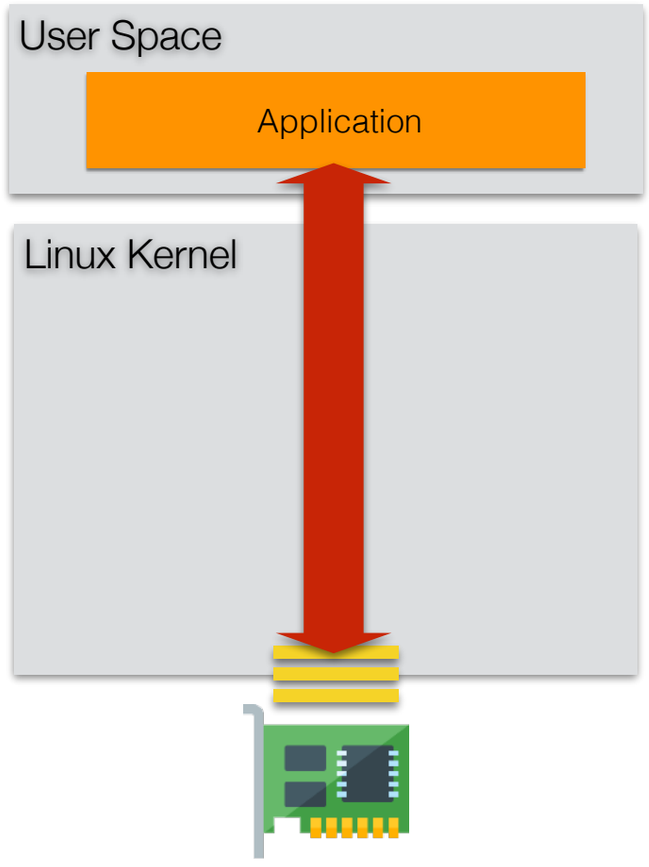
What's new in PF_RING, n2disk, nBox

Alfredo Cardigliano
cardigliano@ntop.org

PF_RING

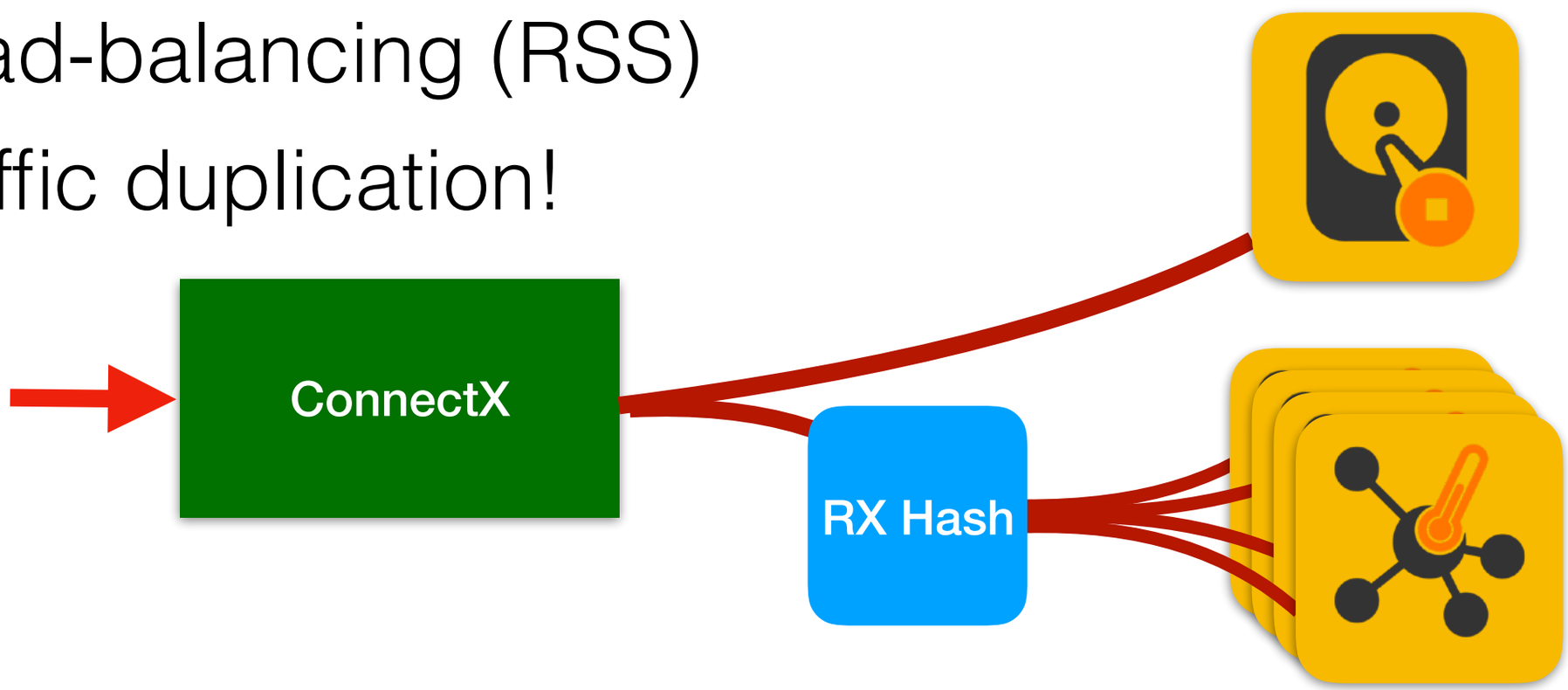
PF_RING

- As of today PF_RING provides:
  - (Limited) packet capture acceleration with any adapter using Linux kernel drivers
  - XDP (Linux eXpress Data Path) acceleration with Linux drivers supporting AF_XDP
  - Best (Zero-Copy Kernel-Bypass) acceleration with PF_RING ZC drivers up to 100 Gbps with:
    - Commodity adapters from Intel, Mellanox
    - FPGA adapters from Napatech, Silicom FPGA and other vendors



NVIDIA/Mellanox Adapters

- PF_RING ZC driver for ConnectX 4/5/6 NEW
- Performance up to 100 Gbps
- Hardware packet timestamps
- Hardware packet filtering
- Load-balancing (RSS)
- Traffic duplication!



