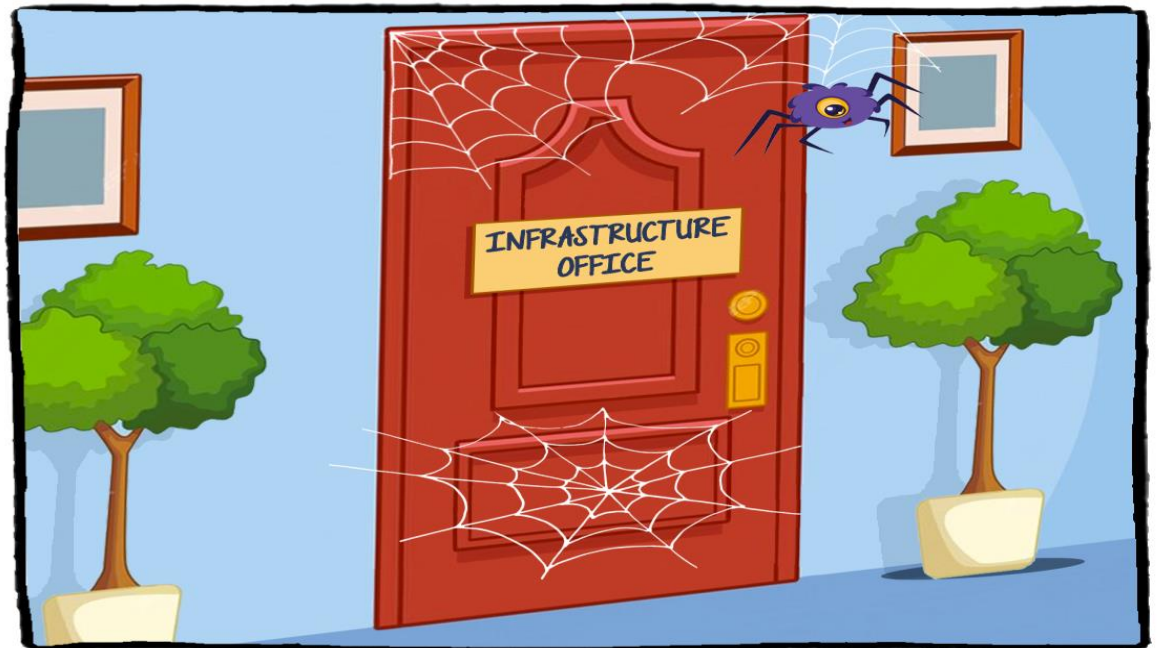# Exploring Virtualisation and Monitoring Opportunities in Networking

