

# TRABALHO FINAL MININET

SHELDON GABRIEL BERNARDO MARTINS – 1802

JOÃO PEDRO ANDRADE MOREIRA - 1723

LUCAS FRANQUEIRA CARNEIRO FONSECA-1734



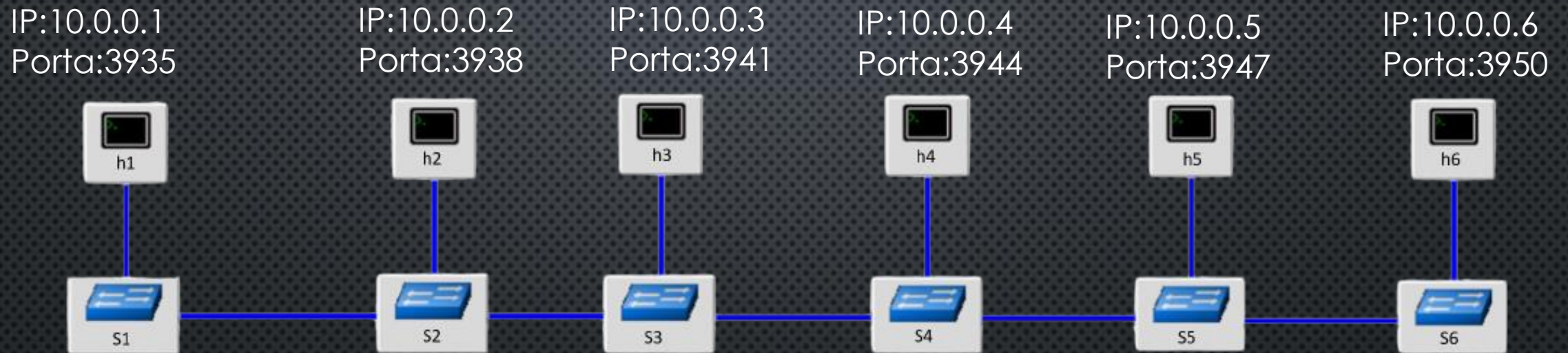
# Inspecionando informações das interfaces dos hosts

```
mininet> dump
<Host h1: h1-eth0:10.0.0.1 pid=3935>
<Host h2: h2-eth0:10.0.0.2 pid=3938>
<Host h3: h3-eth0:10.0.0.3 pid=3941>
<Host h4: h4-eth0:10.0.0.4 pid=3944>
<Host h5: h5-eth0:10.0.0.5 pid=3947>
<Host h6: h6-eth0:10.0.0.6 pid=3950>
<OVSSwitch s1: lo:127.0.0.1,s1-eth1:None,s1-eth2:None pid=3956>
<OVSSwitch s2: lo:127.0.0.1,s2-eth1:None,s2-eth2:None,s2-eth3:None pid=3959>
<OVSSwitch s3: lo:127.0.0.1,s3-eth1:None,s3-eth2:None,s3-eth3:None pid=3962>
<OVSSwitch s4: lo:127.0.0.1,s4-eth1:None,s4-eth2:None,s4-eth3:None pid=3965>
<OVSSwitch s5: lo:127.0.0.1,s5-eth1:None,s5-eth2:None,s5-eth3:None pid=3968>
<OVSSwitch s6: lo:127.0.0.1,s6-eth1:None,s6-eth2:None pid=3971>
<Controller c0: 127.0.0.1:6653 pid=3928>
mininet> |
```

```
mininet> pingallfull
*** Ping: testing ping reachability
h1 -> h2 h3 h4 h5 h6
h2 -> h1 h3 h4 h5 h6
h3 -> h1 h2 h4 h5 h6
h4 -> h1 h2 h3 h5 h6
h5 -> h1 h2 h3 h4 h6
h6 -> h1 h2 h3 h4 h5
*** Results:
h1->h2: 1/1, rtt min/avg/max/mdev 2.324/2.324/2.324/0.000 ms
h1->h3: 1/1, rtt min/avg/max/mdev 3.067/3.067/3.067/0.000 ms
h1->h4: 1/1, rtt min/avg/max/mdev 3.390/3.390/3.390/0.000 ms
h1->h5: 1/1, rtt min/avg/max/mdev 4.109/4.109/4.109/0.000 ms
h1->h6: 1/1, rtt min/avg/max/mdev 4.319/4.319/4.319/0.000 ms
h2->h1: 1/1, rtt min/avg/max/mdev 0.975/0.975/0.975/0.000 ms
h2->h3: 1/1, rtt min/avg/max/mdev 1.930/1.930/1.930/0.000 ms
h2->h4: 1/1, rtt min/avg/max/mdev 2.510/2.510/2.510/0.000 ms
h2->h5: 1/1, rtt min/avg/max/mdev 3.087/3.087/3.087/0.000 ms
h2->h6: 1/1, rtt min/avg/max/mdev 9.424/9.424/9.424/0.000 ms
h3->h1: 1/1, rtt min/avg/max/mdev 2.969/2.969/2.969/0.000 ms
h3->h2: 1/1, rtt min/avg/max/mdev 2.400/2.400/2.400/0.000 ms
h3->h4: 1/1, rtt min/avg/max/mdev 4.779/4.779/4.779/0.000 ms
h3->h5: 1/1, rtt min/avg/max/mdev 6.342/6.342/6.342/0.000 ms
h3->h6: 1/1, rtt min/avg/max/mdev 11.028/11.028/11.028/0.000 ms
