

## How to measure the Ethernet network throughput

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Some DIL/NetPC applications require the knowledge of a given Ethernet LAN throughput. For throughput measurement the DIL/NetPC ADNP/1520 Starter Kit CD-ROM (versions from 2005 or newer) comes with the NETIO benchmark tool from Kai Uwe Rommel. The CD-ROM directory */Netio* contain one pre-build NETIO executable (*netio-linux-x86*) for the ADNP/1520 Linux O/S and for Linux-based PCs.

The Ethernet LAN throughput benchmark requires two instances of NETIO. One instance has to run on one machine as a server process, the second NETIO instance runs as client on another machine and is used to perform the benchmark. When executed without arguments, the program will explain its usage.

- **1. Step:** Run one instance of NETIO (*netio-linux-x86*) on your PC in server mode (*-s* argument). Then run an instance of NETIO in client mode on your ADNP/1520 (*netio-linux-x86*). The following measurement sample data shows the throughput from the ADNP/1520 to the PC.

```
# cat /proc/version
Linux version 2.4.20 (mha@mha) SSV20030328 (gcc version 2.95.4 ...)
# ./netio-linux-x86 192.168.0.1
NETIO - Network Throughput Benchmark, Version 1.14
(c) 1997-2001 Kai Uwe Rommel
TCP/IP connection established.
Packet size 1 KByte: 1390 KByte/s (14221312 Byte in 10.00 s)
Packet size 2 KByte: 1576 KByte/s (16156672 Byte in 10.00 s)
Packet size 4 KByte: 1600 KByte/s (16388096 Byte in 10.00 s)
Packet size 8 KByte: 1601 KByte/s (16392192 Byte in 10.00 s)
Packet size 16 KByte: 1628 KByte/s (16678912 Byte in 10.00 s)
Packet size 32 KByte: 1663 KByte/s (17038840 Byte in 10.00 s)
```

- **2. Step:** Run one instance of NETIO (*netio-linux-x86*) on your ADNP/1520 in server mode (*-s* argument). Then run an instance of NETIO in client mode on your Linux-based PC (*netio-linux-x86*). The following measurement sample data shows the throughput from the PC to the ADNP/1520.

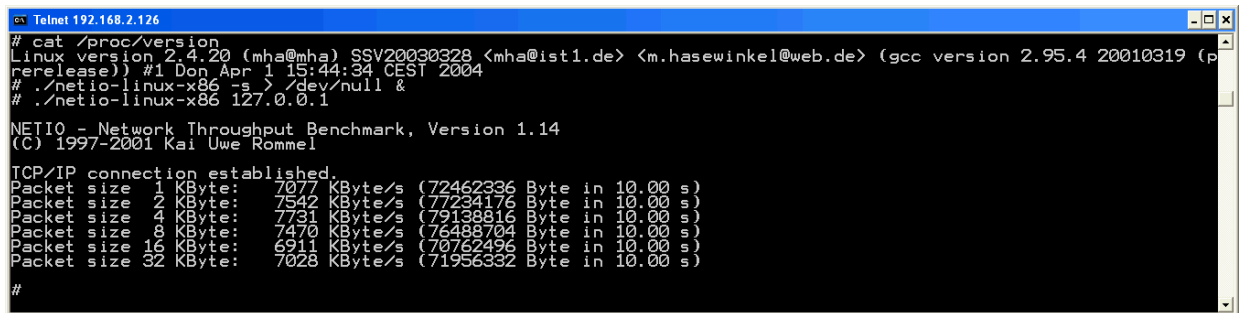
```
# cat /proc/version
Linux version 2.2.14 (mha@mha) (gcc version 2.95.2 19991024)
Thu Feb 15 13:33:45 CET 2001
# ./netio-linux-x86 192.168.0.126
NETIO - Network Throughput Benchmark, Version 1.14
(c) 1997-2001 Kai Uwe Rommel
TCP/IP connection established.
Packet size 1 KByte: 1584 KByte/s (16218112 Byte in 10.00 s)
Packet size 2 KByte: 1644 KByte/s (16830464 Byte in 10.00 s)
Packet size 4 KByte: 1640 KByte/s (16793600 Byte in 10.00 s)
Packet size 8 KByte: 1553 KByte/s (15900672 Byte in 10.00 s)
Packet size 16 KByte: 1638 KByte/s (16777216 Byte in 10.00 s)
Packet size 32 KByte: 1546 KByte/s (15826461 Byte in 10.00 s)
```

- **3. Step:** Run two instance of NETIO (*netio-linux-x86*) on your DIL/NetPC ADNP/1520 and

measure the *localhost* (IP address 127.0.0.1) throughput. The following output shows a sample.

```
# cat /proc/version
Linux version 2.4.20 (mha@mha) SSV20030328 (gcc version 2.95.4 ...
# ./netio-linux-x86 -s > /dev/null &
# ./netio-linux-x86 127.0.0.1
```

```
NETIO - Network Throughput Benchmark, Version 1.14
(c) 1997-2001 Kai Uwe Rommel
TCP/IP connection established.
Packet size 1 KByte: 7077 KByte/s (72462336 Byte in 10.00 s)
Packet size 2 KByte: 7542 KByte/s (77234176 Byte in 10.00 s)
Packet size 4 KByte: 7731 KByte/s (79138816 Byte in 10.00 s)
Packet size 8 KByte: 7470 KByte/s (76488704 Byte in 10.00 s)
Packet size 16 KByte: 6911 KByte/s (70762496 Byte in 10.01 s)
Packet size 32 KByte: 7028 KByte/s (71956332 Byte in 10.01 s)
```



```
Telnet 192.168.2.126
# cat /proc/version
Linux version 2.4.20 (mha@mha) SSV20030328 (mha@ist1.de) (gcc version 2.95.4 20010319 (p
rerelease)) #1 Don Apr 1 15:44:34 CEST 2004
# ./netio-linux-x86 -s > /dev/null &
# ./netio-linux-x86 127.0.0.1

NETIO - Network Throughput Benchmark, Version 1.14
(C) 1997-2001 Kai Uwe Rommel
TCP/IP connection established.
Packet size 1 KByte: 7077 KByte/s (72462336 Byte in 10.00 s)
Packet size 2 KByte: 7542 KByte/s (77234176 Byte in 10.00 s)
Packet size 4 KByte: 7731 KByte/s (79138816 Byte in 10.00 s)
Packet size 8 KByte: 7470 KByte/s (76488704 Byte in 10.00 s)
Packet size 16 KByte: 6911 KByte/s (70762496 Byte in 10.00 s)
Packet size 32 KByte: 7028 KByte/s (71956332 Byte in 10.00 s)
#
```

**Please note:** NETIO version 1.14 – which is used within this paper – is supporting only TCP-based throughput benchmarks. Other versions allow also UDP-based measurement and the usage of Windows-based PCs as server or client. Watch the Web for newer versions of NETIO. Make sure, that server and client run the same version of NETIO.

That's all.