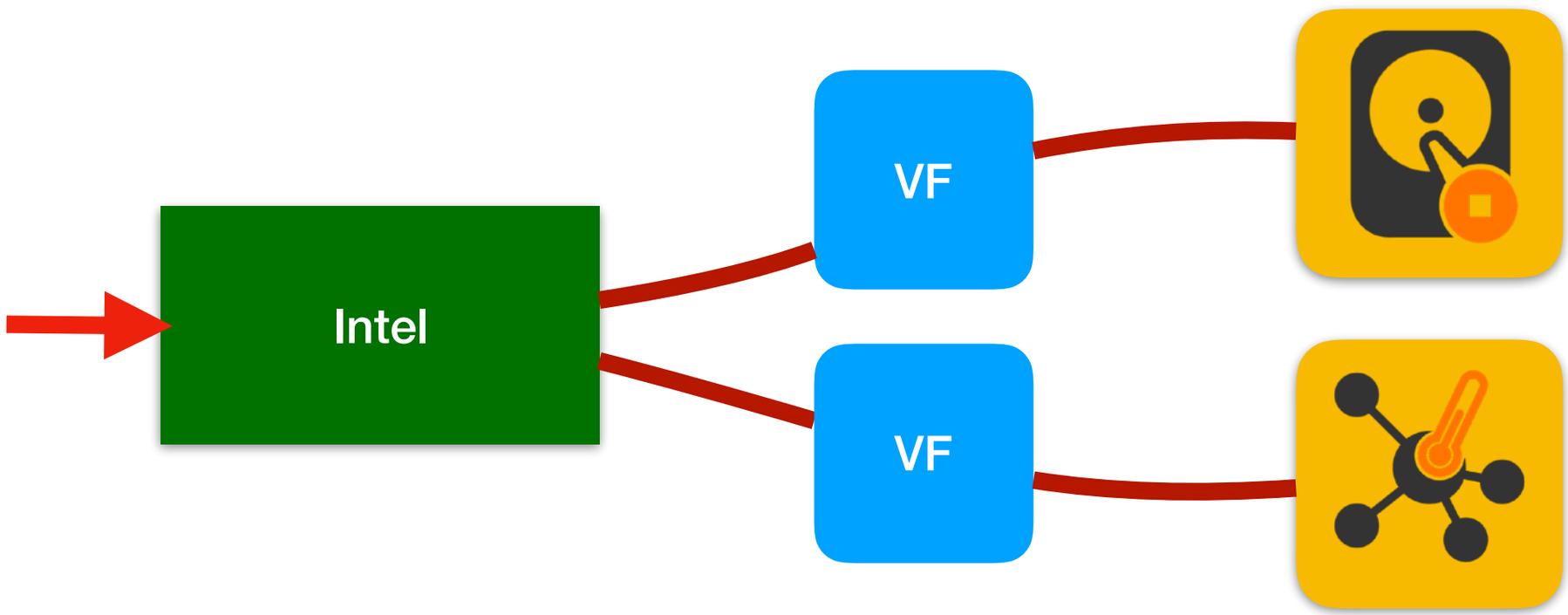
Intel Adapters

- Supported families:
  - **e1000e** (8254x/8256x/8257x/8258x)
  - **igb** (82575/82576/82580/I350)
  - **ixgbe** (82599/X520/X540/X550)
    - **ixgbevf** (ixgbe VF)
  - **i40e** (X710/XL710/XXV710)
    - **iavf** (i40e VF) 

  - **ice** (E810)
  - ~~**fm10k**~~ 

Intel with VFs

- SR-IOV Virtual Functions are virtualized instances of the physical interface (usually used by VMs)
- Traffic is steered to VFs based on MAC (and VLAN)
- i40e VFs (iavf) support **trust mode** which enables promiscuous capture (with **duplication**!)



n2disk

n2disk