h4->h1: 1/1, rtt min/avg/max/mdev 3.774/3.774/3.774/0.000 ms
h4->h2: 1/1, rtt min/avg/max/mdev 3.254/3.254/3.254/0.000 ms
h4->h3: 1/1, rtt min/avg/max/mdev 2.292/2.292/2.292/0.000 ms
h4->h5: 1/1, rtt min/avg/max/mdev 8.133/8.133/8.133/0.000 ms
h4->h6: 1/1, rtt min/avg/max/mdev 6.132/6.132/6.132/0.000 ms
h5->h1: 1/1, rtt min/avg/max/mdev 4.567/4.567/4.567/0.000 ms
h5->h2: 1/1, rtt min/avg/max/mdev 4.319/4.319/4.319/0.000 ms
h5->h3: 1/1, rtt min/avg/max/mdev 3.106/3.106/3.106/0.000 ms
h5->h4: 1/1, rtt min/avg/max/mdev 2.385/2.385/2.385/0.000 ms
h5->h6: 1/1, rtt min/avg/max/mdev 4.740/4.740/4.740/0.000 ms
h6->h1: 1/1, rtt min/avg/max/mdev 5.588/5.588/5.588/0.000 ms
h6->h2: 1/1, rtt min/avg/max/mdev 9.536/9.536/9.536/0.000 ms
h6->h3: 1/1, rtt min/avg/max/mdev 4.467/4.467/4.467/0.000 ms
h6->h4: 1/1, rtt min/avg/max/mdev 2.937/2.937/2.937/0.000 ms
h6->h5: 1/1, rtt min/avg/max/mdev 1.436/1.436/1.436/0.000 ms
```



# Desenho ilustrativo da topologia com suas informações





# Testes de ping entre os diferentes nós, pacotes chegando nos nós com uso do comando tcpdump.

```
mininet> h1 tcpdump -XX -n -i h1-eth0
13:54:30.646791 IP 10.0.0.1 > 10.0.0.2: ICMP echo request, id 2926, seq 1, length 64
 0x0000: 0000 0000 0002 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 854f 4000 4001 a157 0a00 0001 0a00 .T.0@.@..W.....
 0x0020: 0002 0800 8b74 0b6e 0001 96d5 5b65 7ade .....t.n....[ez.
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.648604 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 2926, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0002 0800 4500 .....E.
 0x0010: 0054 3f82 0000 4001 2725 0a00 0002 0a00 .T?.@.@.'%.....
 0x0020: 0001 0000 9374 0b6e 0001 96d5 5b65 7ade .....t.n....[ez.
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.649369 IP 10.0.0.1 > 10.0.0.3: ICMP echo request, id 2927, seq 1, length 64
 0x0000: 0000 0000 0003 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 2675 4000 4001 0031 0a00 0001 0a00 .T&u@.@..l.....
 0x0020: 0003 0800 7169 0b6f 0001 96d5 5b65 94e8 .....qi.o....[e..
