

# Nordic WiFi probes

WiFiMon meeting - GN4-2-SA3T5  
Zürich  
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# Background

- ▶ Started in 2014 - wanted to see client experience
- ▶ Based on simple scripts, changes not so simple
- ▶ Positive feedback from users
- ▶ From summer 2016

Student - Fredrik Strupe

Improve configuration management and administration

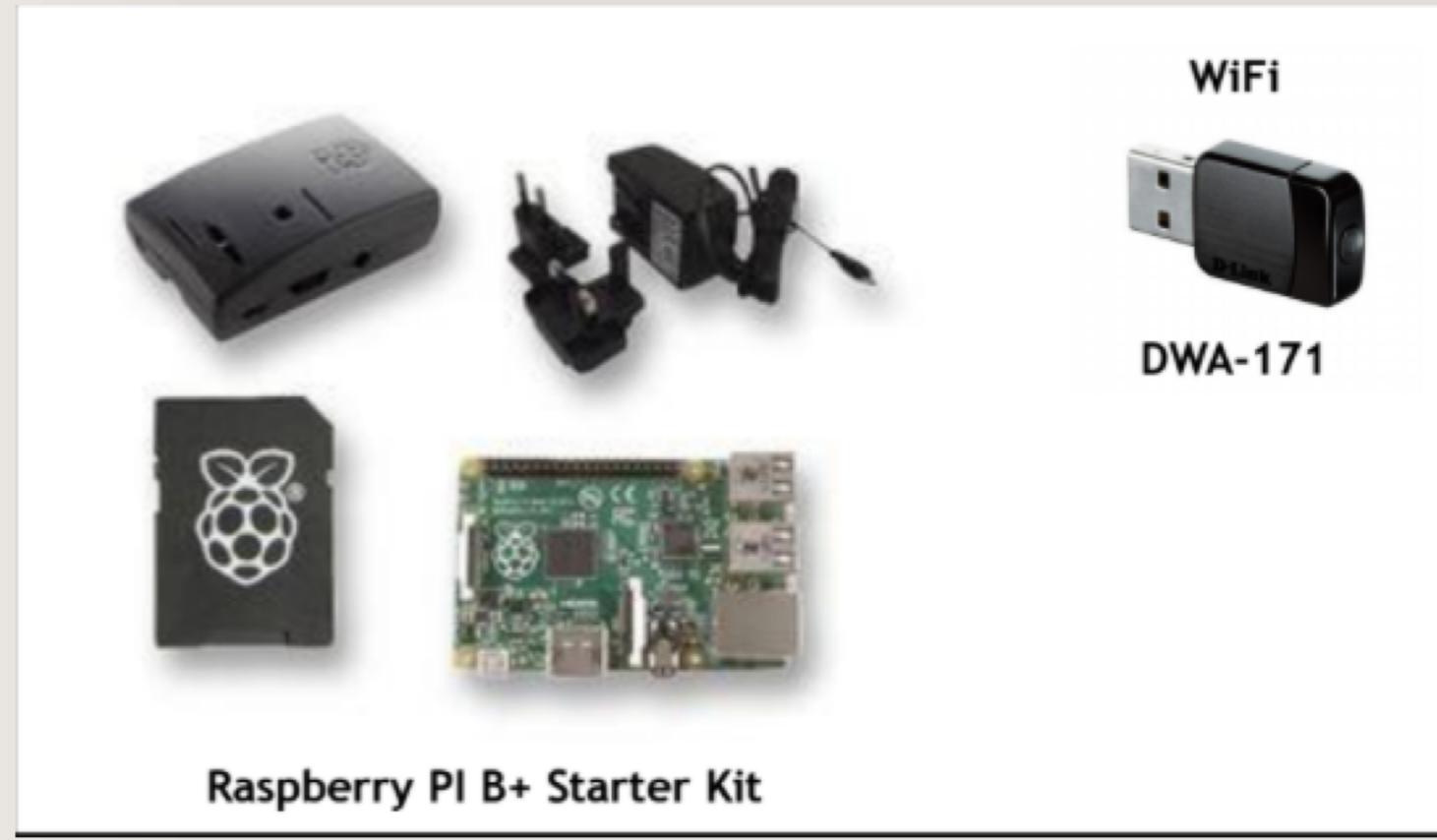
- ▶ Tested a commercial solution (7Signal)
  - Lots of functionality
  - Huge cost

