



INTERNET AS IT  
SHOULD BE



Martin Jürgensen  
April 2019

# ABOUT WAOO

- Waoo is a Danish Internet Service Provider
- Pure Fiber to the home
- 350.000+ Connected homes.
- 1.000.000+ homes passed (potential costumers)
- 150.000+ TV customers
- Waoo is the challenger in the market
- Denmark is fully penetrated -> cannibalizing on competitors

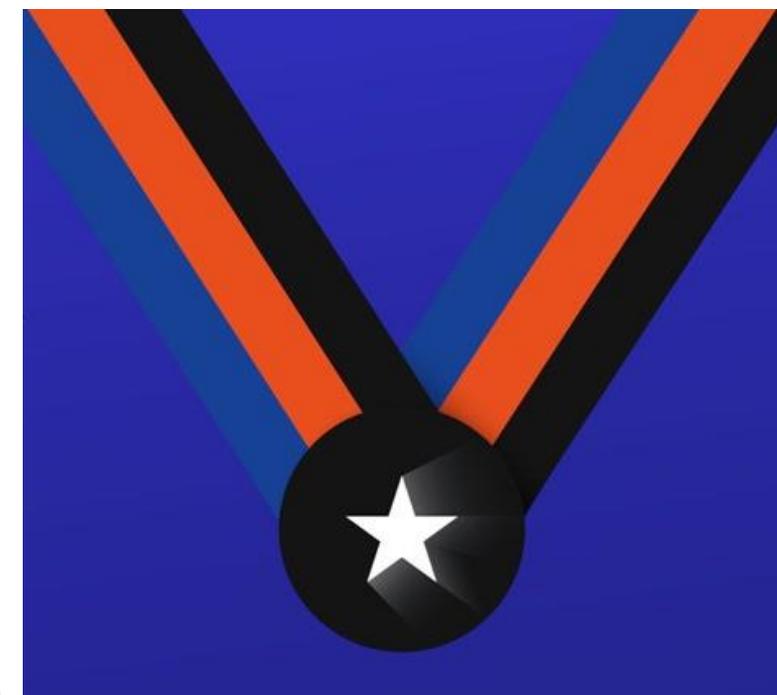
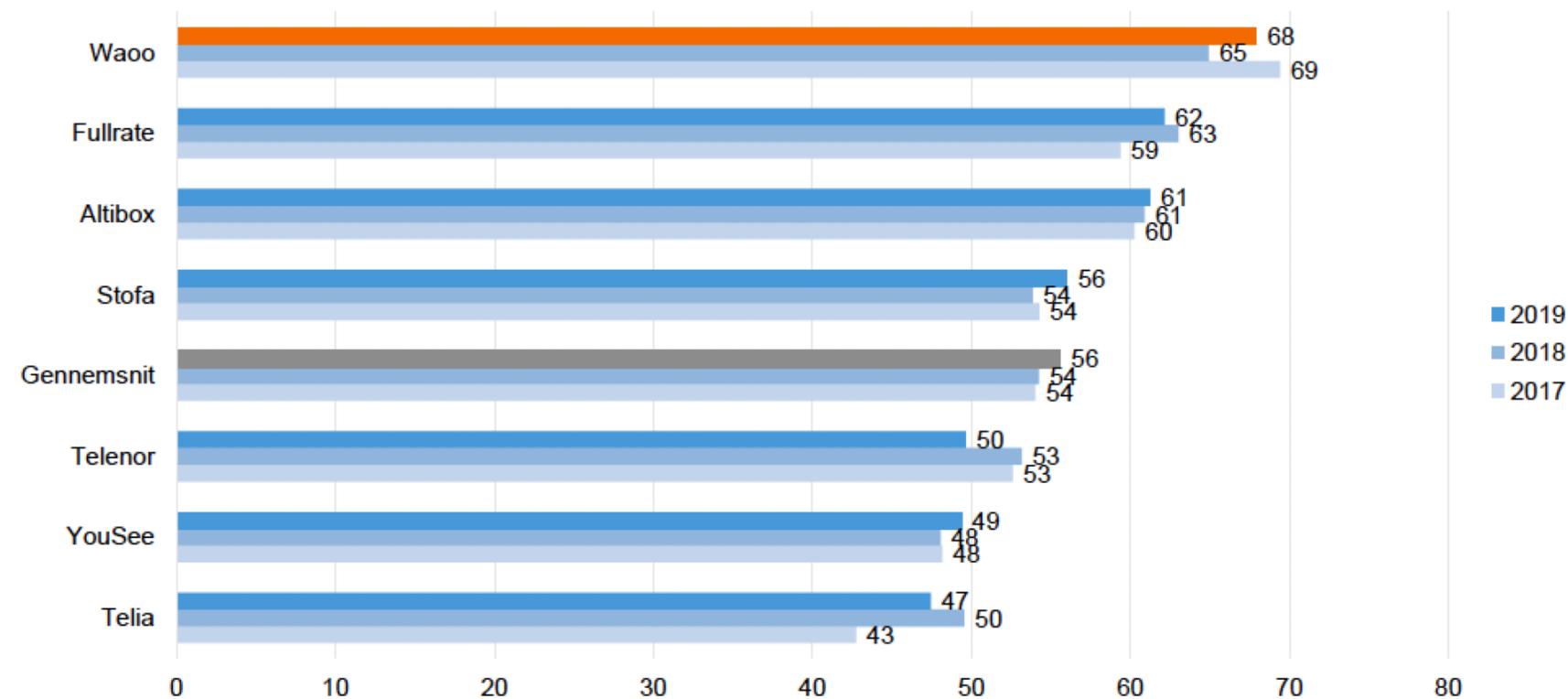
**DENMARKS LEADING  
SUPPLIER  
OF INTERNET, TV AND  
TELEPHONY**