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.651016 IP 10.0.0.3 > 10.0.0.1: ICMP echo reply, id 2927, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0003 0800 4500 .....E.
 0x0010: 0054 e08b 0000 4001 861a 0a00 0003 0a00 .T....@.....
 0x0020: 0001 0000 7969 0b6f 0001 96d5 5b65 94e8 .....yi.o....[e..
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.651822 IP 10.0.0.1 > 10.0.0.4: ICMP echo request, id 2928, seq 1, length 64
 0x0000: 0000 0000 0004 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 02eb 4000 4001 23ba 0a00 0001 0a00 .T..@.@.#.....
 0x0020: 0004 0800 dc5e 0b70 0001 96d5 5b65 29f2 .....^.p....[e).
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67
```

```
13:54:30.653382 IP 10.0.0.4 > 10.0.0.1: ICMP echo reply, id 2928, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0004 0800 4500 .....E.
 0x0010: 0054 a141 0000 4001 c563 0a00 0004 0a00 .T.A..@..C.....
 0x0020: 0001 0000 e45e 0b70 0001 96d5 5b65 29f2 .....^p....[e].
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.654467 IP 10.0.0.1 > 10.0.0.5: ICMP echo request, id 2929, seq 1, length 64
 0x0000: 0000 0000 0005 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 041f 4000 4001 2285 0a00 0001 0a00 .T..@.@.".....
 0x0020: 0005 0800 8953 0b71 0001 96d5 5b65 7cfc .....S.q....[e].
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.656139 IP 10.0.0.5 > 10.0.0.1: ICMP echo reply, id 2929, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0005 0800 4500 .....E.
 0x0010: 0054 47a6 0000 4001 1efe 0a00 0005 0a00 .TG...@.....
 0x0020: 0001 0000 9153 0b71 0001 96d5 5b65 7cfc .....S.q....[e].
 0x0030: 0900 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.657101 IP 10.0.0.1 > 10.0.0.6: ICMP echo request, id 2930, seq 1, length 64
 0x0000: 0000 0000 0006 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 f2d5 4000 4001 33cd 0a00 0001 0a00 .T..@.@.3.....
 0x0020: 0006 0800 3d48 0b72 0001 96d5 5b65 c806 ....=H.r....[e..
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.659500 IP 10.0.0.6 > 10.0.0.1: ICMP echo reply, id 2930, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0006 0800 4500 .....E.
 0x0010: 0054 142d 0000 4001 5276 0a00 0006 0a00 .T.-..@.RV.....
 0x0020: 0001 0000 4548 0b72 0001 96d5 5b65 c806 .....EH.r....[e..
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.660944 IP 10.0.0.2 > 10.0.0.1: ICMP echo request, id 2931, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0002 0800 4500 .....E.
 0x0010: 0054 3f83 4000 4001 e723 0a00 0002 0a00 .T7.@.@.#.....
 0x0020: 0001 0800 c639 0b73 0001 96d5 5b65 3f14 .....9.s....[e?.
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.660951 IP 10.0.0.1 > 10.0.0.2: ICMP echo reply, id 2931, seq 1, length 64
 0x0000: 0000 0000 0002 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 8553 0000 4001 e153 0a00 0001 0a00 .T.S...@.S.....
 0x0020: 0002 0000 ce39 0b73 0001 96d5 5b65 3f14 .....9.s....[e?.
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.673053 IP 10.0.0.3 > 10.0.0.1: ICMP echo request, id 2936, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0003 0800 4500 .....E.
 0x0010: 0054 e08f 4000 4001 4616 0a00 0003 0a00 .T..@.@.F.....
 0x0020: 0001 0800 d506 0b78 0001 96d5 5b65 3042 .....x....[e0B
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.673061 IP 10.0.0.1 > 10.0.0.3: ICMP echo reply, id 2936, seq 1, length 64
 0x0000: 0000 0000 0003 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 2677 0000 4001 402f 0a00 0001 0a00 .T&w...@.@/.....
 0x0020: 0003 0000 dd06 0b78 0001 96d5 5b65 3042 .....x....[e0B
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.684595 IP 10.0.0.4 > 10.0.0.1: ICMP echo request, id 2941, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0004 0800 4500 .....E.
 0x0010: 0054 a147 4000 4001 855d 0a00 0004 0a00 .T.G@.@.}.....
