PRASHANT
2018360

Computer Network

Assignment – 4

Simulation

Q4:

Host A ping K

Packet loss – 21%

Average RTT – 42.32ms

Host G ping H

Packet loss – 17%

Average RTT – 32.6ms

```
--- 10.0.16.2 ping statistics ---
79 packets transmitted, 62 received, 21% packet loss, time 79000ms
rtt min/avg/max/mdev = 37/42.32/59/3.806 ms
--- 10.0.13.2 ping statistics ---
79 packets transmitted, 65 received, 17% packet loss, time 79000ms
rtt min/avg/max/mdev = 29/32.6/53/5.846 ms
```

Tracing

Q1:

(a) No. of ICMP packets in pcap of A: 141
No. of ICMP packets in pcap of G: 144
No. of ICMP packets in pcap of H: 130
No. of ICMP packets in pcap of K: 124

(b) No. of ARP packets in pcap of A: 4
No. of ARP packets in pcap of G: 4
No. of ARP packets in pcap of H: 4
No. of ARP packets in pcap of K: 4

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Q3:

Below three images are routing table of R4 at three different time at (10s, 40s, 80s).

As we can see routing table at time=10s, the metric value varies from 1,2 and 3

But as we can see routing table at time=40s, there is an drastic increment of some routing, which become 6, 7 and 8. It is just because At time=25s, there is a network connection down between R3-R4 which cost only 1, now the only connection of R4 to R1, R3, R5 is via R5, and R4-R5 cost is 5. That's the reason that whole cost communication is increased, so that metric value is also increased.

And As we can see routing table at time=80s, there is not too much change than the previous table because the network connection between R3-R4 is still down. The metric is almost same than the previous table except the one routing which shows 16 as metric, it is just Poison Reverse which gives the infinity value, and here 16 represent as infinity.

R4 Time = 10s

```
Node: 14, Time: +10.0s, Local time: +10.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 14, Time: +10.0s, Local time: +10.0s, IPv4 RIP table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
10.0.16.0       10.0.12.2       255.255.255.0   UGS   2      -      -   4
10.0.15.0       10.0.12.2       255.255.255.0   UGS   2      -      -   4
10.0.14.0       10.0.9.1        255.255.255.0   UGS   3      -      -   2
10.0.13.0       10.0.9.1        255.255.255.0   UGS   3      -      -   2
10.0.10.0       10.0.9.1        255.255.255.0   UGS   2      -      -   2
10.0.3.0        10.0.9.1        255.255.255.0   UGS   2      -      -   2
10.0.0.0        10.0.9.1        255.255.255.0   UGS   3      -      -   2
10.0.1.0        10.0.9.1        255.255.255.0   UGS   3      -      -   2
10.0.2.0        10.0.9.1        255.255.255.0   UGS   3      -      -   2
10.0.7.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.6.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.5.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.4.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.8.0        0.0.0.0         255.255.255.0   U     1      -      -   1
10.0.9.0        0.0.0.0         255.255.255.0   U     1      -      -   2
10.0.11.0       0.0.0.0         255.255.255.0   U     1      -      -   3
10.0.12.0       0.0.0.0         255.255.255.0   U     1      -      -   4
```

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R4 Time = 40s

```
Node: 14, Time: +40.0s, Local time: +40.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 14, Time: +40.0s, Local time: +40.0s, IPv4 RIP table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
10.0.16.0       10.0.12.2       255.255.255.0   UGS   2      -      -   4
10.0.15.0       10.0.12.2       255.255.255.0   UGS   2      -      -   4
10.0.14.0       10.0.11.2       255.255.255.0   UGS   6      -      -   3
10.0.13.0       10.0.11.2       255.255.255.0   UGS   6      -      -   3
10.0.10.0       10.0.11.2       255.255.255.0   UGS   6      -      -   3
10.0.3.0        10.0.11.2       255.255.255.0   UGS   7      -      -   3
10.0.0.0        10.0.11.2       255.255.255.0   UGS   8      -      -   3
10.0.1.0        10.0.11.2       255.255.255.0   UGS   8      -      -   3
10.0.2.0        10.0.11.2       255.255.255.0   UGS   8      -      -   3
10.0.7.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.6.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.5.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.4.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.8.0        0.0.0.0         255.255.255.0   U     1      -      -   1
10.0.11.0       0.0.0.0         255.255.255.0   U     1      -      -   3
10.0.12.0       0.0.0.0         255.255.255.0   U     1      -      -   4
```

