# Corteca for Managed Wi-Fi

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Get to Fast Faster 2025

# Nokia Corteca

## Cloud and home software powers broadband devices


**Corteca for Experience**
Deliver unstoppable Wi-Fi

**Corteca for Operations**
Reduce your OPEX

**Corteca for Revenue**
Monetize new service offers

A highly interoperable platform to manage your residential networks via industry standards

Corteca Applications

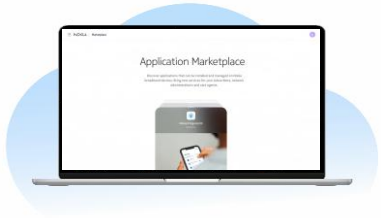
# The Corteca Cloud covers three main groups of use cases

## Wi-Fi management

- Real-time monitoring
- Troubleshooting
- Performance monitoring
- Wi-Fi optimization

## Device management

- Configuration management
- Software lifecycle management
- Remote diagnostics



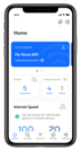

## Application management

- Configuration management
- Software Lifecycle management

# Corteca Cloud

**Corteca Console**

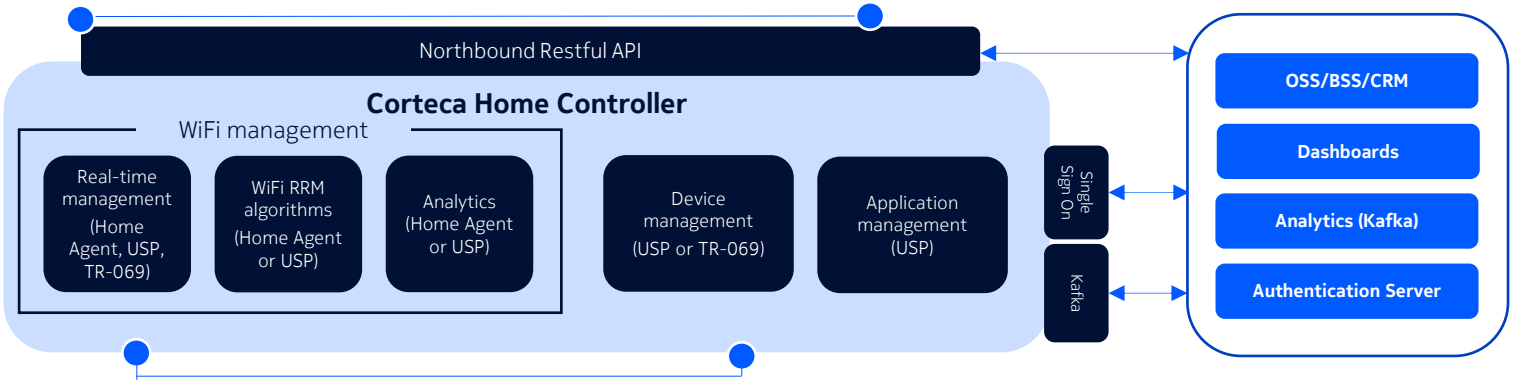
Single user interface application, consisting of several dashboards for different user roles (customer care agents, network admin or operation engineers, technicians) to manage, troubleshoot and optimize home networks.



**Nokia WiFi Mobile App**

For the end-user, self install and management of the WiFi network and gives access to premium services such as parental control; customization options available

**CSP's Backend Services**




## Interoperability with the Home Controller

**USP Agent**

User Service Platform (USP) Agent based on TR-369 Broadband Forum (BBF) standard.

**TR-069 Client**

TR-069 client based on Broadband (BBF) forum standard **(2025 Roadmap)**

**Home Agent**

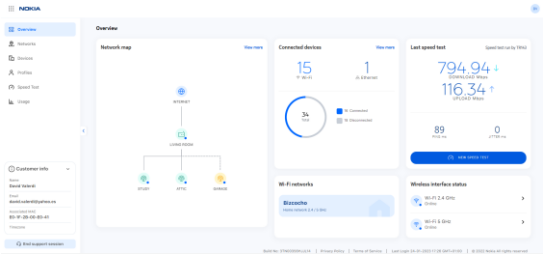
Proprietary agent that interfaces with the Home Controller

# A scalable solution for CSPs

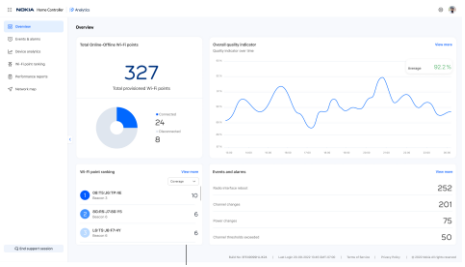
Nokia WiFi can scale from cloud-less device deployments with local self-healing mesh to millions of households remotely managed for WiFi monitoring and optimization


## Cloud-Less (Nokia devices)

- No cloud
- Local RRM via Mesh Middleware
- Local Mobile App access



Real time holistic view of a single home network for customer care agents




Monitoring and WiFi optimization tools for network administrators

## Home Controller L1

### Basic WiFi management
Real time monitoring (for the care agent)

### Device management (USP)
Configuration mgmt.
Software lifecycle mgmt.
Remote diagnostics

### Application management (USP)
Configuration mgmt.
Software lifecycle mgmt.
Troubleshooting

+

## Home Controller L2

### Advanced WiFi management
Real time monitoring (for the care agent)
Proactive troubleshooting
WiFi optimization
Performance monitoring

### Device management (USP)
Configuration mgmt.
Software lifecycle mgmt.
Remote diagnostics

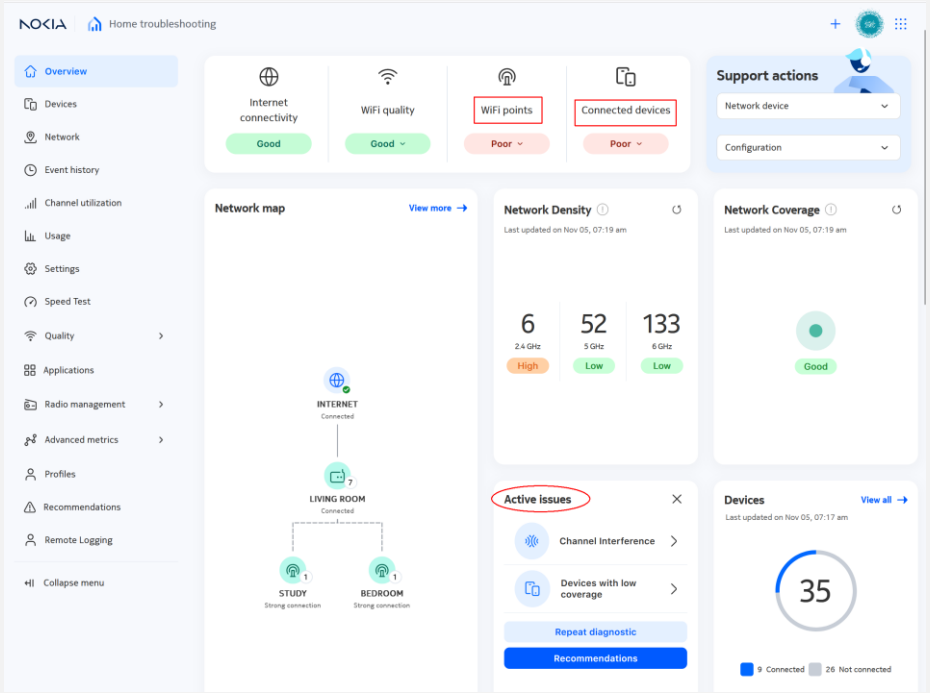
### Application management (USP)
Configuration mgmt.
Software lifecycle mgmt.
Troubleshooting

# Managed WiFi with Corteca

- Troubleshooting Home WiFi
- Proactive Network Monitoring

# Corteca Home Troubleshooting - Overview

## From high-level Home WiFi topology view to alarms, history and recommendations in just a few clicks

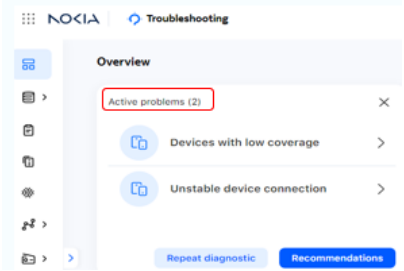


# Corteca Offers various troubleshooting paths

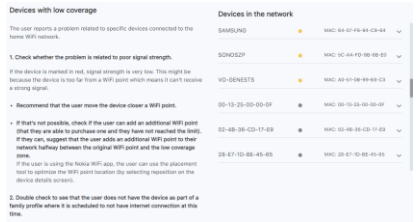
## Care Agents can choose the troubleshooting path per their skillset and preference

View the issues that Corteca has identified automatically and review the given recommendations

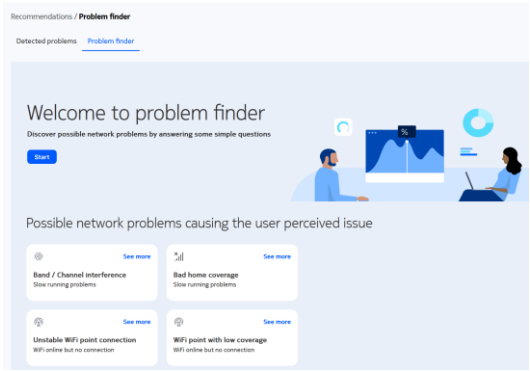
Identified problems:

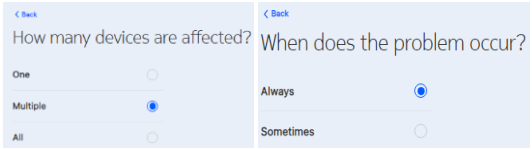



Recommendations:



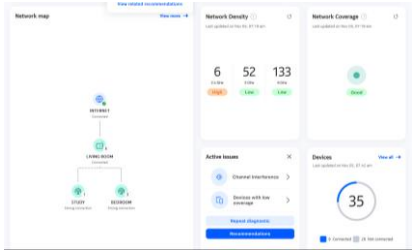

Answer questions about the observed issue and then Corteca gives causes and recommendations




Use the well-organized Corteca portal to easily navigate from a high-level view to detailed charts and alarms

From top-level view:

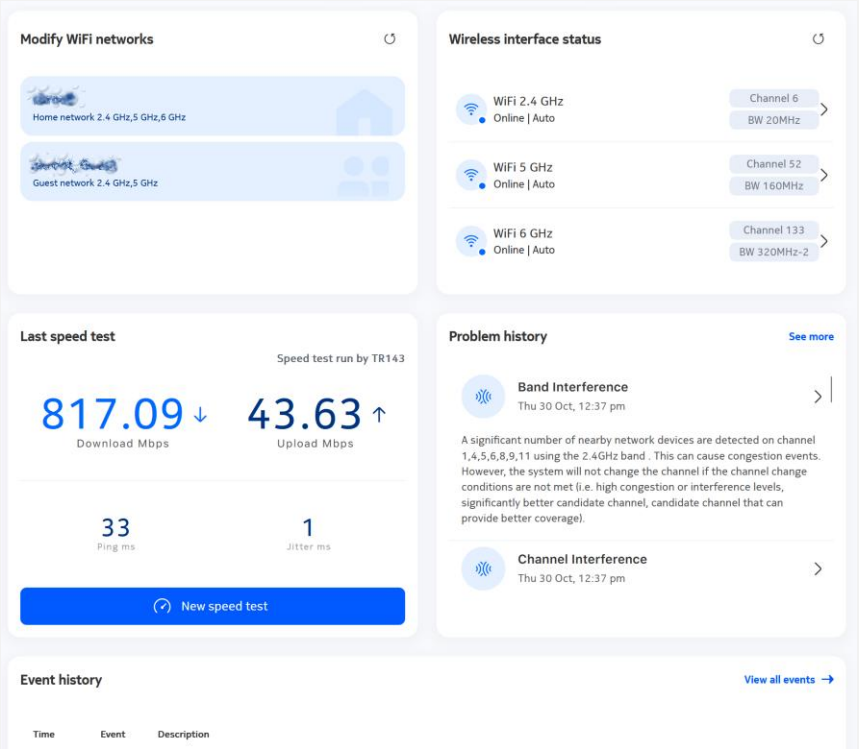


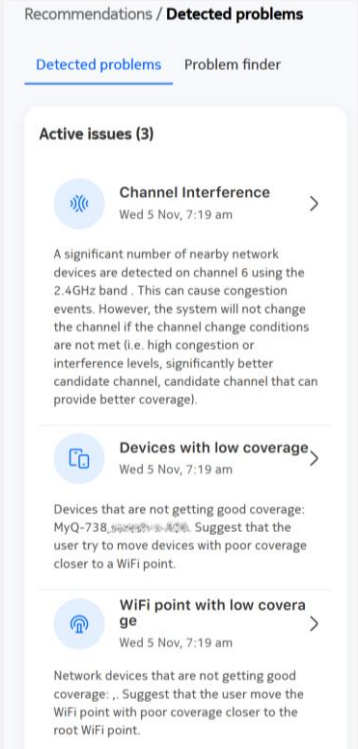
to details in just a couple of clicks


Corteca activation service includes training sessions for the Care Agents

# Overall network health

## Get an overall assessment easily and then proceed to recommendations

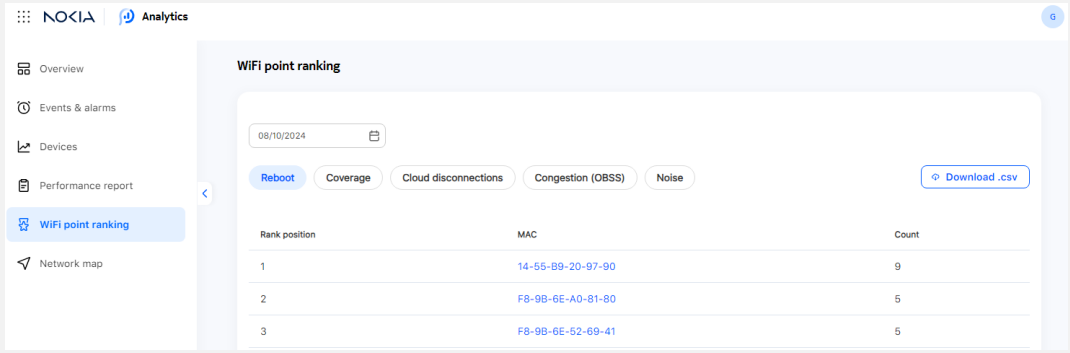


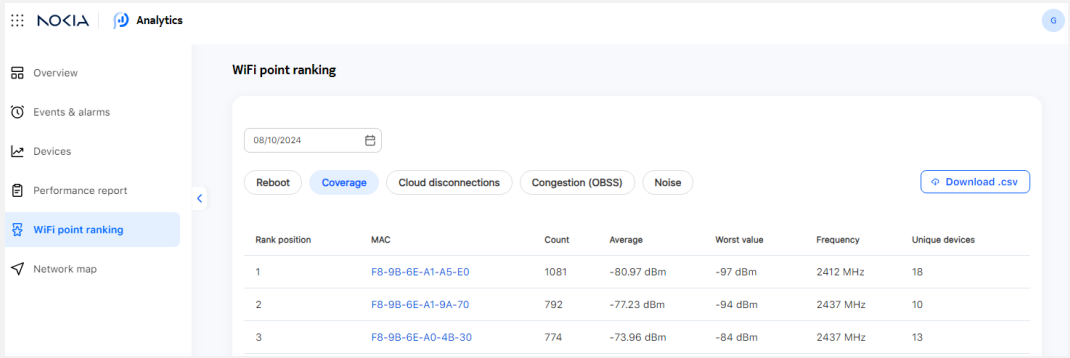
# Proactively identify the problem APs – reboots, coverage

## Identify the problem APs before the end-user calls you

APs that have rebooted most frequently



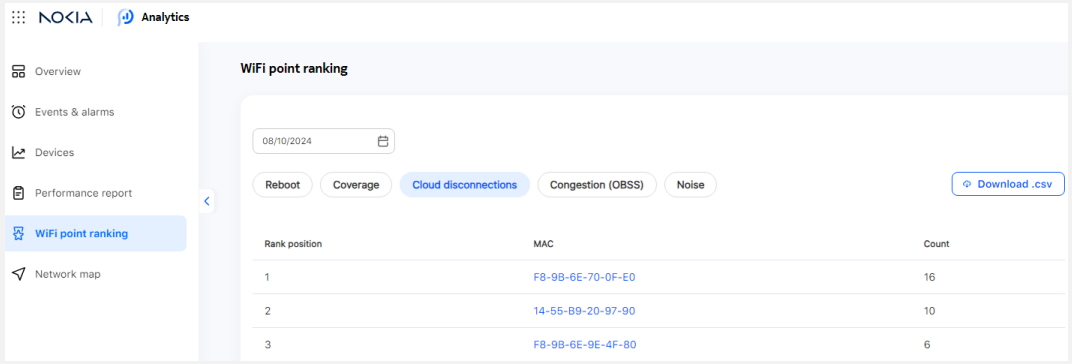

APs that offer the worst coverage



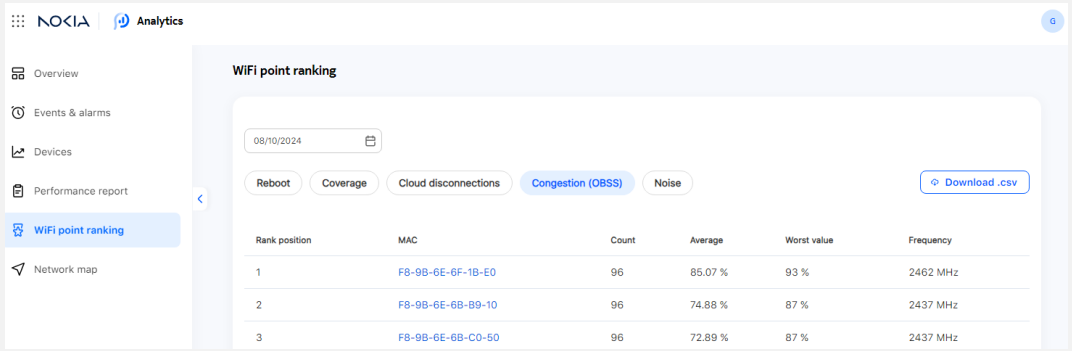
# Proactively identify the problem APs – cloud disconnections, OBSS congestion

