**Пингуем**

nikelau@nikelau-15NBC1005:~$ ping -c 5 172.21.0.3

PING 172.21.0.3 (172.21.0.3) 56(84) bytes of data.

64 bytes from 172.21.0.3: icmp\_seq=1 ttl=64 time=0.109 ms

64 bytes from 172.21.0.3: icmp\_seq=2 ttl=64 time=0.084 ms

64 bytes from 172.21.0.3: icmp\_seq=3 ttl=64 time=0.100 ms

64 bytes from 172.21.0.3: icmp\_seq=4 ttl=64 time=0.098 ms

64 bytes from 172.21.0.3: icmp\_seq=5 ttl=64 time=0.090 ms

--- 172.21.0.3 ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 4065ms

rtt min/avg/max/mdev = 0.084/0.096/0.109/0.008 ms

nikelau@nikelau-15NBC1005:~$ ping6 -c 5 fd00::2

PING fd00::2 (fd00::2) 56 data bytes

64 bytes from fd00::2: icmp\_seq=1 ttl=64 time=0.151 ms

64 bytes from fd00::2: icmp\_seq=2 ttl=64 time=0.227 ms

64 bytes from fd00::2: icmp\_seq=3 ttl=64 time=0.119 ms

64 bytes from fd00::2: icmp\_seq=4 ttl=64 time=0.104 ms

64 bytes from fd00::2: icmp\_seq=5 ttl=64 time=0.107 ms

--- fd00::2 ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 4087ms

rtt min/avg/max/mdev = 0.104/0.141/0.227/0.045 ms

**Пакеты IPv4**

nikelau@nikelau-15NBC1005:~$ sudo tcpdump -i br-cb419593c5aa

tcpdump: verbose output suppressed, use -v[v]... for full protocol decode

listening on br-cb419593c5aa, link-type EN10MB (Ethernet), snapshot length 262144 bytes

22:50:56.292914 IP nikelau-15NBC1005 > 172.21.0.3: ICMP echo request, id 401, seq 1, length 64

22:50:56.293007 IP 172.21.0.3 > nikelau-15NBC1005: ICMP echo reply, id 401, seq 1, length 64

22:50:57.306017 IP nikelau-15NBC1005 > 172.21.0.3: ICMP echo request, id 401, seq 2, length 64

22:50:57.306064 IP 172.21.0.3 > nikelau-15NBC1005: ICMP echo reply, id 401, seq 2, length 64

22:50:58.330078 IP nikelau-15NBC1005 > 172.21.0.3: ICMP echo request, id 401, seq 3, length 64

22:50:58.330127 IP 172.21.0.3 > nikelau-15NBC1005: ICMP echo reply, id 401, seq 3, length 64

22:50:59.354479 IP nikelau-15NBC1005 > 172.21.0.3: ICMP echo request, id 401, seq 4, length 64

22:50:59.354527 IP 172.21.0.3 > nikelau-15NBC1005: ICMP echo reply, id 401, seq 4, length 64

22:51:00.378566 IP nikelau-15NBC1005 > 172.21.0.3: ICMP echo request, id 401, seq 5, length 64

22:51:00.378613 IP 172.21.0.3 > nikelau-15NBC1005: ICMP echo reply, id 401, seq 5, length 64

22:51:01.657973 ARP, Request who-has 172.21.0.3 tell nikelau-15NBC1005, length 28

22:51:01.658012 ARP, Request who-has nikelau-15NBC1005 tell 172.21.0.3, length 28

22:51:01.658030 ARP, Reply nikelau-15NBC1005 is-at 02:42:b9:3a:17:14 (oui Unknown), length 28

22:51:01.658049 ARP, Reply 172.21.0.3 is-at 02:42:ac:15:00:03 (oui Unknown), length 28

**Пакеты IPv6**

22:51:06.115290 IP6 nikelau-15NBC1005 > fd00::2: ICMP6, echo request, id 403, seq 1, length 64

22:51:06.115320 IP6 fd00::2 > nikelau-15NBC1005: ICMP6, echo reply, id 403, seq 1, length 64

22:51:07.162051 IP6 nikelau-15NBC1005 > fd00::2: ICMP6, echo request, id 403, seq 2, length 64

22:51:07.162085 IP6 fd00::2 > nikelau-15NBC1005: ICMP6, echo reply, id 403, seq 2, length 64

22:51:07.781508 IP nikelau-15NBC1005.57621 > 172.21.255.255.57621: UDP, length 44

22:51:08.186054 IP6 nikelau-15NBC1005 > fd00::2: ICMP6, echo request, id 403, seq 3, length 64

22:51:08.186101 IP6 fd00::2 > nikelau-15NBC1005: ICMP6, echo reply, id 403, seq 3, length 64

22:51:09.210021 IP6 nikelau-15NBC1005 > fd00::2: ICMP6, echo request, id 403, seq 4, length 64

22:51:09.210059 IP6 fd00::2 > nikelau-15NBC1005: ICMP6, echo reply, id 403, seq 4, length 64

22:51:10.234518 IP6 nikelau-15NBC1005 > fd00::2: ICMP6, echo request, id 403, seq 5, length 64

22:51:10.234571 IP6 fd00::2 > nikelau-15NBC1005: ICMP6, echo reply, id 403, seq 5, length 64

22:51:11.387019 IP6 fe80::42:acff:fe15:3 > nikelau-15NBC1005: ICMP6, neighbor solicitation, who has nikelau-15NBC1005, length 32

22:51:11.387060 IP6 nikelau-15NBC1005 > fe80::42:acff:fe15:3: ICMP6, neighbor advertisement, tgt is nikelau-15NBC1005, length 24

22:51:12.714092 IP6 nikelau-15NBC1005.mdns > ff02::fb.mdns: 0 [9q] PTR (QM)? \_nfs.\_tcp.local. PTR (QM)? \_ipp.\_tcp.local. PTR (QM)? \_ipps.\_tcp.local. PTR (QM)? \_ftp.\_tcp.local. PTR (QM)? \_webdav.\_tcp.local. PTR (QM)? \_webdavs.\_tcp.local. PTR (QM)? \_sftp-ssh.\_tcp.local. PTR (QM)? \_smb.\_tcp.local. PTR (QM)? \_afpovertcp.\_tcp.local. (141)

**Вывод**

TTL для IPv4 = 64, Hop Limit (hlim) для IPv6 тоже = 64, что аналогично TTL.  
Присутствуют стандартные сетевые пакеты: ARP (для IPv4) и Neighbor Discovery (для IPv6).  
Передача идет по внутренним Docker-сетям, поэтому задержки минимальны.  
По IPv6 мультикастовый DNS-запрос (mdns).

| Параметр | IPv4 | IPv6 |
| --- | --- | --- |
| IP-адрес | 172.21.0.3 (32 bit) | fd00::2 (128 bit) |
| Протокол | ICMP | ICMPv6 |
| TTL / Hop Limit | TTL 64 | Hop Limit 64 |
| Приоритет трафика | TOS | Traffic Class |
| Задержка (rtt) | ~0.096 ms | ~0.141 ms |
| Доп. пакеты в трафике | ARP, UDP broadcast | Neighbor Solicitation, mDNS, NA |