# Changes (since 2015)

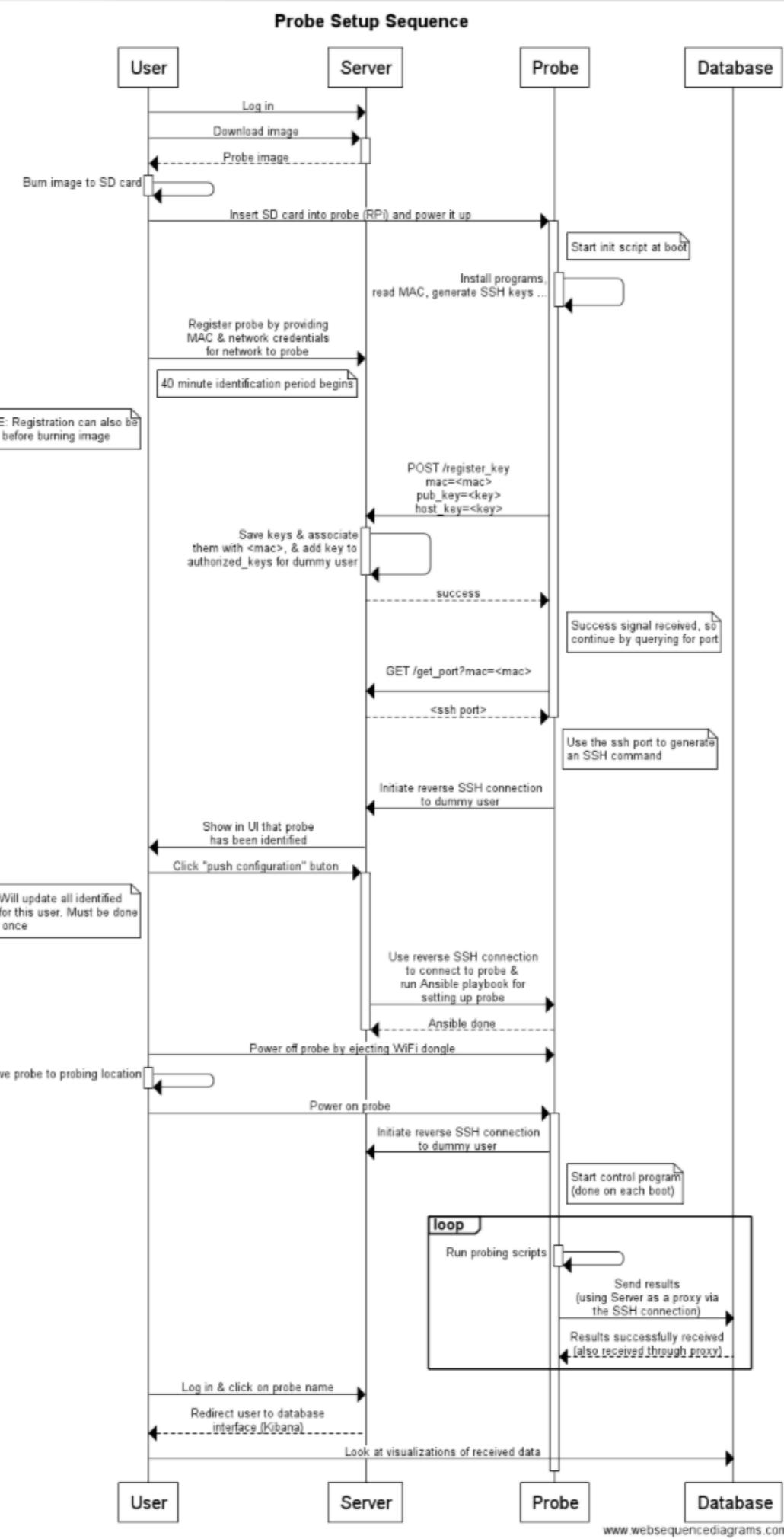
- ▶ Raspbian -> Kali linux (RPI v1, 2, 3)
- ▶ Administration
  - <https://wifiprobe.labs.uninett.no>
- ▶ Ansible for configuration management
- ▶ Presentation / data storage
  - Zabbix -> Grafana/InfluxDB -> Kibana/Elasticsearch
- ▶ Wired interface
- ▶ Federated login
- ▶ Documentation

# Unchanged (from 2015)

- ▶ HW: RPI1, 2 or 3 og D-link SWA-171
- ▶ Measurements:
  - Signal strength, channel info, SSID's
  - Association time (auth + asso), DHCP
  - Respons time (dns, http)
  - Up & download speed
- ▶ Measurement scripts
  - owamp, iperf3, curl etc



# System overview



# Status

- ▶ 10 - 15 probes registered

- ▶ A few challenges

Probes attached to single user (not institution)

Routing - Eth interface

Status update of admin interface

- ▶ Next steps

Triggers / send notification?

