Routing Protocol

Description and Sample Runs

The following topology was constructed:
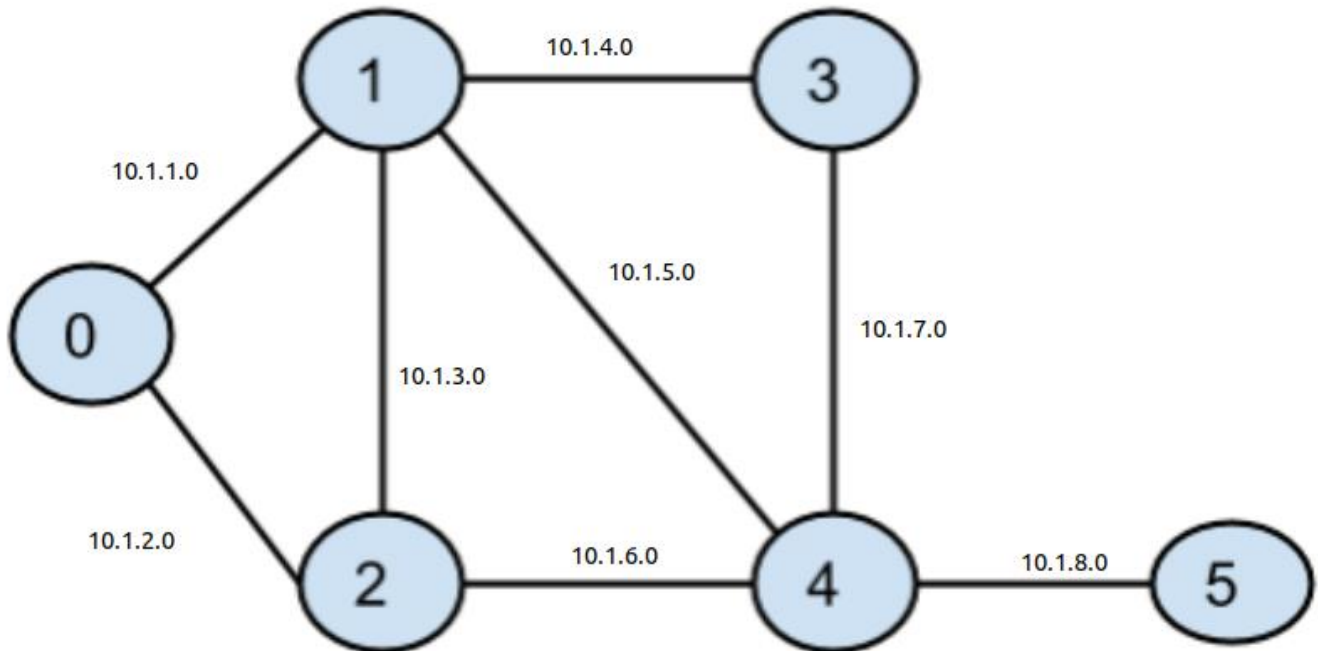

Figure 1: Network topology.

