

ID: 22301242

Data Size: 1024

```
4 echoClient.SetAttribute("MaxPackets", ns_core.IntegerValue(1))

vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
^
SyntaxError: invalid syntax
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
At time +2s client sent 1024 bytes to 10.1.1.2 port 9
At time +2.00369s server received 1024 bytes from 10.1.1.1 port 49153
At time +2.00369s server sent 1024 bytes to 10.1.1.1 port 49153
At time +2.00737s client received 1024 bytes from 10.1.1.2 port 9
FlowID: 1 (UDP 10.1.1.1/49153 --> 10.1.1.2/9)
Tx Bytes: 1052
Rx Bytes: 1052
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0036864
Throughput: 467.5555555555554
FlowID: 2 (UDP 10.1.1.2/9 --> 10.1.1.1/49153)
Tx Bytes: 1052
Rx Bytes: 1052
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0036864
Throughput: 467.5555555555554
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```

Data Size: 128

```
vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
Mean Delay: 0.0036864
Throughput: 467.5555555555554
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
At time +2s client sent 128 bytes to 10.1.1.2 port 9
At time +2.00225s server received 128 bytes from 10.1.1.1 port 49153
At time +2.00225s server sent 128 bytes to 10.1.1.1 port 49153
At time +2.00451s client received 128 bytes from 10.1.1.2 port 9
FlowID: 1 (UDP 10.1.1.1/49153 --> 10.1.1.2/9)
Tx Bytes: 156
Rx Bytes: 156
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0022528
Throughput: 69.33333333333333
FlowID: 2 (UDP 10.1.1.2/9 --> 10.1.1.1/49153)
Tx Bytes: 156
Rx Bytes: 156
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0022528
Throughput: 69.33333333333333
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```

Data Size: 256

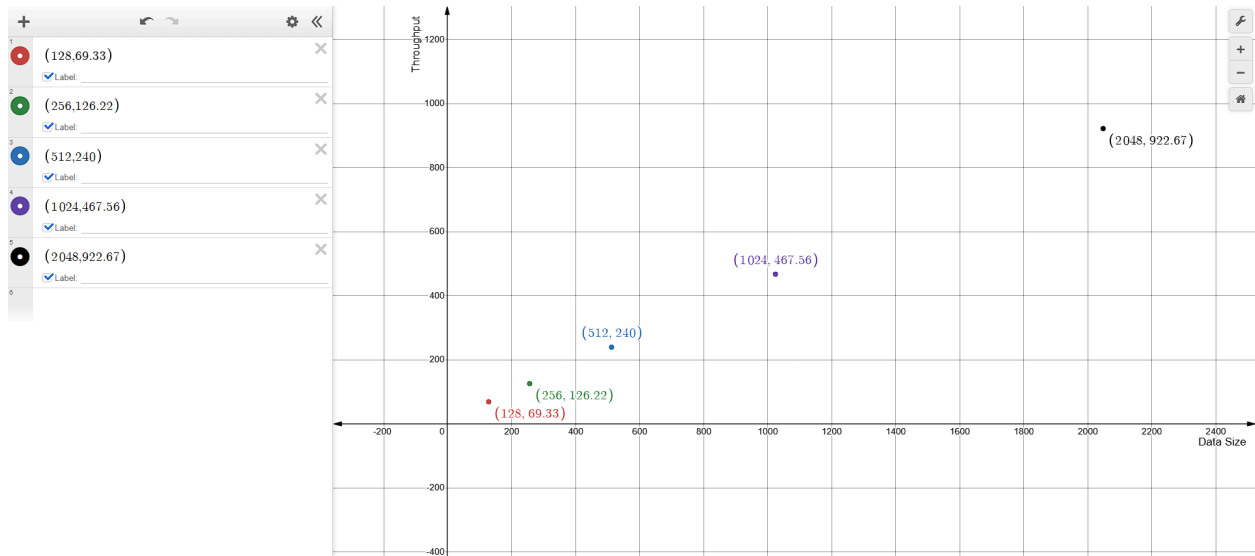
```
vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
Mean Delay: 0.0022528
Throughput: 69.33333333333333
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
At time +2s client sent 256 bytes to 10.1.1.2 port 9
At time +2.00246s server received 256 bytes from 10.1.1.1 port 49153
At time +2.00246s server sent 256 bytes to 10.1.1.1 port 49153
At time +2.00492s client received 256 bytes from 10.1.1.2 port 9
FlowID: 1 (UDP 10.1.1.1/49153 --> 10.1.1.2/9)
Tx Bytes: 284
Rx Bytes: 284
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0024576
Throughput: 126.22222222222223
FlowID: 2 (UDP 10.1.1.2/9 --> 10.1.1.1/49153)
Tx Bytes: 284
Rx Bytes: 284
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0024576
Throughput: 126.22222222222223
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```

Data Size: 512