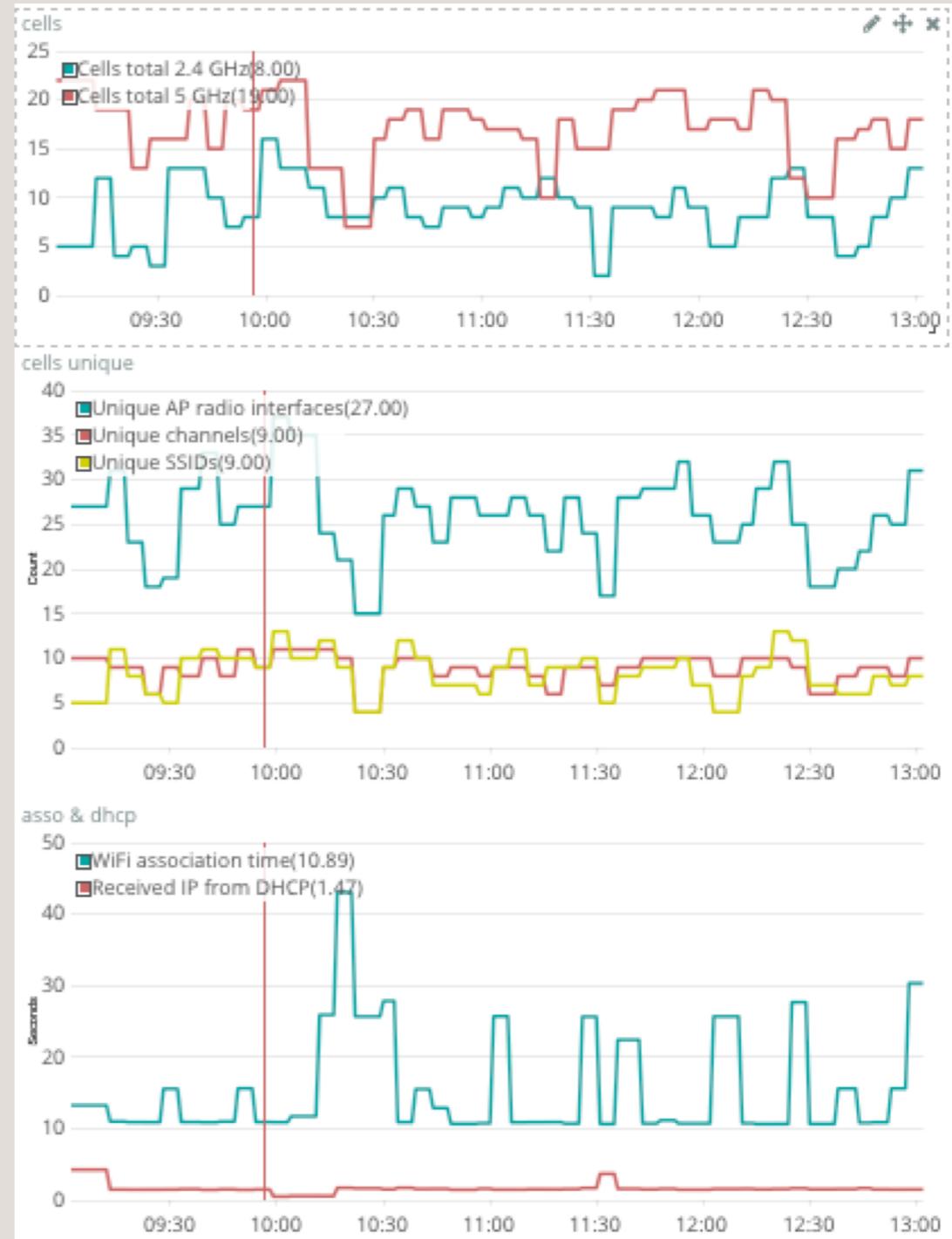
Collect more data

- ▶ Started cooperation with SUNET / Nordunet

- ▶ Geant participation

GN4-2 SA3T5 WiFi Mon

Nordic contribution 0,4 FTE



# Documentation

## ► Probe administration:

<https://wifiprobe.labs.uninett.no/>

- User instructions

## ► Technical:

<http://wifiprobe-doc.paas.uninett.no>

- Overview in above link, including more explanations
- Links to github repositories

# Probe setup

## ► Follow instructions on administration page

Download correct image, copy to SD card

Choose DB; UNINETT Elasticsearch by default

Register prober (MAC)

"Identified" - means PI have collected necessary programs to connect to server and reverse tunnel has been established

"Push configuration to probes" - converts RPI into a probe

- All "Identified" probes will be converted, or updated with changes.

