Project: Network Traffic Management Lab (iperf3 + Linux tc)

Lab Topology (both networks)

LAN Client VM → generates traffic

LAN Server VM → receives traffic

Same subnet, test port: 5201

Network 1 — Baseline + Traffic Shaping (TBF rate limiting)

Goal
Measure baseline throughput, then **apply bandwidth shaping** (simulate congestion), re-test, and rollback.

Step N1.1 — Confirm IP config (Client)
Run on: Ubuntu Client

ip a
ip route

✅ Evidence:

```
yasmim@lan-client-1:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether f2:1d:67:fa:b1:53 brd ff:ff:ff:ff:ff:ff
    inet 192.168.64.2/24 metric 100 brd 192.168.64.255 scope global dynamic enp0s1
       valid_lft 2742sec preferred_lft 2742sec
    inet6 fdcd:c6d0:e822:b904:f01d:67ff:fefa:b153/64 scope global dynamic mngtmpaddr noprefixroute
       valid_lft 2591964sec preferred_lft 604764sec
    inet6 fe80::f01d:67ff:fefa:b153/64 scope link
       valid_lft forever preferred_lft forever
yasmim@lan-client-1:~$ ip route
default via 192.168.64.1 dev enp0s1 proto dhcp src 192.168.64.2 metric 100
192.168.64.0/24 dev enp0s1 proto kernel scope link src 192.168.64.2 metric 100
192.168.64.1 dev enp0s1 proto dhcp scope link src 192.168.64.2 metric 100
yasmim@lan-client-1:~$
```

- Evidences/Network 1/Evaluate stage/ip a + route_client1.png

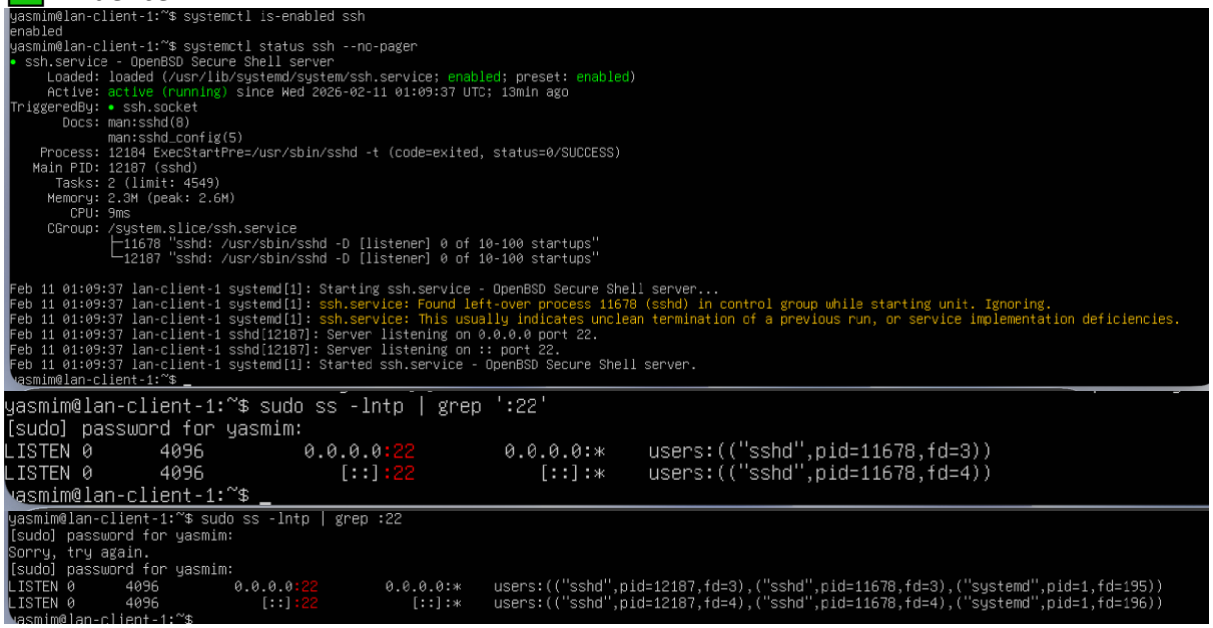
---

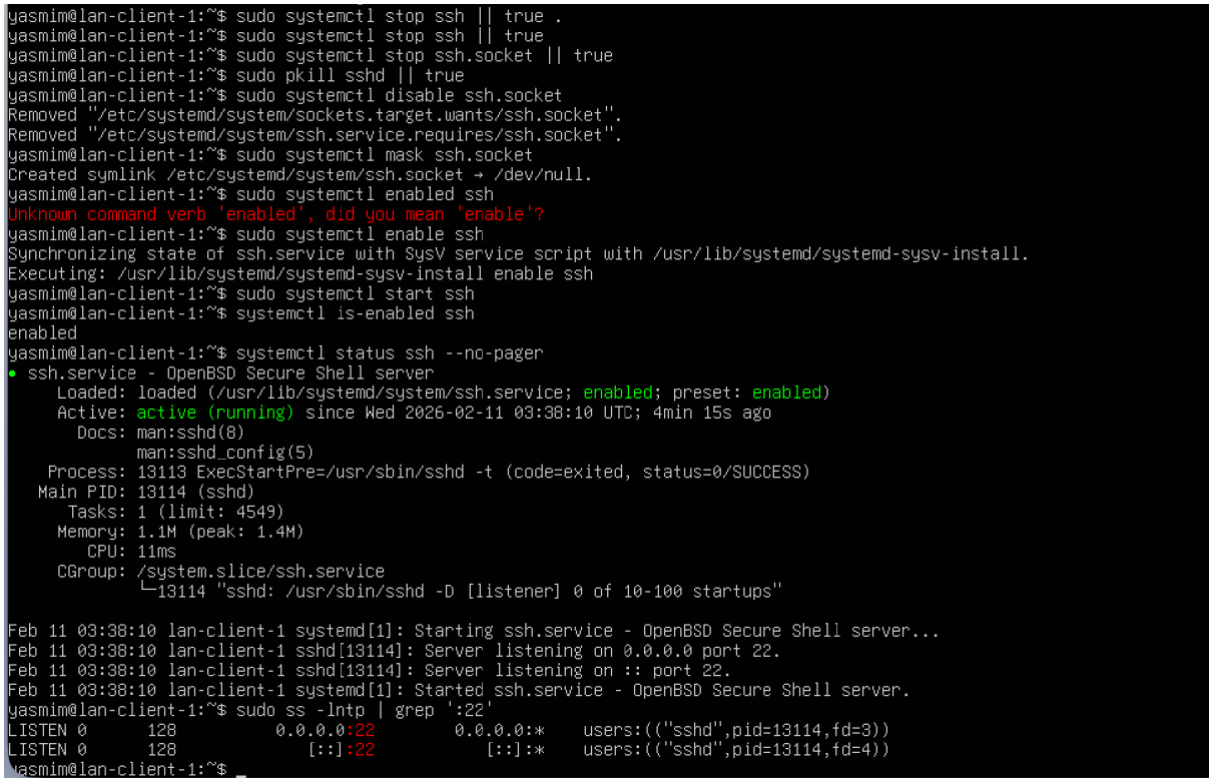
Step N1.2 — SSH + Port 22 checks (Server)