R4 Time = 80s

```
Node: 14, Time: +80.0s, Local time: +80.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 14, Time: +80.0s, Local time: +80.0s, IPv4 RIP table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
10.0.16.0       10.0.12.2       255.255.255.0   UGS   2      -      -   4
10.0.15.0       10.0.12.2       255.255.255.0   UGS   2      -      -   4
10.0.14.0       10.0.11.2       255.255.255.0   UGS   6      -      -   3
10.0.13.0       10.0.11.2       255.255.255.0   UGS   6      -      -   3
10.0.10.0       10.0.11.2       255.255.255.0   UGS   6      -      -   3
10.0.3.0        10.0.11.2       255.255.255.0   UGS   7      -      -   3
10.0.0.0        10.0.11.2       255.255.255.0   UGS   8      -      -   3
10.0.1.0        10.0.11.2       255.255.255.0   UGS   8      -      -   3
10.0.2.0        10.0.11.2       255.255.255.0   UGS   8      -      -   3
10.0.7.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.6.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.5.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.4.0        10.0.8.1        255.255.255.0   UGS   2      -      -   1
10.0.8.0        0.0.0.0         255.255.255.0   U     1      -      -   1
10.0.9.0        10.0.11.2       255.255.255.0   UGS   16     -      -   3
10.0.11.0       0.0.0.0         255.255.255.0   U     1      -      -   3
10.0.12.0       0.0.0.0         255.255.255.0   U     1      -      -   4
```

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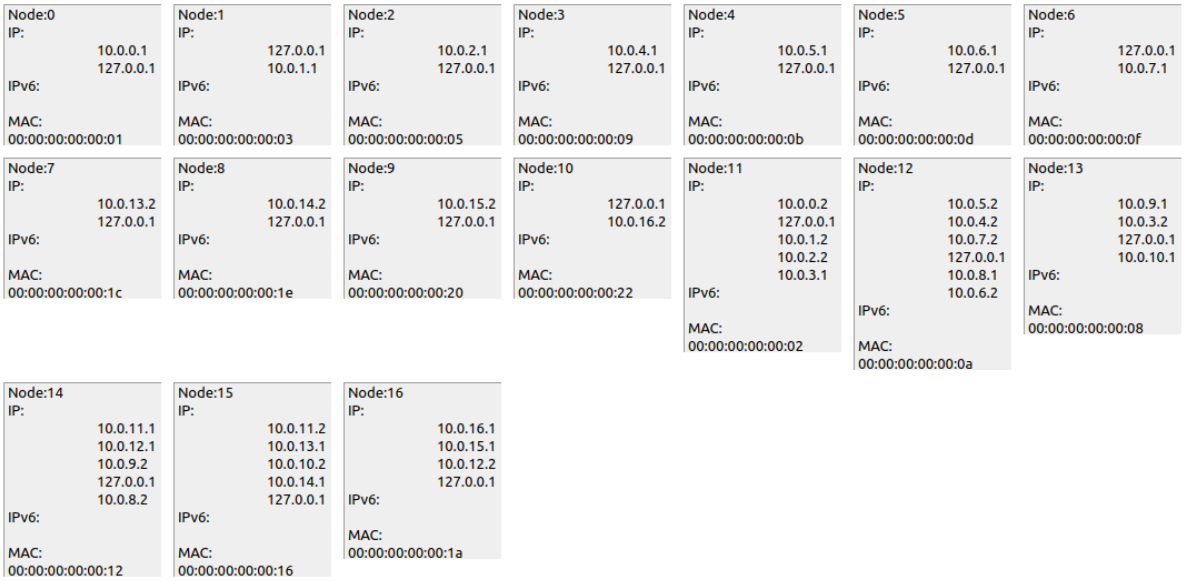
Visualization

Q2:

Below image represent the stats of all nodes in a network, detail about their IP, Gateways, IPv6 and MAC.



