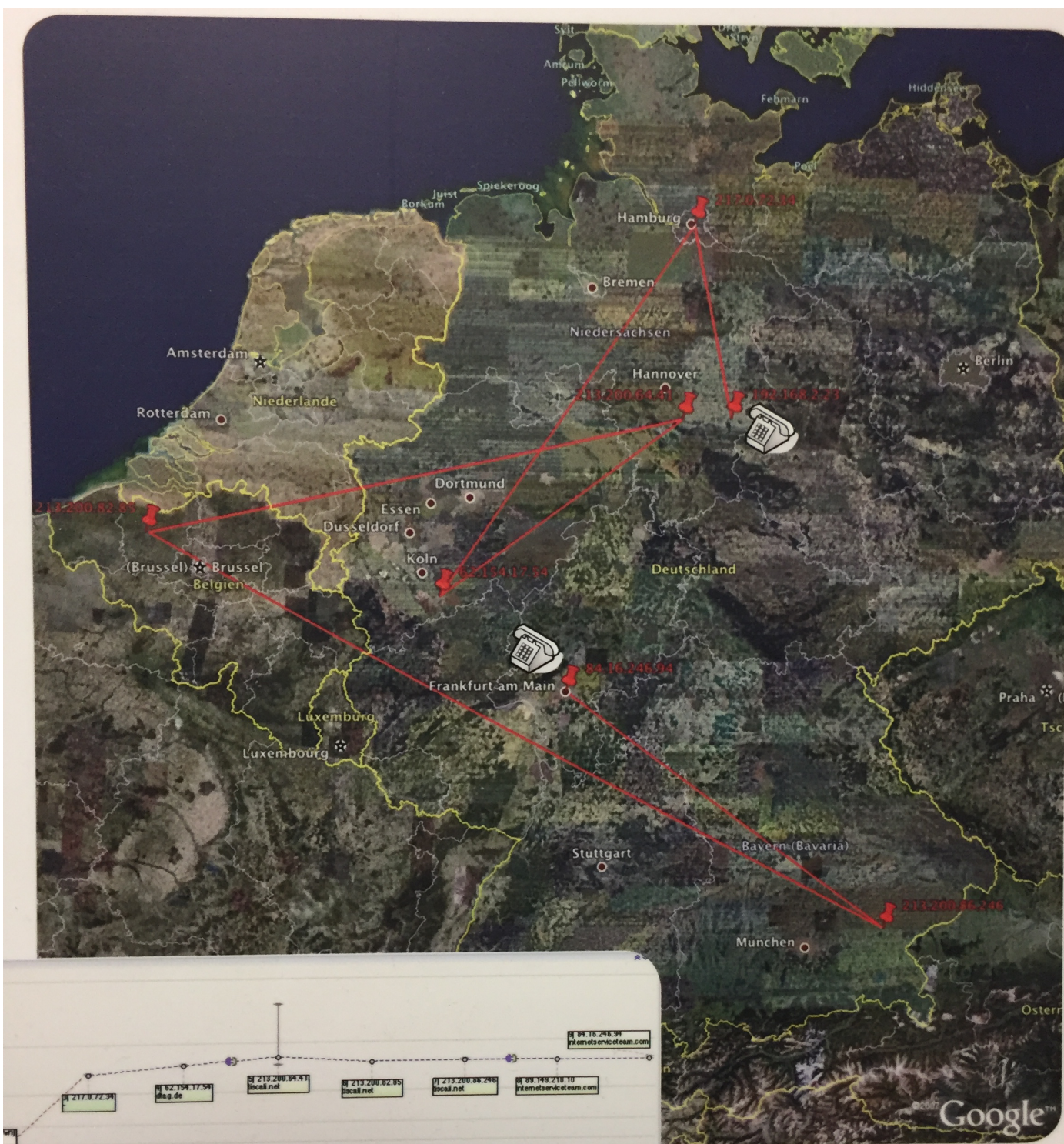


Type	Meaning	Type	Meaning
0	Echo Reply	17	Address Mask Request
3	Destination Unreachable	18	Address Mask Reply
4	Source Quench	30	Traceroute
5	Redirect (change a route)	31	Datagram Conversion Error
6	Alternate Host Address	32	Mobile Host Redirect
8	Echo Request	33	Where-Are-You (for IPv6)
9	Router Advertisement	34	I-Am-Here (for IPv6)
10	Router Discovery	35	Mobile Registration Request
11	Time Exceeded	36	Mobile Registration Reply
12	Parameter Problem	37	Domain Name Request
13	Timestamp Request	38	Domain Name Reply
14	Timestamp Reply	39	SKIP (Simple Key Mgmt)
15	Information Request	40	Photuris
16	Information Reply	41	Experimental Mobility

