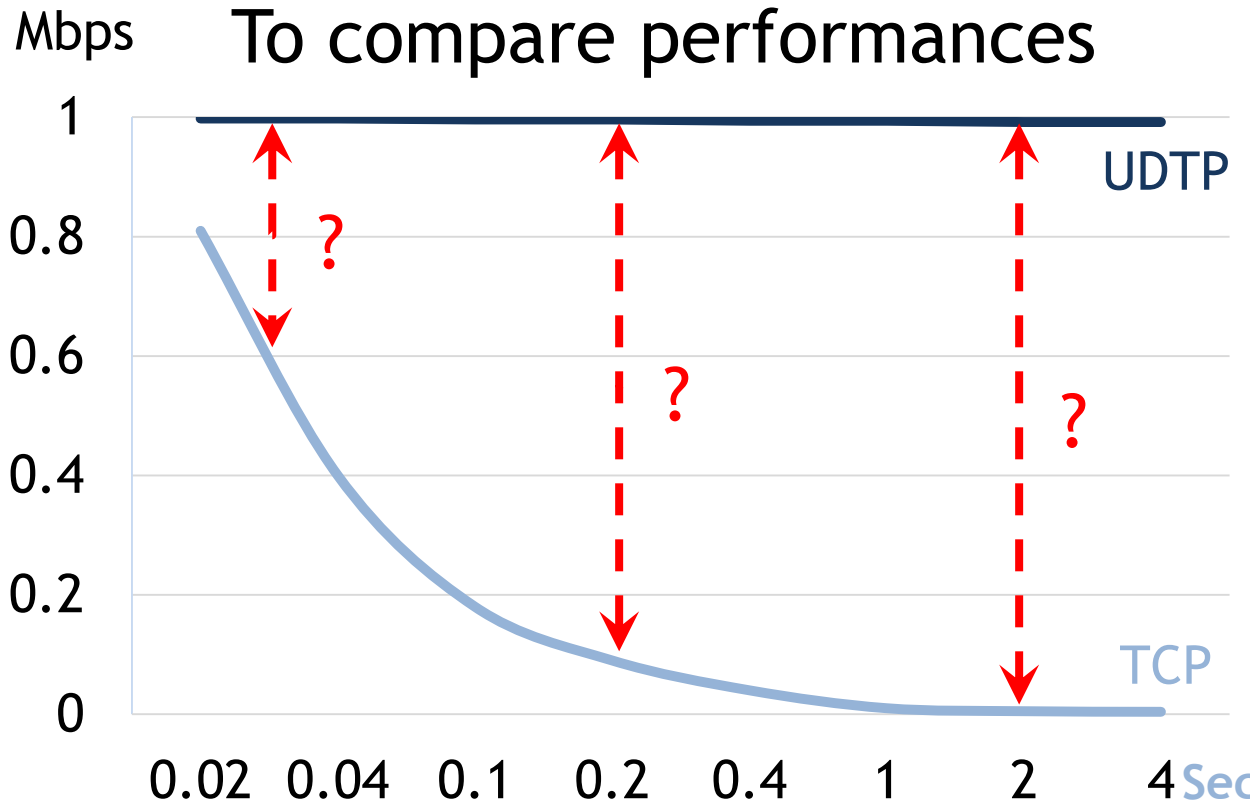
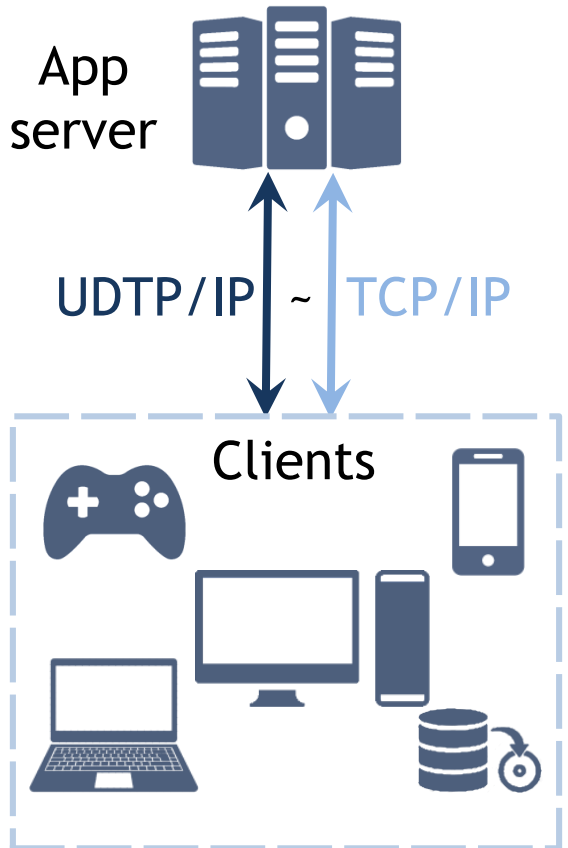