Elisantila Gaci, RASH
WiFiMon Service Manager

Workshop Yerevan, Armenia

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www.geant.org

GN5-1
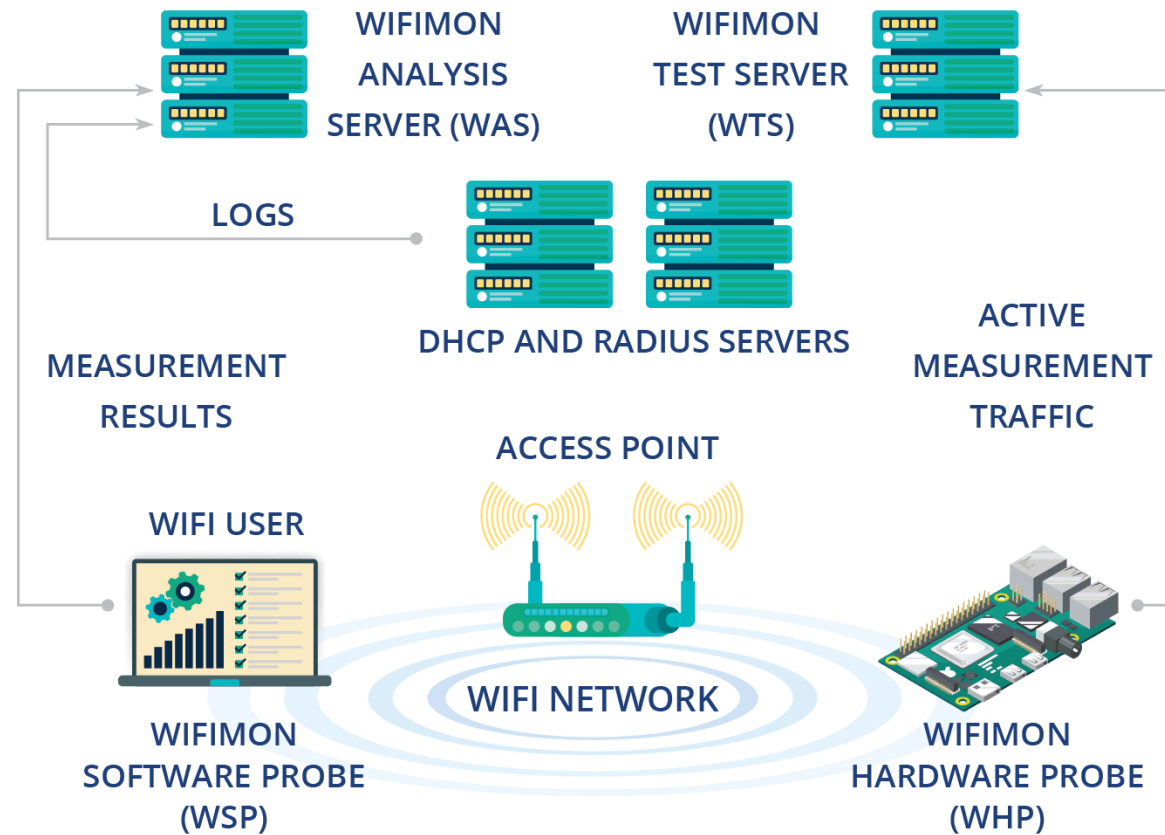
WiFiMon: Introduction

- An open-source wifi network monitoring and performance verification system

- Vendor - independent,

- Transparent to the WiFi network users

- Uses well-known open-source components

- Independent of WiFi network technology

- Captures user's perception of the network quality

How it works

WiFiMon

- WiFiMon relies on two monitoring data sources:

- Crowdsourced measurements

- Hardware probe measurements

- Performance data collected from active measurements:
  - Calculated by end-devices (WSP's and WHP's)
  - Streamed to the WAS
  - Optionally correlated with RADIUS/DHCP logs for richer analysis
  - Visualized through various dashboards of the WAS;