## ► Notes

Remove WiFi dongle = "soft shutdown"

Probes tab + Edit; change scripts to run and intervals

Save as default = all new probes

Anonymous ID must be entered

Status changes to "Identified" and "Updated" takes time...

# Examples

The screenshot shows a web-based interface for managing WiFi probes. At the top, there is a dark header bar with the UNINETT logo and the title "WiFi Probes". Below the header, the page title "Probes" is centered above a table. The table has columns for Name, MAC address, Location, Identification status, Connection status (eth0 / wlan0), Update status, and Actions. Two rows of data are displayed:

Name	MAC address	Location	Identification status	Connection status (eth0 / wlan0)	Update status	Actions		
Sandane	10:62:EB:3B:FC:3F	Sandane Lufthamn	Identified	Up / Up	Updated (20 hours ago)	<button>Reboot</button>	<button>Edit</button>	<button>Remove</button>
Førde	10:62:EB:3B:FA:82	Førde Bringeland	Identification period expired (Click to renew period)	Down / Down	Not updated	<button>Reboot</button>	<button>Edit</button>	<button>Remove</button>

# Probe setup

Here you can set the credentials of the network the probe should perform measurements on, and adjust the interval test scripts will be run at.

[Save configuration](#)

[Save configuration as default](#)

Network

Test scripts

Basic info

## Network configuration

Fill out information and credentials of the network(s) the probe should be connected to when doing measurements.

Any (will not differentiate between 2.4 GHz and 5 GHz)

SSID

eduroam

Anonymous ID

avinor@sysuser.uninett.no

Username / User ID

eduroam-monitoring-probes@sysuser.uninett.no

Password

.....

CA Certificate

[Velg fil](#) ingen fil er markert

(Currently using the following certificate: UNINETT\_Certificate\_Authority.cer)

# Probe setup

Here you can set the credentials of the network the probe should perform measurements on, and adjust the interval test scripts will be run at.

Network    Test scripts Basic info

[Save configuration](#) [Save configuration as default](#)

## Test script configuration

Here you can adjust some test script parameters if desired.

Description	Script filename	Arguments	Minute interval	Enabled
AP & dhcp connection time	connect_8812.sh	any	5	<input checked="" type="checkbox"/> (Required)
Scan for number of cells	scan.sh		5	<input checked="" type="checkbox"/>
Check if ipv6 is available	check_ipv6.sh	any	5	<input checked="" type="checkbox"/>
Measure link quality & bitrate	collect.sh	any	5	<input checked="" type="checkbox"/>
Measure HTTP and DNS request time for ipv4	check_http_v4.sh	any	5	<input checked="" type="checkbox"/>
Measure connection time for ipv4	run_owping4.sh	any	5	<input checked="" type="checkbox"/>
Measure throughput for ipv4	run_bwctl4.sh	any	60	<input checked="" type="checkbox"/>

# Probe setup

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## Basic info

The MAC address is needed for initialization, and the rest is for easier probe identification.

Probe name

Sandane

wlan0 MAC address

\*\*\*\*\*



Probe location

Sandane Lufthamn

# Presentation of measurements

- ▶ Direct link from admin to probe results
- ▶ All probes can be seen
- ▶ Edit kibana dashboard, interval etc

The screenshot shows a web-based administration interface for WiFi Probes. At the top, there is a navigation bar with links for Home, Instructions, Download image, Databases, Probes (which is the active tab), and Log out (as avinor). The main content area is titled "Probes" and displays a table with two rows of data. The columns are labeled: Name, MAC address, Location, Identification status, Connection status (eth0 / wlan0), Update status, and Actions. The first probe, "Sandane", has a green "Identified" button in the Identification status column. Its connection status is "Up / Up" and update status is "Updated (20 hours ago)". The second probe, "Førde", has a red "Identification period expired (Click to renew period)" button in the Identification status column. Its connection status is "Down / Down" and update status is "Not updated". Each probe row includes "Reboot", "Edit", and "Remove" buttons in the Actions column.

Name	MAC address	Location	Identification status	Connection status (eth0 / wlan0)	Update status	Actions		
Sandane	10:62:EB:3B:FC:3F	Sandane Lufthamn	Identified	Up / Up	Updated (20 hours ago)	<button>Reboot</button>	<button>Edit</button>	<button>Remove</button>
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# Examples



# Examples



???

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