Wi-Fi Network Monitoring with GÉANT WiFiMon

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Measuring the performance of the WiFi networks is challenging:

- Shared medium
- Physical obstacles
- Other networks
- Antenna positioning

Measuring only signal strength or link quality from fixed points is not sufficient to get the impression about the Quality of user’s Experience (QoE).

Vendor solutions – closed and focused on the network equipment (APs)

Why a system for WiFi monitoring?

WiFi is among the most popular network access methods.
What WiFiMon offers?

WiFiMon is vendor-independent, open-source monitoring tool transparent to the WiFi network users.

It uses well known open-source components:
- ELK
- Akamai Boomerang
- Libretest/Speedtest
- NetTest

It is an active monitoring tool which creates a low network overhead (similar to one site visit).

It captures user’s perception of the network quality and provides metrics like: throughput, latency, signal strength, link quality,…
The WiFiMon Service

- **GÉANT Service since 2020!**
- Combines crowdsourced and hardware probe measurements
- Correlation with data from RADIUS and DHCP logs to strengthen analysis options, e.g. throughput per Access Point (AP)
- Who is it for?
  - NREN’s
  - Campus Networks
  - Conference Venues
  - Moderate-size Organizations

**Contribution:**
- Detection of Wi-Fi throughput degradation
- Determination of underperforming areas within a Wi-Fi network
- Solve remote user complaints: “my WiFi/Internet is not working!”
**WiFiMon vs Other Monitoring Tools**

- No requirements for end user intervention or installation of apps
- Centralized view of Wi-Fi performance available to the Wi-Fi administrator

<table>
<thead>
<tr>
<th>WiFiMon</th>
<th>Ookla Speedtest</th>
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<tbody>
<tr>
<td>Measurements are triggered:</td>
<td></td>
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<tr>
<td>automatically by visiting a site</td>
<td>by pressing “GO”</td>
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<tr>
<td>Results are collected by:</td>
<td></td>
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<tr>
<td>the Wi-Fi administrator</td>
<td>the end users</td>
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</table>
How WiFiMon Works

**WiFiMon Components:**

- WiFiMon Software Probes (WSPs)
- WiFiMon Hardware Probes (WHPs)
- WiFiMon Test Server (WTS)
- WiFiMon Analysis Server (WAS)
How to Install WiFiMon

Two Options:

- Institutions install all components **within their premises**
  - Ansible playbook for WAS automated installation
  - Manual installation for WTS
  - All data stay within the institution premises
  - Support from WiFiMon team for all components

- **NMaaS** (more appropriate for testing/trying WiFiMon)
  - Another GÉANT Service
  - WiFiMon WAS instance deployed on NMaaS
  - WTS installation still required by institutions (should be close to the monitored network)
  - Support from WiFiMon team for interfacing WTS and Dockerized WAS on NMaaS

**Manual WAS installation:** Abandoned by WiFiMon
New UI since mid-2022
Metrics and graphs (1)
Metrics and graphs (2)
WiFiMon resources

- WiFiMon video: https://www.youtube.com/watch?v=9LuGlF6JSnA
- GEANT WiFiMon page: https://network.geant.org/wifimon/
- WiFiMon wiki page: https://wiki.geant.org/display/WIF
- WiFiMon code: https://bitbucket.software.geant.org/projects/WFMON/repos/agent/browse
- WiFiMon Infoshare: https://www.youtube.com/watch?v=VXQV2zWRKgo
- Publications and Presentations: https://wiki.geant.org/display/WIF/WiFiMon+Publications
Thank you

Any questions?

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