Settings:
Node 0 is acting as a client, and node 5 is acting as a server.
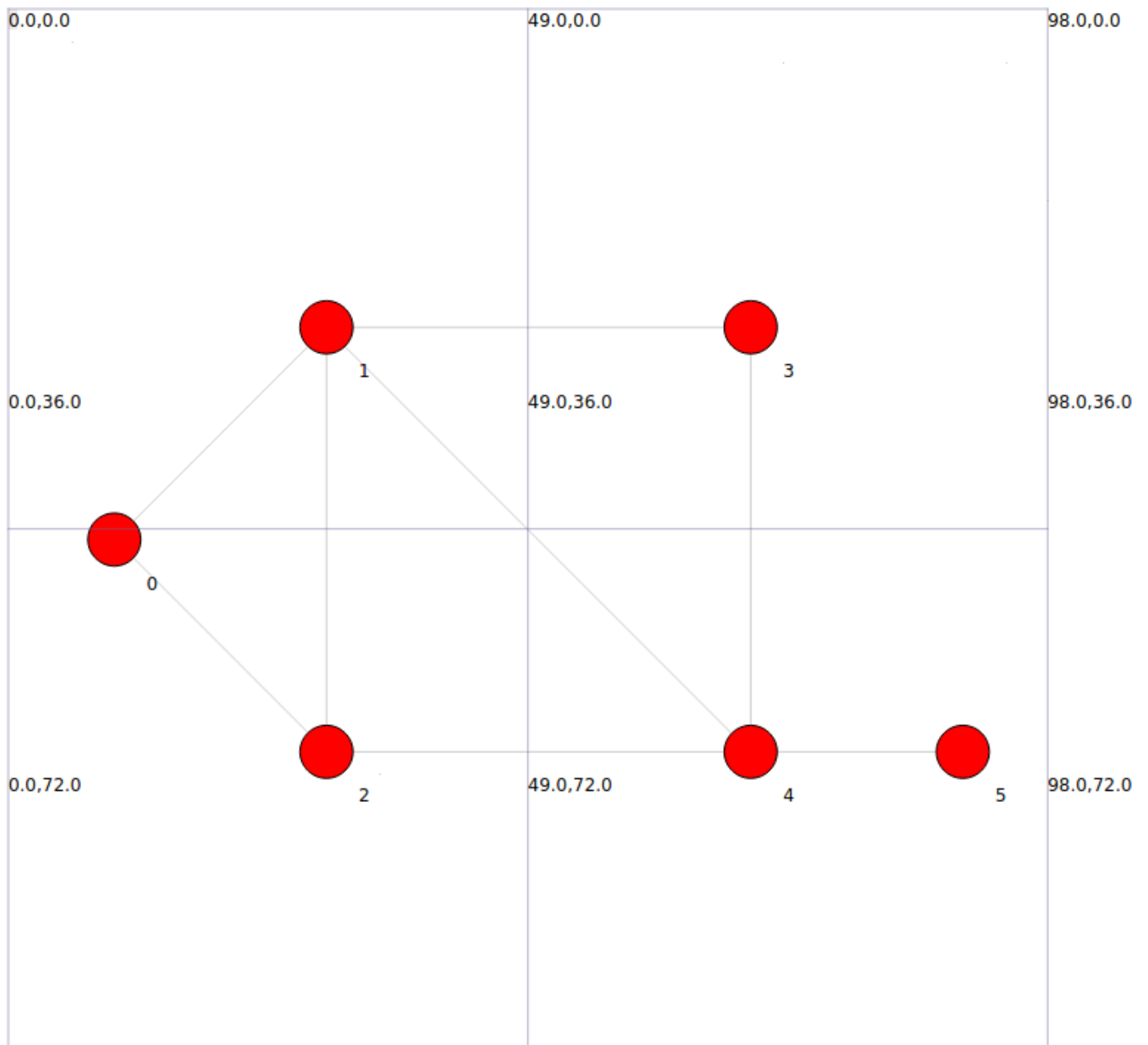Server port = 9
Client settings:

```
// client
UdpEchoClientHelper client(i45.GetAddress(1), port);
client.SetAttribute("MaxPackets", UintegerValue(1));
client.SetAttribute("Interval", TimeValue(Seconds (1.0)));
client.SetAttribute("PacketSize", UintegerValue(1024));
```

When sending a packet, the result is as follows:

```
At time 2s client sent 1024 bytes to 10.1.8.2 port 9
At time 2.77197s server received 1024 bytes from 10.1.1.1 port 49153
At time 2.77197s server sent 1024 bytes to 10.1.1.1 port 49153
At time 3.54395s client received 1024 bytes from 10.1.8.2 port 9
```

Running Net Anim the process goes as follows:

