

SPIN

Software and demo



The SPIN project at SIDN Labs

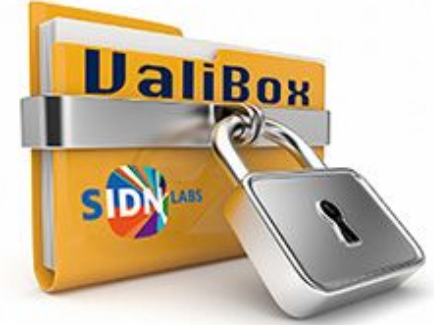
- Security and Privacy for In-home Networks
- Research and prototype of SPIN functionality:
 - Visualise network traffic
 - Signal problems based on traffic patterns
 - Perform measurements on (IoT) devices
- Goal: Protect the Internet by protecting the home

The SPIN project at SIDN Labs

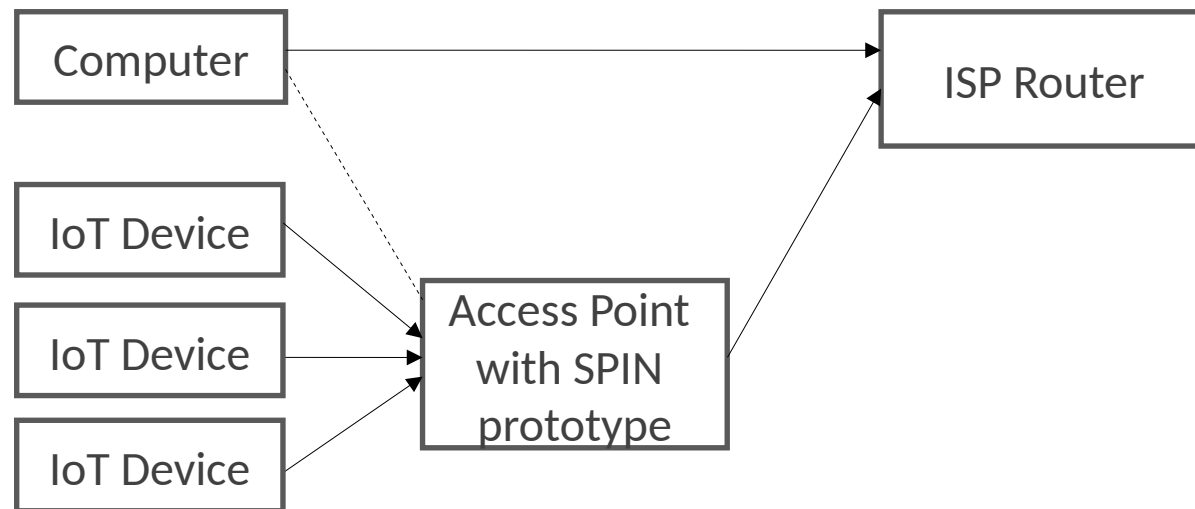
- Open source in-home router/AP software that
- Provides insight into device activity on the Internet
- Serves as platform for research and experimentation:
 - Who do my devices talk to?
 - What kind of traffic?
 - What happens if I block it?
 - Can we implement <WILD IDEA 462> and will things still work?

Prototype built on OpenWRT

- Currently bundled with Valibox:
- <http://valibox.sidnlabs.nl>
- Source at <https://github.com/SIDN/spin>
- Also runs on Debian and Raspberry Pi (with some hammering)