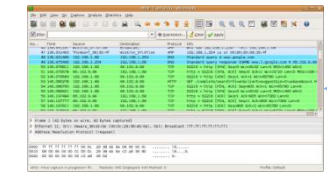
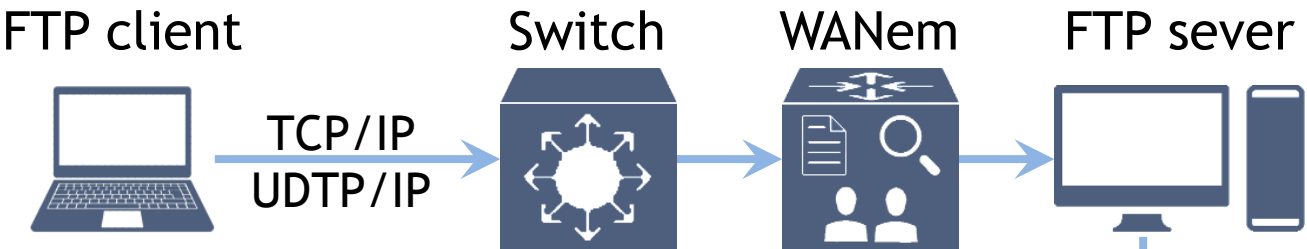
IPx17

Test result

Test objectives



In-house testbed

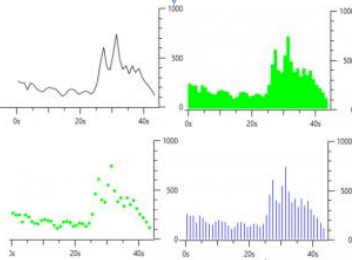


Traffic analysis



Traffic analyzer

*.log



Post processing

Tests:

- 1000 files by 10KB
- 100 files by 1MB
- 10 files by 100MB
- 1 file of 10GB
- RTT (ms):
1, 25, 50, 75, 100,
150, 200, 250
- Packet loss (%):
0.001, 0.01, 0.1, 1

In-house test desktop



WANem, The Wide Area Network Emulator - Chromium

WANem, The Wide Area Network Emulator

TATA CONSULTANCY SERVICES
Performance Engineering Research Centre

WANem commands successfully created
WANem is running Stop WANem

Interface: eth0		Packet Limit 150000 (Default=1000)		Symmetrical Networks: Yes					
Bandwidth	Choose BW	CCDL FDDI, Fast Ethernet - 100 Mbps		Other: Specify BW(Kbps) 102400					
Delay		Loss		Duplication					
Delay time(ms)	50	Loss(%)	0.025	Duplication(%)	0				
Jitter(ms)	20	Correlation(%)	10	Correlation(%)	0				
Correlation(%)	0			Correlation(%)	0				
Distribution		-N/A-		Gap(packet)		0			
Idle timer Disconnect		Type	none	Idle Timer		Disconnect Timer			
Random Disconnect		Type	none	MTTF Low	MTTF High	MTR Low	MTR High		
Random connection Disconnect		Type	none	MTTF Low	MTTF High	MTR Low	MTR High		
IP source address	any	IP source subnet		IP dest address	any	IP dest subnet		Application port if any	any