 0x0020: 0001 0800 bdd4 0b7d 0001 96d5 5b65 476f .....EH.r....[e..
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67
```

```
13:54:30.659500 IP 10.0.0.6 > 10.0.0.1: ICMP echo reply, id 2930, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0006 0800 4500 .....E.
 0x0010: 0054 142d 0000 4001 5276 0a00 0006 0a00 .T.-..@.RV.....
 0x0020: 0001 0000 4548 0b72 0001 96d5 5b65 c806 .....EH.r....[e..
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.660944 IP 10.0.0.2 > 10.0.0.1: ICMP echo request, id 2931, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0002 0800 4500 .....E.
 0x0010: 0054 3f83 4000 4001 e723 0a00 0002 0a00 .T7.@.@.#.....
 0x0020: 0001 0800 c639 0b73 0001 96d5 5b65 3f14 .....9.s....[e?.
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.660951 IP 10.0.0.1 > 10.0.0.2: ICMP echo reply, id 2931, seq 1, length 64
 0x0000: 0000 0000 0002 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 8553 0000 4001 e153 0a00 0001 0a00 .T.S...@.S.....
 0x0020: 0002 0000 ce39 0b73 0001 96d5 5b65 3f14 .....9.s....[e?.
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.673053 IP 10.0.0.3 > 10.0.0.1: ICMP echo request, id 2936, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0003 0800 4500 .....E.
 0x0010: 0054 e08f 4000 4001 4616 0a00 0003 0a00 .T..@.@.F.....
 0x0020: 0001 0800 d506 0b78 0001 96d5 5b65 3042 .....x....[e0B
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.673061 IP 10.0.0.1 > 10.0.0.3: ICMP echo reply, id 2936, seq 1, length 64
 0x0000: 0000 0000 0003 0000 0000 0001 0800 4500 .....E.
 0x0010: 0054 2677 0000 4001 402f 0a00 0001 0a00 .T&w...@.@/.....
 0x0020: 0003 0000 dd06 0b78 0001 96d5 5b65 3042 .....x....[e0B
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67

13:54:30.684595 IP 10.0.0.4 > 10.0.0.1: ICMP echo request, id 2941, seq 1, length 64
 0x0000: 0000 0000 0001 0000 0000 0004 0800 4500 .....E.
 0x0010: 0054 a147 4000 4001 855d 0a00 0004 0a00 .T.G@.@.}.....
 0x0020: 0001 0800 bdd4 0b7d 0001 96d5 5b65 476f .....EH.r....[e..