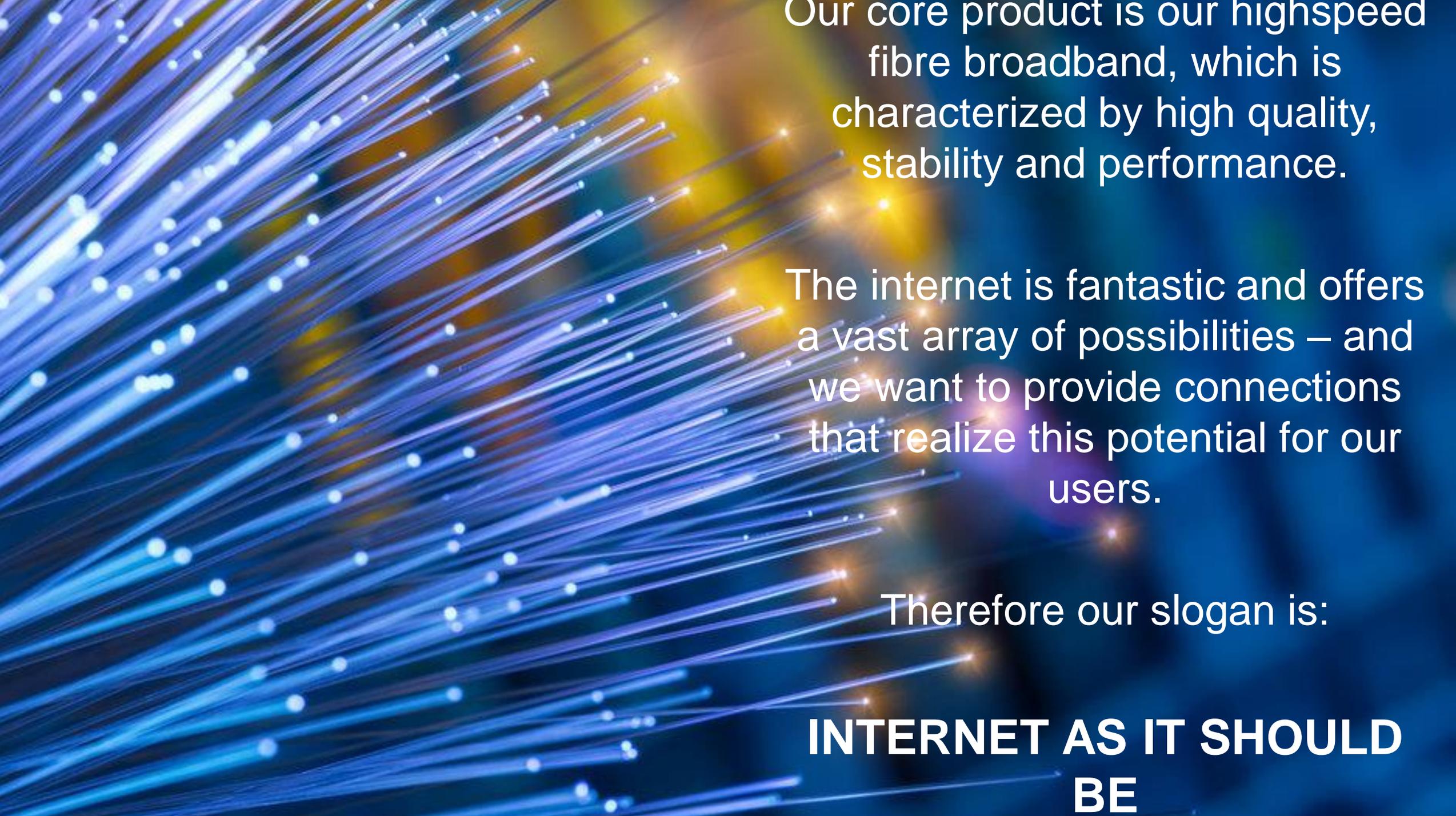


# DENMARKS BEST INTERNET

## Loyalitetsindekset

# ROW



The background of the entire image is a dynamic, abstract composition of numerous thin, glowing lines in shades of blue and yellow. These lines appear to be light trails from fiber optic cables, creating a sense of movement and connectivity. The lines are most concentrated on the left side and fan out towards the right, with some lines ending in small, bright circular spots. The overall effect is a futuristic and high-tech aesthetic.

Our core product is our highspeed fibre broadband, which is characterized by high quality, stability and performance.

The internet is fantastic and offers a vast array of possibilities – and we want to provide connections that realize this potential for our users.

Therefore our slogan is:

**INTERNET AS IT SHOULD  
BE**

# SPEED

# GUARANTEE

WAOC PROVIDES SPEED GUARANTEE

- We over-provision with 5-10% to the gateway
- Customers gets at least 100/100, 300/300 or 500/500
- No guarantee over WiFi (Yet)



**HASTIGHEDSGARANTI**

TESTDINHASTIGHED.DK

**WAOC**

**WAOO SMART WIFI**

**THE CONCEPT**



# Change of Mindset and Go-To-Market

**To**

An inspiring brand that provides solutions that realizes the full potential of the internet

– experiences!

SHIFT

**From**

A “classic” Telco ISP approach with a focus on rational messages – speed!



# WAOO SMART WIFI

The WiFi-set always ensures the most optimal WiFi-signal in all parts of the home – and therefore helps getting the most out of a Waoos fibre connection.



# SMART WIFI - THE CONCEPT

## Survey

- Conjoint survey shows WiFi was most important (after price).
- Speed, speed guarantee, Online storage etc was less important.

## Our philosophy about high speed and WiFi

- It is all about convenience
  - When you try high speed over WiFi you will never go back.
- WiFi like water - flows everywhere
  - You need a bigger pipe to fill your bathtub compared to washing your hands

# SMART WIFI

## Our rational to do this was:

- Primary: Experience value of internet
- Secondary: Increase ARPU
- 2/3 is private houses and 1/3 Multi Dwelling Units
- We typically deliver a set of 2 MESH units.
- They are pre-paired + extra clients can be added
- Single packs sold to small apartments
- Rental concept – not buy



# SMART WIFI – TECH FACTS

Wao Smart WiFi is our intelligent WiFi-solution using MESH-technology.