## Identify the problem APs before the end-user calls you

APs that disconnected from Corteca Cloud most frequently

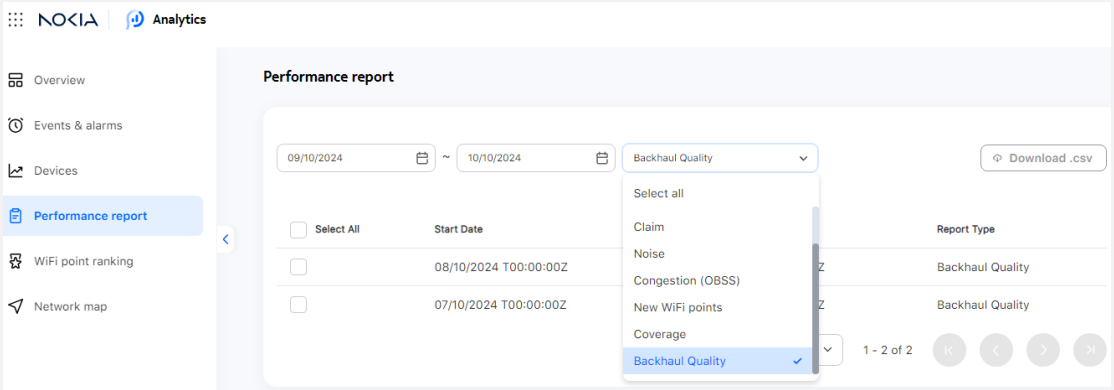



APs that experience the worst OBSS congestion



# Backhaul Quality Report

## Backhaul Quality Report identifies APs with unstable backhaul link



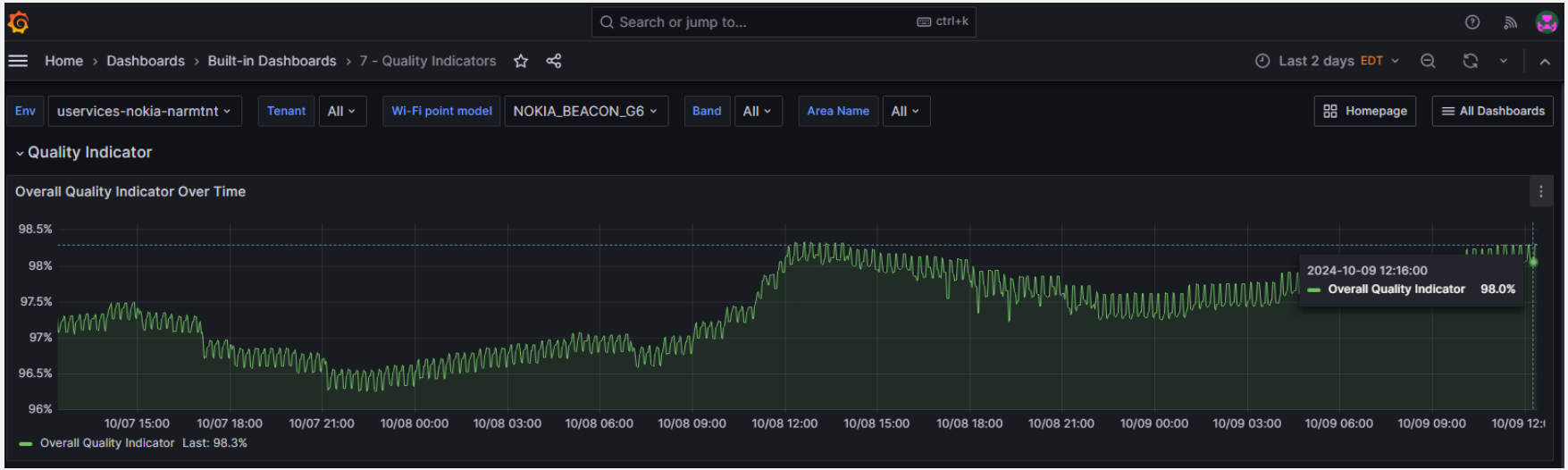

| DEVICEID | NETWORKID | SUBSCRIBERID | STATE | STARTTIME | ENDTIME | ENDREASON |
|---|---|---|---|---|---|---|
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | POOR | 2024-10-08T03:15:26.322Z | 2024-10-08T05:19:29.407Z | BACKHAUL_STATE_CHANGED_TO_FAIR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | FAIR | 2024-10-08T05:19:29.407Z | 2024-10-08T05:19:53.388Z | BACKHAUL_STATE_CHANGED_TO_POOR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | POOR | 2024-10-08T05:19:53.388Z | 2024-10-08T07:16:36.263Z | BACKHAUL_STATE_CHANGED_TO_FAIR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | FAIR | 2024-10-08T07:16:36.263Z | 2024-10-08T07:17:20.279Z | BACKHAUL_STATE_CHANGED_TO_POOR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | POOR | 2024-10-08T07:17:20.279Z | 2024-10-08T07:26:25.359Z | BACKHAUL_STATE_CHANGED_TO_FAIR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | FAIR | 2024-10-08T07:26:25.359Z | 2024-10-08T07:26:40.355Z | BACKHAUL_STATE_CHANGED_TO_POOR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | POOR | 2024-10-08T07:26:40.355Z | 2024-10-08T07:27:42.374Z | BACKHAUL_STATE_CHANGED_TO_FAIR |
| F8-9B-6E-70-13-40 | F8-9B-6E-A1-C2-B0 | _6358075397 | FAIR | 2024-10-08T07:27:42.374Z | 2024-10-08T07:28:06.376Z | BACKHAUL_STATE_CHANGED_TO_POOR |

# Monitor overall health of the network

A network engineer can keep an eye on the health of the network

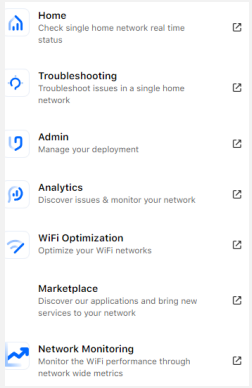
A Quality Indicator can be viewed over desired time interval and across all or specific device types in the network

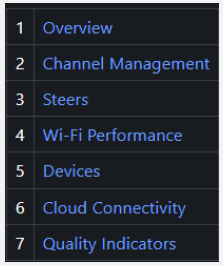
The Quality Indicator takes into consideration these metrics: coverage, congestion and noise



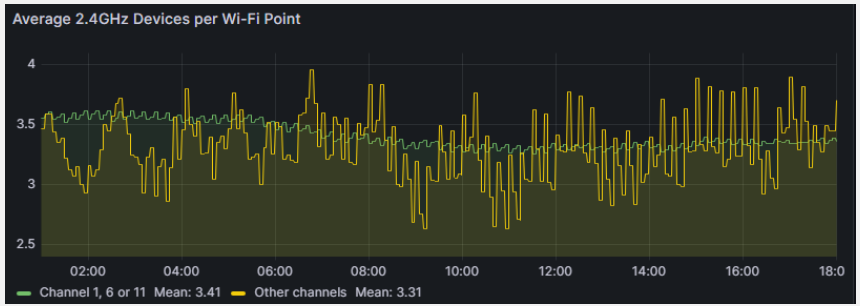
# End-users' WiFi client stats

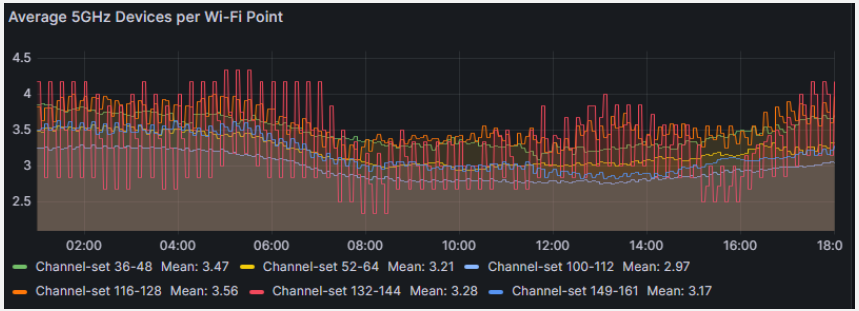
## Find out what bands/channels the clients are using. How many clients on an AP?




Number of clients per band

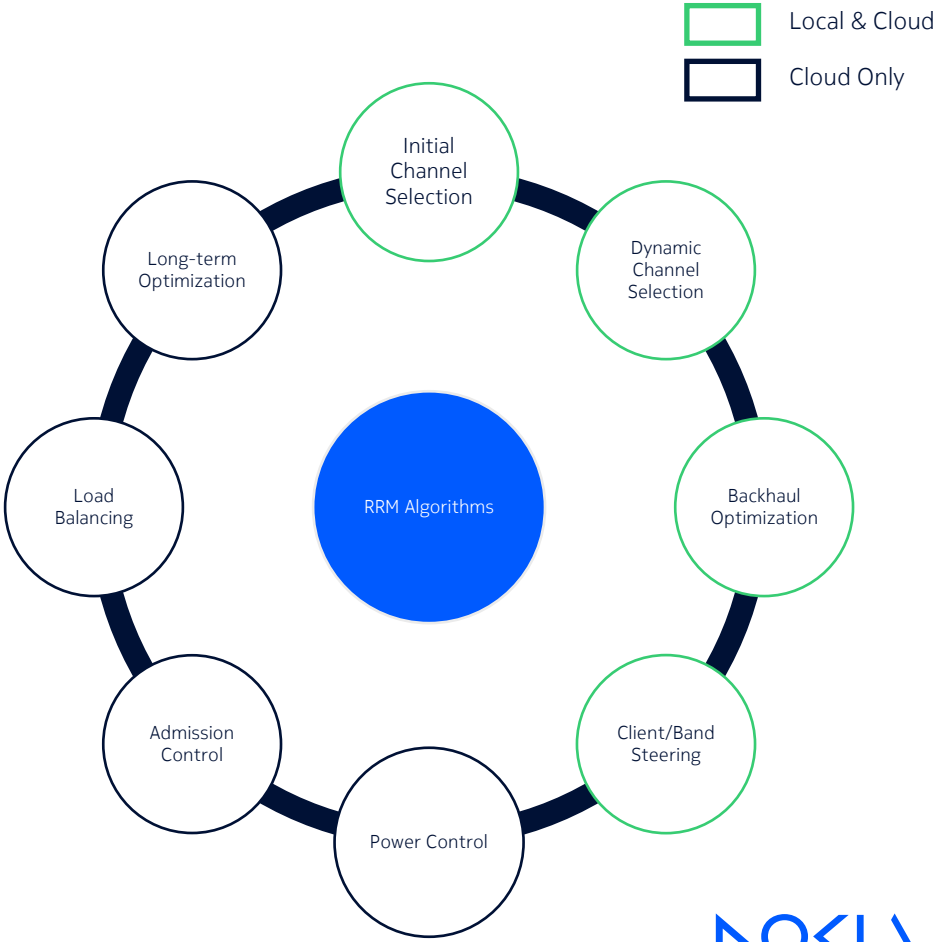



# Corteca L2: Wi-Fi Optimization
# Radio Resource Management (RRM)

# Nokia RRM algorithm suite

- Comprehensive suite of RRM algorithms
  - Local mesh middleware includes Edge Controller with core steering and channel selection;
  - Cloud adds intelligence (i.e., more advanced algorithms) and optimization
- Local (stand-alone, embedded):
  - Algorithms and intelligence built on top of EasyMesh standards
- Cloud (crowdsourced machine learning):
  - Introduces bias's based on local conditions
  - Grouping of Wi-Fi points to create cluster profiles with unique RRM parameters
  - Adjust RRM parameters dynamically via browser-based UI or API's