 0x0030: 0a00 0809 0a0b 0c0d 0e0f 1011 1213 1415 .....
 0x0040: 1617 1819 1a1b 1c1d 1e1f 2021 2223 2425 .....!""#$%
 0x0050: 2627 2829 2a2b 2c2d 2e2f 3031 3233 3435 &'()*+,-./012345
 0x0060: 3637 67
```

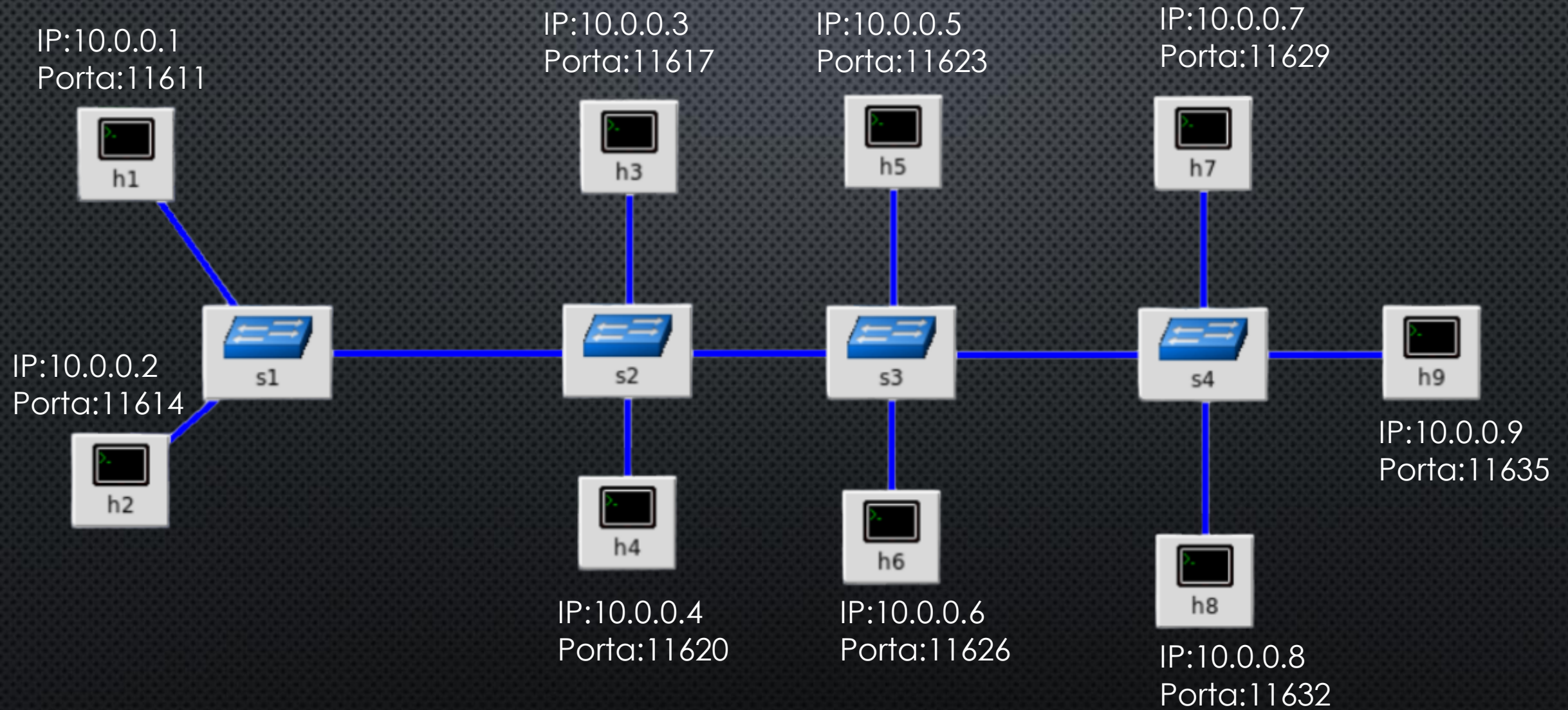


# INSPECIONANDO INFORMAÇÕES DAS INTERFACES, ENDEREÇOS MAC, IP E PORTAS

```
mininet> dump
<Host h1: h1-eth0:10.0.0.1 pid=11611>
<Host h2: h2-eth0:10.0.0.2 pid=11614>
<Host h3: h3-eth0:10.0.0.3 pid=11617>
<Host h4: h4-eth0:10.0.0.4 pid=11620>
<Host h5: h5-eth0:10.0.0.5 pid=11623>
<Host h6: h6-eth0:10.0.0.6 pid=11626>
<Host h7: h7-eth0:10.0.0.7 pid=11629>
<Host h8: h8-eth0:10.0.0.8 pid=11632>
<Host h9: h9-eth0:10.0.0.9 pid=11635>
<OVSSwitch s1: lo:127.0.0.1,s1-eth1:None,s1-eth2:None,s1-eth3:None pid=11641>
<OVSSwitch s2: lo:127.0.0.1,s2-eth1:None,s2-eth2:None,s2-eth3:None,s2-eth4:None pid=11644>
<OVSSwitch s3: lo:127.0.0.1,s3-eth1:None,s3-eth2:None,s3-eth3:None,s3-eth4:None pid=11647>
<OVSSwitch s4: lo:127.0.0.1,s4-eth1:None,s4-eth2:None,s4-eth3:None,s4-eth4:None pid=11650>
<Controller c0: 127.0.0.1:6653 pid=11604>
```



# Desenho ilustrativo da topologia com suas informações





# TESTES DE PING

```
mininet> pingallfull
```

```
*** Ping: testing ping reachability
```

```
h1 -> h2 h3 h4 h5 h6 h7 h8 h9
```

```
h2 -> h1 h3 h4 h5 h6 h7 h8 h9
```

```
h3 -> h1 h2 h4 h5 h6 h7 h8 h9
```

```
h4 -> h1 h2 h3 h5 h6 h7 h8 h9
```

```
h5 -> h1 h2 h3 h4 h6 h7 h8 h9
```

```
h6 -> h1 h2 h3 h4 h5 h7 h8 h9
```

```
h7 -> h1 h2 h3 h4 h5 h6 h8 h9
```

```
h8 -> h1 h2 h3 h4 h5 h6 h7 h9
```

```
h9 -> h1 h2 h3 h4 h5 h6 h7 h8
```

```
*** Results:
```

```
h1->h2: 1/1, rtt min/avg/max/ndev 5.821/5.821/5.821/0.000 ms
h1->h3: 1/1, rtt min/avg/max/ndev 5.649/5.649/5.649/0.000 ms
h1->h4: 1/1, rtt min/avg/max/ndev 3.311/3.311/3.311/0.000 ms
h1->h5: 1/1, rtt min/avg/max/ndev 4.040/4.040/4.040/0.000 ms
h1->h6: 1/1, rtt min/avg/max/ndev 3.096/3.096/3.096/0.000 ms
h1->h7: 1/1, rtt min/avg/max/ndev 5.153/5.153/5.153/0.000 ms
h1->h8: 1/1, rtt min/avg/max/ndev 4.954/4.954/4.954/0.000 ms