0.0,0.0 49.0,0.0 98.0,0.0

0.0,36.0 49.0,36.0 98.0,36.0

1

3

0

0.0,72.0 49.0,72.0 98.0,72.0

2 4 5

0.0,0.0   49.0,0.0   98.0,0.0

0.0,36.0   49.0,36.0   98.0,36.0

0.0,72.0   49.0,72.0   98.0,72.0

0.0,0.0   49.0,0.0   98.0,0.0

0.0,36.0   49.0,36.0   98.0,36.0

1   3

0

0.0,72.0   49.0,72.0   98.0,72.0

2   4   5

0.0,0.0   49.0,0.0   98.0,0.0

0.0,36.0   49.0,36.0   98.0,36.0

0.0,72.0   49.0,72.0   98.0,72.0
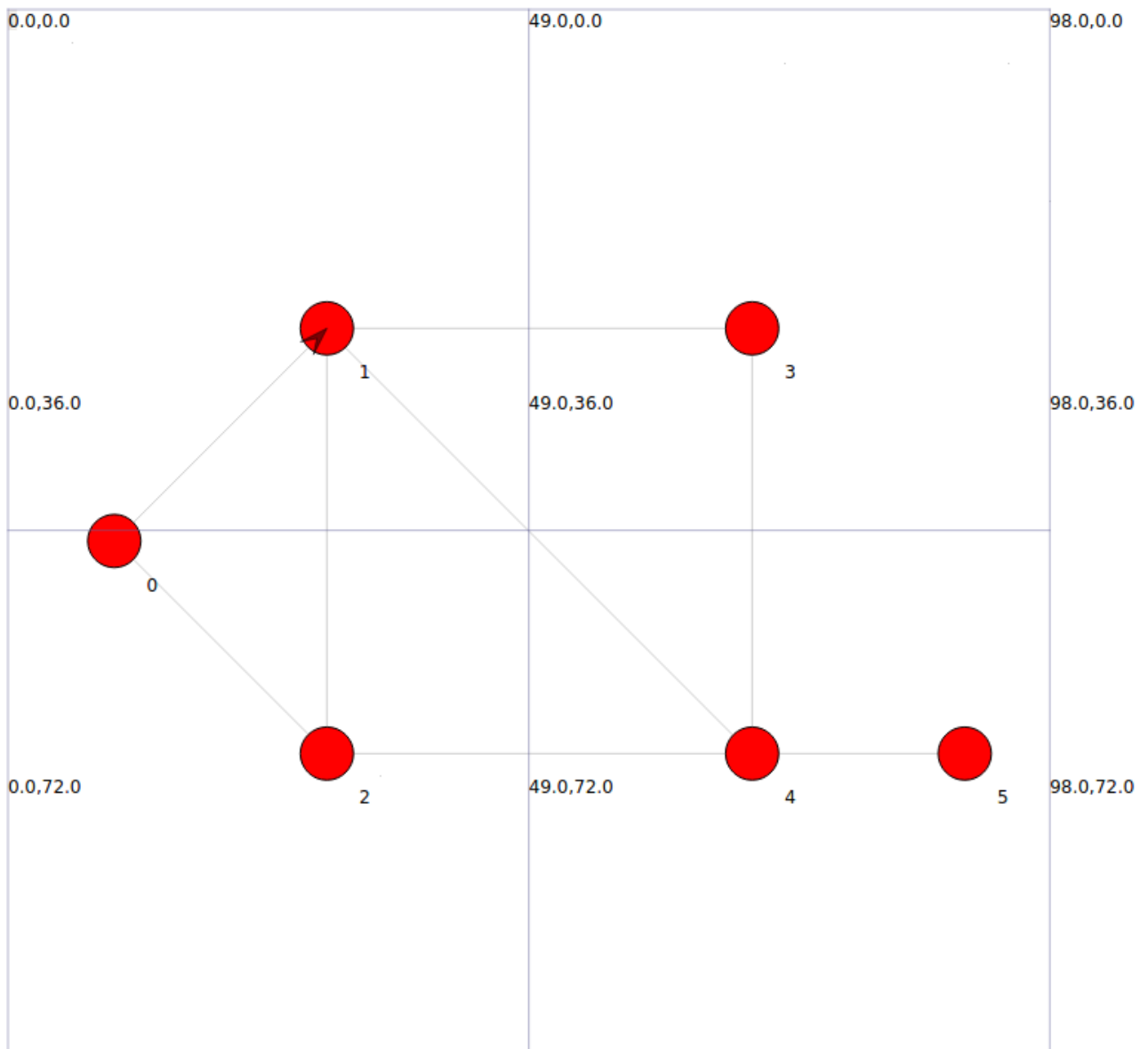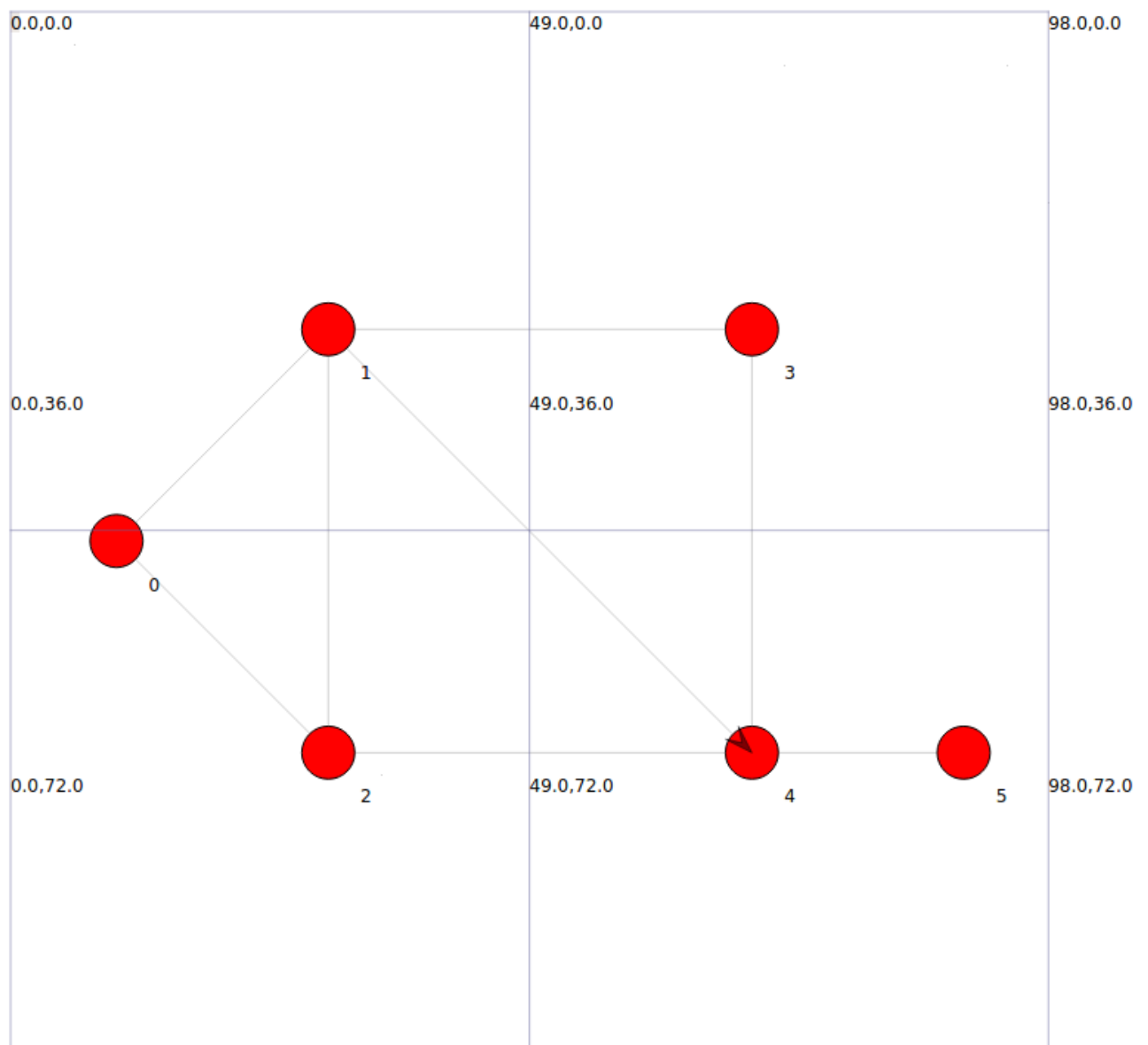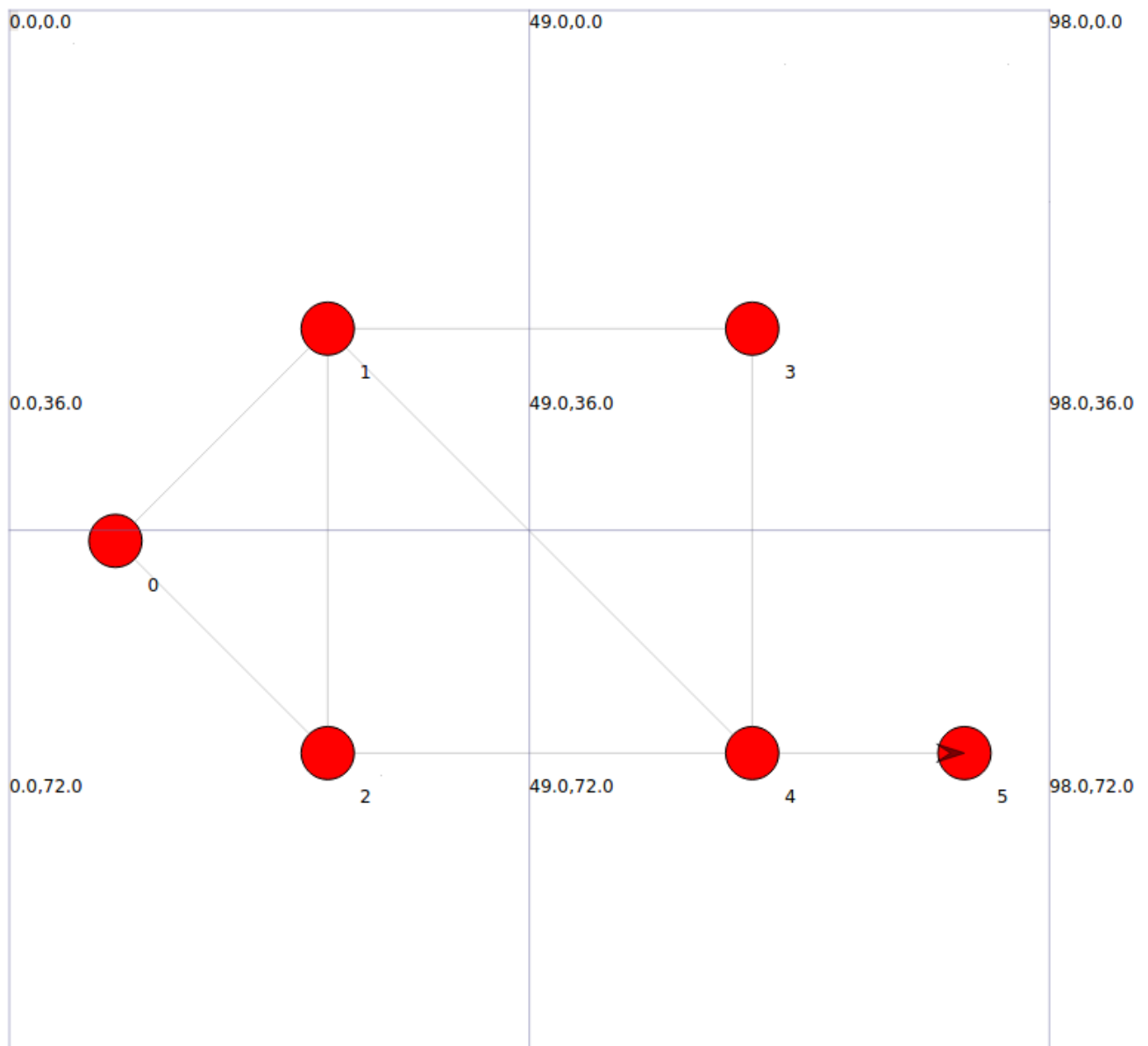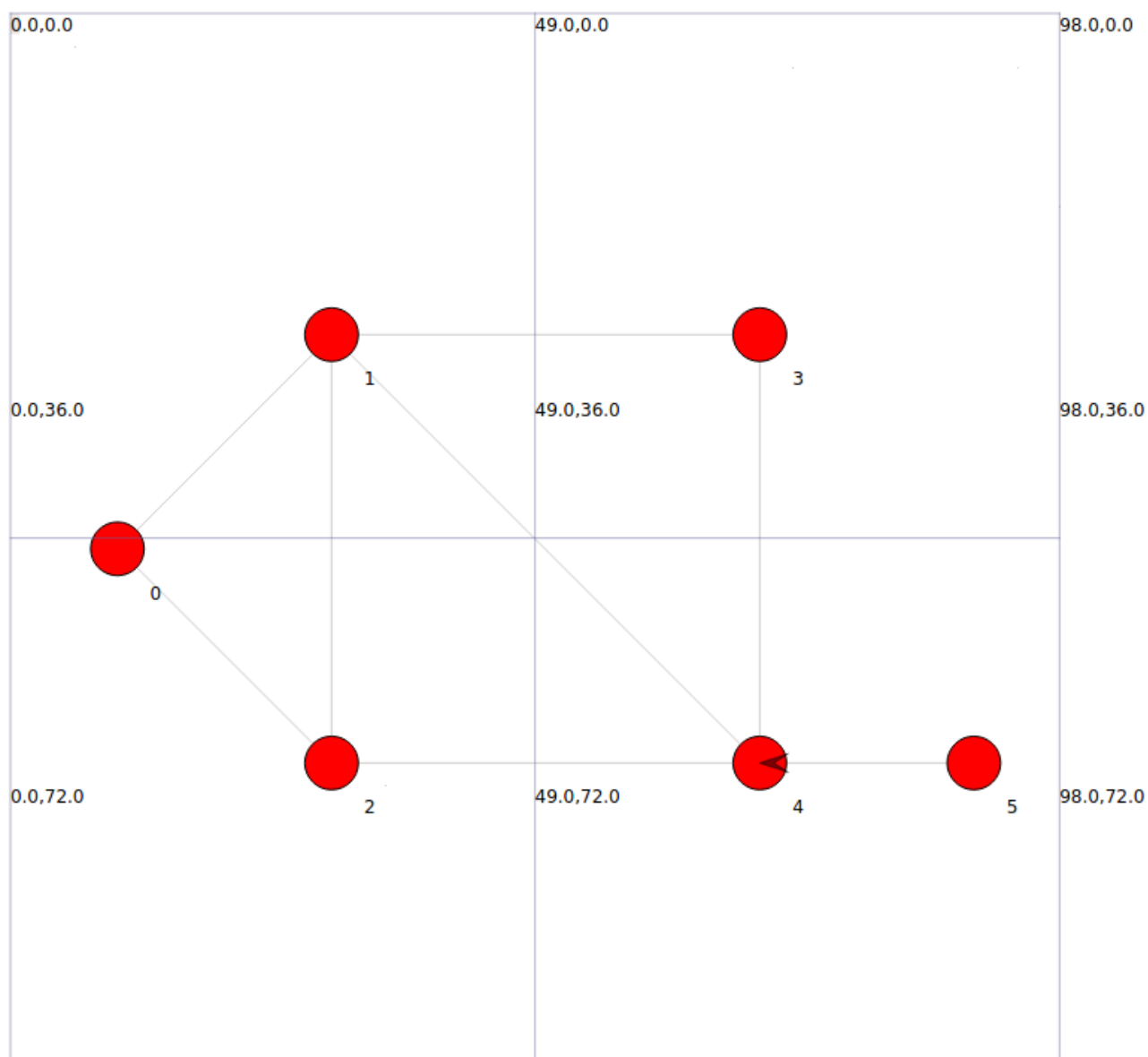
Routing Table:

```
Node: 0, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Ipv4StaticRouting
Node: 0, Time: +10.0s, Local time: +10.0s, Ipv4StaticRouting table
Destination     Gateway          Genmask          Flags Metric Ref    Use Iface
127.0.0.0       0.0.0.0          255.0.0.0        U     0      -      -   0
10.1.1.0        0.0.0.0          255.255.255.0    U     0      -      -   1
10.1.2.0        0.0.0.0          255.255.255.0    U     0      -      -   2

  Priority: -10 Protocol: ns3::Ipv4GlobalRouting
Node: 0, Time: +10.0s, Local time: +10.0s, Ipv4GlobalRouting table
Destination     Gateway          Genmask          Flags Metric Ref    Use Iface
10.1.1.2        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.3.1        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.4.1        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.5.1        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.2.2        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.3.2        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.6.1        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.4.2        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.7.1        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.5.2        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.5.2        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.6.2        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.6.2        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.7.2        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.7.2        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.8.1        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.8.1        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.8.2        10.1.1.2         255.255.255.255 UH     -      -      -   1
10.1.8.2        10.1.2.2         255.255.255.255 UH     -      -      -   2