ICMPv4 Message Types und deren Bedeutung

```
Diederichs-MacBook-Air:~ diederichwermser$ traceroute wikipedia.de
traceroute to wikipedia.de (134.119.24.29), 64 hops max, 52 byte packets
 1 172.20.10.1 (172.20.10.1) 5.099 ms 2.389 ms 3.296 ms
 2 * * *
 3 * * *
 4 * * *
 5 * * *
 6 * * *
 7 * * *
 8 * * *
 9 * * *
10 * * *
11 * * *
12 217.5.105.117 (217.5.105.117) 74.369 ms 27.191 ms
    217.5.105.113 (217.5.105.113) 26.977 ms
13 194.25.6.230 (194.25.6.230) 65.168 ms 40.248 ms 31.096 ms
14 ffm-b1-link.telia.net (213.248.93.184) 29.911 ms 70.213 ms 30.396 ms
15 ffm-bb4-link.telia.net (62.115.121.10) 30.068 ms
    ffm-bb3-link.telia.net (62.115.121.0) 38.693 ms
    ffm-bb4-link.telia.net (62.115.116.165) 30.193 ms
16 koln-b1-link.telia.net (213.155.134.87) 33.444 ms
    koln-b1-link.telia.net (80.91.247.247) 33.155 ms 33.092 ms
17 ae0.cr-nashira.cgn4.core.heg.com (62.115.33.242) 38.873 ms 33.953 ms 35.006 ms
18 xe-0-0-0.dr-master.cgn4.core.heg.com (91.250.127.30) 39.826 ms 102.995 ms 39.042 ms
19 wikipedia.de (134.119.24.29) 34.898 ms 39.065 ms 36.423 ms
```

Beispiel für eine Traceroute-Antwort



Geografische Abbildung einer Traceroute Antwort


```
62 8.820356000 0.0.0.0 255.255.255.255 DHCP 342 DHCP Request - Transaction ID 0x6062e69d
> Frame 62: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface 0
> Ethernet II, Src: Apple_b3:d0:3e (64:76:ba:b3:d0:3e), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
> Internet Protocol Version 4, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255 (255.255.255.255)
> User Datagram Protocol, Src Port: 68 (68), Dst Port: 67 (67)
< Bootstrap Protocol (Request)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 0
  Transaction ID: 0x6062e69d
  Seconds elapsed: 0
  < Bootp flags: 0x0000 (Unicast)
    0... .. = Broadcast flag: Unicast
    .000 0000 0000 0000 = Reserved flags: 0x0000
  Client IP address: 0.0.0.0 (0.0.0.0)
  Your (client) IP address: 0.0.0.0 (0.0.0.0)
  Next server IP address: 0.0.0.0 (0.0.0.0)
  Relay agent IP address: 0.0.0.0 (0.0.0.0)
  Client MAC address: Apple_b3:d0:3e (64:76:ba:b3:d0:3e)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
  < Option: (53) DHCP Message Type (Request)
    Length: 1
    DHCP: Request (3)
  < Option: (55) Parameter Request List
    Length: 10
    Parameter Request List Item: (1) Subnet Mask
    Parameter Request List Item: (121) Classless Static Route
    Parameter Request List Item: (3) Router
    Parameter Request List Item: (6) Domain Name Server
    Parameter Request List Item: (15) Domain Name
    Parameter Request List Item: (119) Domain Search
    Parameter Request List Item: (252) Private/Proxy autodiscovery
    Parameter Request List Item: (95) LDAP [TODO:RFC3679]
    Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
    Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
  > Option: (57) Maximum DHCP Message Size
  > Option: (61) Client identifier
  < Option: (50) Requested IP Address
    Length: 4
    0000 ff ff ff ff ff 64 76 ba b3 d0 3e 00 00 45 00 .....dv...>..E
    0010 01 48 a7 d3 00 00 ff 11 12 d2 00 00 00 00 ff ff ..H.....
    0020 ff ff 00 44 00 43 01 34 a0 b3 01 01 06 00 60 62 ...D.C.4.....b
    0030 e6 9d 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
    0040 00 00 00 00 00 00 64 76 ba b3 d0 3e 00 00 00 00 .....dv..>
```