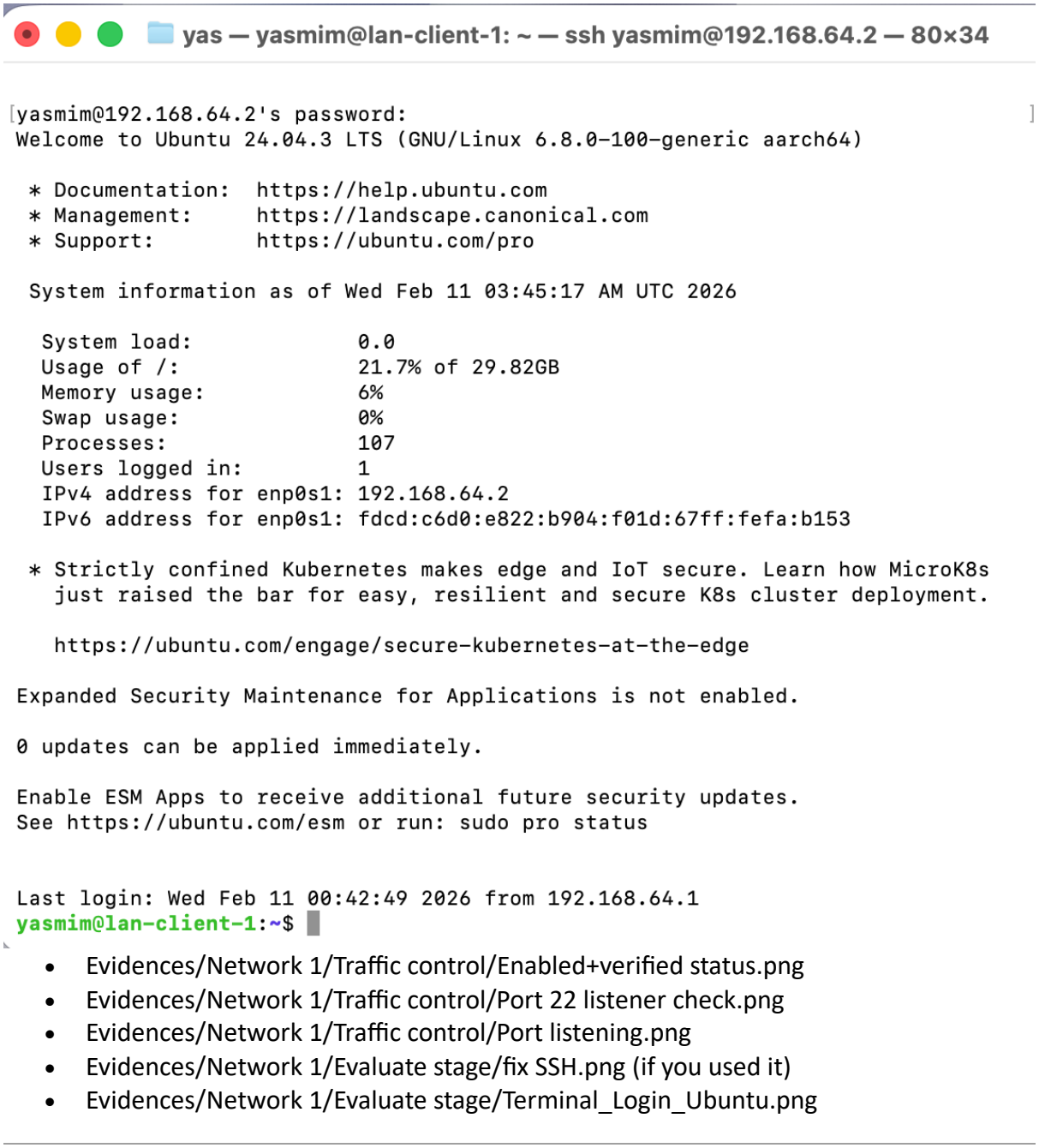
Run on: Ubuntu Server

sudo systemctl status ssh
sudo ss -lntp | grep :22 || echo "Port 22 not listening"