10.1.1.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.3.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.4.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.5.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.4.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.7.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.5.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.5.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.6.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.6.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.7.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.7.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.8.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.8.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.8.0        10.1.1.2         255.255.255.0    UG     -      -      -   1
10.1.8.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.2.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.3.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
10.1.6.0        10.1.2.2         255.255.255.0    UG     -      -      -   2
```
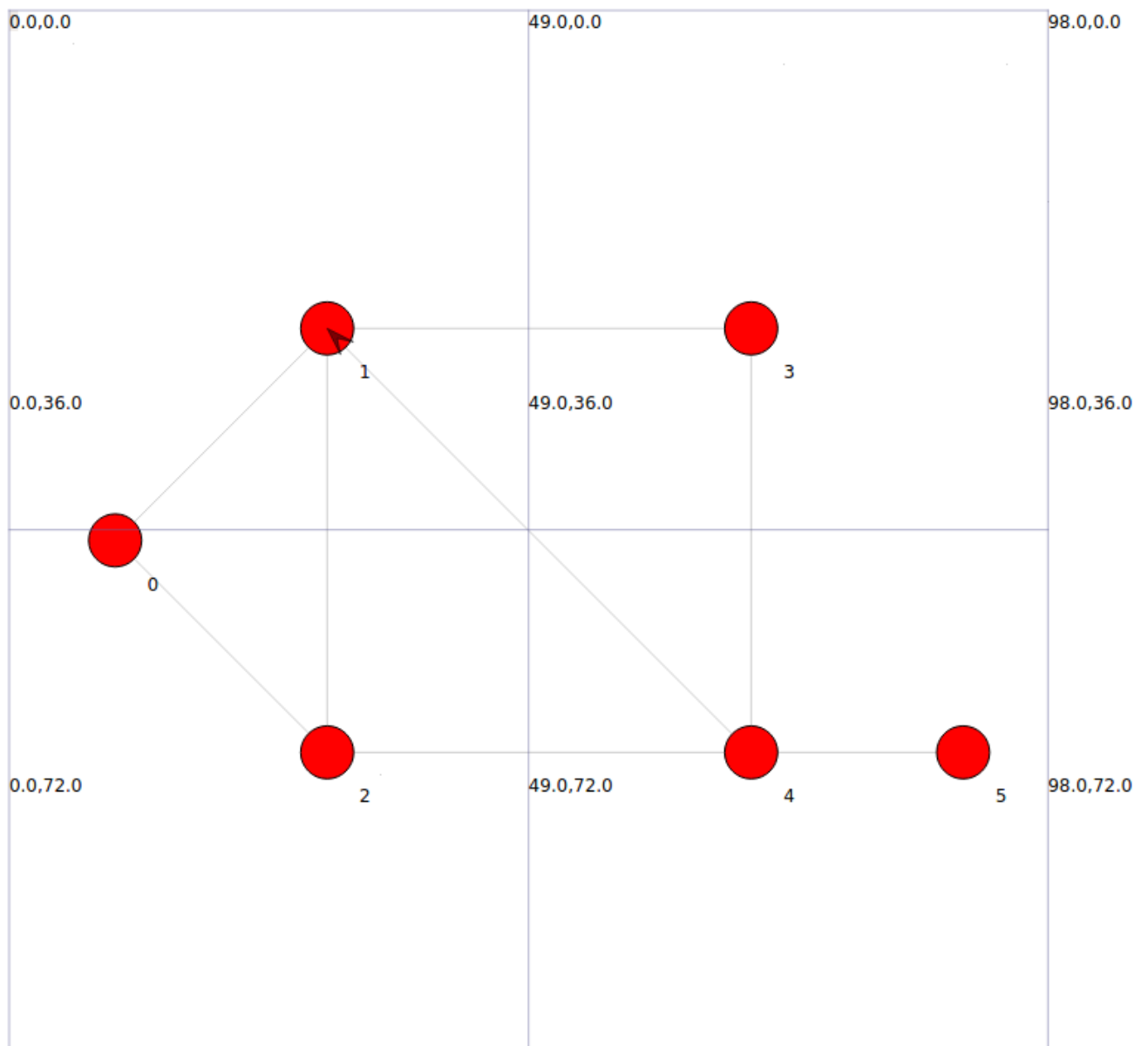
```
Node: 1, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Ipv4StaticRouting
Node: 1, Time: +10.0s, Local time: +10.0s, Ipv4StaticRouting table
Destination     Gateway         Genmask         Flags Metric Ref   Use Iface
127.0.0.0       0.0.0.0         255.0.0.0       U     0      -     -   0
10.1.1.0        0.0.0.0         255.255.255.0   U     0      -     -   1
10.1.3.0        0.0.0.0         255.255.255.0   U     0      -     -   2
10.1.4.0        0.0.0.0         255.255.255.0   U     0      -     -   3
10.1.5.0        0.0.0.0         255.255.255.0   U     0      -     -   4

  Priority: -10 Protocol: ns3::Ipv4GlobalRouting
Node: 1, Time: +10.0s, Local time: +10.0s, Ipv4GlobalRouting table
Destination     Gateway         Genmask         Flags Metric Ref   Use Iface
10.1.1.1        10.1.1.1        255.255.255.255 UH    -      -     -   1
10.1.2.1        10.1.1.1        255.255.255.255 UH    -      -     -   1
10.1.2.2        10.1.3.2        255.255.255.255 UH    -      -     -   2
10.1.3.2        10.1.3.2        255.255.255.255 UH    -      -     -   2
10.1.6.1        10.1.3.2        255.255.255.255 UH    -      -     -   2
10.1.4.2        10.1.4.2        255.255.255.255 UH    -      -     -   3
10.1.7.1        10.1.4.2        255.255.255.255 UH    -      -     -   3
10.1.5.2        10.1.5.2        255.255.255.255 UH    -      -     -   4
10.1.6.2        10.1.5.2        255.255.255.255 UH    -      -     -   4