Tráfico через eth0 - KNemo

```
iperf Done.
root@serg-client2:~/proto.0.2.4# /usr/bin/iperf3 -c 192.168.1.84 -n 72903K
Connecting to host 192.168.1.84, port 5201
[ 4 ] local 192.168.1.85 port 46598 connected to 192.168.1.84 port 5201
[ ID ] Interval      Transfer      Bandwidth      Retir Cmd
[ 4 ] 0.00-1.00 sec   382 KBytes    3.13 Mbits/sec   0    58.0 KBytes
[ 4 ] 1.00-2.00 sec   615 KBytes    5.04 Mbits/sec   0    84.8 KBytes
[ 4 ] 2.00-3.00 sec   861 KBytes    7.05 Mbits/sec   0    126 KBytes
[ 4 ] 3.00-4.00 sec   1.25 MBytes   10.5 Mbits/sec   0    182 KBytes
[ 4 ] 4.00-5.00 sec   1.65 MBytes   13.8 Mbits/sec   0    263 KBytes
[ 4 ] 5.00-6.00 sec   2.35 MBytes   19.8 Mbits/sec   0    376 KBytes
[ 4 ] 6.00-7.00 sec   3.65 MBytes   30.7 Mbits/sec   0    543 KBytes
[ 4 ] 7.00-8.00 sec   4.63 MBytes   38.9 Mbits/sec   0    771 KBytes
[ 4 ] 8.00-9.00 sec   5.91 MBytes   49.6 Mbits/sec   0    1.02 MBytes
[ 4 ] 9.00-10.00 sec  6.42 MBytes   53.9 Mbits/sec   0    1.02 MBytes
[ 4 ] 10.00-11.00 sec  6.38 MBytes   53.5 Mbits/sec   0    1.02 MBytes
[ 4 ] 11.00-12.00 sec  6.41 MBytes   53.8 Mbits/sec   0    1.02 MBytes
[ 4 ] 12.00-13.00 sec  6.39 MBytes   53.6 Mbits/sec   0    1.02 MBytes
[ 4 ] 13.00-14.00 sec  6.48 MBytes   54.3 Mbits/sec   0    1.02 MBytes
[ 4 ] 14.00-15.00 sec  6.43 MBytes   54.0 Mbits/sec   0    1.02 MBytes
[ 4 ] 15.00-16.00 sec  6.58 MBytes   54.5 Mbits/sec   0    1.02 MBytes
[ 4 ] 16.00-16.74 sec  5.06 MBytes   57.5 Mbits/sec   0    1.02 MBytes
[ ID ] Interval      Transfer      Bandwidth      Retr
[ 4 ] 0.00-16.74 sec  71.3 MBytes  35.7 Mbits/sec
[ 4 ] 0.00-16.74 sec  70.9 MBytes  35.5 Mbits/sec

iperf Done.
root@serg-client2:~/proto.0.2.4#
```

```
root@serg-client2:~/proto.0.2.4# /usr/bin/iperf3 -c 192.168.1.84 -n 72903K
Connecting to host 192.168.1.84, port 5201
[ ID ] Interval      Transfer      Bandwidth      Retr
[ 4 ] 0.00-1.00 sec   382 KBytes    3.13 Mbits/sec   0    58.0 KBytes
[ 4 ] 1.00-2.00 sec   615 KBytes    5.04 Mbits/sec   0    84.8 KBytes
[ 4 ] 2.00-3.00 sec   861 KBytes    7.05 Mbits/sec   0    126 KBytes
[ 4 ] 3.00-4.00 sec   1.25 MBytes   10.5 Mbits/sec   0    182 KBytes
[ 4 ] 4.00-5.00 sec   1.65 MBytes   13.8 Mbits/sec   0    263 KBytes
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[ 4 ] 16.00-16.74 sec  5.06 MBytes   57.5 Mbits/sec   0    1.02 MBytes
[ ID ] Interval      Transfer      Bandwidth      Retr
[ 4 ] 0.00-16.74 sec  71.3 MBytes  35.7 Mbits/sec
[ 4 ] 0.00-16.74 sec  70.9 MBytes  35.5 Mbits/sec

iperf Done.
root@serg-client2:~/proto.0.2.4#
```