## Air4920

- 1600 Mbps 3x3 802.11ac + 2x2 802.11n
- Wireless MESH Extender
- Produced by AirTies
- Factory pre-paired as a set
- Supports video (multicast) and data
- Supports Ethernet Backhaul
- Easy addition of extra unit
- Config sharing
- The WiFi-solution can be controlled via a smartphone app



# SMART

# WIFI

- Price and speed was previously the main arguments
- The real value is what the consumer EXPERIENCES
- Before: 6-7 different price points.
- Now: 3 basic packages:

## One standard and two premium:

- 100/100 - Standard WiFi (gateway) + security (\$42)
- 300/300 - **Smart WiFi** - Security - Online storage - Full installation \$50,- (\$8 extra)
- 500/500 - **Smart WiFi** - Security - bigger Online Storage - Full installation - Always newest equipment (\$64,-)
  
- Two highest price points includes **Wao Smart WiFi**
  
- 150.000 MESH units (incl. TV-box)
- More than 90.000 homes



# Simplicity, Premium, Smart-WiFi

- A premium service
- WiFi Included in our top tier packa
- Integrated with wireless TV



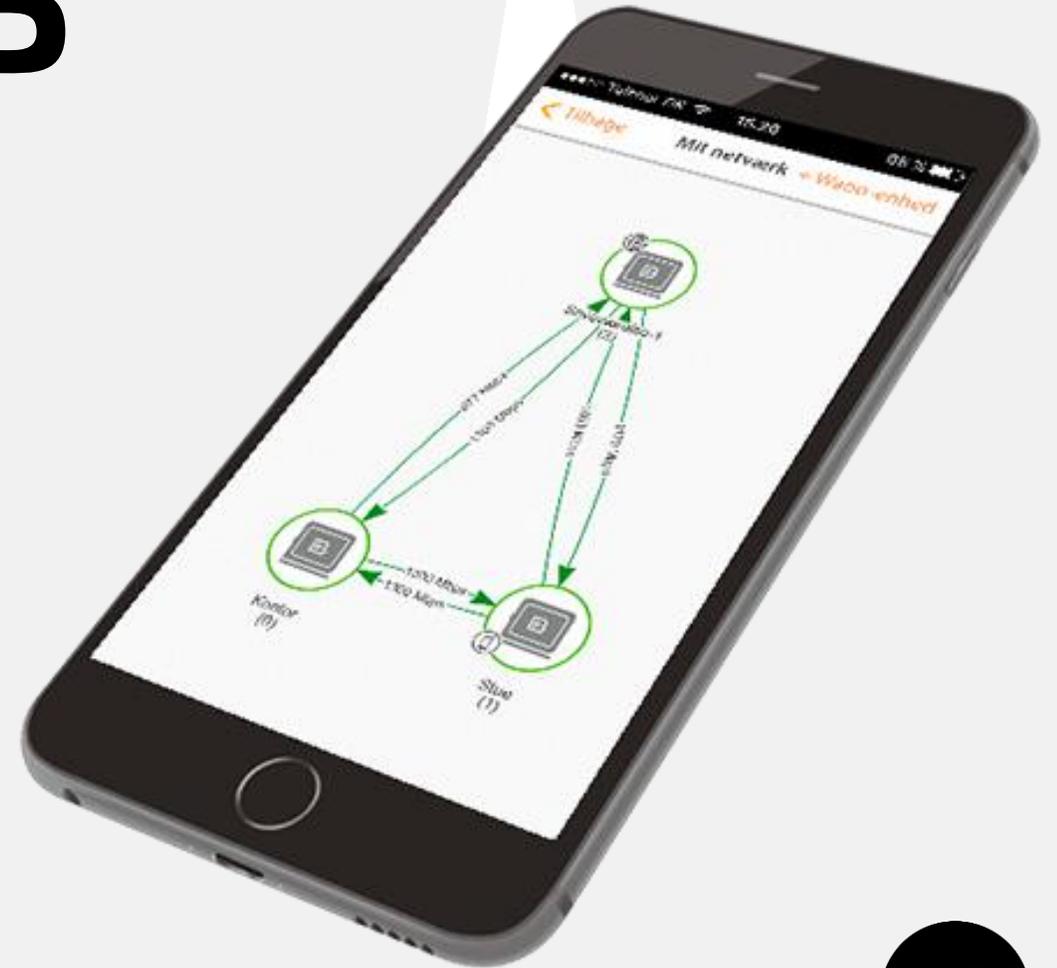
WAOO FIBER BASIC	WAOO FIBER EXTRA	WAOO FIBER FULL
<ul style="list-style-type: none"><li>• 100/100 Mbit/s</li><li>• Waoo Standard WiFi</li><li>• Sikkerhedspakke</li></ul>	<ul style="list-style-type: none"><li>• 300/300 Mbit/s</li><li>• Waoo Smart WiFi</li><li>• Sikkerhedspakke</li><li>• 25 GB online harddisk</li><li>• Waoo Udvidet Installation</li></ul>	<ul style="list-style-type: none"><li>• 500/500 Mbit/s</li><li>• Waoo Smart WiFi</li><li>• Sikkerhedspakke</li><li>• 100 GB online harddisk</li><li>• Waoo Udvidet Installation</li><li>• Altid det nyeste Waoo-udstyr</li></ul>