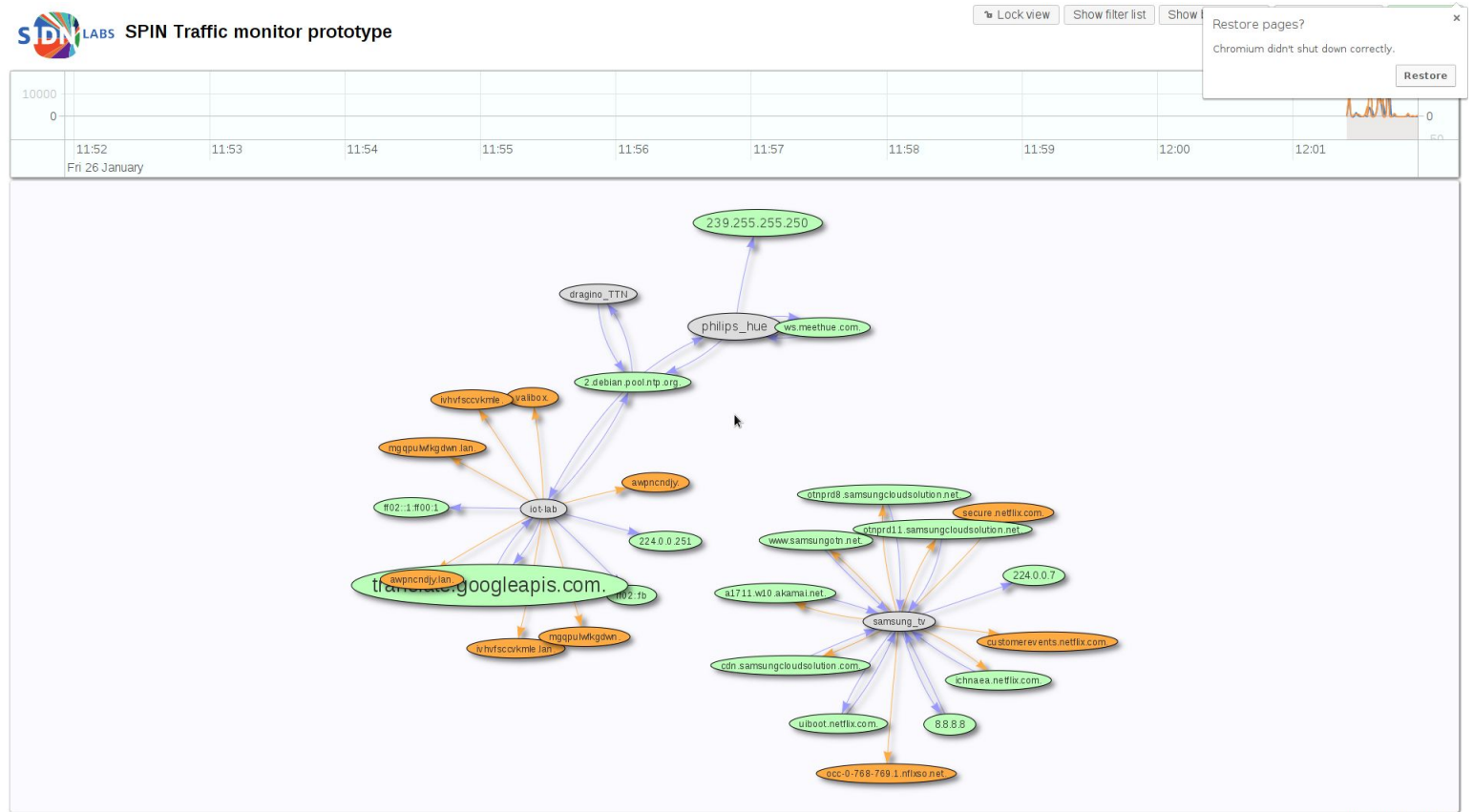


prototype 2, GL-Inet hardware



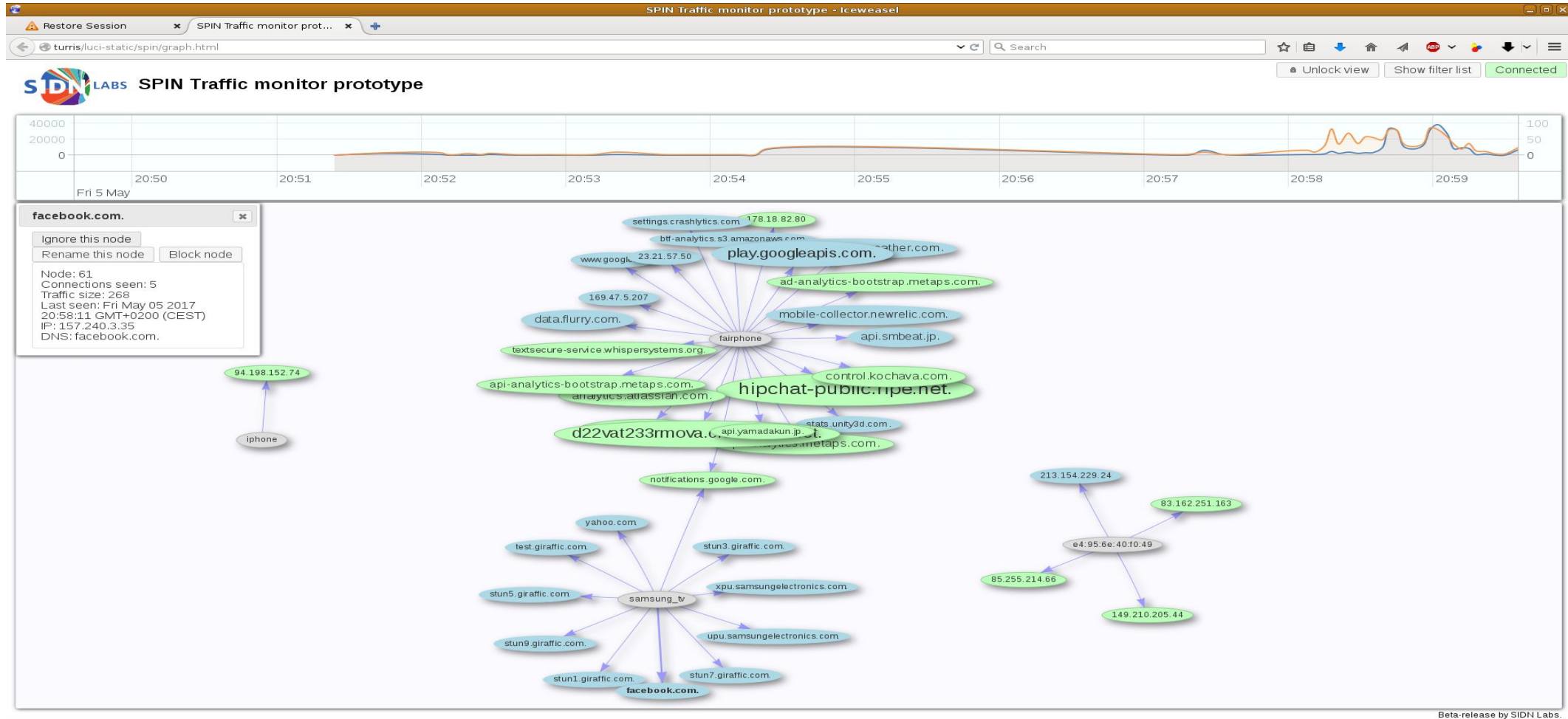
Running prototype: visualiser

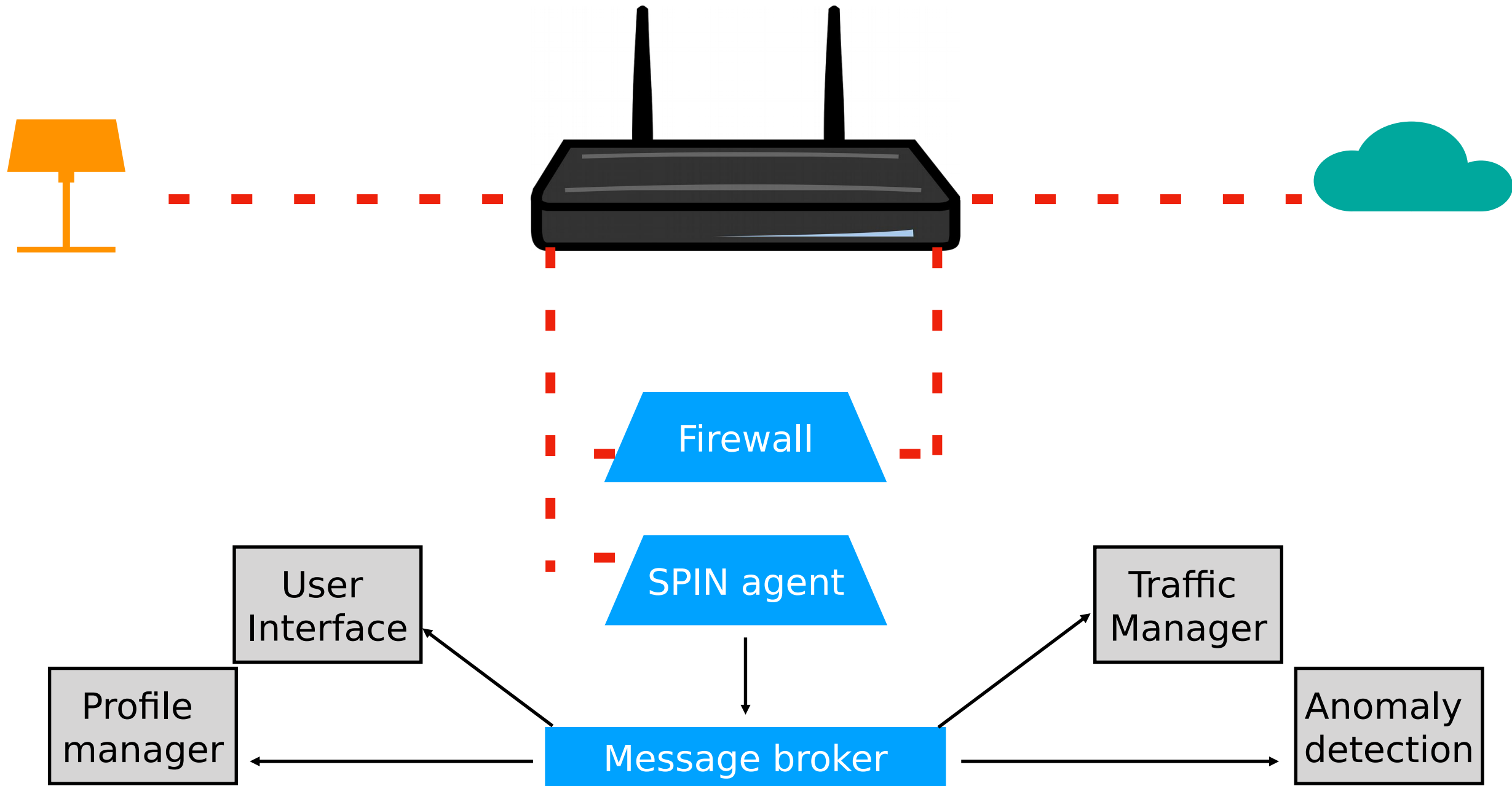
- Shows DNS queries
- Shows data traffic
- User can block traffic based on source or destination
- Download traffic from specific devices
- Research topics:
 - In-depth device traffic analysis
 - Time-series based analysis