- n2disk provides continuous recording: in most cases it's not possible to predict when a network event occurs, on-demand capture is not enough
- Data retention depends on traffic rate and storage size

Traffic rate	10 Gbps
Data on disk (sec)	1,2 GB/s
Data on disk (hour)	4 TB/h
Data on disk (day)	100 TB/day

Saving Space

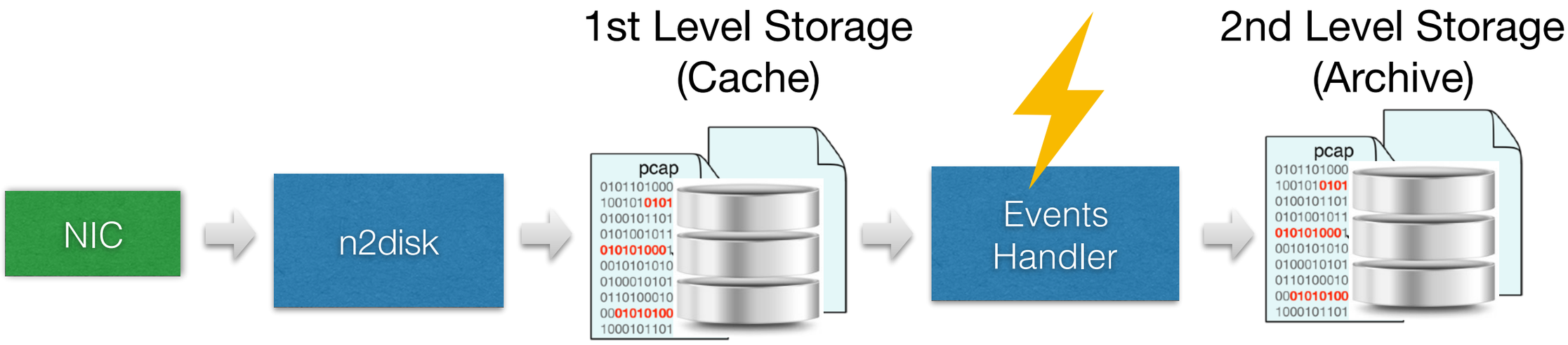
- Packet compression: save up to 5% on Internet traffic (more on LAN traffic)
- Packet slicing: good if interested in headers only
- BPF filtering: difficult to predict
- L7 filtering: good to discard or shunt unwanted traffic (e.g. encrypted, compressed, multimedia)