Who is it for
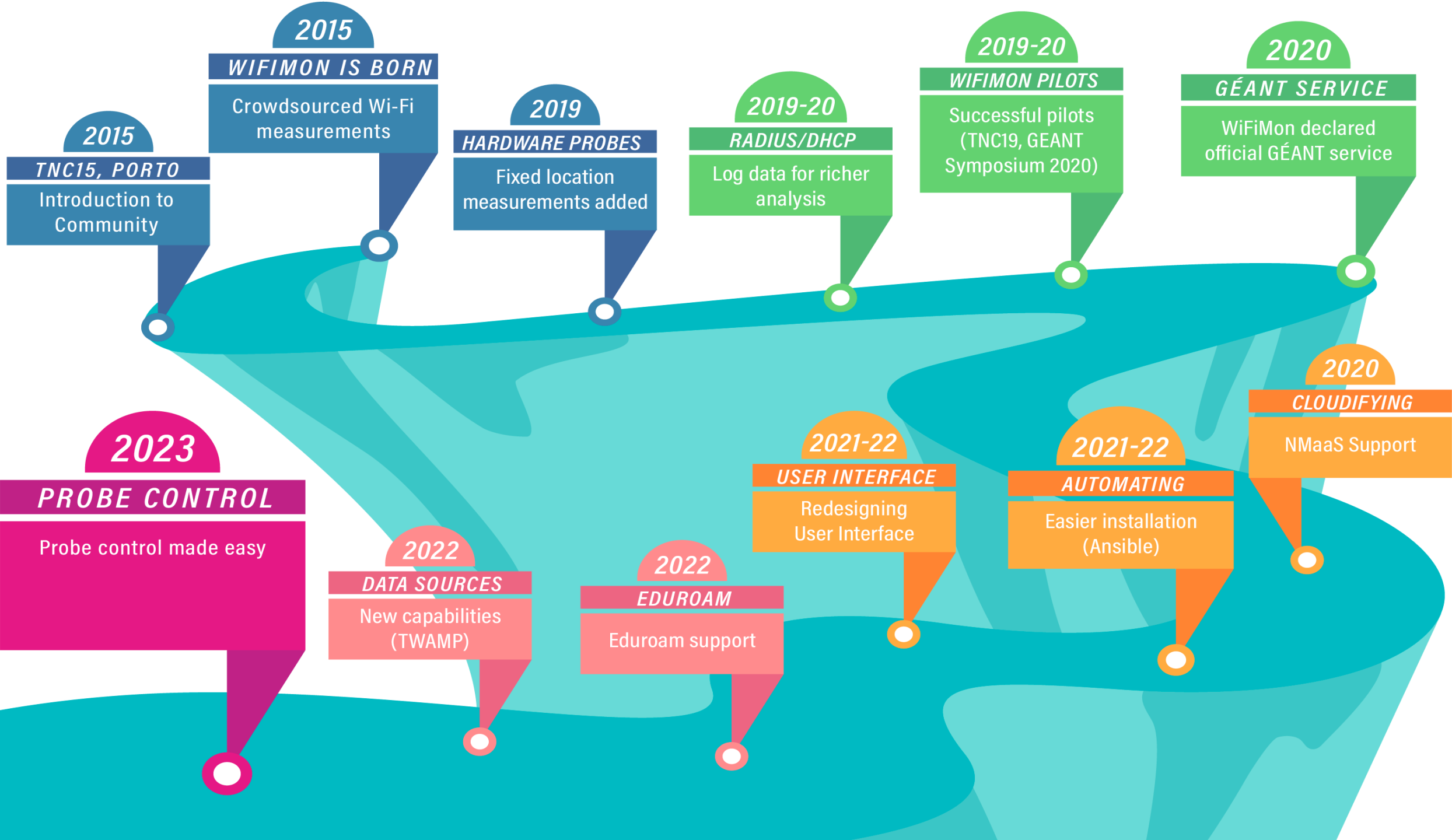
WiFiMon

| NRENs | Campus Networks | Conference Venues |

2015 — TNC15, PORTO
Introduction to Community

2015 — WIFIMON IS BORN
Crowdsourced Wi-Fi measurements

2019 — HARDWARE PROBES
Fixed location measurements added

2019-20 — RADIUS/DHCP
Log data for richer analysis

2019-20 — WIFIMON PILOTS
Successful pilots (TNC19, GÉANT Symposium 2020)

2020 — GÉANT SERVICE
WiFiMon declared official GÉANT service

2020 — CLOUDIFYING
NMaaS Support

2021-22 — AUTOMATING
Easier installation (Ansible)

2021-22 — USER INTERFACE
Redesigning User Interface

2022 — EDUROAM
Eduroam support

2022 — DATA SOURCES
New capabilities (TWAMP)

2023 — PROBE CONTROL
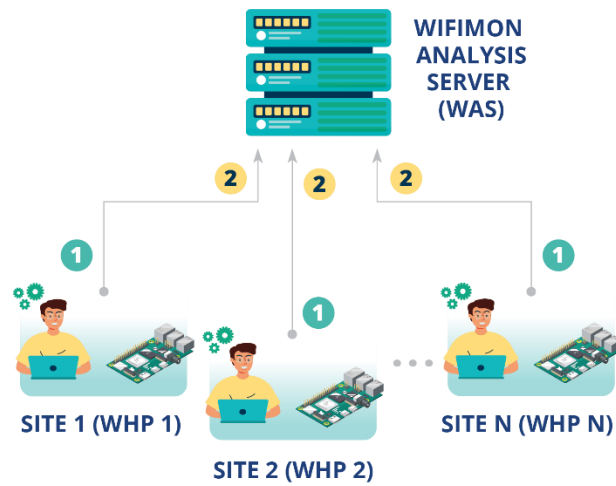Probe control made easy