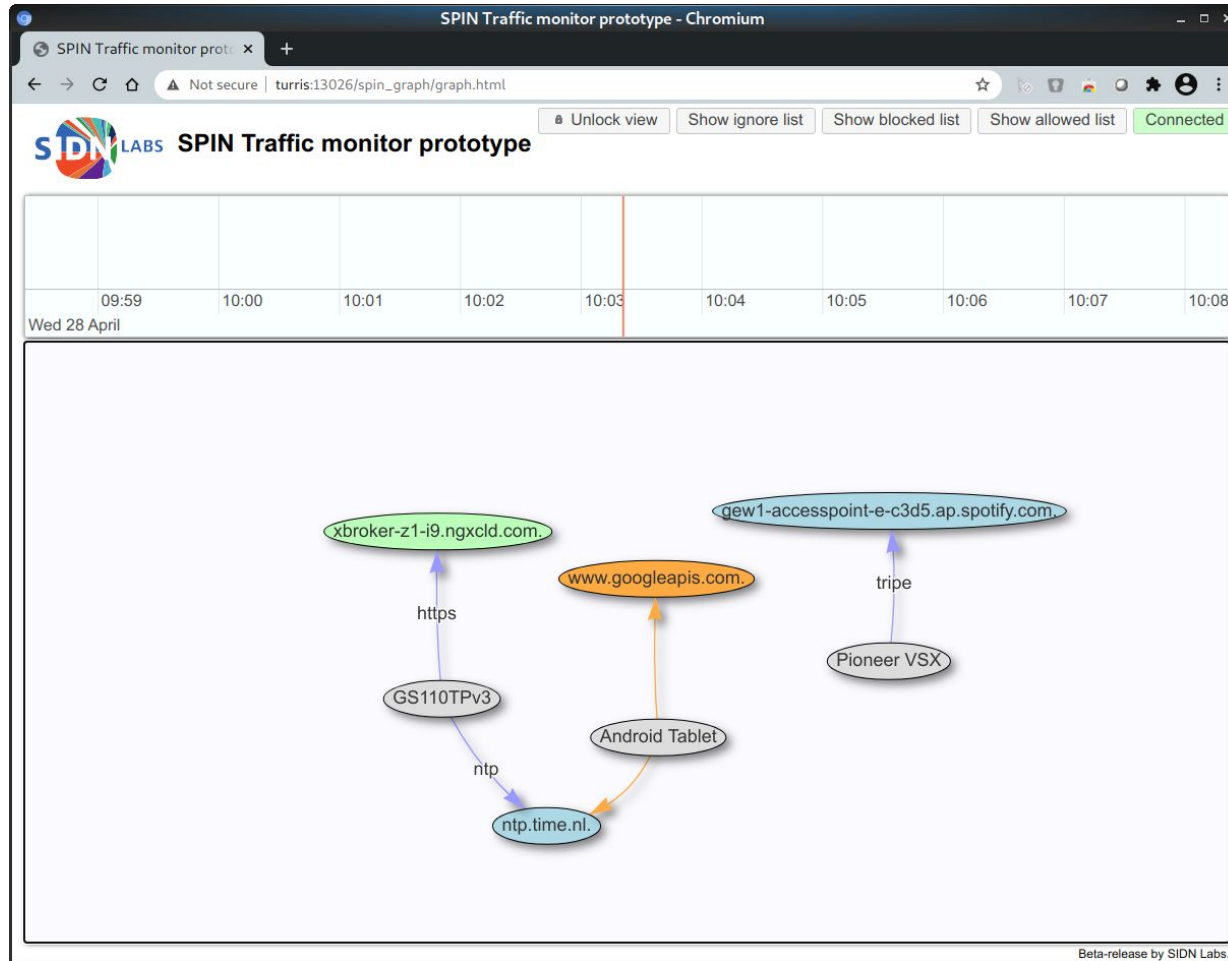
Beta-release by SDN Labs.

SPIN DNS traffic monitor for IoT users





The SPIN 'bubble app'



Legend:

Grey: local device

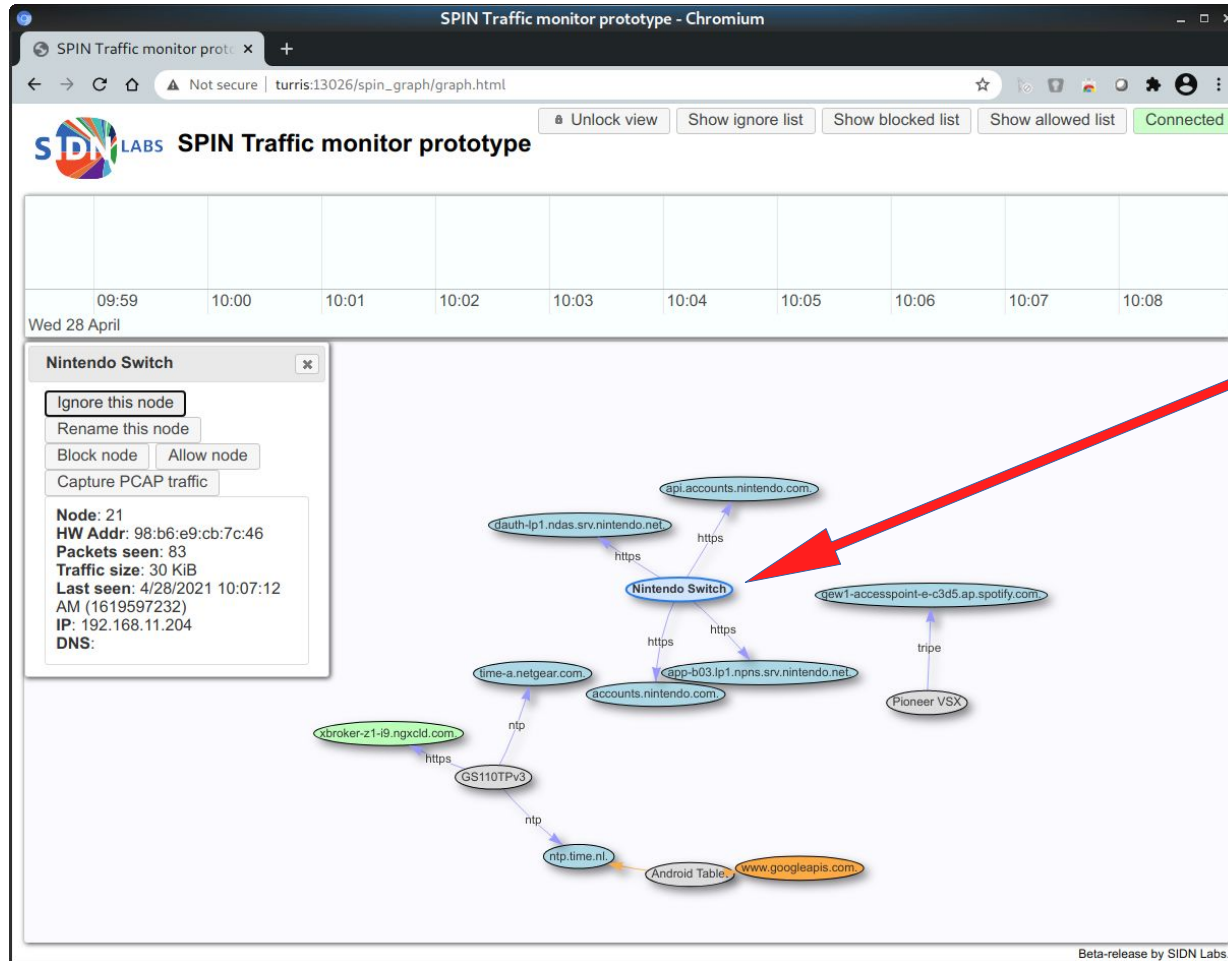
Green: very recent traffic

Blue: recent traffic

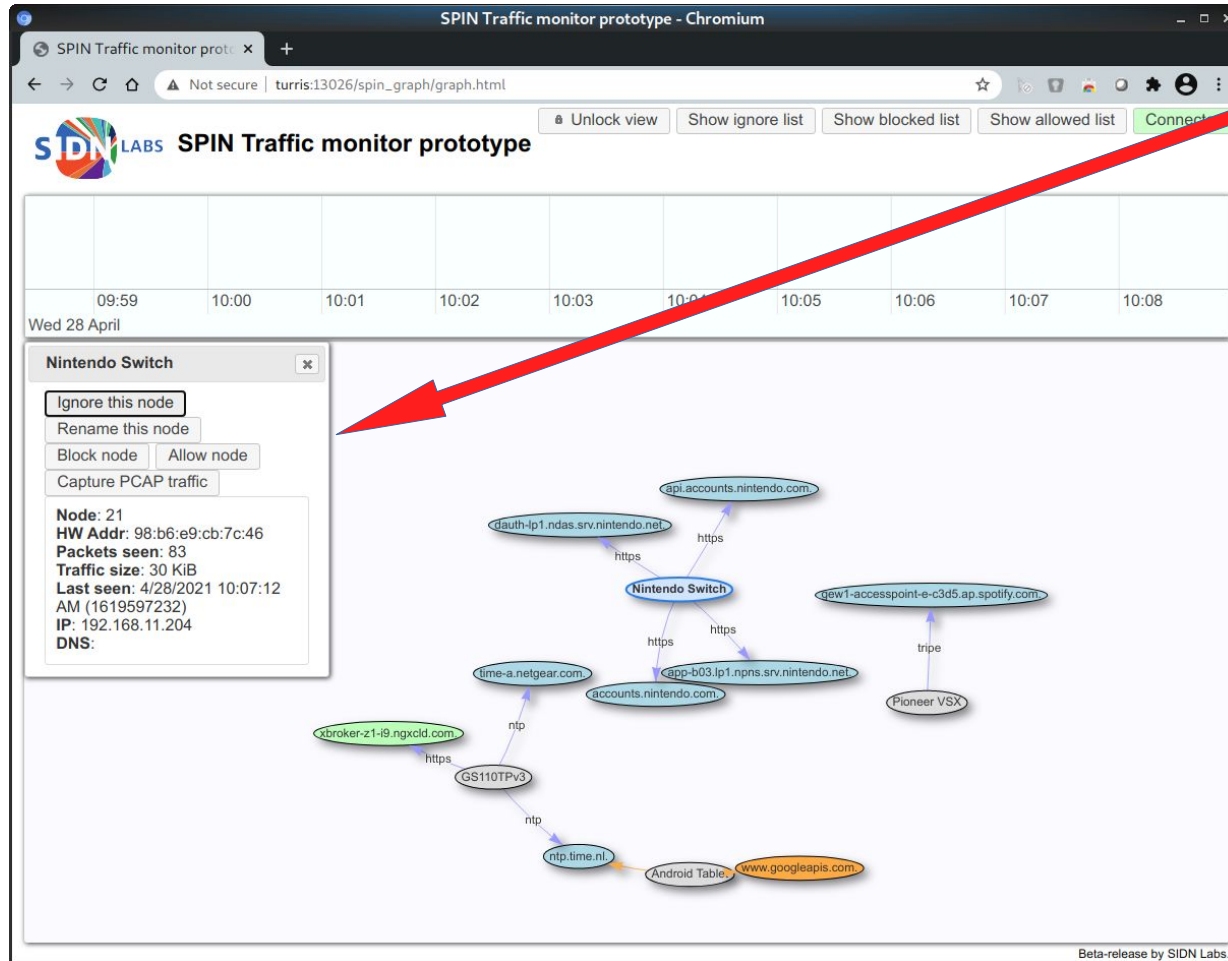
Orange: DNS query only

The SPIN 'bubble app'

Click on a grey node to show more information and options



The SPIN 'bubble app'



Options:

Ignore: stop showing node

Rename: give a user-friendly name

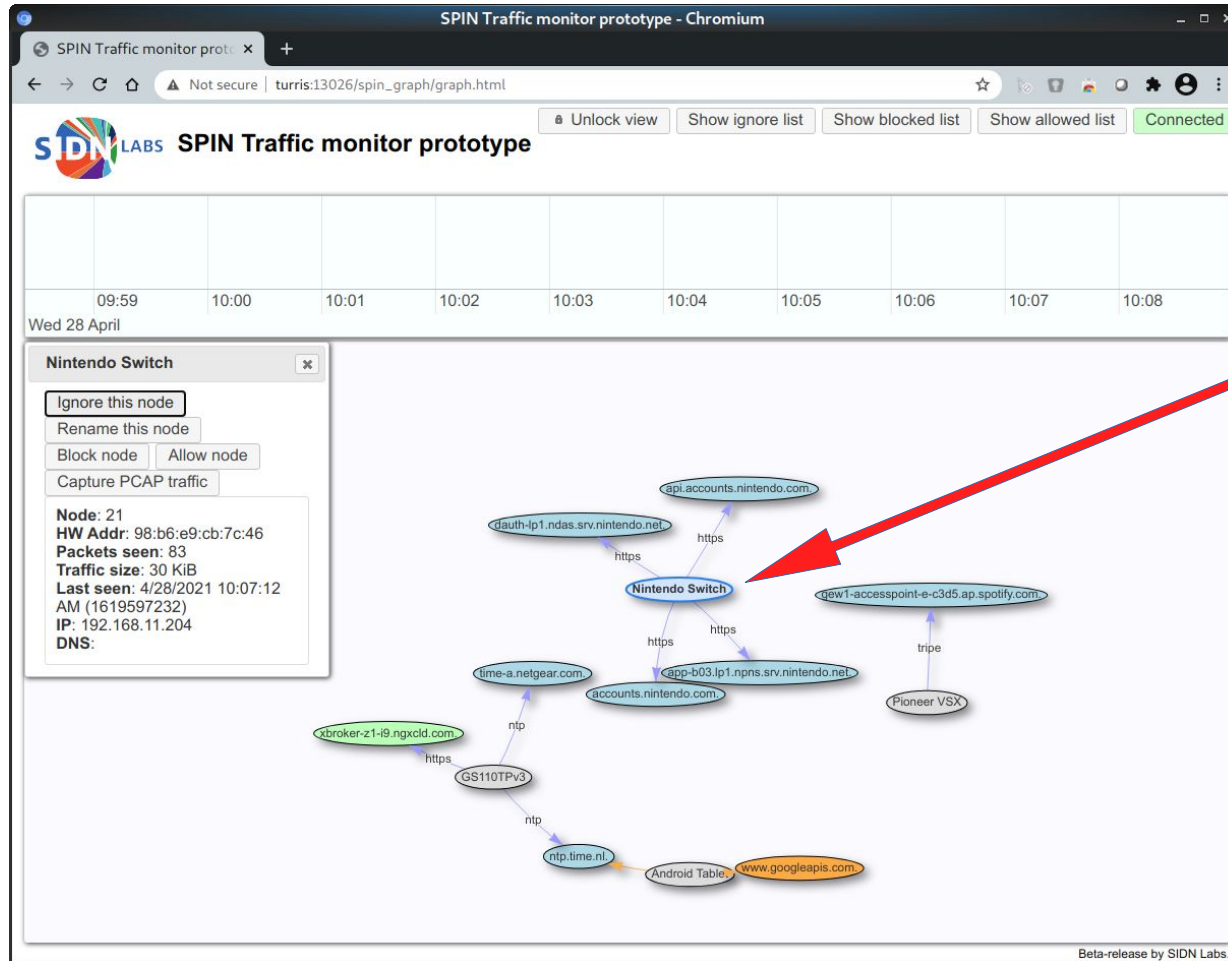
Block: block all traffic

Allow: allow traffic anyway

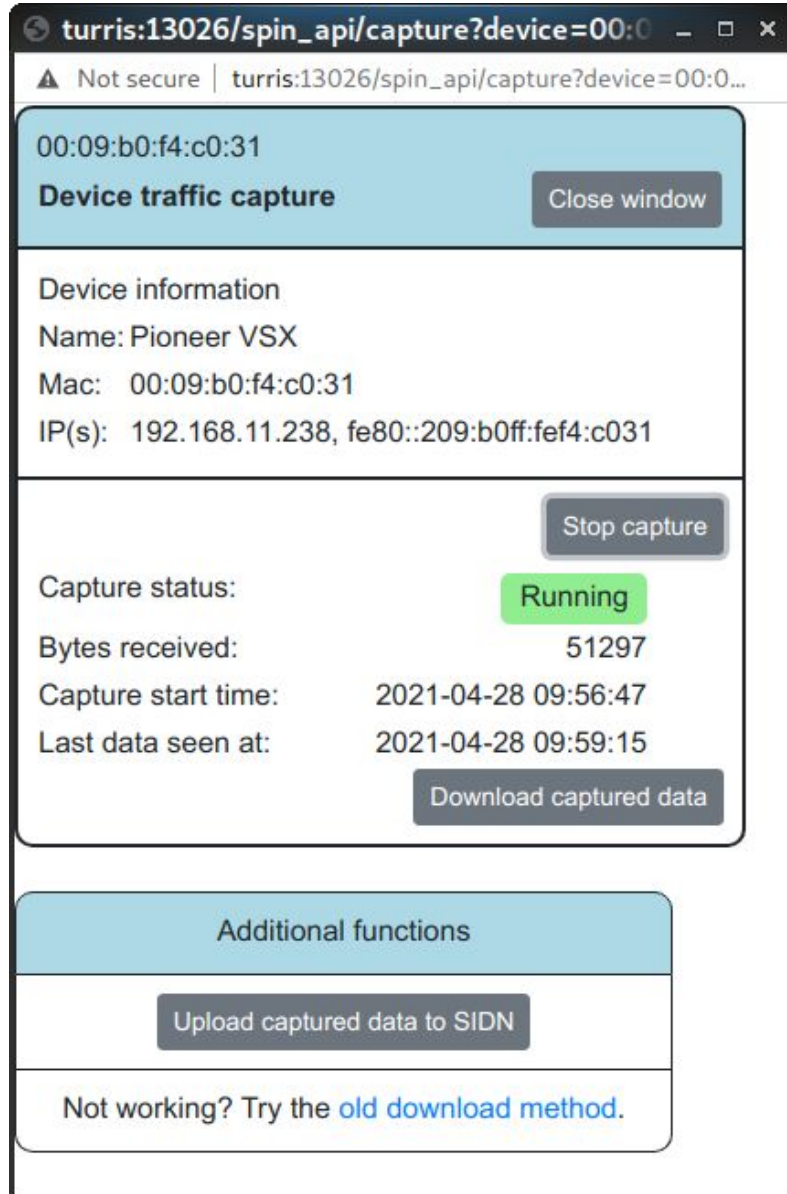
Capture: Capture and download traffic

The SPIN 'bubble app'