Beispiel für einen DHCP - Request (oberer Teil)

```
62.8.820356000 0.0.0.0 255.255.255.255 DHCP 342 DHCP Request - Transaction ID 0x6062e69d
Seconds elapsed: 0
▼ Bootp flags: 0x0000 (Unicast)
  0... .. = Broadcast flag: Unicast
  .000 0000 0000 0000 = Reserved flags: 0x0000
  Client IP address: 0.0.0.0 (0.0.0.0)
  Your (client) IP address: 0.0.0.0 (0.0.0.0)
  Next server IP address: 0.0.0.0 (0.0.0.0)
  Relay agent IP address: 0.0.0.0 (0.0.0.0)
  Client MAC address: Apple_b3:d0:3e (64:76:ba:b3:d0:3e)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
▼ Option: (53) DHCP Message Type (Request)
  Length: 1
  DHCP: Request (3)
▼ Option: (55) Parameter Request List
  Length: 10
  Parameter Request List Item: (1) Subnet Mask
  Parameter Request List Item: (121) Classless Static Route
  Parameter Request List Item: (3) Router
  Parameter Request List Item: (6) Domain Name Server
  Parameter Request List Item: (15) Domain Name
  Parameter Request List Item: (119) Domain Search
  Parameter Request List Item: (252) Private/Proxy autodiscovery
  Parameter Request List Item: (95) LDAP [TODO:RFC3679]
  Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
  Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
  ▶ Option: (57) Maximum DHCP Message Size
  ▶ Option: (61) Client identifier
▼ Option: (50) Requested IP Address
  Length: 4
  Requested IP Address: 10.99.50.230 (10.99.50.230)
▼ Option: (51) IP Address Lease Time
  Length: 4
  IP Address Lease Time: (7776000s) 90 days
▼ Option: (12) Host Name
  Length: 14
  Host Name: Diederichs-Air
▼ Option: (255) End
  Option End: 255
  Padding
0000 ff ff ff ff ff 64 76 ba b3 d0 3e 08 00 45 00 .....dv...>..E.
0010 01 48 a7 d3 00 00 ff 11 12 d2 00 00 00 00 ff ff ..H.....
0020 ff ff 00 44 00 43 01 34 a0 b3 01 01 06 00 60 62 ...D.C.4.....b
0030 e6 9d 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0040 00 00 00 00 00 00 64 76 ba b3 d0 3e 00 00 00 00 .....dv...>.....
```

Beispiel für einen DHCP - Request (unterer Teil)

98 9.400394000 10.99.10.51 10.99.50.230 DHCP 342 DHCP ACK - Transaction ID 0x6062e69e

Frame 98: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface 0

Ethernet II, Src: Vmware_37:e9:10 (00:0c:29:37:e9:10), Dst: Apple_b3:d0:3e (64:76:ba:b3:d0:3e)

Internet Protocol Version 4, Src: 10.99.10.51 (10.99.10.51), Dst: 10.99.50.230 (10.99.50.230)

User Datagram Protocol, Src Port: 67 (67), Dst Port: 68 (68)

Bootstrap Protocol (ACK)

- Message type: Boot Reply (2)
- Hardware type: Ethernet (0x01)
- Hardware address length: 6
- Hops: 0
- Transaction ID: 0x6062e69e
- Seconds elapsed: 0
- Bootp flags: 0x0000 (Unicast)
 - 0... .. = Broadcast flag: Unicast
 - .000 0000 0000 0000 = Reserved flags: 0x0000
- Client IP address: 0.0.0.0 (0.0.0.0)
- Your (client) IP address: 10.99.50.230 (10.99.50.230)
- Next server IP address: 0.0.0.0 (0.0.0.0)
- Relay agent IP address: 0.0.0.0 (0.0.0.0)
- Client MAC address: Apple_b3:d0:3e (64:76:ba:b3:d0:3e)
- Client hardware address padding: 00000000000000000000
- Server host name not given
- Boot file name not given
- Magic cookie: DHCP
- Option: (53) DHCP Message Type (ACK)
 - Length: 1
 - DHCP: ACK (5)
- Option: (54) DHCP Server Identifier
 - Length: 4
 - DHCP Server Identifier: 10.99.10.51 (10.99.10.51)
- Option: (51) IP Address Lease Time
 - Length: 4
 - IP Address Lease Time: (86400s) 1 day
- Option: (1) Subnet Mask
 - Length: 4
 - Subnet Mask: 255.255.0.0 (255.255.0.0)
- Option: (3) Router
 - Length: 4
 - Router: 10.99.1.1 (10.99.1.1)
- Option: (6) Domain Name Server
 - Length: 4
 - Domain Name Server: 10.99.1.1 (10.99.1.1)
- Option: (15) Domain Name
 - Length: 1
 - Domain Name: .

0000 64 76 ba b3 d0 3e 00 0c 29 37 e9 10 08 00 45 10 dv...>...)7...E...

0010 01 48 00 00 00 00 00 11 e7 b6 0a 63 0a 33 0a 63 .H... ..C.3.C...

0020 32 e6 00 43 00 44 01 34 0a 1a 02 01 06 00 60 62 2...C.D.4b...

0030 e6 9e 00 00 00 00 00 00 00 00 0a 63 32 e6 00 00C2...

0040 00 00 00 00 00 00 64 76 ba b3 d0 3e 00 00 00 00dv...>...

Beispiel für eine DHCP - Acknowledge