10.1.7.2        10.1.5.2        255.255.255.255 UH    -      -     -   4
10.1.8.1        10.1.5.2        255.255.255.255 UH    -      -     -   4
10.1.8.2        10.1.5.2        255.255.255.255 UH    -      -     -   4
10.1.1.0        10.1.1.1        255.255.255.0   UG    -      -     -   1
10.1.2.0        10.1.1.1        255.255.255.0   UG    -      -     -   1
10.1.2.0        10.1.3.2        255.255.255.0   UG    -      -     -   2
10.1.3.0        10.1.3.2        255.255.255.0   UG    -      -     -   2
10.1.6.0        10.1.3.2        255.255.255.0   UG    -      -     -   2
10.1.4.0        10.1.4.2        255.255.255.0   UG    -      -     -   3
10.1.7.0        10.1.4.2        255.255.255.0   UG    -      -     -   3
10.1.5.0        10.1.5.2        255.255.255.0   UG    -      -     -   4
10.1.6.0        10.1.5.2        255.255.255.0   UG    -      -     -   4
10.1.7.0        10.1.5.2        255.255.255.0   UG    -      -     -   4
10.1.8.0        10.1.5.2        255.255.255.0   UG    -      -     -   4
10.1.8.0        10.1.5.2        255.255.255.0   UG    -      -     -   4
```

```
Node: 2, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
    Priority: 0 Protocol: ns3::Ipv4StaticRouting
Node: 2, Time: +10.0s, Local time: +10.0s, Ipv4StaticRouting table
Destination     Gateway         Genmask             Flags Metric Ref     Use Iface
127.0.0.0       0.0.0.0         255.0.0.0           U     0      -       -   0
10.1.2.0        0.0.0.0         255.255.255.0       U     0      -       -   1
10.1.3.0        0.0.0.0         255.255.255.0       U     0      -       -   2
10.1.6.0        0.0.0.0         255.255.255.0       U     0      -       -   3

    Priority: -10 Protocol: ns3::Ipv4GlobalRouting
Node: 2, Time: +10.0s, Local time: +10.0s, Ipv4GlobalRouting table
Destination     Gateway         Genmask             Flags Metric Ref     Use Iface
10.1.1.1        10.1.2.1        255.255.255.255 UH   -      -       -   1
10.1.2.1        10.1.2.1        255.255.255.255 UH   -      -       -   1
10.1.1.2        10.1.3.1        255.255.255.255 UH   -      -       -   2
10.1.3.1        10.1.3.1        255.255.255.255 UH   -      -       -   2
10.1.4.1        10.1.3.1        255.255.255.255 UH   -      -       -   2
10.1.5.1        10.1.3.1        255.255.255.255 UH   -      -       -   2
10.1.5.2        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.6.2        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.7.2        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.8.1        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.4.2        10.1.3.1        255.255.255.255 UH   -      -       -   2