# Channel selection algorithms

## How Channel Selection is affected by Corteca License Type


### Initial Channel Selection

When the Wi-Fi point boots up

Selects the best available channel:

- Based on usage/number by neighboring Wi-Fi points, as well as usage of adjacent channels in vicinity
- Factors in neighboring APs, proximity, channels used, received signal strengths from the Wi-Fi points (Cloud)
- Weights applied based on proximity of Wi-Fi points and connected clients (Cloud)

### Dynamic Channel Selection

When configured congestion thresholds have exceeded

- Designed to only change channels when performance is severely degraded
- Ensures target channel has headroom to host moving Wi-Fi points traffic
- Hysteresis built in to avoid ping-pong situations and ripple effects through the network
- Configurable thresholds & periodicity (Cloud)

### Channel Selection Long Term Optimization

Frequency planning based on machine learning algorithms

- LTO is a proactive, heuristics-based algorithm that balances load across channels in a local area to minimize service interruption
- LTO automatically groups Wi-Fi points using a clustering algorithm based on their relative RF proximity
- Historic data collection of high-volume WiFi usage (peak hours), both Nokia Wi-Fi points plus neighbor Wi-Fi points

# Corteca Campaigns

- Firmware Lifecycle Management

# Corteca Campaigns

Campaign is the ability to schedule operations on a set of devices.

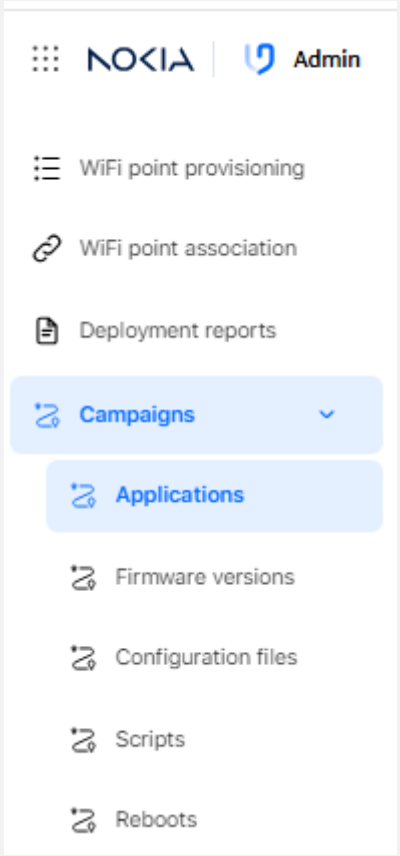
- The “set” of devices can be:
- all the devices registered with Corteca
- all devices of a particular model registered with Corteca
- A specific set of devices identified by their MACs (upload a file with list of MACs)

Campaigns can be configured to run operations:

- at a specific time within a specified time window (e.g., every night between 2:00am and 4:00am)
- after device reboot
- after first connection

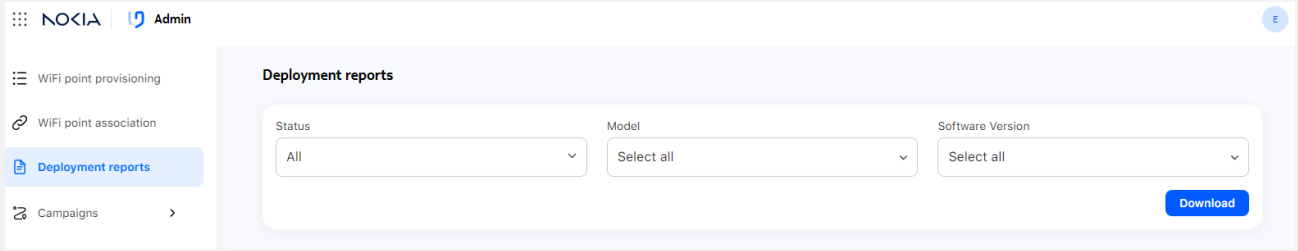
The following operations can be performed using Campaigns:

- Upgrade device firmware
- Download Container Apps to device
- Download Configuration file to device
- Reboot device
- Run Script



# Current FW version in the Deployment Report

## Download the Deployment Report to check that all devices are running the latest firmware




| MAC | Home WiFi ID | Online status | Firmware version | Release Version | Model Name |
|---|---|---|---|---|---|
| B4-63-6F-A3-DC-01 | B4-63-6F-A3-DC-01 | TRUE | 3TN00367IJKL03 | 1.2304.503 | Nokia WiFi Beacon 10 |
| 28-74-F5-CF-4C-91 | 28-74-F5-CF-4C-91 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-E5-B3-71 | 28-74-F5-E5-B3-71 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-CF-28-E1 | 28-74-F5-CF-28-E1 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-94-41-E1 | 28-74-F5-94-41-E1 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 40-E1-E4-1B-B9-01 | 40-E1-E4-1B-B9-01 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| E0-1F-2B-05-4F-01 | E0-1F-2B-05-4F-01 | TRUE | 3FE49062IJKL03 | 1.2304.503 | Beacon 6 |
| 28-74-F5-CF-32-E1 | 38-A0-67-FC-DC-C1 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 38-A0-67-FB-43-81 | 38-A0-67-FB-43-81 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-97-4B-11 | 28-74-F5-97-4B-11 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 40-E1-E4-95-CC-A1 | 40-E1-E4-95-CC-A1 | TRUE | 3FE49062IJKL03 | 1.2304.503 | Beacon 6 |
| 28-74-F5-E6-1C-B1 | 28-74-F5-E6-1C-B1 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-E6-24-F1 | 28-74-F5-E6-24-F1 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 40-E1-E4-95-42-D1 | 40-E1-E4-95-42-D1 | TRUE | 3FE49062IJKL03 | 1.2304.503 | Beacon 6 |
| B4-63-6F-A4-0E-51 | B4-63-6F-A4-0E-51 | TRUE | 3TN00367IJKL03 | 1.2304.503 | Nokia WiFi Beacon 10 |
| B4-63-6F-73-BC-01 | B4-63-6F-73-BC-01 | TRUE | 3TN00367IJKL03 | 1.2304.503 | Nokia WiFi Beacon 10 |
| 38-A0-67-FC-42-91 | 38-A0-67-FC-42-91 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-CF-35-61 | 28-74-F5-CF-35-61 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-CF-27-51 | 28-74-F5-CF-35-61 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |
| 28-74-F5-CF-24-C1 | 28-74-F5-CF-24-C1 | TRUE | 3FE49334IJKL09 | 1.2304.509 | Beacon 2 |

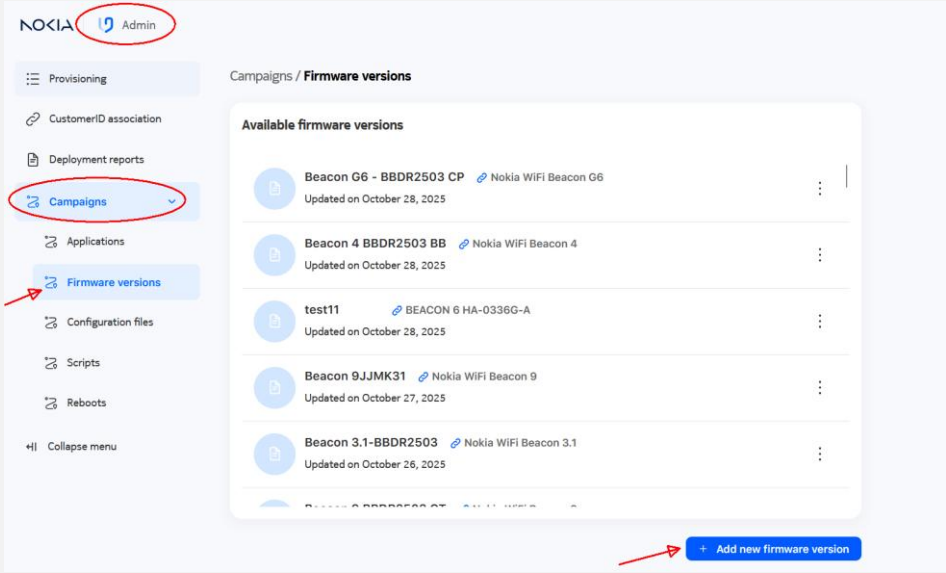
| Row Labels | Count of MAC |
|---|---|
| **Beacon 2** | **41492** |
| 1.2102.286 | 2 |
| 1.2103.403 | 15 |
| 1.2104.497 | 77 |
| 1.2204.504 | 10 |
| 1.2304.509 | 41214 |
| 1.2401.194 | 1 |
| 1.2402.307 | 4 |
| 1.2402.432 | 169 |
| **Beacon 3.1** | **15** |
| 1.2304.503 | 15 |
| **Nokia WiFi Beacon 10** | **1151** |
| 1.2303.421 | 19 |
| 1.2304.503 | 1114 |
| 1.2401.186 | 14 |
| 1.2402.303 | 1 |
| 1.2402.428 | 2 |
| (blank) | 1 |
| **Nokia WiFi Beacon 3.1** | **4661** |
| 1.2304.503 | 4356 |
| 1.2401.190 | 76 |
| 1.2401.323 | 172 |
| 1.2402.303 | 57 |
| **Grand Total** | **47319** |

