

## 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 DNP/9200 Starter Kit CD-ROM comes with the NETIO benchmark tool from Kai Uwe Rommel. The CD-ROM directory */Netio* contain pre-build NETIO executables for the DNP/9200 Linux O/S (*netio-linux-arm.dat*) and for Linux-based PCs (*netio-linux-x86*).

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 DNP/9200 (*netio-linux-arm.dat*). The following measurement sample data shows the throughput from the DNP/9200 to the PC.

```
# cat /proc/version
Linux version 2.4.27-vrsl-ssv1 (mha@ist1.de)
(gcc version 2.95.2 19991024 (release)) #1 Do Aug 18 18:00:40
# ./netio-linux-arm.dat 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: 8876 KByte/s (90951680 Byte in 10.00 s)
Packet size 2 KByte: 8654 KByte/s (88672256 Byte in 10.00 s)
Packet size 4 KByte: 8665 KByte/s (88784896 Byte in 10.00 s)
Packet size 8 KByte: 8632 KByte/s (88449024 Byte in 10.00 s)
Packet size 16 KByte: 8734 KByte/s (89489408 Byte in 10.00 s)
Packet size 32 KByte: 8803 KByte/s (90207551 Byte in 10.00 s)
```

- **2. Step:** Run one instance of NETIO (*netio-linux-arm.dat*) on your DNP/9200 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 DNP/9200.

```
# 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: 9995 KByte/s (102295552 Byte in 10.00 s)
Packet size 2 KByte: 11383 KByte/s (116549632 Byte in 10.00 s)
Packet size 4 KByte: 11429 KByte/s (117018624 Byte in 10.00 s)
Packet size 8 KByte: 11421 KByte/s (116940800 Byte in 10.00 s)
Packet size 16 KByte: 11462 KByte/s (117358592 Byte in 10.00 s)
Packet size 32 KByte: 11476 KByte/s (117502462 Byte in 10.00 s)
```

- **3. Step:** Run two instance of NETIO (*netio-linux-arm.dat*) on your DNP/9200 and measure the *localhost* (IP address 127.0.0.1) throughput. The following output shows a sample.

```
# cat /proc/version
Linux version 2.4.27-vrs1-ssv1 (mha@ist1.de)
(gcc version 2.95.2 19991024 (release)) #1 Do Aug 18 18:00:40
# ./netio-linux-arm.dat -s > /dev/null &
# ./netio-linux-arm.dat 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: 16865 KByte/s (172811264 Byte in 10.00 s)
Packet size 2 KByte: 19041 KByte/s (195131392 Byte in 10.00 s)
Packet size 4 KByte: 18048 KByte/s (184934400 Byte in 10.00 s)
Packet size 8 KByte: 19921 KByte/s (204169216 Byte in 10.00 s)
Packet size 16 KByte: 16512 KByte/s (169213952 Byte in 10.00 s)
Packet size 32 KByte: 16962 KByte/s (173828935 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.