✅ Evidence:




yasmim@lan-client-1:~$ sudo systemctl stop ssh || true .
yasmim@lan-client-1:~$ sudo systemctl stop ssh || true
yasmim@lan-client-1:~$ sudo systemctl stop ssh.socket || true
yasmim@lan-client-1:~$ sudo pkill sshd || true
yasmim@lan-client-1:~$ sudo systemctl disable ssh.socket
Removed "/etc/systemd/system/sockets.target.wants/ssh.socket".
Removed "/etc/systemd/system/ssh.service.requires/ssh.socket".
yasmim@lan-client-1:~$ sudo systemctl mask ssh.socket
Created symlink /etc/systemd/system/ssh.socket → /dev/null.
yasmim@lan-client-1:~$ sudo systemctl enabled ssh
Unknown command verb 'enabled', did you mean 'enable'?
yasmim@lan-client-1:~$ sudo systemctl enable ssh
Synchronizing state of ssh.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable ssh
yasmim@lan-client-1:~$ sudo systemctl start ssh
yasmim@lan-client-1:~$ systemctl is-enabled ssh
enabled
yasmim@lan-client-1:~$ systemctl status ssh --no-pager
• ssh.service - OpenBSD Secure Shell server
Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
Active: active (running) since Wed 2026-02-11 03:38:10 UTC; 4min 15s ago
Docs: man:sshd(8)
man:sshd_config(5)
Process: 13113 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
Main PID: 13114 (sshd)
Tasks: 1 (limit: 4549)
Memory: 1.1M (peak: 1.4M)
CPU: 11ms
CGroup: /system.slice/ssh.service
└─13114 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"
Feb 11 03:38:10 lan-client-1 systemd[1]: Starting ssh.service - OpenBSD Secure Shell server...
Feb 11 03:38:10 lan-client-1 sshd[13114]: Server listening on 0.0.0.0 port 22.
Feb 11 03:38:10 lan-client-1 sshd[13114]: Server listening on :: port 22.
Feb 11 03:38:10 lan-client-1 systemd[1]: Started ssh.service - OpenBSD Secure Shell server.
yasmim@lan-client-1:~$ sudo ss -lntp | grep ':22'
LISTEN 0 128 0.0.0.0:22 0.0.0.0:* users:(("sshd",pid=13114,fd=3))
LISTEN 0 128 [::]:22 [::]:* users:(("sshd",pid=13114,fd=4))
yasmim@lan-client-1:~$

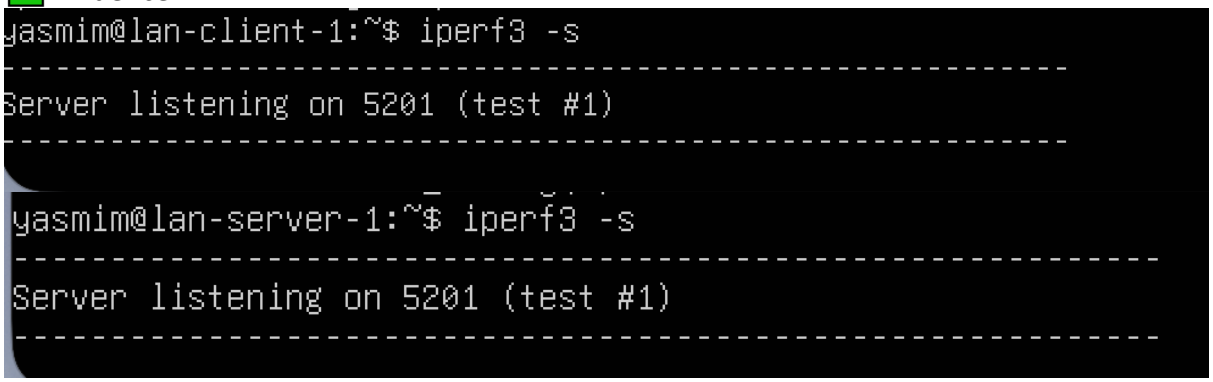


- Evidences/Network 1/Traffic control/Enabled+verified status.png
- Evidences/Network 1/Traffic control/Port 22 listener check.png
- Evidences/Network 1/Traffic control/Port listening.png
- Evidences/Network 1/Evaluate stage/fix SSH.png (if you used it)
- Evidences/Network 1/Evaluate stage/Terminal_Login_Ubuntu.png

Step N1.3 — Start iperf3 server (Server)
Run on: Ubuntu Server

iperf3 -s

✅ Evidence:



- Evidences/Network 1/Traffic control/Client server listening on 5201....png
- Evidences/Network 1/Evaluate stage/Server listening on 5201.png

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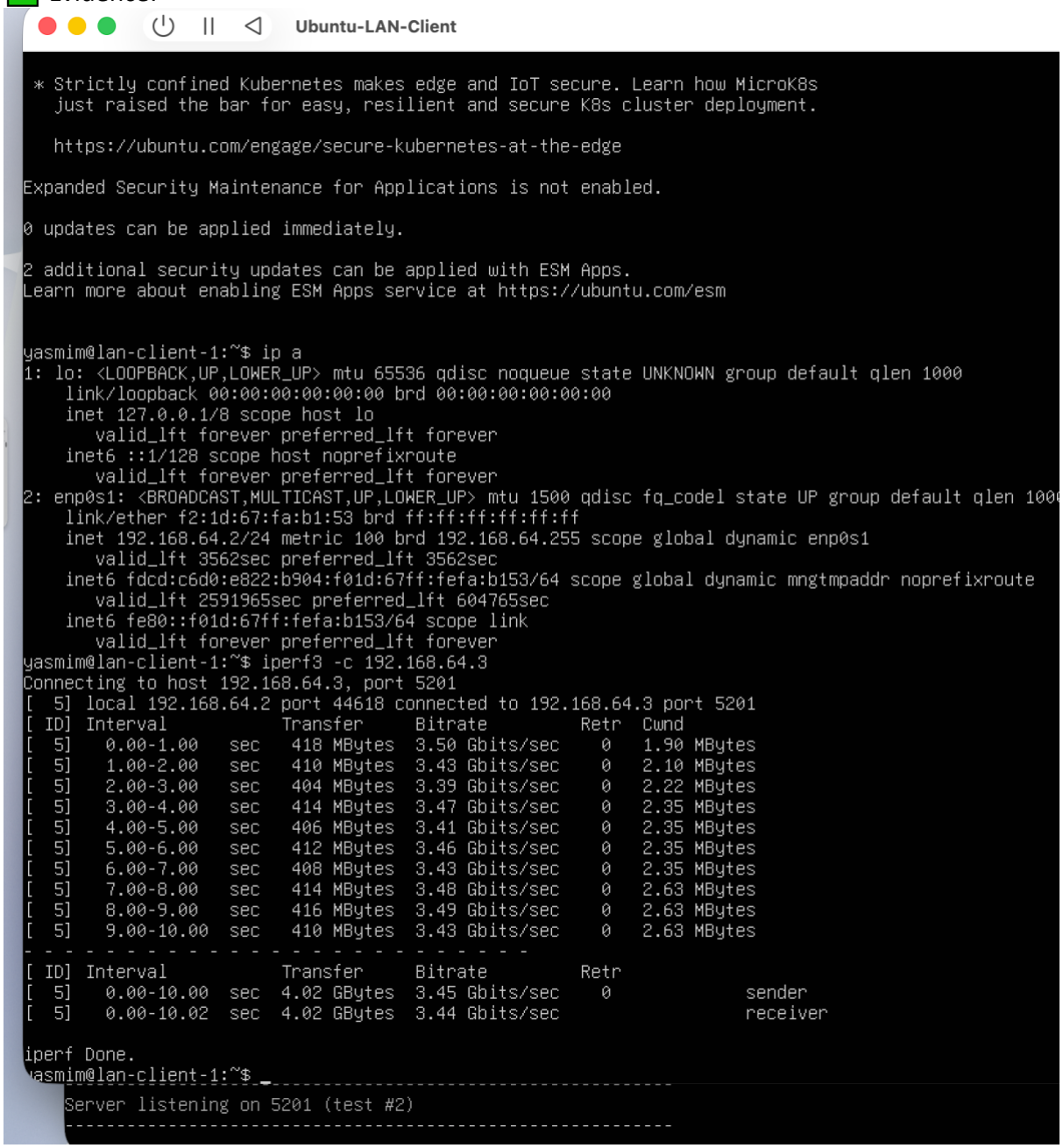
Step N1.4 — Run baseline throughput test (Client)
Run on: Ubuntu Client