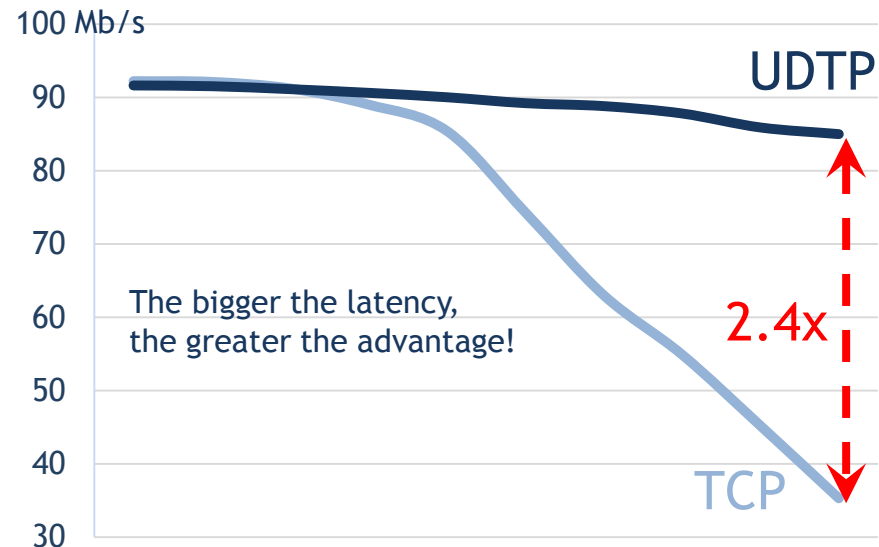
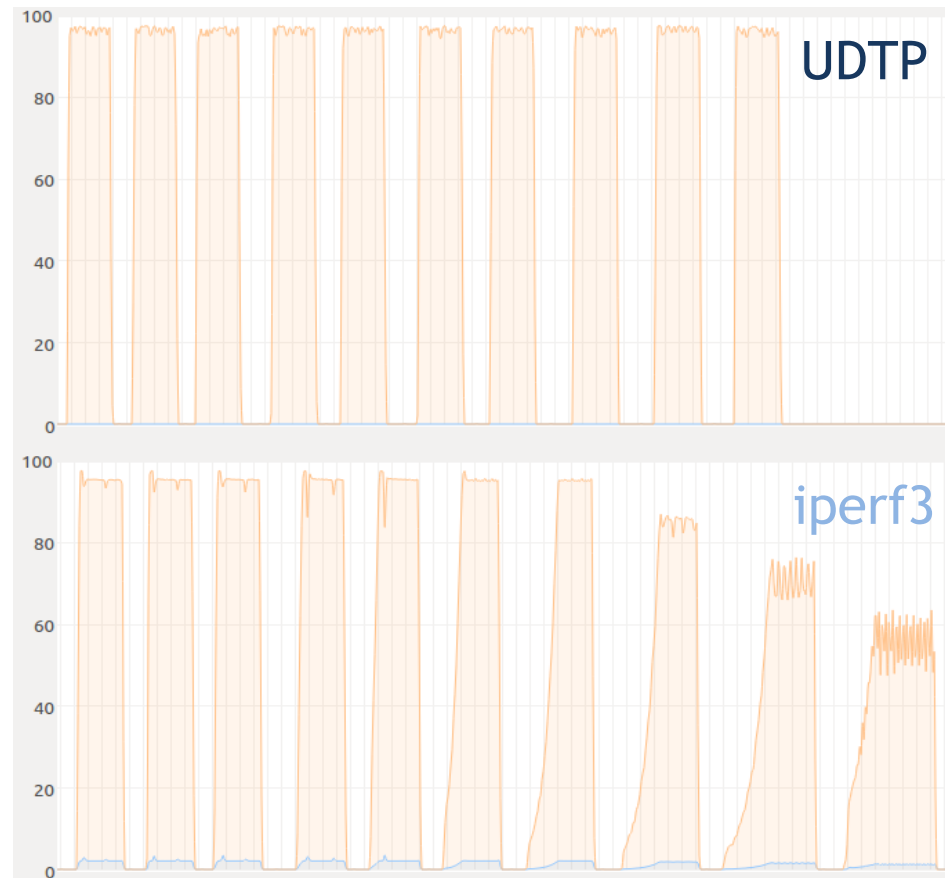
```
root@serg-client2:~/proto.0.2.4# /usr/bin/iperf3 -c 192.168.1.84 -n 72903K
Connecting to host 192.168.1.84, port 5201
[ ID ] Interval      Transfer      Bandwidth      Retr
[ 4 ] 0.00-1.00 sec   382 KBytes    3.13 Mbits/sec   0    58.0 KBytes
[ 4 ] 1.00-2.00 sec   615 KBytes    5.04 Mbits/sec   0    84.8 KBytes
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[ ID ] Interval      Transfer      Bandwidth      Retr
[ 4 ] 0.00-16.74 sec  71.3 MBytes  35.7 Mbits/sec
[ 4 ] 0.00-16.74 sec  70.9 MBytes  35.5 Mbits/sec

iperf Done.
root@serg-client2:~/proto.0.2.4#
```