Not all traffic is alike

- What if our storage does not satisfy the desired data retention, even after filtering?
- Traffic matching Network events is more important then the rest of the traffic
- We want to:
  - Prioritize selected traffic (e.g. security alerts)
  - Delete the rest of the traffic first, when the disk is full

Smart Data Retention

- Process Network events generated by ntopng
- Use a 1st level storage to implement continuous recording with a short data retention (cache)
- Use a 2nd level storage to archive traffic for Network events with a longer data retention (archive)



nBox

nBox Appliance

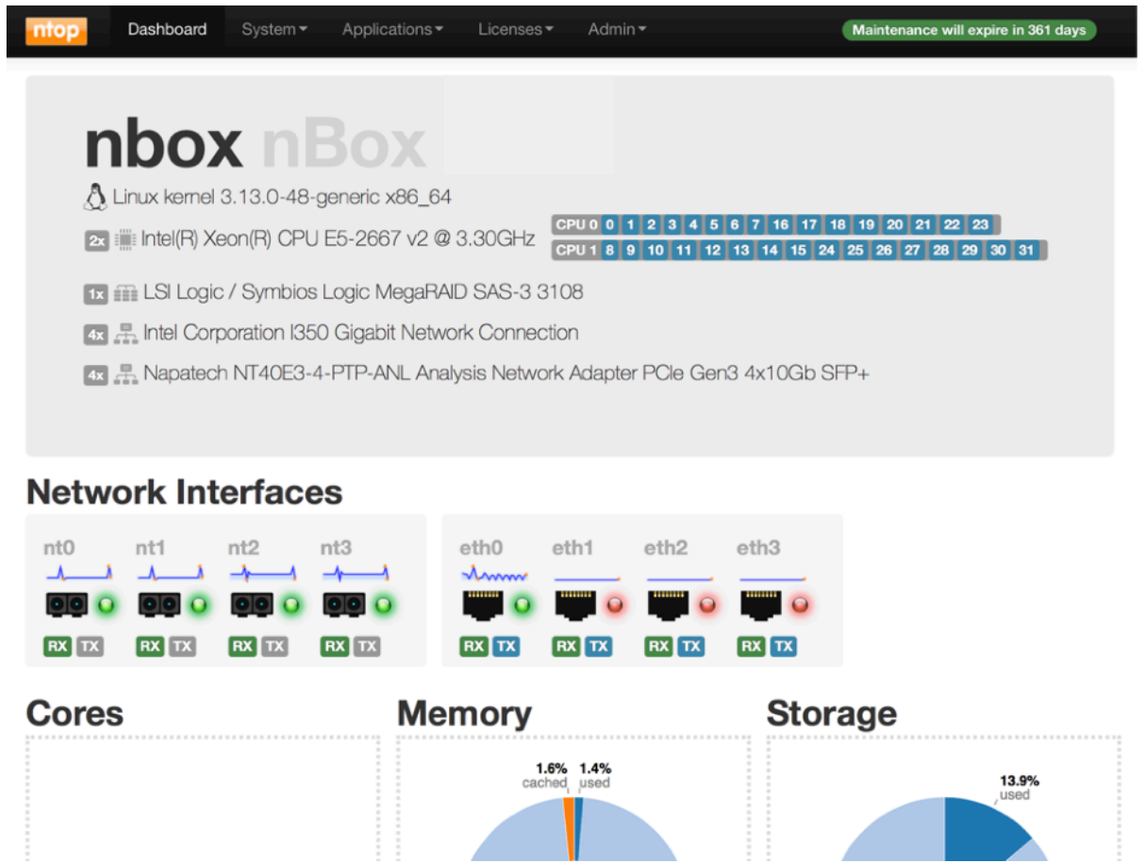
- A turnkey solution for those who don't want to bother with hardware selection, software installation and tuning

nBox NetFlow

nBox Recorder

nBox UI

- Supported on Ubuntu only
- UI based on old technologies (Perl CGI)



- It's time to rewrite it from scratch!