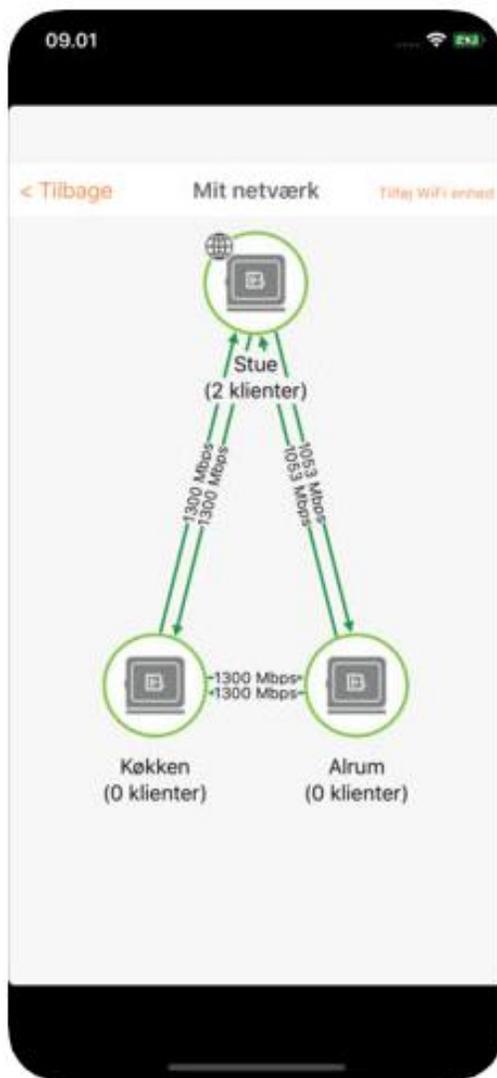
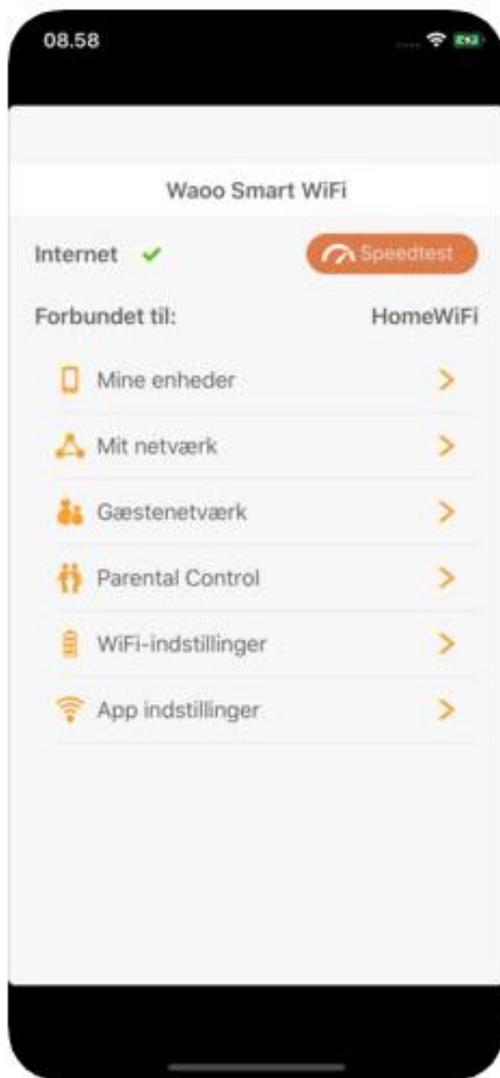
# SMART WIFI APP