WHP Configuration & Control
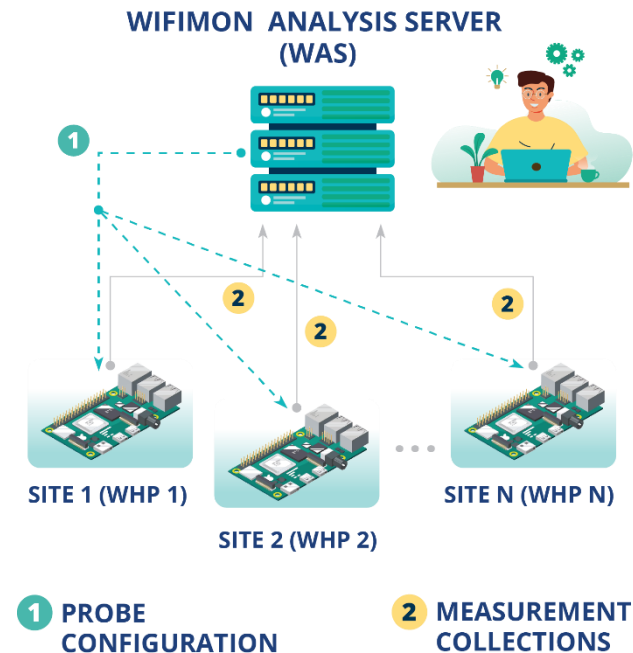
WiFiMon

Old approach
Administrator feedback demonstrated **limitations**:
- In **NAT networks**
- In **public networks**
- Administrators edit config directly

Novel approach required!!!
→ Remote & user-friendly configuration of WHP's from a central point (WAS)
→ Flexibility to control WHP's behind NAT networks

WHP Configuration Made easy

WiFiMon

- Administrators (re)configure WHP's from the WiFiMon UI

Provided data:

- Device ID
- FQDN's/IP addresses of WiFiMon components
- Location information

Configuration files are generated based on Jinja2 templates

Remote WHP Configuration Made Possible

WiFiMon

- Solution based on the **Salt** infrastructure management tool

WiFiMon Analysis Server → Salt Master

WiFiMon Hardware Probes → Salt Minions

SALT MASTER

WIFIMON ANALYSIS SERVER (WAS)

SALT MINIONS

Remote WHP Configuration Made Possible

WiFiMon
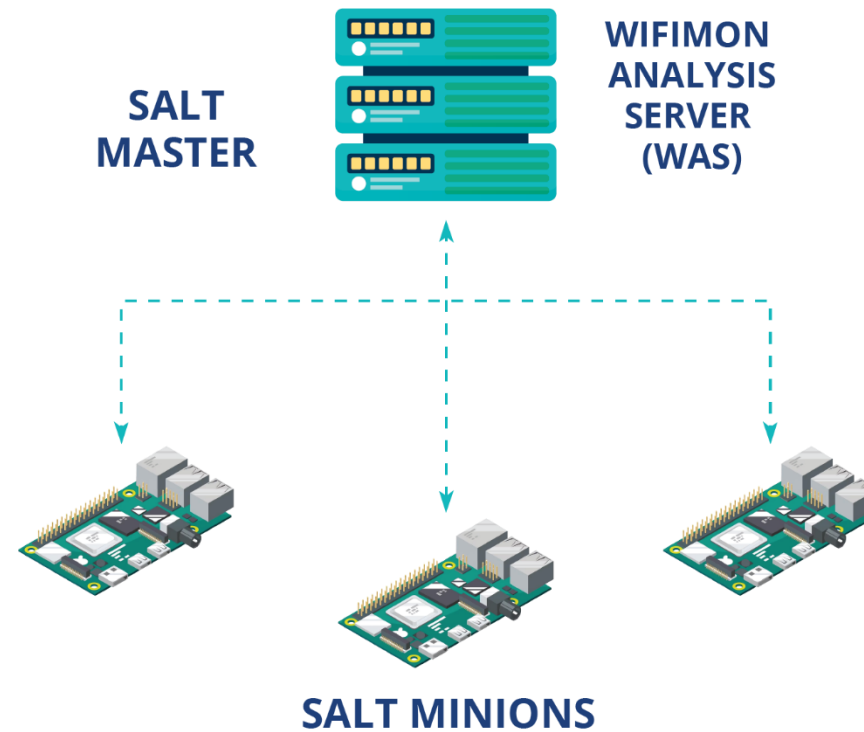
1 **Salt establishes application layer communication:**
- WHP's are remotely configured from the WAS
- Remote reconfiguration possible even for WHP's behind NAT
- Public IP addresses are not required → IP space is not consumed

2 **Salt includes a ZeroMQ message broker:**
Parallel configuration regardless of the WHP number

3 **Configuration files** generated from **templates** are transferred from the WAS to the respective probes

Future work

- Machine learning for performance prediction

- More visualization options

WiFiMon

Thank You

WiFiMon mailing list: wifimon-ops@lists.geant.org