10.1.4.2        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.7.1        10.1.3.1        255.255.255.255 UH   -      -       -   2
10.1.7.1        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.8.2        10.1.6.2        255.255.255.255 UH   -      -       -   3
10.1.1.0        10.1.2.1        255.255.255.0   UG   -      -       -   1
10.1.2.0        10.1.2.1        255.255.255.0   UG   -      -       -   1
10.1.1.0        10.1.3.1        255.255.255.0   UG   -      -       -   2
10.1.3.0        10.1.3.1        255.255.255.0   UG   -      -       -   2
10.1.4.0        10.1.3.1        255.255.255.0   UG   -      -       -   2
10.1.5.0        10.1.3.1        255.255.255.0   UG   -      -       -   2
10.1.4.0        10.1.3.1        255.255.255.0   UG   -      -       -   2
10.1.4.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
10.1.7.0        10.1.3.1        255.255.255.0   UG   -      -       -   2
10.1.7.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
10.1.5.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
10.1.6.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
10.1.7.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
10.1.8.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
10.1.8.0        10.1.6.2        255.255.255.0   UG   -      -       -   3
```

```
Node: 3, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Ipv4StaticRouting
Node: 3, Time: +10.0s, Local time: +10.0s, Ipv4StaticRouting table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
127.0.0.0       0.0.0.0         255.0.0.0       U     0      -      -   0
10.1.4.0        0.0.0.0         255.255.255.0   U     0      -      -   1
10.1.7.0        0.0.0.0         255.255.255.0   U     0      -      -   2

  Priority: -10 Protocol: ns3::Ipv4GlobalRouting
Node: 3, Time: +10.0s, Local time: +10.0s, Ipv4GlobalRouting table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
10.1.1.2        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.3.1        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.4.1        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.5.1        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.5.2        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.6.2        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.7.2        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.8.1        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.1.1        