## SELF SERVICE APP

- Easy installation
- Monitor network
- Manage devices
- Parental control
- Guest SSID



# SMART WIFI



# TV BOX



TV box includes a WiFi access point as part of the MESH.

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TV box includes a WiFi access point  
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# SMART WiFi

- This is **WiFi as a service** - we need to be able to support and monitor them to give good service.
- TV box includes a WiFi access point as part of the MESH.
- We are not in control of the gateway - 30 different models.
- We always deliver 2 MESH units.
- They are pre-paired - extra clients can be added
- Cloud monitoring – Remote Management
- App to help install and monitor the setup.



# REMOTE



Statistics Overview

All Domains



149.024  
Access Points

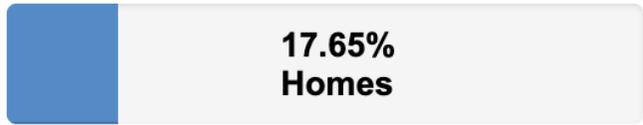


461.427  
Total Wireless Devices



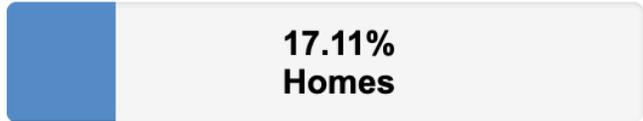
1.95 GB  
Average Download per Day per Device

## Recommended Actions



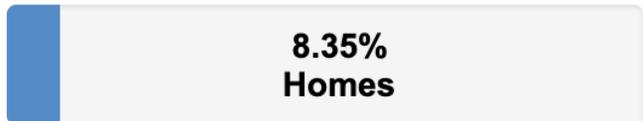
### Candidates for broadband upgrade

High number of clients, heavy downloads, high end device profile detected, needs fast broadband



