

8 things network engineers do with Snabb

From quick & dirty to production

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Snabb: User- space network functions

Open source network functions,
bypassing Linux kernel

Target 5-50 Gbps/core depending on
workload

```
$ git clone \
    https://github.com/snabbco/snabb
$ cd snabb
$ make
$ ./src/snabb
```

How are people using it?

1:
Simple,
scalable
load
generation

```
$ snabb \  
    packetblaster replay foo.pcap 82:00.1
```

Fills NIC TX descriptors with packets,
makes NIC transmit them in a loop: no
CPU/PCIe usage



Luke Gorrie

@lukego

Following



Just a fun screenshot: Generating 200Gbps of 64-byte packets with two CPU cores (one per numa) and 20x10G ports.

```

File Edit View Terminal Tabs Help
lugano-1:luke:~ x lugano-4:luke:~ x Untitled x

Transmissions (last 1 sec):
apps report:
07:00.0 GPTC (Good TX packets) 14,880,844 GPRC (Good RX packets) 14,880,848
03:00.0 GPTC (Good TX packets) 14,880,560 GPRC (Good RX packets) 14,880,560
09:00.1 GPTC (Good TX packets) 14,880,849 GPRC (Good RX packets) 14,880,849
09:00.0 GPTC (Good TX packets) 14,880,832 GPRC (Good RX packets) 14,880,831
05:00.1 GPTC (Good TX packets) 14,880,602 GPRC (Good RX packets) 14,880,603
05:00.0 GPTC (Good TX packets) 14,880,604 GPRC (Good RX packets) 14,880,604
03:00.1 GPTC (Good TX packets) 14,880,543 GPRC (Good RX packets) 14,880,531
01:00.0 GPTC (Good TX packets) 14,880,495 GPRC (Good RX packets) 14,880,496
07:00.1 GPTC (Good TX packets) 14,880,832 GPRC (Good RX packets) 14,880,833
01:00.1 GPTC (Good TX packets) 14,880,515 GPRC (Good RX packets) 14,880,513

-----

Transmissions (last 1 sec):
apps report:
88:00.0 GPTC (Good TX packets) 14,880,880 GPRC (Good RX packets) 14,880,869
84:00.0 GPTC (Good TX packets) 14,880,505 GPRC (Good RX packets) 14,880,505
8a:00.1 GPTC (Good TX packets) 14,880,500 GPRC (Good RX packets) 14,880,488
8a:00.0 GPTC (Good TX packets) 14,880,513 GPRC (Good RX packets) 14,880,500
86:00.1 GPTC (Good TX packets) 14,880,818 GPRC (Good RX packets) 14,880,817
86:00.0 GPTC (Good TX packets) 14,880,816 GPRC (Good RX packets) 14,880,811
84:00.1 GPTC (Good TX packets) 14,880,476 GPRC (Good RX packets) 14,880,468
82:00.0 GPTC (Good TX packets) 14,880,538 GPRC (Good RX packets) 14,880,538
88:00.1 GPTC (Good TX packets) 14,880,852 GPRC (Good RX packets) 14,880,852
82:00.1 GPTC (Good TX packets) 14,880,527 GPRC (Good RX packets) 14,880,525

-----

 1 [|||||||100.0%] 7 [ 0.0%] 13 [|||||||100.0%] 19 [ 0.0%]
 2 [ 0.0%] 8 [ 0.7%] 14 [ 0.0%] 20 [ 0.0%]
 3 [ 0.0%] 9 [ 0.0%] 15 [ 0.0%] 21 [ 0.0%]
 4 [ 0.0%] 10 [ 0.0%] 16 [ 0.0%] 22 [ 0.0%]
 5 [ 0.0%] 11 [ 0.0%] 17 [ 0.0%] 23 [ 0.0%]
 6 [ 0.7%] 12 [ 0.0%] 18 [ 0.0%] 24 [ 0.0%]
Mem[|||||||] 8.24G/31.4G Tasks: 32, 9 thr; 3 running
Swp[ ] 0K/0K Load average: 1.94 1.74 1.30
Uptime: 01:51:44

PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
9655 root 20 0 339M 12008 4060 R 100.0 0.0 1:23.50 ./snabb packetblaster synth -S
9703 root 20 0 339M 12100 3936 R 99.6 0.0 1:22.62 ./snabb packetblaster synth -S
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit

```

3:36 PM - 17 Apr 2016

2:
Find
no-
drop
rate
on a
network
function

```
$ snabb \  
  loadtest find-limit foo.pcap 82:00.1
```

Bisection between 0 and max bitrate of
NIC, determine point at which packets
drop

Can shell out to script to signal pass/
fail

3: Generate replayable test traffic

```
$ snabb \  
    packetblaster lwaftr --help # many opts
```

Ad-hoc workload-specific packet generation, save to pcap file. Like scapy

Can also generate workload-specific packets and send directly over the wire

4: Layer 2 VPN

```
$ snabb l2vpn l2vpn.conf
```

RFC 4664 layer 2 learning bridge over IPv6

Built by SWITCH network engineer Alexander Gall because what he needed wasn't on offer

In production linking academic sites in Switzerland

l2vpn branch, <https://github.com/alexandergall/snabb>

5: IPSec VPN

Vita: <https://github.com/inters/vita>

Secure VPN between sites, IPSec, 1-10 Gbps/core

Funded by NLnet Foundation

Author (Max Rottenkolber, @eugeneia_) is here!!

(interlude)

Reminder: it's all open source!

Use it for free, modify it freely

Need help? A number of consultancies
do Snabb work

6: Network monitoring

```
$ snabb ipfix probe 82:00.0 82:00.1
```

Unsampled IPFIX export

Modifiable: one user added multi-core scaling via custom RSS; fixes headed upstream

Configurable per-flow data collection (e.g. src/dst AS)

7: Border router tunnel endpoint

```
$ snabb lwaftr run lwaftr.conf
```

Lightweight 4-over-6 AFTR: processes all IPv4 traffic for a network

YANG-enabled, runtime reconfigurable

Multi-process: one instance can manage many NICs in a machine

See K. Zorbadelos (OTE) at RIPE76:
<https://ripe76.ripe.net/archives/video/30/>

8: L7 DPI and firewall

```
$ snabb wall spy pci 02:00.0
```

```
https://snabbwall.org/
```

Uses nDPI library

**N+1:
Your
use
case!**

`https://github.com/snabbco/snabb`

Really easy to prototype in Snabb
(written in Lua)

Want to learn more? See Open Source
track on Thursday, 16h-17h30

Happy hacking!