Click on a grey node to show more information and options



The SPIN 'bubble app'



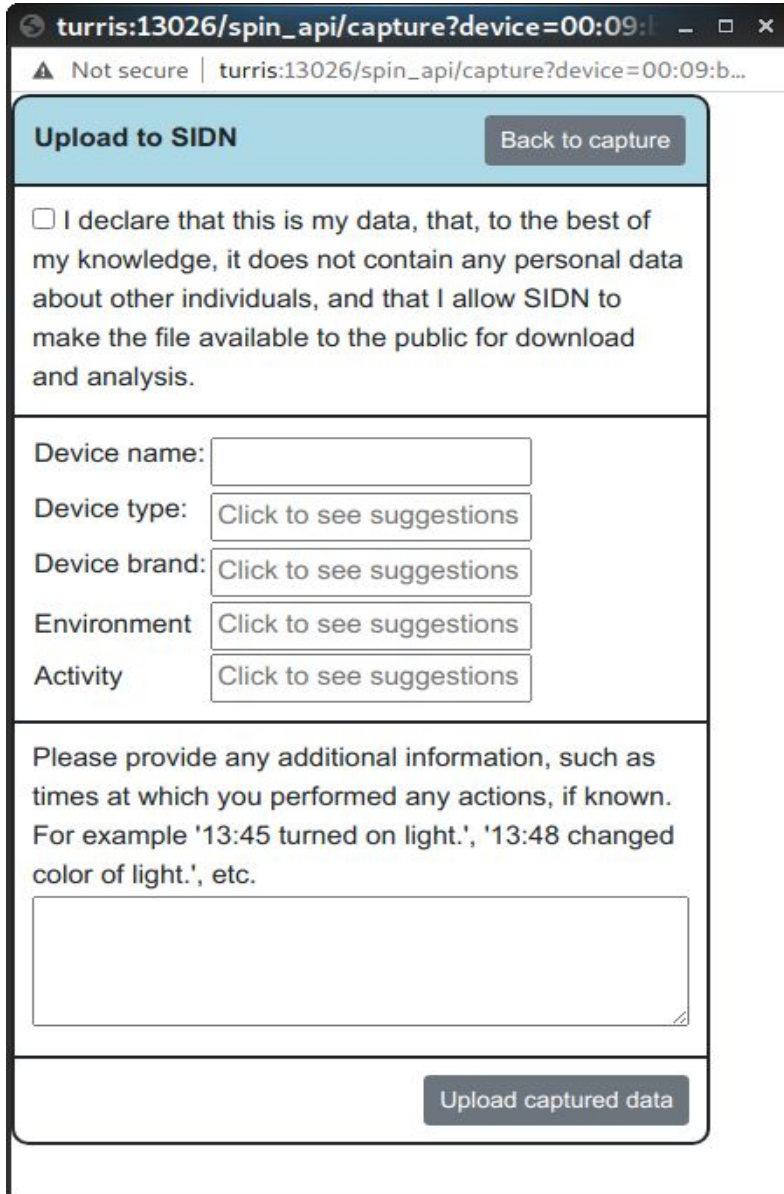
Capture screen:

Start/stop

Download (as pcap file)

Upload (to SIDN, optional)

The SPIN 'bubble app'



The screenshot shows a web browser window with the address bar displaying 'turris:13026/spin_api/capture?device=00:09:...' and a 'Not secure' warning. The page has a light blue header with the text 'Upload to SIDN' and a 'Back to capture' button. Below the header is a checkbox with the text: 'I declare that this is my data, that, to the best of my knowledge, it does not contain any personal data about other individuals, and that I allow SIDN to make the file available to the public for download and analysis.' Underneath the checkbox are five input fields: 'Device name:' (a text box), 'Device type:' (a button labeled 'Click to see suggestions'), 'Device brand:' (a button labeled 'Click to see suggestions'), 'Environment' (a button labeled 'Click to see suggestions'), and 'Activity' (a button labeled 'Click to see suggestions'). Below these fields is a text area with the prompt: 'Please provide any additional information, such as times at which you performed any actions, if known. For example '13:45 turned on light.', '13:48 changed color of light.', etc.' At the bottom of the form is a large text box and an 'Upload captured data' button.

turris:13026/spin_api/capture?device=00:09:...

Not secure | turris:13026/spin_api/capture?device=00:09:b...

Upload to SIDN Back to capture

☐ I declare that this is my data, that, to the best of my knowledge, it does not contain any personal data about other individuals, and that I allow SIDN to make the file available to the public for download and analysis.

Device name:

Device type: Click to see suggestions

Device brand: Click to see suggestions

Environment Click to see suggestions

Activity Click to see suggestions

Please provide any additional information, such as times at which you performed any actions, if known. For example '13:45 turned on light.', '13:48 changed color of light.', etc.

