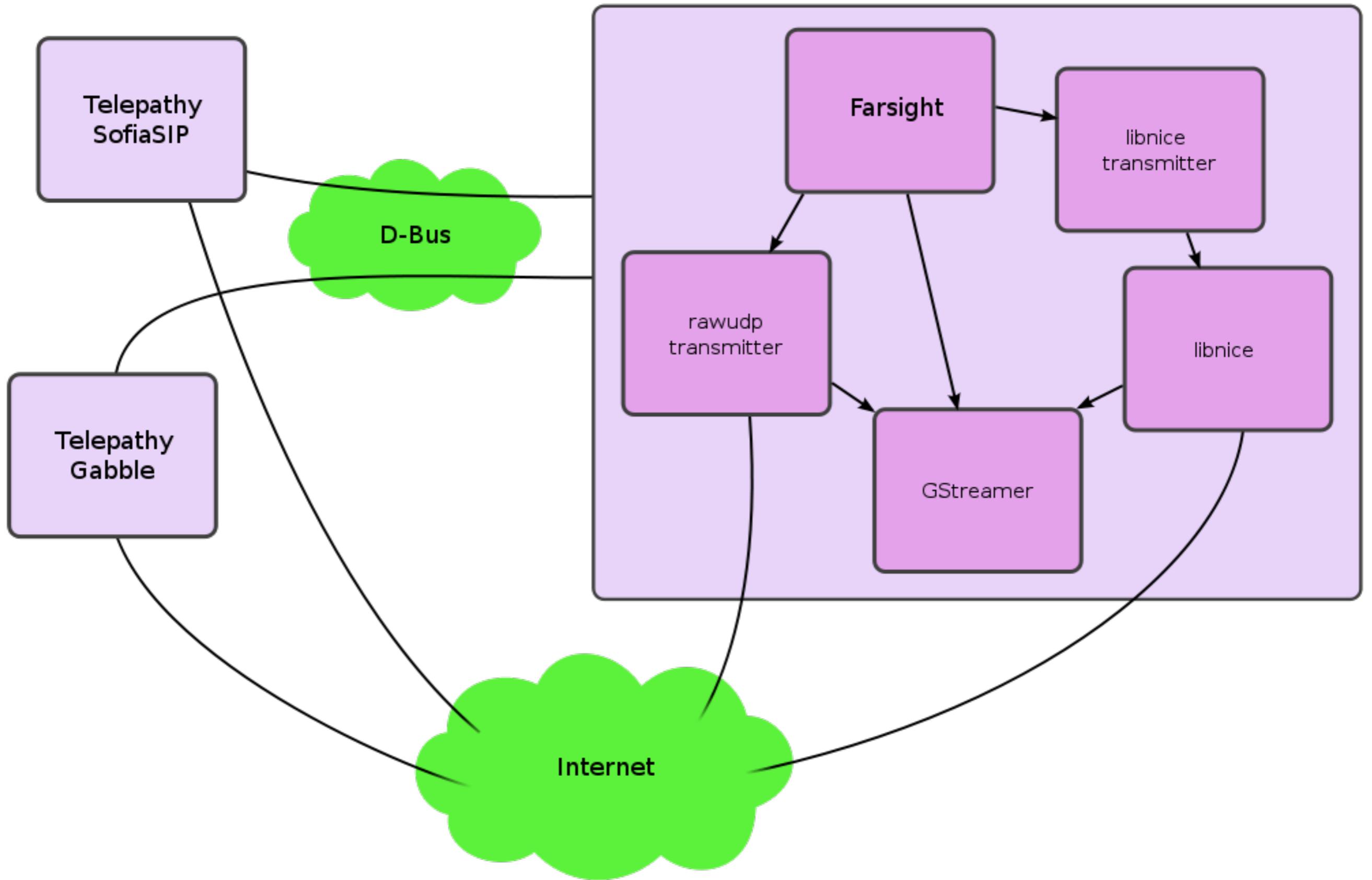
# **Farsight**

voice + video calls for GStreamer



**Telepathy**

# Telepathy Stream Engine



**tubes**

# **summary**

peer-to-peer is good

NATs are bad

ICE replaces ad-hoc NAT punching solutions

# **webs**

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[nice@lists.freedesktop.org](mailto:nice@lists.freedesktop.org)