Below image represent the communication between nodes for routing the packet data. As we clearly see that node 11, 12, 13, 14, 15 and 16 are communicating massively because they all are routers, they are core of this network topology. That's why in the most of the communicating lines between these. Also, as we can see most of the nodes haven't communicating to other because they are host and they didn't communicating to others.

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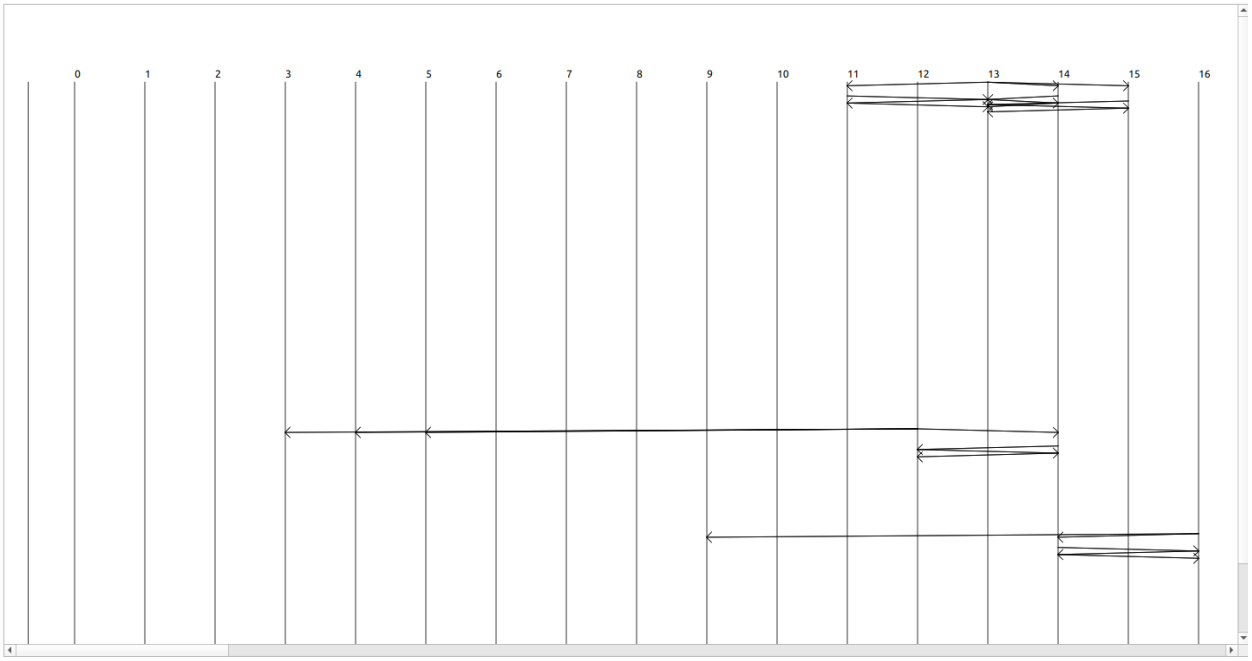