h1->h9: 1/1, rtt min/avg/max/ndev 6.933/6.933/6.933/0.000 ms
h2->h1: 1/1, rtt min/avg/max/ndev 1.101/1.101/1.101/0.000 ms
h2->h3: 1/1, rtt min/avg/max/ndev 3.453/3.453/3.453/0.000 ms
h2->h4: 1/1, rtt min/avg/max/ndev 3.622/3.622/3.622/0.000 ms
h2->h5: 1/1, rtt min/avg/max/ndev 4.151/4.151/4.151/0.000 ms
h2->h6: 1/1, rtt min/avg/max/ndev 4.360/4.360/4.360/0.000 ms
h2->h7: 1/1, rtt min/avg/max/ndev 5.309/5.309/5.309/0.000 ms
h2->h8: 1/1, rtt min/avg/max/ndev 5.642/5.642/5.642/0.000 ms
h2->h9: 1/1, rtt min/avg/max/ndev 5.407/5.407/5.407/0.000 ms
h3->h1: 1/1, rtt min/avg/max/ndev 1.673/1.673/1.673/0.000 ms
h3->h2: 1/1, rtt min/avg/max/ndev 1.835/1.835/1.835/0.000 ms
h3->h4: 1/1, rtt min/avg/max/ndev 2.319/2.319/2.319/0.000 ms
h3->h5: 1/1, rtt min/avg/max/ndev 3.365/3.365/3.365/0.000 ms
h3->h6: 1/1, rtt min/avg/max/ndev 3.298/3.298/3.298/0.000 ms
h3->h7: 1/1, rtt min/avg/max/ndev 4.959/4.959/4.959/0.000 ms
h3->h8: 1/1, rtt min/avg/max/ndev 4.593/4.593/4.593/0.000 ms
h3->h9: 1/1, rtt min/avg/max/ndev 4.965/4.965/4.965/0.000 ms
h4->h1: 1/1, rtt min/avg/max/ndev 1.030/1.030/1.030/0.000 ms
h4->h2: 1/1, rtt min/avg/max/ndev 1.556/1.556/1.556/0.000 ms
h4->h3: 1/1, rtt min/avg/max/ndev 1.127/1.127/1.127/0.000 ms
h4->h5: 1/1, rtt min/avg/max/ndev 3.486/3.486/3.486/0.000 ms
h4->h6: 1/1, rtt min/avg/max/ndev 3.556/3.556/3.556/0.000 ms
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h4->h7: 1/1, rtt min/avg/max/ndev 4.439/4.439/4.439/0.000 ms
h4->h8: 1/1, rtt min/avg/max/ndev 4.602/4.602/4.602/0.000 ms
h4->h9: 1/1, rtt min/avg/max/ndev 4.079/4.079/4.079/0.000 ms
h5->h1: 1/1, rtt min/avg/max/ndev 1.689/1.689/1.689/0.000 ms
h5->h2: 1/1, rtt min/avg/max/ndev 1.597/1.597/1.597/0.000 ms
h5->h3: 1/1, rtt min/avg/max/ndev 1.290/1.290/1.290/0.000 ms
h5->h4: 1/1, rtt min/avg/max/ndev 1.253/1.253/1.253/0.000 ms
h5->h6: 1/1, rtt min/avg/max/ndev 1.462/1.462/1.462/0.000 ms
h5->h7: 1/1, rtt min/avg/max/ndev 2.003/2.003/2.003/0.000 ms
h5->h8: 1/1, rtt min/avg/max/ndev 2.200/2.200/2.200/0.000 ms
h5->h9: 1/1, rtt min/avg/max/ndev 2.093/2.093/2.093/0.000 ms