Upload captured data

Upload screen:

Provide information about device

Suggestions are available

The SPIN 'bubble app'

Uploaded captures
available in overview

SPIN: Security and Privacy for In-home Networks by SIDN Labs - Chromium

SPIN Traffic monitor prot: x SPIN: Security and Privacy x +

spin.sidnlabs.nl/en/pcaps/?page=1

SIDN LABS About For whom Software User-Manual IOT-PCAPS SPIN @ Github

IoT device traffic data analysis

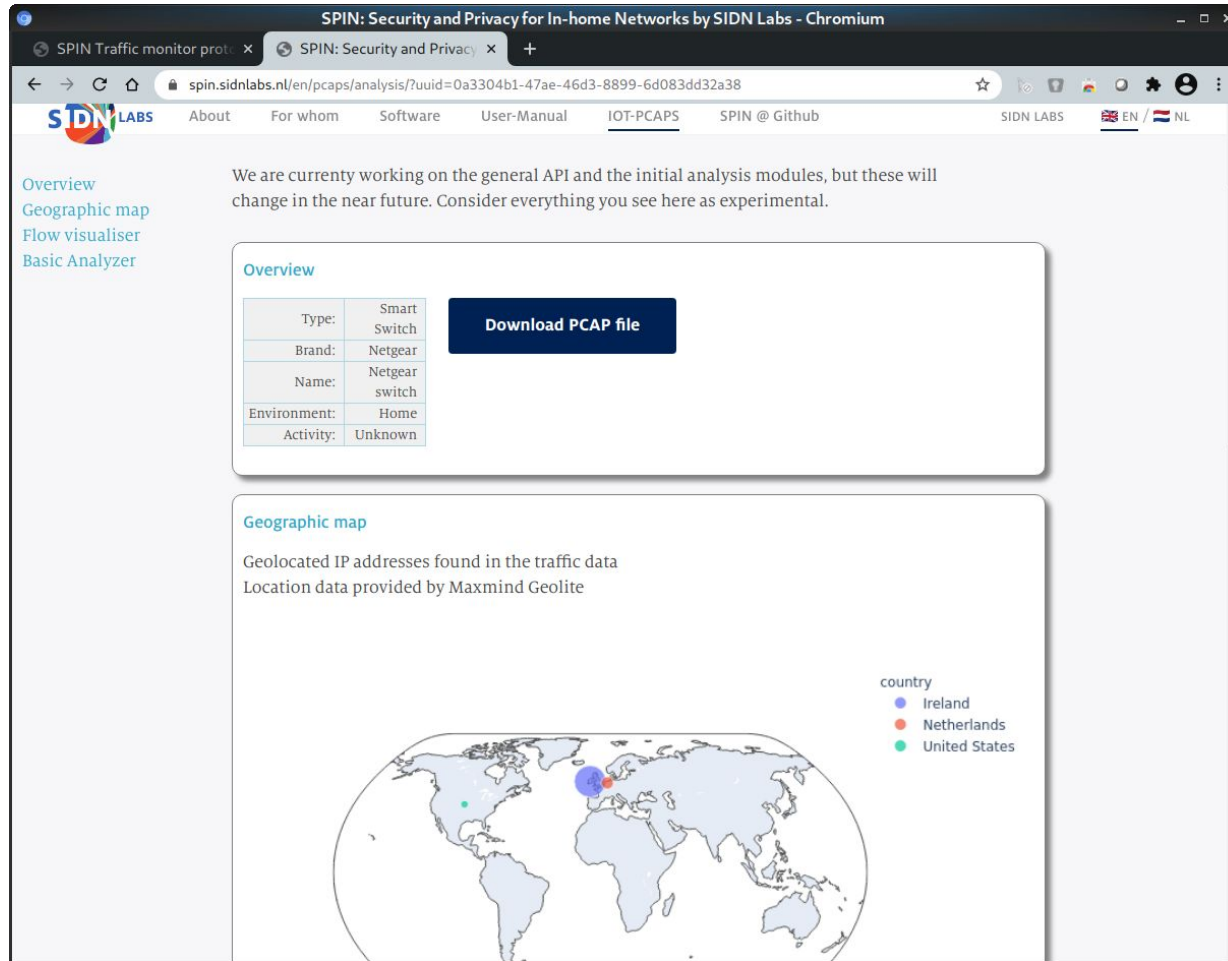
PCAP files matching search: 37765 [Upload a new PCAP file](#)

Search	<input type="text"/>	×	Source	Nothing selected	×
Device Type	Nothing selected	×	Device Brand	Nothing selected	×
Environment	Nothing selected	×	Activity	Nothing selected	×

source	type	brand	name	environment	activity	analyses done
Upload	Smart Switch	Netgear	Netgear switch	Home	Unknown	3/3
Upload	Smart Switch	Netgear	Netgear switch	Home	Unknown	3/3
Upload	Smart Switch	Netgear	Netgear switch	Home	Unknown	3/3
Upload	Camera	Philips	PC			3/3
Upload	Smart Switch	Netgear	GS110TPv3	Home	None	3/3
Upload	asdf	asdf	asdf	asdf	asdf	3/3
Upload	asdf	asdf	asdf	asdf	asdf	3/3
Upload	asdf	asdf	asdf	asdf	asdf	3/3
Upload	Honeypot	Honeypot	Honeypot	Honeypot Frankfurt	Unknown	3/3
Honeypot	Honeypot	Honeypot	Honeypot	Honeypot Frankfurt		3/3

First Prev 1 2 3 4 5 Next Last

The SPIN 'bubble app'



Uploaded files get additional analysis, such as geolocation of traffic targets

Demo

Demo time!

Sites

SPIN website: <https://spin.sidnlabs.nl>

Valibox website: <https://valibox.sidnlabs.nl>

SIDN Labs: <https://sidnlabs.nl>