### Candidates for Wi-Fi network upgrade

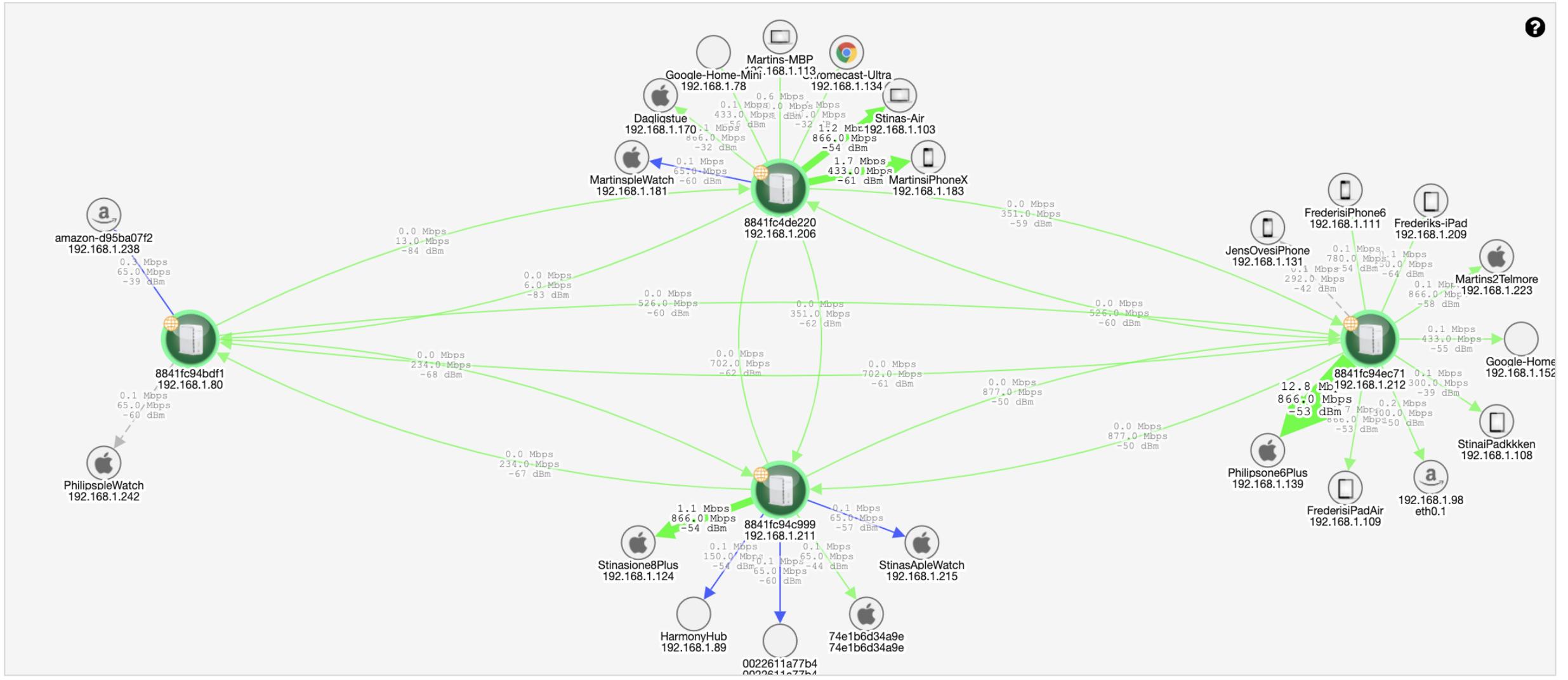
Coverage problems detected, needs extenders



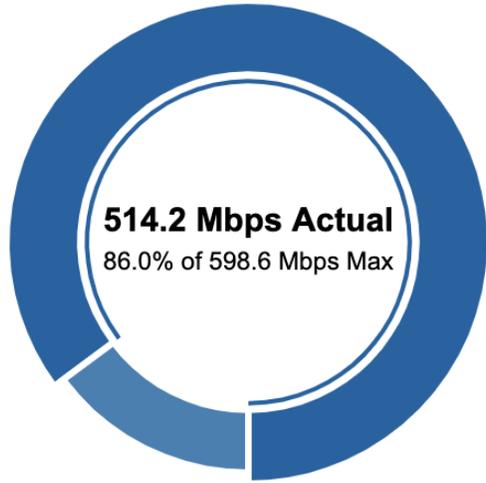
### Candidates for wireless device upgrade

Low end wireless devices detected, usage pattern justifies high end, recommend upgrading customer's wireless devices