In-house specification

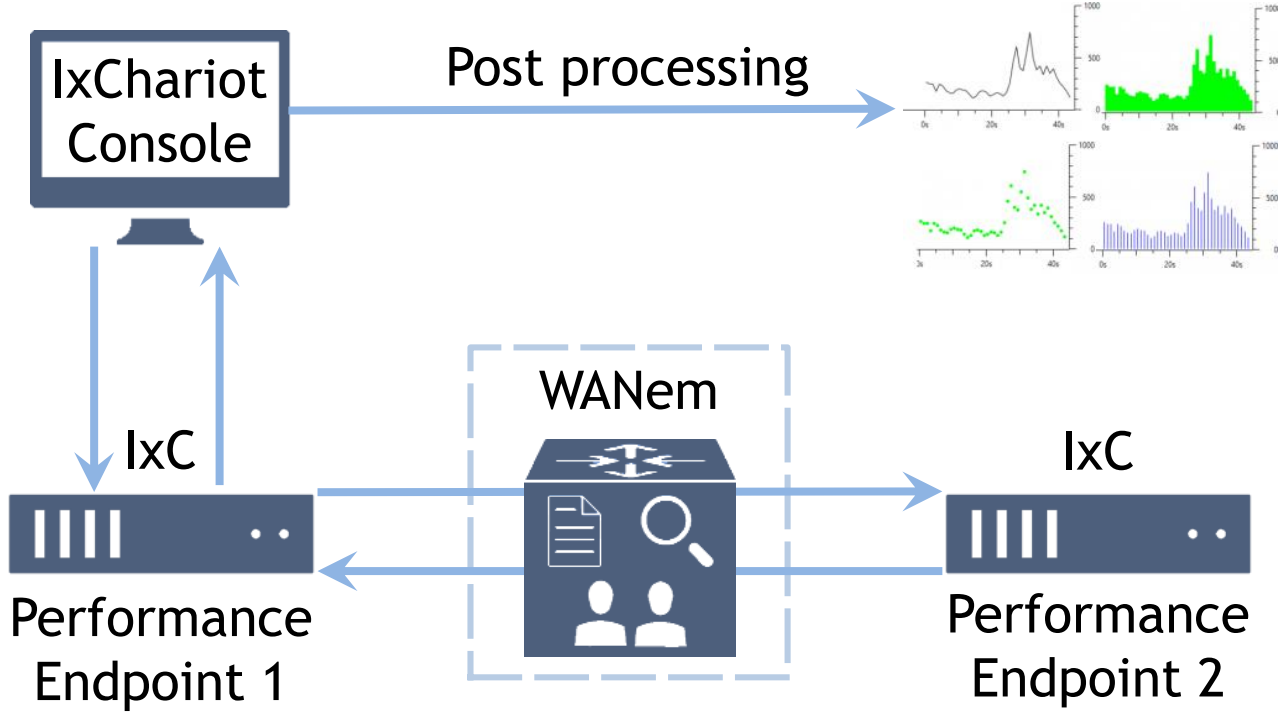
- UDTP: 0.2.4
- TCP: /iperf3 -c xxx.xxx.xxx.xxx -n 71M
- Ubuntu 14.04 LTS
- Cisco 2950 switch
- Latency (ms): 50
- RTT (ms): 100
- Jitter (ms): 20
- Packet loss (%): 0.01

Tests with 0.01% loss



Latency	1 ms	3	6	11	15	20	27	33	40	50
RTT, ms	2	6	12	22	30	40	54	66	80	100
Jitter, ms	0	1	2	3	5	8	10	12	15	20
UDTP	91.6	91.5	91.1	90.6	90.0	89.2	88.8	87.8	85.9	85.0
TCP	92.2	92.1	91.2	89.0	85.4	74.3	63.0	54.9	45.2	35.3
x	1.0	1.0	1.0	1.0	1.1	1.2	1.4	1.6	1.9	2.4

External testbed



Tests:

- 1000 files by 10KB
- 100 files by 1MB
- 10 files by 100MB
- 1 file of 10GB
- RTT (ms):
1, 25, 50, 75, 100,
150, 200, 250,
500, 1000
- Packet loss (%):
0.001, 0.01, 0.1, 1

External test is pending...



Vasily Prosin

CEO

@ Vasily.Prosin@IPv17.com

📱 +7(926)232-2655

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We transmit data 17x faster!