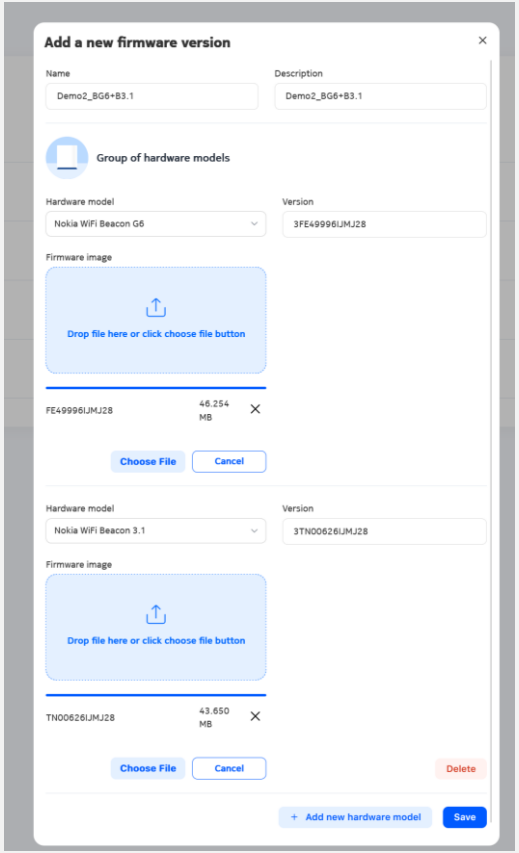
# Firmware Campaign using Corteca

## Admin dashboard

Nokia Root Beacon & Extender firmware can be upgraded via Corteca

1. Add new firmware image(s) for specific Beacon models
2. A campaign can support root and extenders of different models

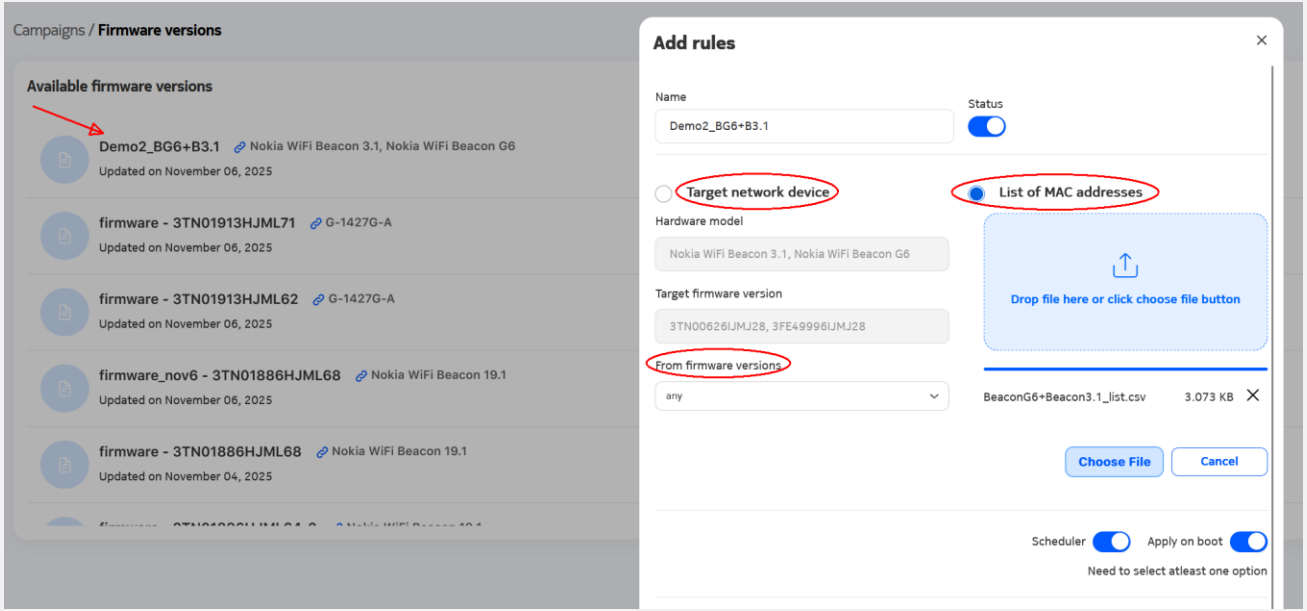


# Firmware Campaign using Corteca

## Admin dashboard

1. Add a Rule for the firmware activation
2. Select CPEs to be updated (all, limited set, etc.)

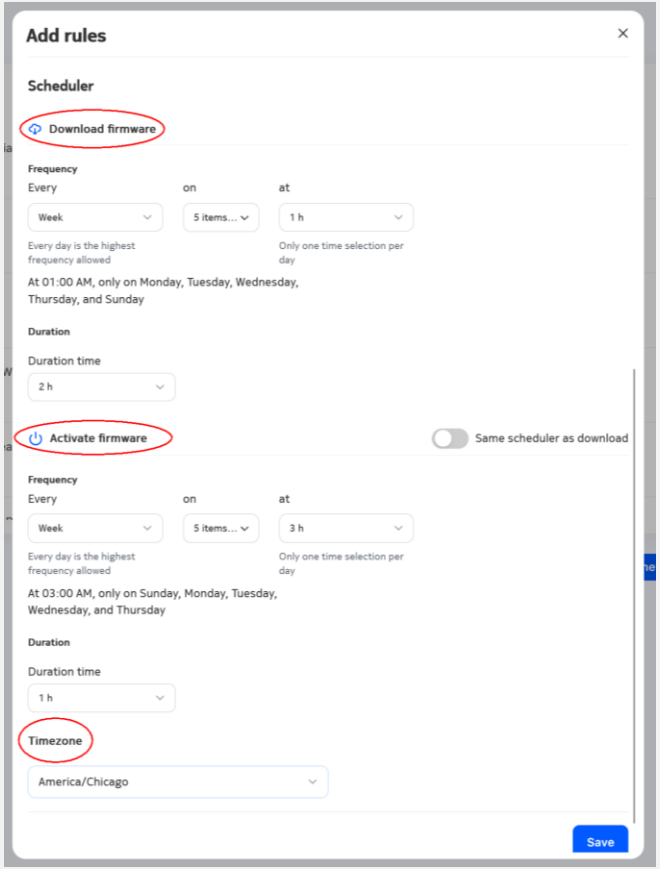


# Firmware Campaign using Corteca

## Admin dashboard

Schedule when to Activate Firmware

1. When to Download Firmware to the CPE
2. When to Activate the firmware (service impact)
3. Timezone for the CPEs in this campaign

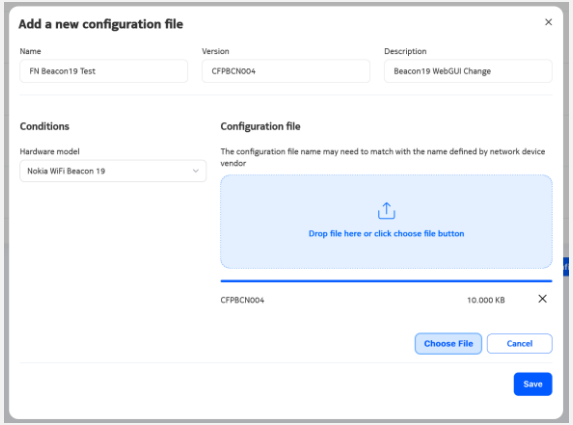


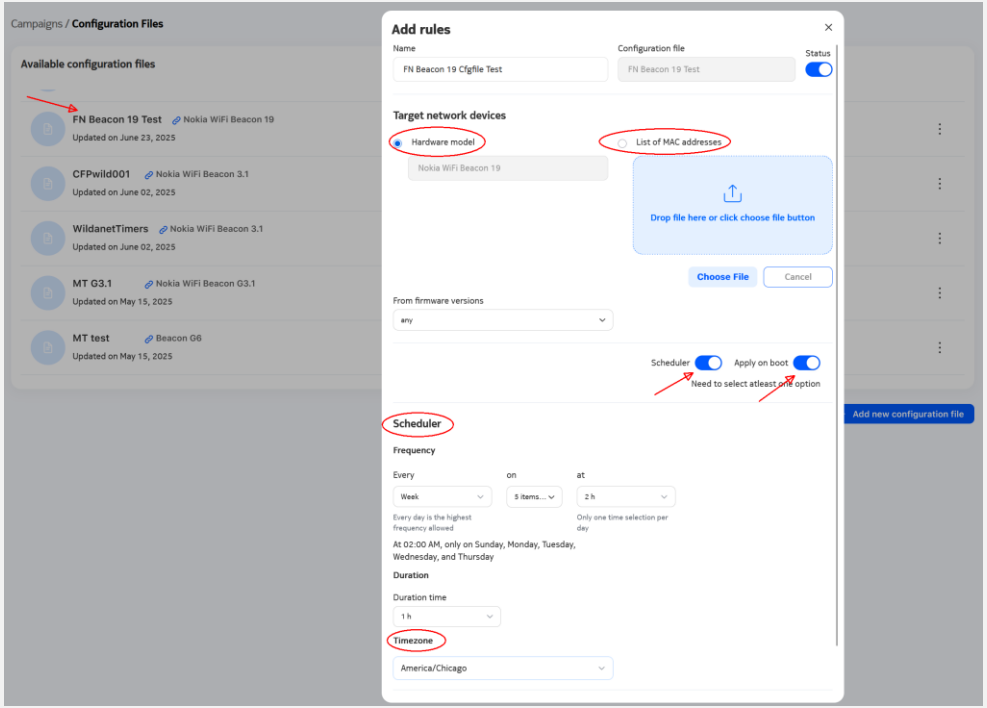
# Configuration files Campaign

## Admin dashboard

1. Create and upload a configuration file
2. Add a rule when to activate
   - Apply on boot

   and/or
   - Based on a specific schedule
3. Select time duration
4. Select timezone