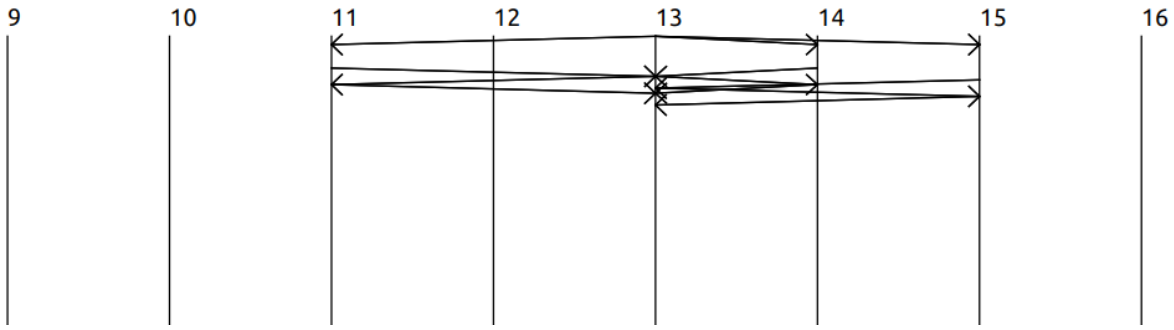

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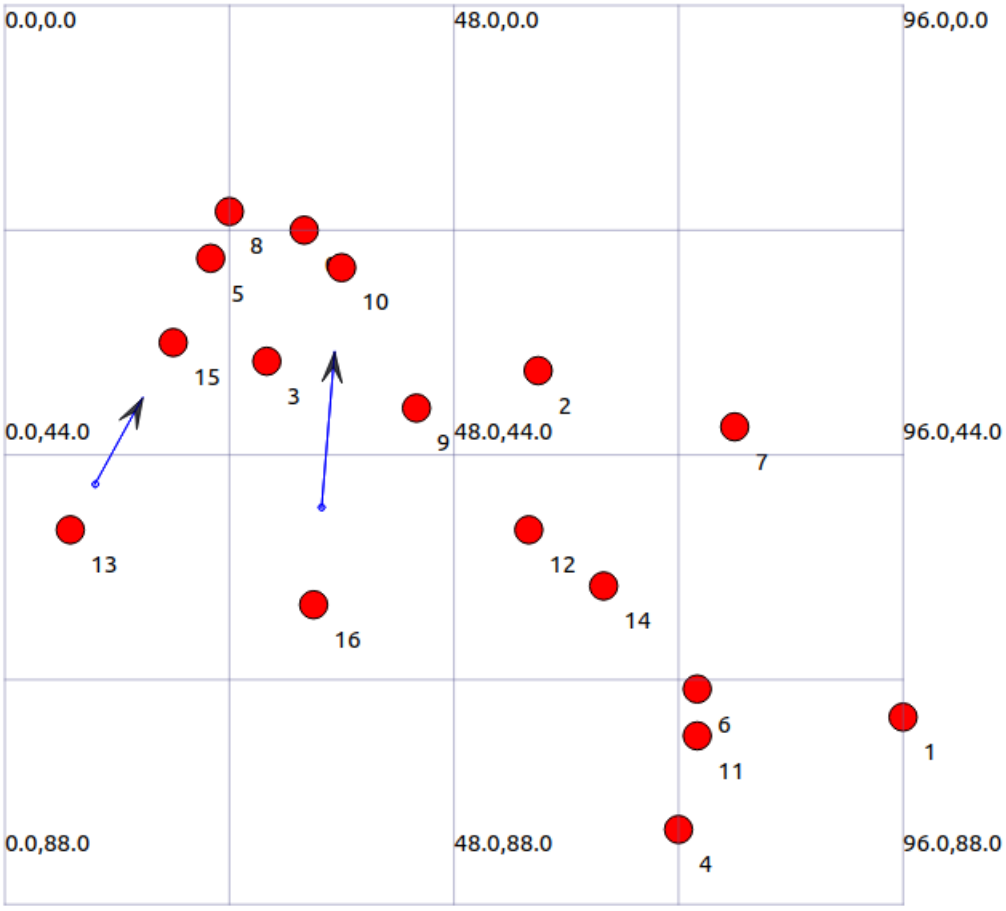
Here below image represent some footage of the animation of this .xml file from NetAnim Visualization.



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