

How to measure the Ethernet network throughput

Some DIL/NetPC applications require the knowledge of a given Ethernet LAN throughput. For throughput measurement the DIL/NetPC DNP/5280 Starter Kit CD-ROM Version 1.7 (or newer) comes with the NETIO benchmark tool from Kai Uwe Rommel. The CD-ROM directory */Netio* contain pre-build NETIO executables for the DNP/5280 uClinux O/S (*netio-linux-m68k*) 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/5280 (*netio-linux-m68k*). The following measurement sample data shows the throughput from the DNP/5280 to the PC.

```
# cat /proc/version
Linux version 2.4.22-uc0 (mha@mha) (gcc version 2.95.3 20010315
(release) (ColdFire patches - 20010318 from
http://fiddes.net/coldfire/) (uClinux XIP and shared lib patches from
http://www.snapgear.com/)) #1 Don Jun 10 15:44:06 CEST 2004
# ./netio-linux-m68k 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: 971 KByte/s (9958400 Byte in 10.02 s)
Packet size 2 KByte: 1038 KByte/s (10659840 Byte in 10.03 s)
Packet size 4 KByte: 1075 KByte/s (11034624 Byte in 10.02 s)
Packet size 8 KByte: 1094 KByte/s (11223040 Byte in 10.02 s)
Packet size 16 KByte: 1103 KByte/s (11321344 Byte in 10.02 s)
Packet size 32 KByte: 1053 KByte/s (10813110 Byte in 10.03 s)
```

- **2. Step:** Run one instance of NETIO (*netio-linux-m68k*) on your DNP/5280 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/5280.

```
# 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: 1941 KByte/s (19868672 Byte in 9.99 s)
Packet size 2 KByte: 2005 KByte/s (20527104 Byte in 10.00 s)
Packet size 4 KByte: 2000 KByte/s (20475904 Byte in 10.00 s)
Packet size 8 KByte: 1995 KByte/s (20430848 Byte in 10.00 s)
Packet size 16 KByte: 1995 KByte/s (20430848 Byte in 10.00 s)
Packet size 32 KByte: 2000 KByte/s (20479375 Byte in 10.00 s)
```

- **3. Step:** Run two instance of NETIO (*netio-linux-m68k*) on your DNP/5280 and measure the */localhost* (IP address 127.0.0.1) throughput. The following output shows a sample.

```
# cat /proc/version
Linux version 2.4.22-uc0 (mha@mha) (gcc version 2.95.3 20010315
(release) (ColdFire patches - 20010318 from
http://fiddes.net/coldfire/) (uClinux XIP and shared lib patches from
http://www.snapgear.com/)) #1 Don Jun 10 15:44:06 CEST 2004
# ./netio-linux-m68k -s > /dev/null &
# ./netio-linux-m68k 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: 2269 KByte/s (23241728 Byte in 10.00 s)
Packet size 2 KByte: 2628 KByte/s (26923008 Byte in 10.00 s)
Packet size 4 KByte: 2833 KByte/s (29020160 Byte in 10.00 s)
Packet size 8 KByte: 2965 KByte/s (30375936 Byte in 10.00 s)
Packet size 16 KByte: 3118 KByte/s (31948800 Byte in 10.01 s)
Packet size 32 KByte: 2776 KByte/s (28441756 Byte in 10.01 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.