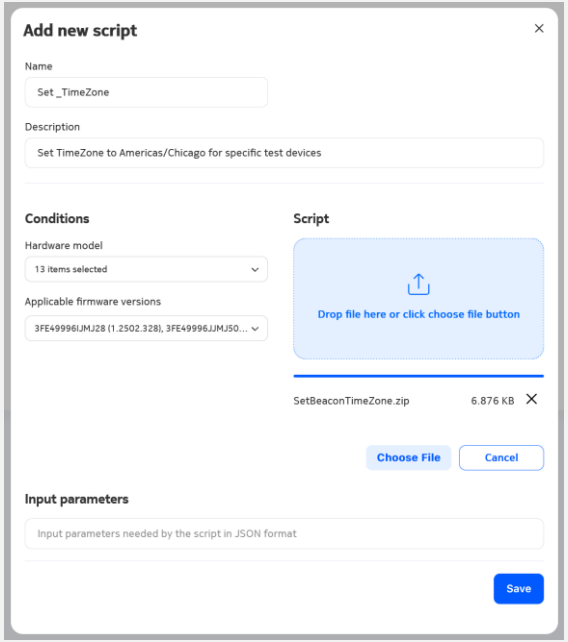


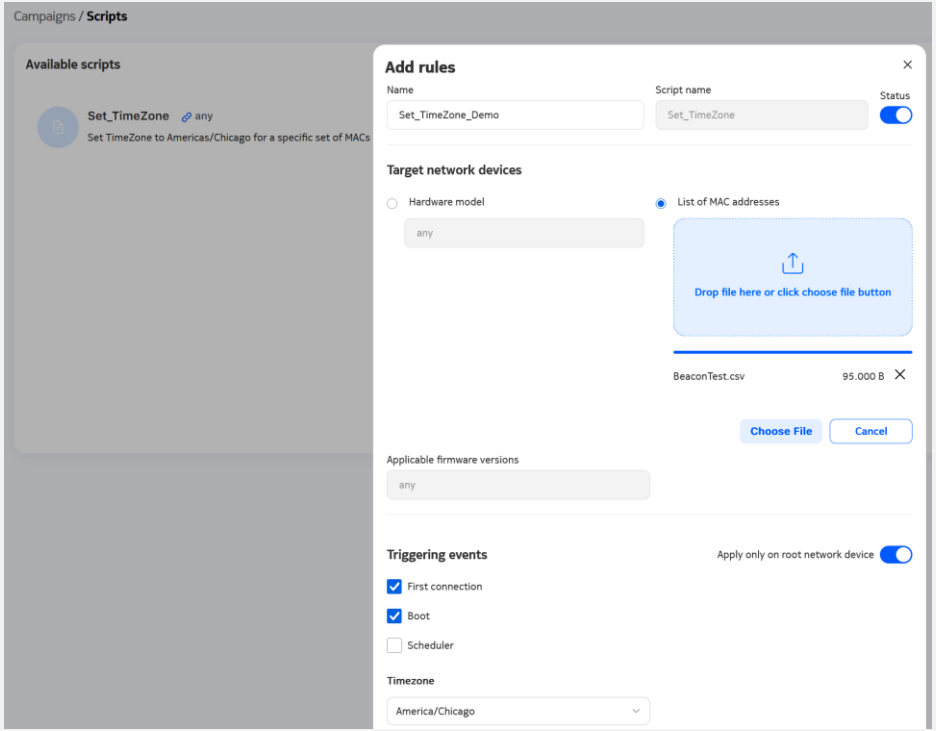



# Scripts Campaign

## Admin dashboard

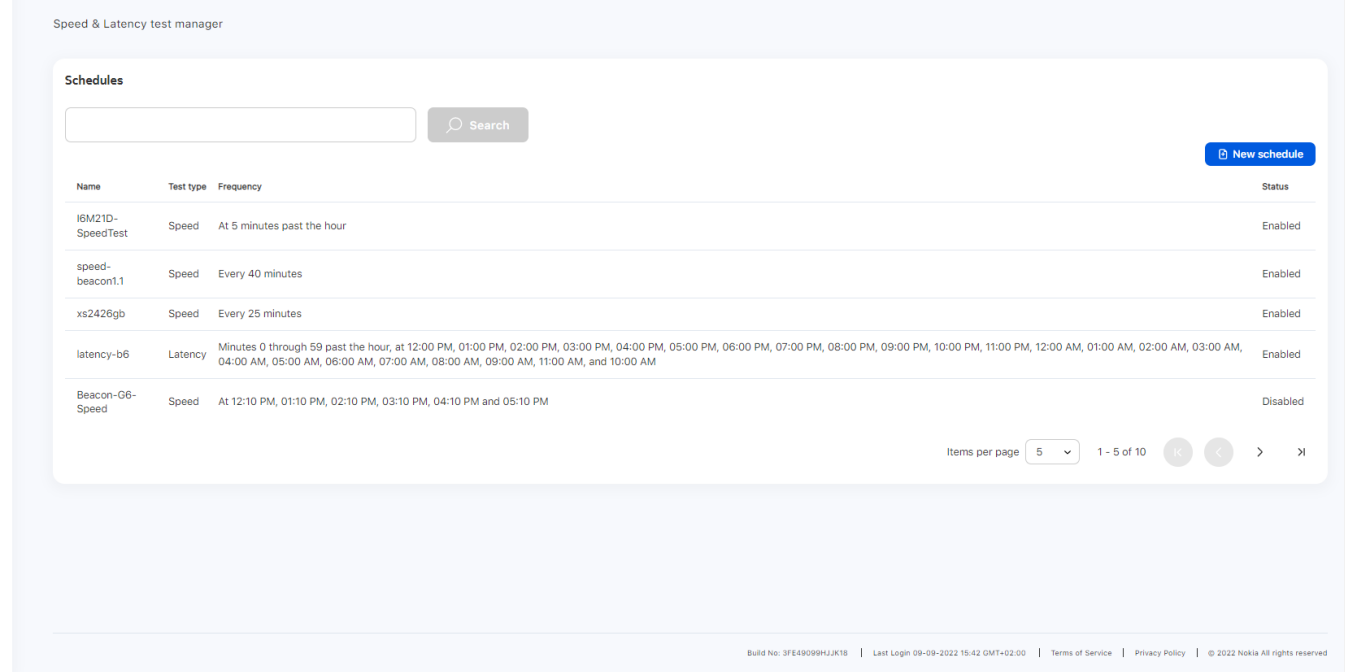
Upload a Javascript that will be executed periodically or upon certain event triggers



# Speed & Latency Test Orchestration

- Create speed and/or latency test schedules
- Define the Wi-Fi points to use as probes
- Retrieve the compliance report