iperf3 -c 192.168.64.3 -t 10

✅ Evidence:


Ubuntu-LAN-Client
* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
just raised the bar for easy, resilient and secure K8s cluster deployment.
https://ubuntu.com/engage/secure-kubernetes-at-the-edge
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
2 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm
yasmim@lan-client-1:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host noprefixroute
valid_lft forever preferred_lft forever
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 100
link/ether f2:1d:67:fa:b1:53 brd ff:ff:ff:ff:ff:ff
inet 192.168.64.2/24 metric 100 brd 192.168.64.255 scope global dynamic enp0s1
valid_lft 3562sec preferred_lft 3562sec
inet6 fdcd:c6d0:e822:b904:f01d:67ff:fefa:b153/64 scope global dynamic mngtmpaddr noprefixroute
valid_lft 2591965sec preferred_lft 604765sec
inet6 fe80::f01d:67ff:fefa:b153/64 scope link
valid_lft forever preferred_lft forever
yasmim@lan-client-1:~$ iperf3 -c 192.168.64.3
Connecting to host 192.168.64.3, port 5201
[5] local 192.168.64.2 port 44618 connected to 192.168.64.3 port 5201
[ID] Interval Transfer Bitrate Retr Cwnd
[5] 0.00-1.00 sec 418 MBytes 3.50 Gbits/sec 0 1.90 MBytes
[5] 1.00-2.00 sec 410 MBytes 3.43 Gbits/sec 0 2.10 MBytes
[5] 2.00-3.00 sec 404 MBytes 3.39 Gbits/sec 0 2.22 MBytes
[5] 3.00-4.00 sec 414 MBytes 3.47 Gbits/sec 0 2.35 MBytes
[5] 4.00-5.00 sec 406 MBytes 3.41 Gbits/sec 0 2.35 MBytes
[5] 5.00-6.00 sec 412 MBytes 3.46 Gbits/sec 0 2.35 MBytes
[5] 6.00-7.00 sec 408 MBytes 3.43 Gbits/sec 0 2.35 MBytes
[5] 7.00-8.00 sec 414 MBytes 3.48 Gbits/sec 0 2.63 MBytes
[5] 8.00-9.00 sec 416 MBytes 3.49 Gbits/sec 0 2.63 MBytes
[5] 9.00-10.00 sec 410 MBytes 3.43 Gbits/sec 0 2.63 MBytes
[ID] Interval Transfer Bitrate Retr
[5] 0.00-10.00 sec 4.02 GBytes 3.45 Gbits/sec 0 sender
[5] 0.00-10.02 sec 4.02 GBytes 3.44 Gbits/sec receiver
iperf Done.
yasmim@lan-client-1:~$
Server listening on 5201 (test #2)

```
Last login: Wed Feb 11 06:42:49 2026 from 192.168.64.1
yasmim@lan-client-1:~$ iperf3 --version
iperf 3.16 (cJSON 1.7.15)
Linux lan-client-1 6.8.0-100-generic #100-Ubuntu SMP PREEMPT_DYNAMIC Tue Jan 13
16:39:21 UTC 2026 aarch64
Optional features available: CPU affinity setting, IPv6 flow label, SCTP, TCP co
ngestion algorithm setting, sendfile / zerocopy, socket pacing, authentication,
bind to device, support IPv4 don't fragment, POSIX threads
yasmim@lan-client-1:~$ iperf3 -c 192.168.64.2
Connecting to host 192.168.64.2, port 5201
[  5] local 192.168.64.2 port 58428 connected to 192.168.64.2 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[  5]   0.00-1.00   sec  13.0 GBytes   112 Gbits/sec    0   1.56 MBytes
[  5]   1.00-2.00   sec  12.0 GBytes   103 Gbits/sec    2   2.06 MBytes
[  5]   2.00-3.00   sec  13.1 GBytes   113 Gbits/sec    0   2.12 MBytes
[  5]   3.00-4.00   sec  12.8 GBytes   110 Gbits/sec    1   2.75 MBytes
[  5]   4.00-5.00   sec  12.8 GBytes   110 Gbits/sec    0   2.75 MBytes
[  5]   5.00-6.00   sec  13.2 GBytes   113 Gbits/sec    0   2.75 MBytes
[  5]   6.00-7.00   sec  12.9 GBytes   110 Gbits/sec    0   2.75 MBytes
[  5]   7.00-8.00   sec  12.4 GBytes   107 Gbits/sec    1   2.75 MBytes
[  5]   8.00-9.00   sec  13.1 GBytes   113 Gbits/sec    0   2.87 MBytes
[  5]   9.00-10.00  sec  11.9 GBytes   102 Gbits/sec    0   3.18 MBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate         Retr
[  5]   0.00-10.00  sec   127 GBytes   109 Gbits/sec    4             sender
[  5]   0.00-10.00  sec   127 GBytes   109 Gbits/sec                  receiver

iperf Done.
yasmim@lan-client-1:~$
```

```
iperf Done.
yasmim@lan-client-1:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether f2:1d:67:fa:b1:53 brd ff:ff:ff:ff:ff:ff
    inet 192.168.64.2/24 metric 100 brd 192.168.64.255 scope global dynamic enp0s1
       valid_lft 3561sec preferred_lft 3561sec
    inet6 fdcd:c6d0:e822:b904:f01d:67ff:fefa:b153/64 scope global dynamic mngtmpaddr noprefixroute
       valid_lft 2591949sec preferred_lft 604749sec
    inet6 fe80::f01d:67ff:fefa:b153/64 scope link
       valid_lft forever preferred_lft forever
yasmim@lan-client-1:~$ _
```