```
vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
Mean Delay: 0.0024576
Throughput: 126.22222222222223
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
At time +2s client sent 512 bytes to 10.1.1.2 port 9
At time +2.00287s server received 512 bytes from 10.1.1.1 port 49153
At time +2.00287s server sent 512 bytes to 10.1.1.1 port 49153
At time +2.00573s client received 512 bytes from 10.1.1.2 port 9
FlowID: 1 (UDP 10.1.1.1/49153 --> 10.1.1.2/9)
Tx Bytes: 540
Rx Bytes: 540
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0028672
Throughput: 240.0
FlowID: 2 (UDP 10.1.1.2/9 --> 10.1.1.1/49153)
Tx Bytes: 540
Rx Bytes: 540
Tx Packets: 1
Rx Packets: 1
Lost Packets: 0
Mean Delay: 0.0028672
Throughput: 240.0
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```

Data Size: 2048

```
24
2
2 vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
2
2 Mean Delay: 0.0028672
2 Throughput: 240.0
2 vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
3 At time +2s client sent 2048 bytes to 10.1.1.2 port 9
3 At time +2.00536s server received 2048 bytes from 10.1.1.1 port 49153
3 At time +2.00536s server sent 2048 bytes to 10.1.1.1 port 49153
3 At time +2.01072s client received 2048 bytes from 10.1.1.2 port 9
3 FlowID: 1 (UDP 10.1.1.1/49153 --> 10.1.1.2/9)
3 Tx Bytes: 2076
3 Rx Bytes: 2076
3 Tx Packets: 1
3 Rx Packets: 1
3 Lost Packets: 0
4 Mean Delay: 0.00536
4 Throughput: 922.6666666666666
4 FlowID: 2 (UDP 10.1.1.2/9 --> 10.1.1.1/49153)
4 Tx Bytes: 2076
4 Rx Bytes: 2076
4 Tx Packets: 1
4 Rx Packets: 1
4 Lost Packets: 0
4 Mean Delay: 0.00536
4 Throughput: 922.6666666666666
5 vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```



Graph: throughput vs data size

In this assignment, the graph shows the relationship between packet size and throughput for a ns3 client-server network. As the packet size increases from 128 bytes to 2048 bytes, the measured throughput rises steadily from a low value (69 units) up to 922.67 units, forming an overall increasing curve. This behavior occurs because larger packets carry more useful payload relative to protocol overhead, so the link is utilized more efficiently and a higher amount of data can be delivered per unit time. Within the tested range, no saturation or drop in performance is observed, indicating that, for this configuration, using larger packet sizes improves throughput.

```
pen v [J+1] ~/Downloads/ns-allinone-3.40/ns-3.40/examples/tutorial Save = -
vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ ./ns3 shell
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
At time +2s client sent 1024 bytes to 10.1.1.2 port 9
At time +2.00369s server received 1024 bytes from 10.1.1.1 port 49153
At time +2.00369s server sent 1024 bytes to 10.1.1.1 port 49153
At time +2.00737s client received 1024 bytes from 10.1.1.2 port 9
vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```

```
30
31
32 vboxuser@ubuntu22: ~/Downloads/ns-allinone-3.40/ns-3.40
33 type object 'ns3' has no attribute 'Animationinterface'
34 'ns3::Animationinterface' is not a known C++ class
35 'Animationinterface' is not a known C++ template
36 'Animationinterface' is not a known C++ enum
37 vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ python3 examples/tutorial/first.py
38 AnimationInterface WARNING:Node:0 Does not have a mobility model. Use SetConstantPosition if
39 it is stationary
40 AnimationInterface WARNING:Node:1 Does not have a mobility model. Use SetConstantPosition if
41 it is stationary
42 AnimationInterface WARNING:Node:0 Does not have a mobility model. Use SetConstantPosition if
43 it is stationary
44 AnimationInterface WARNING:Node:1 Does not have a mobility model. Use SetConstantPosition if
45 it is stationary
46 At time +2s client sent 1024 bytes to 10.1.1.2 port 9
47 At time +2.00369s server received 1024 bytes from 10.1.1.1 port 49153
48 At time +2.00369s server sent 1024 bytes to 10.1.1.1 port 49153
49 At time +2.00737s client received 1024 bytes from 10.1.1.2 port 9
50 vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$ ls
51 AUTHORS          cmake-cache      examples          README.md        src
52 bindings         CMakeLists.txt  first.xml         RELEASE_NOTES.md test.py
53 build            contrib         LICENSE          scratch          utils
54 build-support    CONTRIBUTING.md ns3              setup.cfg        utils.py
55 CHANGES.md      doc             pyproject.toml   setup.py         VERSION
56 vboxuser@ubuntu22:~/Downloads/ns-allinone-3.40/ns-3.40$
```