New nBox UI

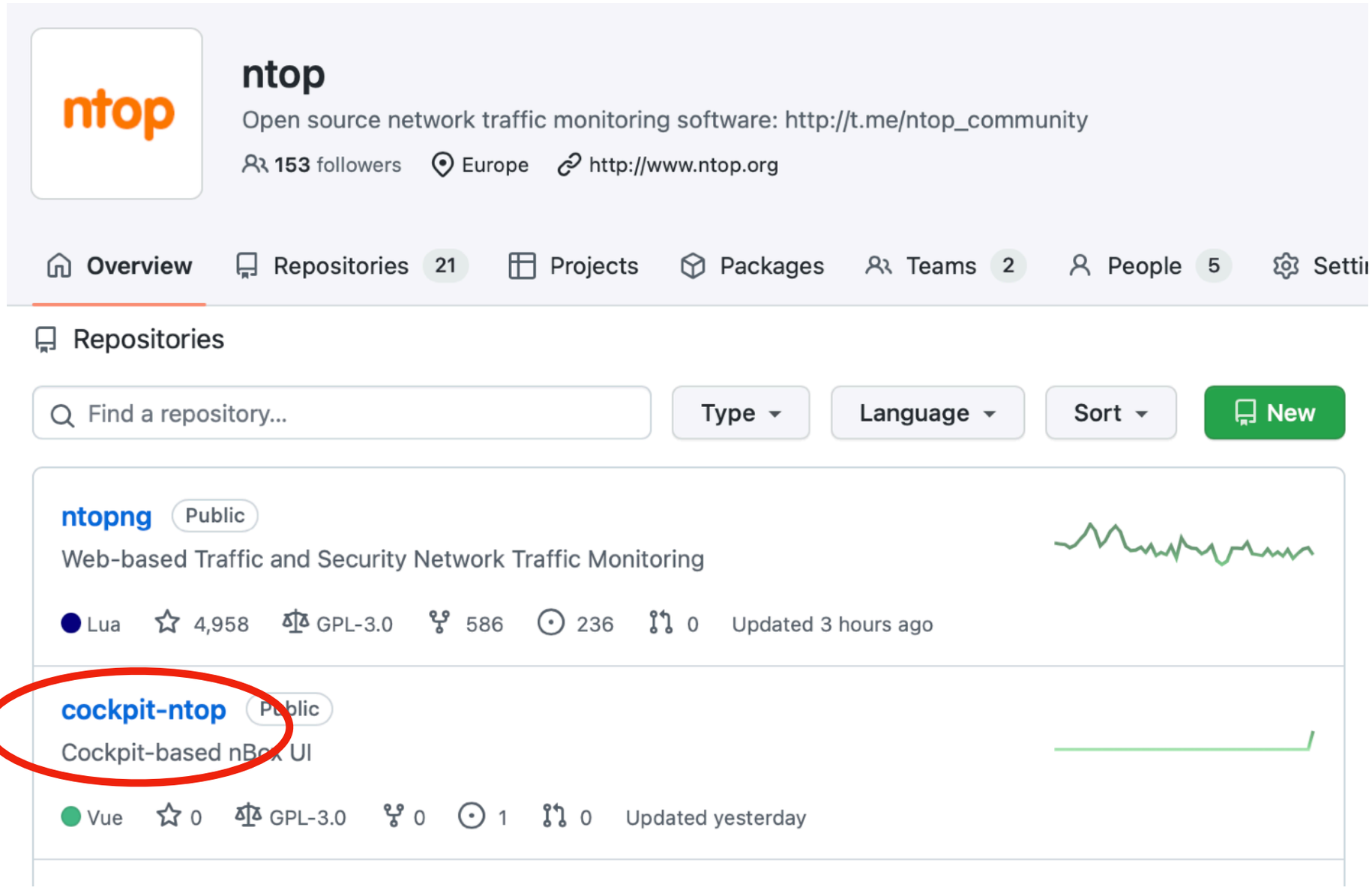
- Integrated in Cockpit, an open source web-based UI for servers sponsored by Red Hat
- Runs on most Linux distributions, including Ubuntu, Debian, CentOS
- Extensible by means of plugins (Javascript API)
- ntop plugins written in modern HTTP and Vue.js

New nBox UI

Live Preview!

Already on Github

- Contributions are welcome!



Thank you