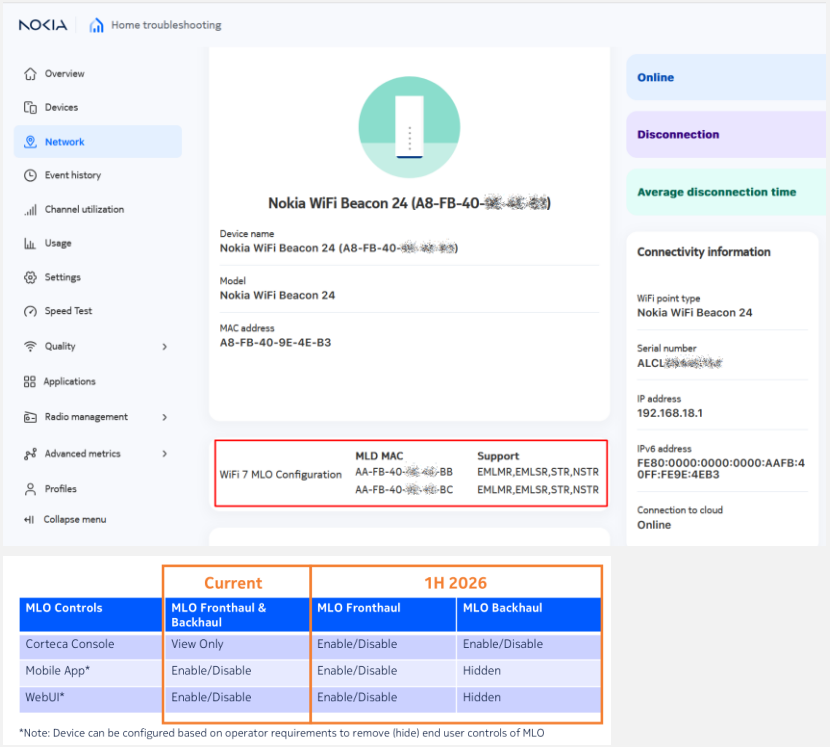

Included in the Home Controller L1 license

A separate keycloak role to access

# Corteca Support for Wi-Fi 7

# WiFi 7 - Multi-Link Operations Support

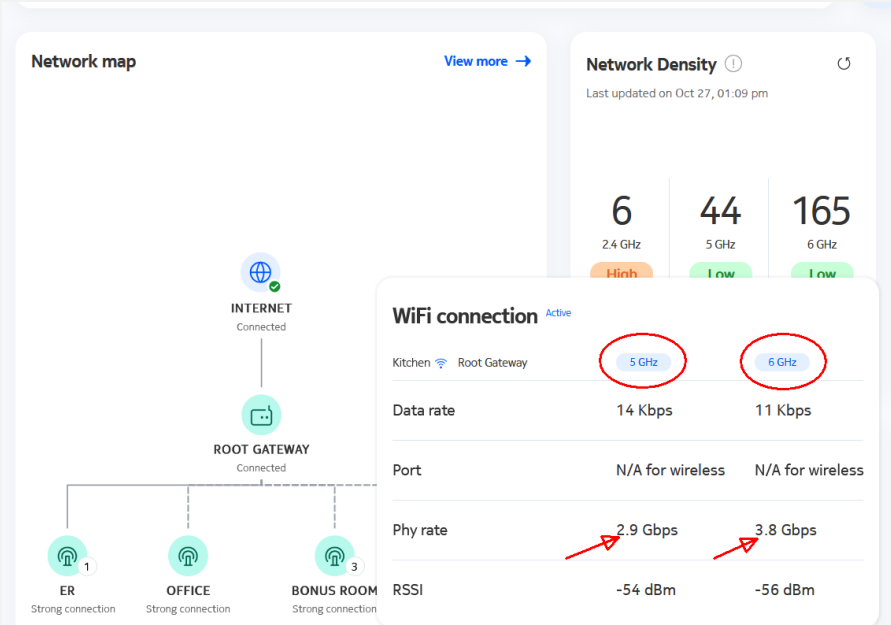
## Home troubleshooting dashboard




| | Current | 1H 2026 | |
|---|---|---|---|
| MLO Controls | MLO Fronthaul & Backhaul | MLO Fronthaul | MLO Backhaul |
| Corteca Console | View Only | Enable/Disable | Enable/Disable |
| Mobile App* | Enable/Disable | Enable/Disable | Hidden |
| WebUI* | Enable/Disable | Enable/Disable | Hidden |

*Note: Device can be configured based on operator requirements to remove (hide) end user controls of MLO

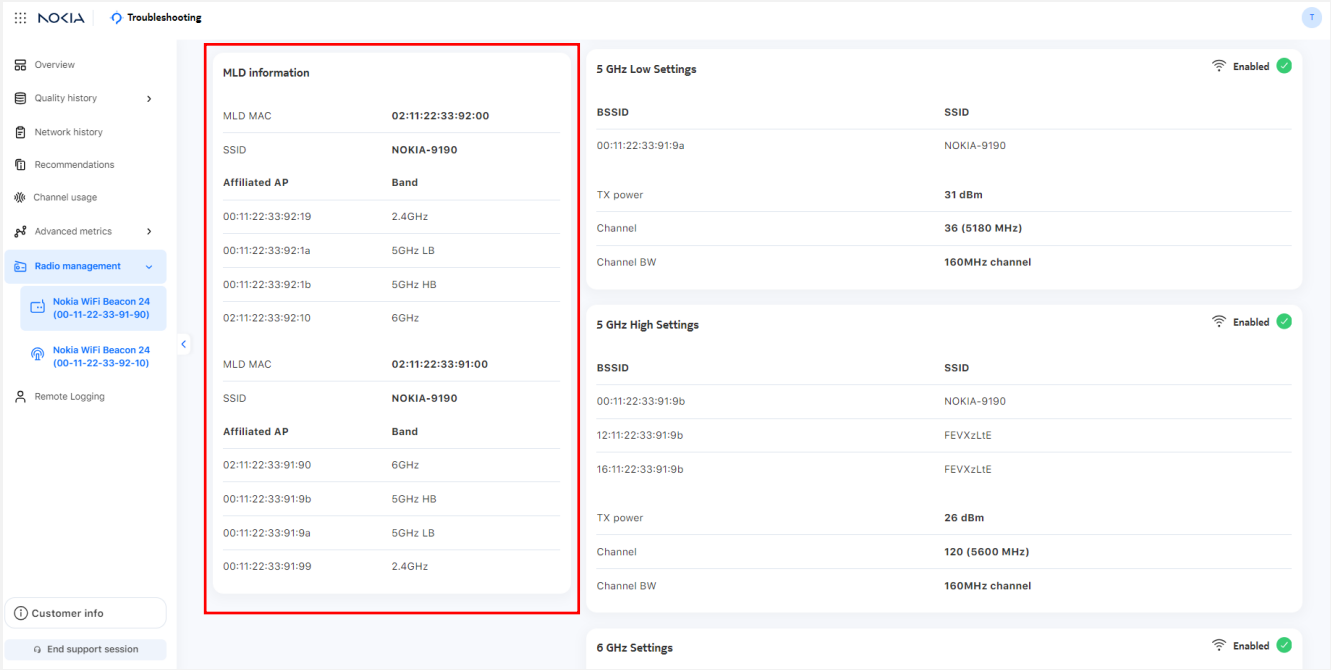
In a mesh config with MLO enabled, backhaul can use MLO. Screenshot below shows Beacon 19s using 5GHz and 6GHz for backhaul.



# WiFi 7 - Radio management page (L2)

## Home troubleshooting dashboard

When the home network is based on WiFi7 enabled devices, there is a new card with MLD information, which includes the SSID, the MLD MAC and the mapping of BSSID and radio bands. If the network device supports MLO backhaul, MLO backhaul BSSID will be also shown in the page.

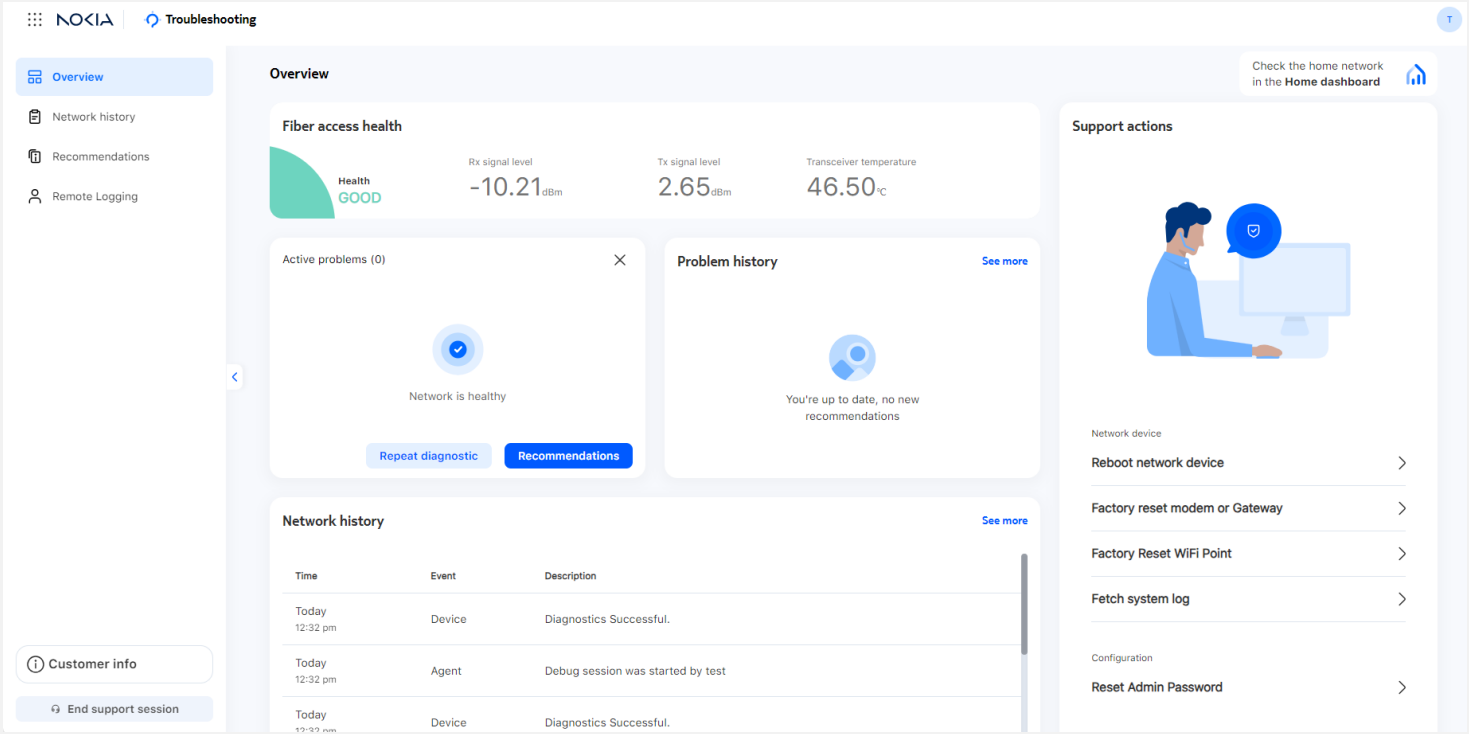


# Corteca supports

- non-WiFi CPEs
- 3rd Party CPEs

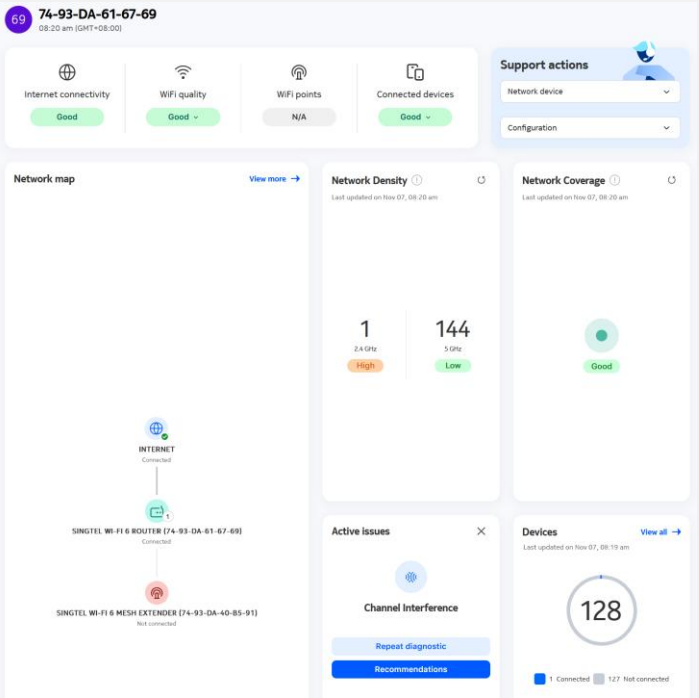
# Corteca supports non-WiFi CPEs: L2 ONT & FWA Receiver