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.2.1        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.2.2        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.2.2        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.3.2        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.3.2        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.6.1        10.1.4.1        255.255.255.255 UH    -      -      -   1
10.1.6.1        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.8.2        10.1.7.2        255.255.255.255 UH    -      -      -   2
10.1.1.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.3.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.4.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.5.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.1.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.2.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.2.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.2.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.3.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.3.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.6.0        10.1.4.1        255.255.255.0   UG    -      -      -   1
10.1.6.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.5.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.6.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.7.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.8.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
10.1.8.0        10.1.7.2        255.255.255.0   UG    -      -      -   2
```

```
Node: 4, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Ipv4StaticRouting
Node: 4, Time: +10.0s, Local time: +10.0s, Ipv4StaticRouting table
Destination     Gateway         Genmask          Flags Metric Ref    Use Iface
127.0.0.0       0.0.0.0         255.0.0.0        U     0      -      -   0
10.1.5.0        0.0.0.0         255.255.255.0    U     0      -      -   1
10.1.6.0        0.0.0.0         255.255.255.0    U     0      -      -   2
10.1.7.0        0.0.0.0         255.255.255.0    U     0      -      -   3
10.1.8.0        0.0.0.0         255.255.255.0    U     0      -      -   4

  Priority: -10 Protocol: ns3::Ipv4GlobalRouting
Node: 4, Time: +10.0s, Local time: +10.0s, Ipv4GlobalRouting table
Destination     Gateway         Genmask          Flags Metric Ref    Use Iface
10.1.1.2        10.1.5.1        255.255.255.255 UH    -      -      -   1
10.1.3.1        10.1.5.1        255.255.255.255 UH    -      -      -   1