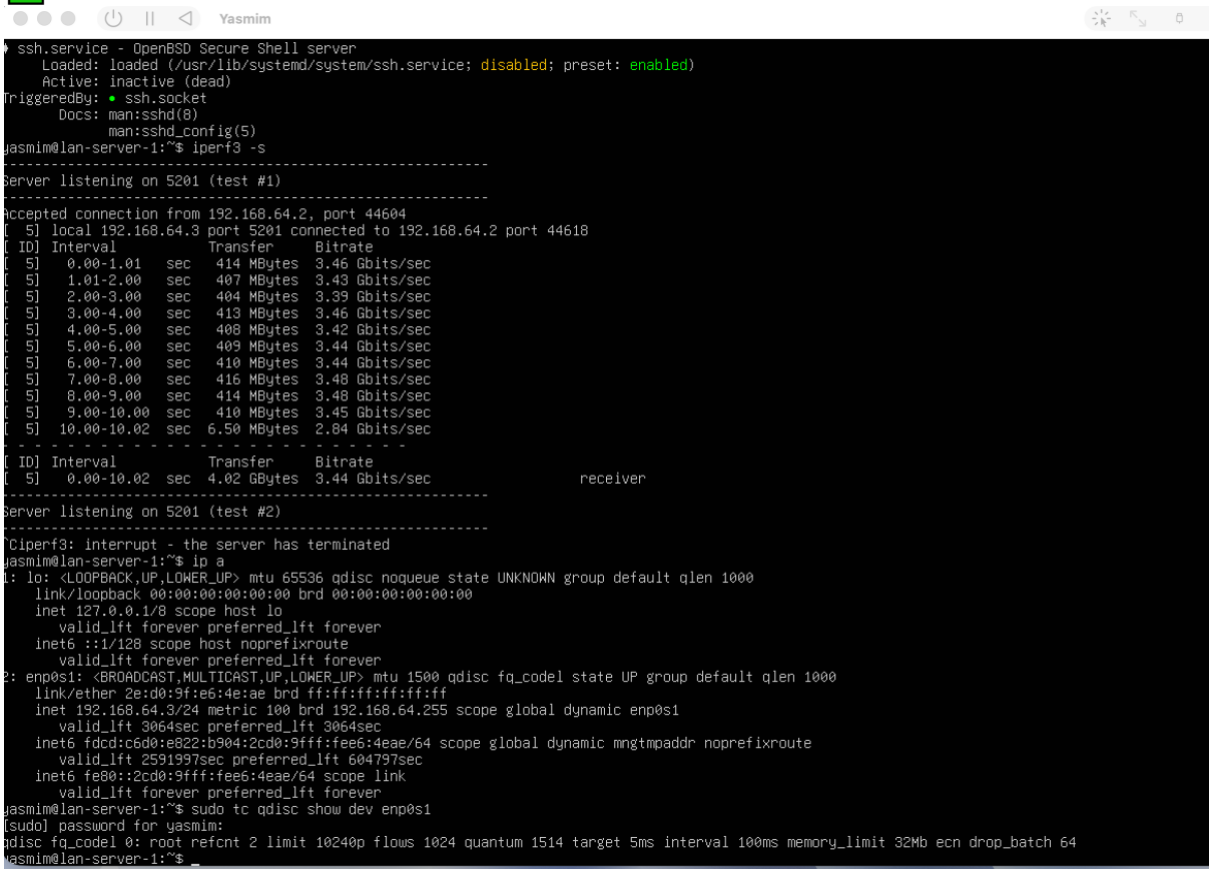
- Evidences/Network 1/Evaluate stage/iperf3 CLIENT to SERVER.png
- Evidences/Network 1/Evaluate stage/iperf3 test result.png
- Evidences/Network 1/Traffic control/Baseline throughput.png

---

Step N1.5 — Check current qdisc (Server)
Run on: Ubuntu Server

sudo tc qdisc show dev enp0s1

✅ Evidence:

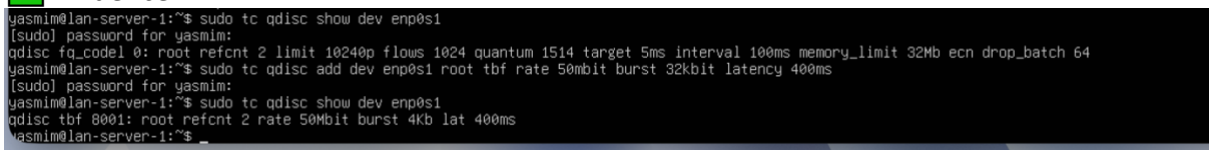


- Evidences/Network 1/Traffic control/qdisc.png

Step N1.6 — Apply traffic shaping (TBF) (Server)
Run on: Ubuntu Server

sudo tc qdisc add dev enp0s1 root tbf rate 50mbit burst 32kbit latency 400ms
sudo tc qdisc show dev enp0s1

✅ Evidence:

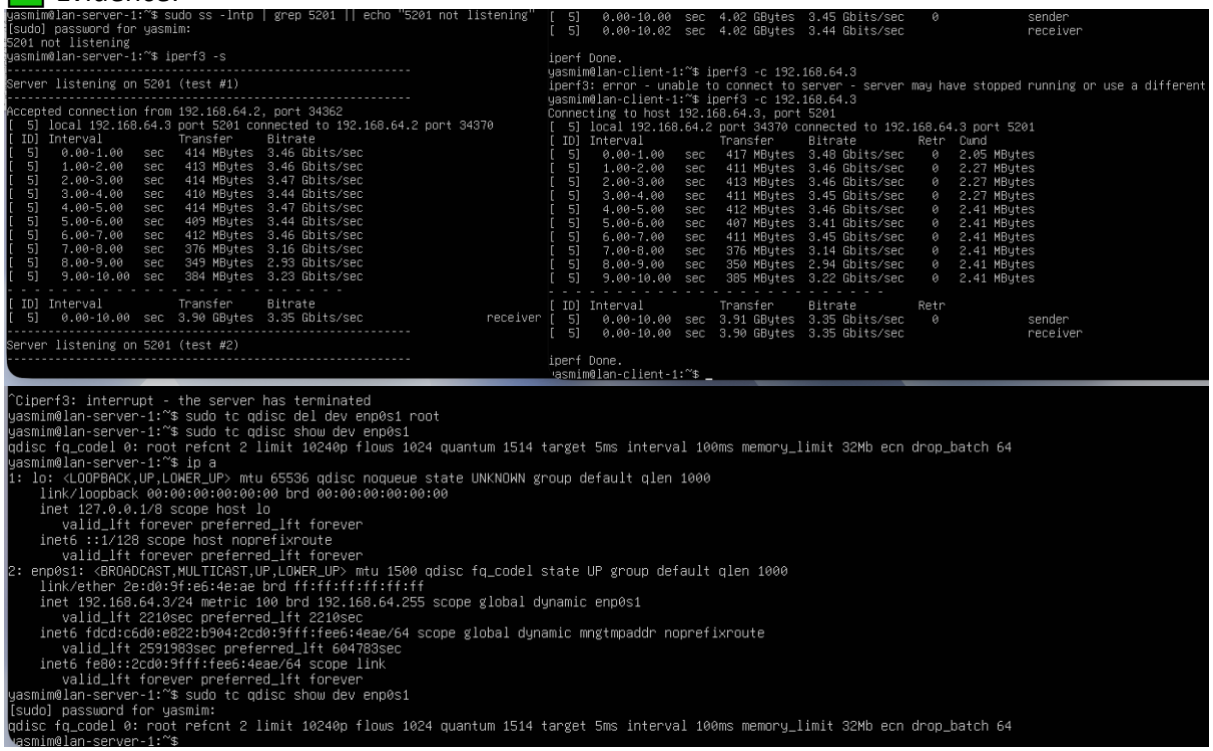


- Evidences/Network 1/Traffic control/TC applied.png

Step N1.7 — Re-test after shaping (Client)
Run on: Ubuntu Client

iperf3 -c 192.168.64.3 -t 10

✅ Evidence:

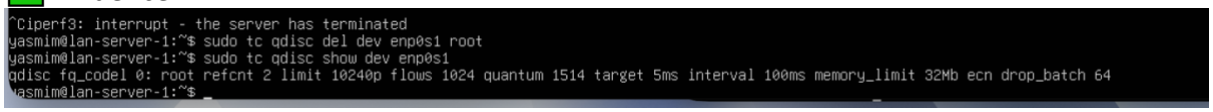


- Evidences/Network 1/Traffic control/test after tc_limited speed.png
- Evidences/Network 1/Traffic control/tc shaping.png

Step N1.8 — Rollback (remove shaping) (Server)
Run on: Ubuntu Server

sudo tc qdisc del dev enp0s1 root 2>/dev/null
sudo tc qdisc show dev enp0s1

✅ Evidence:



- Evidences/Network 1/Traffic control/tc removed.png

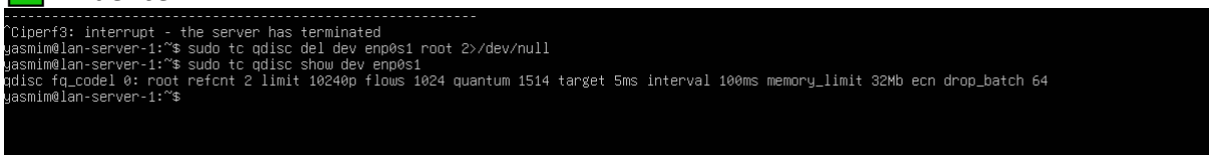
Network 2 — Baseline + NetEm impairment (delay/jitter/loss)

Goal
Simulate unstable WAN conditions using netem and observe impact.

Step N2.1 — Ensure no old tc rule is active (Server)
Run on: Ubuntu Server

sudo tc qdisc del dev enp0s1 root 2>/dev/null
sudo tc qdisc show dev enp0s1

✅ Evidence:

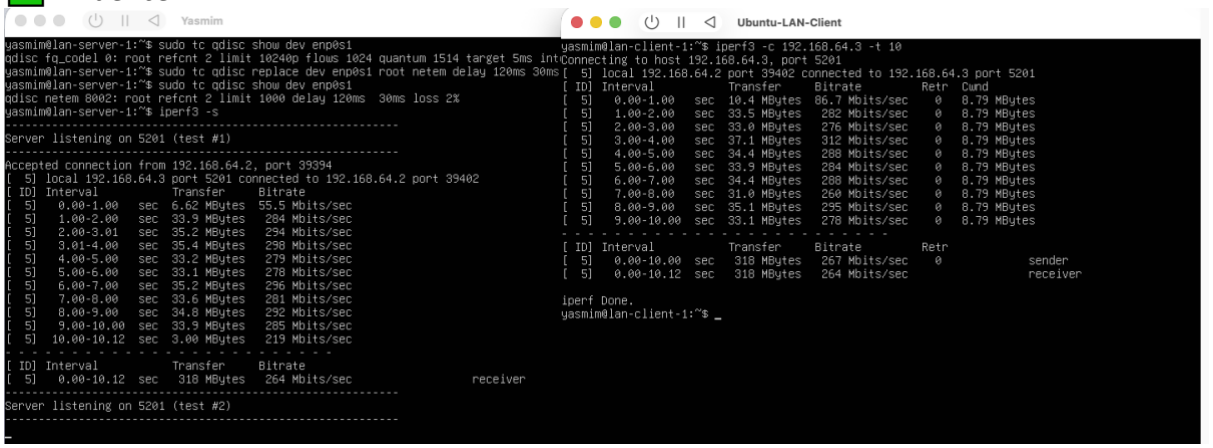


- Evidences/Network 2/N2_tc_removed.png

Step N2.2 — Start iperf3 server (Server)
Run on: Ubuntu Server

iperf3 -s

✅ Evidence:



- Evidences/Network 2/N2_Server_listening.png

Step N2.3 — Baseline throughput (Client)
Run on: Ubuntu Client

iperf3 -c 192.168.64.3 -t 10

✅ Evidence:

Ubuntu-LAN-Client

```
yasmim@lan-client-1:~$ iperf3 -c 192.168.64.3 -t 10
Connecting to host 192.168.64.3, port 5201
[  5] local 192.168.64.2 port 55324 connected to 192.168.64.3 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[  5]   0.00-1.00   sec   421 MBytes  3.52 Gbits/sec    0   2.07 MBytes
[  5]   1.00-2.00   sec   410 MBytes  3.45 Gbits/sec    0   2.19 MBytes
[  5]   2.00-3.00   sec   413 MBytes  3.46 Gbits/sec    0   2.30 MBytes
[  5]   3.00-4.00   sec   416 MBytes  3.49 Gbits/sec    0   2.56 MBytes
[  5]   4.00-5.00   sec   416 MBytes  3.48 Gbits/sec    0   2.56 MBytes
[  5]   5.00-6.00   sec   412 MBytes  3.46 Gbits/sec    0   2.56 MBytes
[  5]   6.00-7.00   sec   405 MBytes  3.40 Gbits/sec    0   2.56 MBytes
[  5]   7.00-8.00   sec   414 MBytes  3.47 Gbits/sec    0   2.56 MBytes
[  5]   8.00-9.00   sec   414 MBytes  3.47 Gbits/sec    0   2.56 MBytes
[  5]   9.00-10.01  sec   417 MBytes  3.47 Gbits/sec    0   2.56 MBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate         Retr
[  5]   0.00-10.01  sec  4.04 GBytes  3.47 Gbits/sec    0             sender
[  5]   0.00-10.01  sec  4.04 GBytes  3.47 Gbits/sec                  receiver

iperf Done.
yasmim@lan-client-1:~$
```

Yasmim

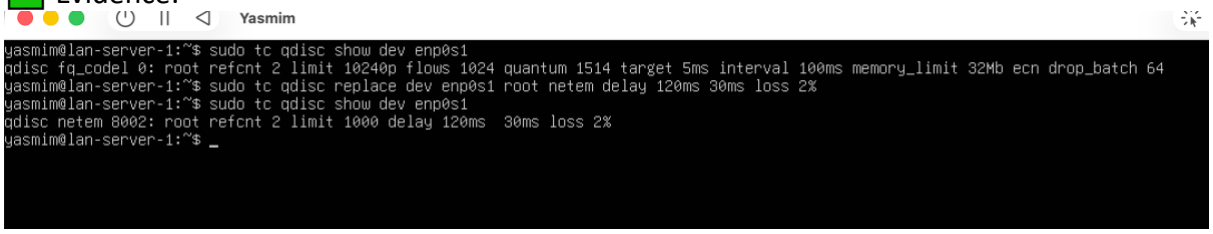
```
yasmim@lan-server-1:~$ sudo tc qdisc del dev enp0s1 root 2>/dev/null
[sudo] password for yasmim:
yasmim@lan-server-1:~$ tc qdisc show dev enp0s1
qdisc fq_codel 0: root refcnt 2 limit 10240p flows 1024 quantum 1514 target 5ms interval 100ms memory_limit 32Mb ecn drop_batch 64
yasmim@lan-server-1:~$ iperf3 -s
-----------------------------------------------------------
Server listening on 5201 (test #1)
-----------------------------------------------------------
Accepted connection from 192.168.64.2, port 55312
[  5] local 192.168.64.3 port 5201 connected to 192.168.64.2 port 55324
[ ID] Interval           Transfer     Bitrate
[  5]   0.00-1.00   sec   417 MBytes  3.49 Gbits/sec
[  5]   1.00-2.00   sec   411 MBytes  3.45 Gbits/sec
[  5]   2.00-3.00   sec   413 MBytes  3.47 Gbits/sec
[  5]   3.00-4.00   sec   417 MBytes  3.49 Gbits/sec
[  5]   4.00-5.00   sec   416 MBytes  3.48 Gbits/sec
[  5]   5.00-6.00   sec   410 MBytes  3.44 Gbits/sec
[  5]   6.00-7.00   sec   405 MBytes  3.39 Gbits/sec
[  5]   7.00-8.00   sec   414 MBytes  3.48 Gbits/sec
[  5]   8.00-9.00   sec   413 MBytes  3.47 Gbits/sec
[  5]   9.00-10.00  sec   418 MBytes  3.50 Gbits/sec
[  5]  10.00-10.01  sec  3.88 MBytes  2.81 Gbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate
[  5]   0.00-10.01  sec  4.04 GBytes  3.47 Gbits/sec                  receiver
-----------------------------------------------------------
Server listening on 5201 (test #2)
-----------------------------------------------------------
```

- Evidences/Network 2/Client_N2_baseline_iperf_test.png
- Evidences/Network 2/Server_N2_baseline_iperf_test.png

Step N2.4 — Apply netem impairment (Server)
Run on: Ubuntu Server

sudo tc qdisc replace dev enp0s1 root netem delay 120ms 30ms loss 2%
sudo tc qdisc show dev enp0s1

✅ Evidence:



- Evidences/Network 2/N2_tc_netem_applied.png

Step N2.5 — Test after impairment (Client)
Run on: Ubuntu Client

iperf3 -c 192.168.64.3 -t 10
ping -c 20 192.168.64.3

✅ Evidence:

Ubuntu-LAN-Client

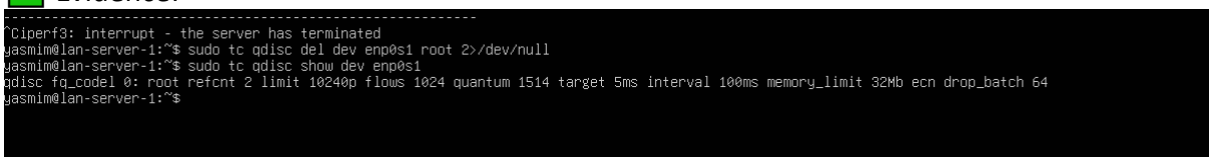
```
yasmim@lan-client-1:~$ iperf3 -c 192.168.64.3 -t 10
Connecting to host 192.168.64.3, port 5201
[  5] local 192.168.64.2 port 55324 connected to 192.168.64.3 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[  5]   0.00-1.00   sec   421 MBytes  3.52 Gbits/sec    0   2.07 MBytes
[  5]   1.00-2.00   sec   410 MBytes  3.45 Gbits/sec    0   2.19 MBytes
[  5]   2.00-3.00   sec   413 MBytes  3.46 Gbits/sec    0   2.30 MBytes
[  5]   3.00-4.00   sec   416 MBytes  3.49 Gbits/sec    0   2.56 MBytes
[  5]   4.00-5.00   sec   416 MBytes  3.48 Gbits/sec    0   2.56 MBytes
[  5]   5.00-6.00   sec   412 MBytes  3.46 Gbits/sec    0   2.56 MBytes
[  5]   6.00-7.00   sec   405 MBytes  3.40 Gbits/sec    0   2.56 MBytes
[  5]   7.00-8.00   sec   414 MBytes  3.47 Gbits/sec    0   2.56 MBytes
[  5]   8.00-9.00   sec   414 MBytes  3.47 Gbits/sec    0   2.56 MBytes
[  5]   9.00-10.01  sec   417 MBytes  3.47 Gbits/sec    0   2.56 MBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate         Retr
[  5]   0.00-10.01  sec  4.04 GBytes  3.47 Gbits/sec    0             sender
[  5]   0.00-10.01  sec  4.04 GBytes  3.47 Gbits/sec                  receiver

iperf Done.
yasmim@lan-client-1:~$


yasmim@lan-client-1:~$ ping -c 20 192.168.64.3
PING 192.168.64.3 (192.168.64.3) 56(84) bytes of data.
64 bytes from 192.168.64.3: icmp_seq=1 ttl=64 time=145 ms
64 bytes from 192.168.64.3: icmp_seq=2 ttl=64 time=133 ms
64 bytes from 192.168.64.3: icmp_seq=3 ttl=64 time=143 ms
64 bytes from 192.168.64.3: icmp_seq=4 ttl=64 time=145 ms
64 bytes from 192.168.64.3: icmp_seq=5 ttl=64 time=119 ms
64 bytes from 192.168.64.3: icmp_seq=6 ttl=64 time=92.7 ms
64 bytes from 192.168.64.3: icmp_seq=7 ttl=64 time=95.8 ms
64 bytes from 192.168.64.3: icmp_seq=8 ttl=64 time=115 ms
64 bytes from 192.168.64.3: icmp_seq=9 ttl=64 time=130 ms
64 bytes from 192.168.64.3: icmp_seq=10 ttl=64 time=108 ms
64 bytes from 192.168.64.3: icmp_seq=11 ttl=64 time=150 ms
64 bytes from 192.168.64.3: icmp_seq=12 ttl=64 time=95.3 ms
64 bytes from 192.168.64.3: icmp_seq=13 ttl=64 time=142 ms
64 bytes from 192.168.64.3: icmp_seq=14 ttl=64 time=111 ms
64 bytes from 192.168.64.3: icmp_seq=15 ttl=64 time=149 ms
64 bytes from 192.168.64.3: icmp_seq=16 ttl=64 time=109 ms
64 bytes from 192.168.64.3: icmp_seq=17 ttl=64 time=107 ms
64 bytes from 192.168.64.3: icmp_seq=18 ttl=64 time=97.6 ms
64 bytes from 192.168.64.3: icmp_seq=19 ttl=64 time=151 ms
64 bytes from 192.168.64.3: icmp_seq=20 ttl=64 time=122 ms

--- 192.168.64.3 ping statistics ---
20 packets transmitted, 20 received, 0% packet loss, time 19074ms
rtt min/avg/max/mdev = 92.747/123.036/150.908/19.968 ms
yasmim@lan-client-1:~$
```

- Evidences/Network 2/ N2_tc_netem_applied.png

Step N2.6 — Rollback (remove netem) (Server)
Run on: Ubuntu Server

sudo tc qdisc del dev enp0s1 root 2>/dev/null
sudo tc qdisc show dev enp0s1

✅ Evidence:



- Evidences/Network 2/N2_tc_removed.png

✅ Evidence Mapping Summary

Network 1 evidence list

- **IP & route validation:** Evaluate stage/ip a + route_client1.png
- **iperf server ready:** Evaluate stage/Server listening on 5201.png + Traffic control/Client server listening on 5201...png
- **baseline throughput:** Evaluate stage/iperf3 CLIENT to SERVER.png + Traffic control/Baseline throughput.png
- **qdisc baseline:** Traffic control/qdisc.png
- **TBF applied:** Traffic control/TC applied.png
- **throughput reduced after shaping:** Traffic control/test after tc_limited speed.png
- **rollback (tc removed):** Traffic control/tc removed.png
-

Network 2 evidence list

- **tc cleared:** N2_tc_removed.png
- **iperf server ready:** N2_Server_listening.png
- **baseline throughput:** Client_N2_baseline_iperf_test.png + Server_N2_baseline_iperf_test.png
- **netem applied:** N2_tc_netem_applied.png
- **performance impact after netem:** N2_iperf_after_netem.png

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