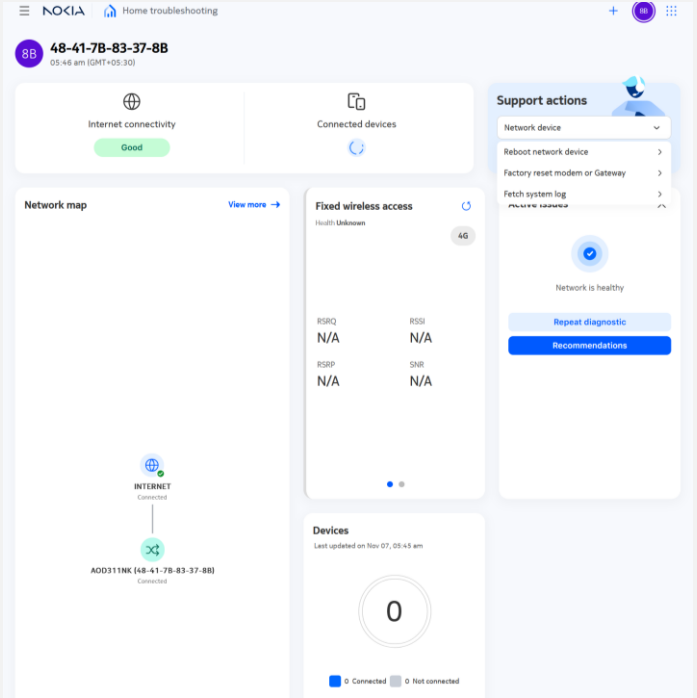
## Troubleshooting and Fiber access metrics



# Corteca - 3rd Party Routers and FWA Receiver

## 3rd Party Fixed Wireless Access point



# Appendix

# Case A: 150k APs network - Nokia Beacons + Home Controller

| Capability | Base benefits | End Benefits |
|---|---|---|
| **Proactive optimization - RRM algorithms**<br>Automatic optimization of the WiFi networks | **WiFi Performance**<br>• Aggregated throughput increase (i.e. increased capacity)<br>• Higher physical WiFi rates allocated<br>• Less noise and congestion events | **Business metrics**<br>• Reduction in total number of customer care calls (i.e. reduction in customer care costs)<br>• Increased NPS due to better user connectivity experience (i.e. potential higher ARPU)<br>• Reduction in churn due to better network quality (i.e. higher number of customers)<br>• Less field technician customer visits (i.e. reduction of field technician costs) |
| **Reactive case handling - Real time visibility**<br>Holistic view of the real time WiFi network status of a single Home | **Solving customer tickets**<br>• WiFi settings (passwords, SSIDs, etc.)<br>• Routers, WiFi Extenders onboarding<br>• Easy-to-solve performance issues (e.g. AP reboot, manual channel change, WiFi Extender wrongly positioned) | **Business metrics**<br>• Reduction in Average Handling Time (AHT) (i.e. reduction in customer care costs)<br>• Increased number of First Call Resolution (FCR) calls Time (i.e. reduction in customer care costs)<br>• Less field technician customer visits (i.e. reduction of field technician costs) |
| **Enhanced visibility**<br>Availability of metrics at different granularity levels from the aggregation at network level to a specific WiFi client's | **Better knowledge**<br>• About your customers (user profiling)<br>• About the quality delivered to your customers | **Business metrics**<br>• Increased NPS due to a better user knowledge (i.e. potential higher ARPU)<br>• More efficient marketing campaigns due to a better definition of the target (i.e. potential higher ARPU and lower marketing costs) |
| **User facing apps**<br>Expose WiFi management and diagnosis capabilities to the subscriber | **Value added services**<br>• DIY resolution of problems<br>• Parental control / Content filtering | **Business metrics**<br>• Reduction in total number of customer care calls (i.e. reduction in customer care costs)<br>• Less field technician customer visits (i.e. reduction of field technician costs)<br>• Introduction of value-added services experience (i.e. potential higher ARPU) |

# Case A: Benefits by using Home Controller L1 tools

## 150k APs network - Nokia Beacons + Home Controller

**9 out of 10**

Customers think that their WiFi experience has improved after installing Beacons

**0.9% vs. 2.5%**

**Call Ratio**

Customers with Beacons vs. ~2.5% customers with other modem / CPEs

**8 out of 10**

Customers did not have any need for support during / after installation

**11 min vs. 22 min**

Average handling time (per support call)

Reduced from 22mins

### Qualitative feedback

We have recently begun tracking the difference in customers satisfaction in our monthly Customer Satisfactory Analysis.

Although we do not have much data yet, it looks like satisfaction has increased on all parameters:

- Satisfied with my internet
- Value for money
- WiFi stability
- WiFi coverage

# Case B: 1M live network – 3rd party CPEs

Only RRM algorithms related benefits are being evaluated in "Customer X" (i.e. WiFi Performance improvements & reduction of calls)

| Capability | Base benefits | End Benefits |
|---|---|---|
| **Proactive optimization - RRM algorithms**<br>Automatic optimization of the WiFi networks | **WiFi Performance**<br>• Aggregated throughput increase (i.e. increased capacity)<br>• Higher physical WiFi rates allocated<br>• Less noise and congestion events | **Business metrics**<br>• Reduction in total number of customer care calls (i.e. reduction in customer care costs)<br>• Increased NPS due to better user connectivity experience (i.e. potential higher ARPU)<br>• Reduction in churn due to better network quality (i.e. higher number of customers)<br>• Less field technician customer visits (i.e. reduction of field technician costs) |
| **Reactive case handling - Real time visibility**<br>Holistic view of the real time WiFi network status of a single Home | **Solving customer tickets**<br>• WiFi settings (passwords, SSIDs, etc.)<br>• Routers, WiFi Extenders onboarding<br>• Easy-to-solve performance issues (e.g. AP reboot, manual channel change, WiFi Extender wrongly positioned) | **Business metrics**<br>• Reduction in Average Handling Time (AHT) (i.e. reduction in customer care costs)<br>• Increased number of First Call Resolution (FCR) calls Time (i.e. reduction in customer care costs)<br>• Less field technician customer visits (i.e. reduction of field technician costs) |
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| **User facing apps**<br>Expose WiFi management and diagnosis capabilities to the subscriber | **Value added services**<br>• DIY resolution of problems<br>• Parental control / Content filtering | **Business metrics**<br>• Reduction in total number of customer care calls (i.e. reduction in customer care costs)<br>• Less field technician customer visits (i.e. reduction of field technician costs)<br>• Introduction of value-added services experience (i.e. potential higher ARPU) |

# Case B: Activation of RRM algorithms (Home Controller L2)

## 3rd party CPEs: Activation of "CPE B" units and band steering in 90K "CPE B"s & 115k "CPE A" and "CPE C" FUT

### AP Throughput

By activating band steering (from 50k to 115k routers) **only in 31% of "CPE A" base**

+23%

### AP Throughput

By activating band steering **only in 15% of "CPE B" base**

+16%

### 5GHz utilisation

By activating band steering (from 50k to 115k routers) **only in 31% of "CPE A" base**

+30%

### Noise events

By activating channel management in recently updated 40k "CPE C" routers

-65%

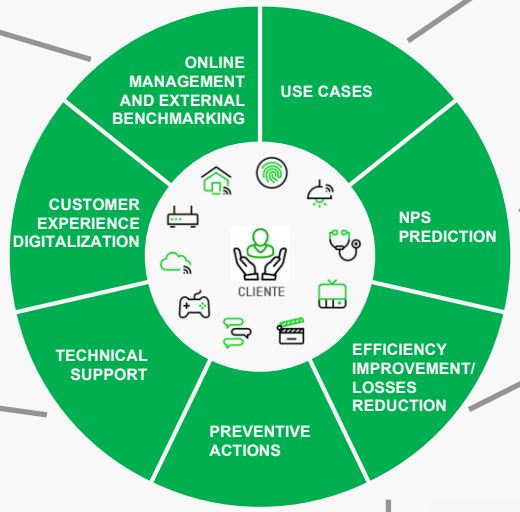
22% of WiFi related customer complaints in "CPE B" base after activation of RRM (source "Customer X")

# CEC – Customer Experience Center

## Main results of the first half of the year

- **Speed Test Ranking** Leadership for NPS Rating
- **73K communications** sent to the customers;
- **Technical Support Center with network integrated diagnose, customer WI-FI coverage and devices information;**
- **Digitization of massive failure of Social Networks and Applications.**

- **Redirecting** 27.5K customers **with recurrent problems to** differentiated **service;**
- **Technical Support Cell** service level **of 82%.**




- **1.7MM proactive communications sent to customers on** how to improve their Oi Fibra experience**;**
- **~44% of Customers** improved their use experience **one week after the communication**.

- **NPS Predictive** Model implementation**;**
- **Increase of 29% in** Corporate NPS

- **90%** reduction in unproductive **installations;**
- Proactive monitoring **for cases of ONTs stolen**

- 16.9k/month preventive **maintenance visits**
- 500K actions/month **remote corrective**

Source: Oi


NOKIA