10.1.4.1        10.1.5.1        255.255.255.255 UH    -      -      -   1
10.1.5.1        10.1.5.1        255.255.255.255 UH    -      -      -   1
10.1.2.2        10.1.6.1        255.255.255.255 UH    -      -      -   2
10.1.3.2        10.1.6.1        255.255.255.255 UH    -      -      -   2
10.1.6.1        10.1.6.1        255.255.255.255 UH    -      -      -   2
10.1.4.2        10.1.7.1        255.255.255.255 UH    -      -      -   3
10.1.7.1        10.1.7.1        255.255.255.255 UH    -      -      -   3
10.1.8.2        10.1.8.2        255.255.255.255 UH    -      -      -   4
10.1.1.1        10.1.5.1        255.255.255.255 UH    -      -      -   1
10.1.1.1        10.1.6.1        255.255.255.255 UH    -      -      -   2
10.1.2.1        10.1.5.1        255.255.255.255 UH    -      -      -   1
10.1.2.1        10.1.6.1        255.255.255.255 UH    -      -      -   2
10.1.1.0        10.1.5.1        255.255.255.0    UG    -      -      -   1
10.1.3.0        10.1.5.1        255.255.255.0    UG    -      -      -   1
10.1.4.0        10.1.5.1        255.255.255.0    UG    -      -      -   1
10.1.5.0        10.1.5.1        255.255.255.0    UG    -      -      -   1
10.1.1.0        10.1.5.1        255.255.255.0    UG    -      -      -   1
10.1.1.0        10.1.6.1        255.255.255.0    UG    -      -      -   2
10.1.2.0        10.1.5.1        255.255.255.0    UG    -      -      -   1
10.1.2.0        10.1.6.1        255.255.255.0    UG    -      -      -   2
10.1.2.0        10.1.6.1        255.255.255.0    UG    -      -      -   2
10.1.3.0        10.1.6.1        255.255.255.0    UG    -      -      -   2
10.1.6.0        10.1.6.1        255.255.255.0    UG    -      -      -   2
10.1.4.0        10.1.7.1        255.255.255.0    UG    -      -      -   3
10.1.7.0        10.1.7.1        255.255.255.0    UG    -      -      -   3
10.1.8.0        10.1.8.2        255.255.255.0    UG    -      -      -   4
```

```
Node: 5, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Ipv4StaticRouting
Node: 5, Time: +10.0s, Local time: +10.0s, Ipv4StaticRouting table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
127.0.0.0       0.0.0.0         255.0.0.0       U     0      -      -   0
10.1.8.0        0.0.0.0         255.255.255.0   U     0      -      -   1

  Priority: -10 Protocol: ns3::Ipv4GlobalRouting
Node: 5, Time: +10.0s, Local time: +10.0s, Ipv4GlobalRouting table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         10.1.8.1        0.0.0.0         UG    -      -      -   1
```