h6->h1: 1/1, rtt min/avg/max/ndev 1.712/1.712/1.712/0.000 ms
h6->h2: 1/1, rtt min/avg/max/ndev 1.884/1.884/1.884/0.000 ms
h6->h3: 1/1, rtt min/avg/max/ndev 1.339/1.339/1.339/0.000 ms
h6->h4: 1/1, rtt min/avg/max/ndev 1.323/1.323/1.323/0.000 ms
h6->h5: 1/1, rtt min/avg/max/ndev 0.991/0.991/0.991/0.000 ms
h6->h7: 1/1, rtt min/avg/max/ndev 2.122/2.122/2.122/0.000 ms
h6->h8: 1/1, rtt min/avg/max/ndev 2.203/2.203/2.203/0.000 ms
h6->h9: 1/1, rtt min/avg/max/ndev 2.262/2.262/2.262/0.000 ms
h7->h1: 1/1, rtt min/avg/max/ndev 2.316/2.316/2.316/0.000 ms
h7->h2: 1/1, rtt min/avg/max/ndev 2.516/2.516/2.516/0.000 ms
h7->h3: 1/1, rtt min/avg/max/ndev 1.902/1.902/1.902/0.000 ms
h7->h4: 1/1, rtt min/avg/max/ndev 1.996/1.996/1.996/0.000 ms
h7->h5: 1/1, rtt min/avg/max/ndev 1.441/1.441/1.441/0.000 ms
h7->h6: 1/1, rtt min/avg/max/ndev 1.373/1.373/1.373/0.000 ms
h7->h8: 1/1, rtt min/avg/max/ndev 1.733/1.733/1.733/0.000 ms
h7->h9: 1/1, rtt min/avg/max/ndev 1.594/1.594/1.594/0.000 ms
h8->h1: 1/1, rtt min/avg/max/ndev 2.467/2.467/2.467/0.000 ms
h8->h2: 1/1, rtt min/avg/max/ndev 2.564/2.564/2.564/0.000 ms
h8->h3: 1/1, rtt min/avg/max/ndev 2.032/2.032/2.032/0.000 ms
h8->h4: 1/1, rtt min/avg/max/ndev 1.984/1.984/1.984/0.000 ms
h8->h5: 1/1, rtt min/avg/max/ndev 1.479/1.479/1.479/0.000 ms
h8->h6: 1/1, rtt min/avg/max/ndev 1.740/1.740/1.740/0.000 ms
h8->h7: 1/1, rtt min/avg/max/ndev 1.041/1.041/1.041/0.000 ms
h8->h9: 1/1, rtt min/avg/max/ndev 1.634/1.634/1.634/0.000 ms
h9->h1: 1/1, rtt min/avg/max/ndev 2.526/2.526/2.526/0.000 ms
h9->h2: 1/1, rtt min/avg/max/ndev 2.569/2.569/2.569/0.000 ms
h9->h3: 1/1, rtt min/avg/max/ndev 2.089/2.089/2.089/0.000 ms
h9->h4: 1/1, rtt min/avg/max/ndev 1.961/1.961/1.961/0.000 ms
h9->h5: 1/1, rtt min/avg/max/ndev 1.553/1.553/1.553/0.000 ms
h9->h6: 1/1, rtt min/avg/max/ndev 1.544/1.544/1.544/0.000 ms
h9->h7: 1/1, rtt min/avg/max/ndev 0.972/0.972/0.972/0.000 ms
h9->h8: 1/1, rtt min/avg/max/ndev 1.000/1.000/1.000/0.000 ms
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