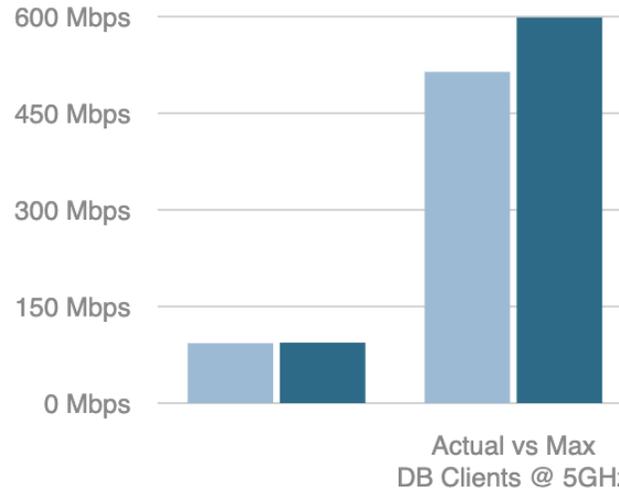




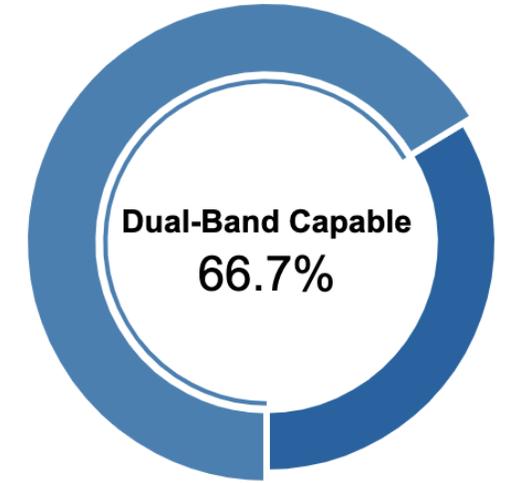
### Client Coverage Efficiency



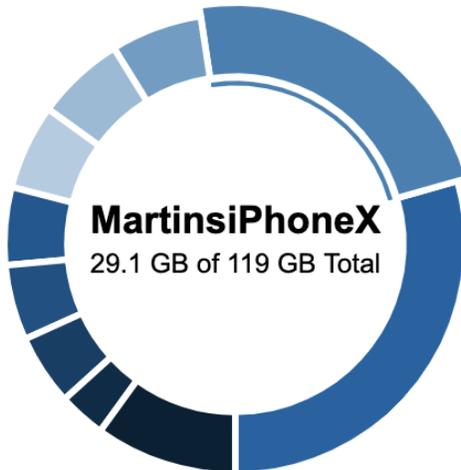
### Dual-Band Client Performance



### Client Dual-Band Capability

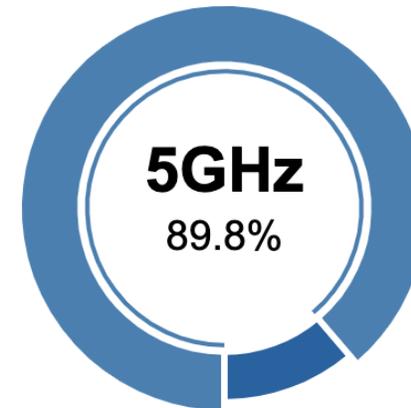


### Data Usage per Client



### Steering Performance

SB Client Uptime	<b>626 Hours</b>
DB Client Uptime	<b>2366 Hours</b>
@ 5GHz	<b>2125 Hours</b>
@ 2.4GHz	<b>241 Hours</b>
<b>Total Duration</b>	<b>2992 Hours</b>
<b>Average Weekly Connection Time</b>	
Single Band Clients	<b>63 Hours</b>
Dual-Band Clients	<b>118 Hours</b>



 Steering Actions	
2.4GHz → 5GHz	<b>0</b>
5GHz → 5GHz	<b>0</b>
2.4GHz → 2.4GHz	<b>0</b>
5GHz → 2.4GHz	<b>0</b>
<b>Total steers</b>	<b>0</b>



Friendly Name	Vendor	MAC Address	LAN IP	Capabilities	Max Phyrate	AP Connected	Estimated Throughput	Data Usage
➤ Philipsone6Plus	Apple	1c9148b9925f	192.168.1.139	2x2 AC Dual	867 Mbps	8841fc94ec71	227.90 Mbps	37.75 GB
➤ MartinsiPhoneX	Apple	4098ad2992af	192.168.1.183	2x2 AC Dual	433 Mbps	8841fc4de220	181.81 Mbps	29.14 GB
➤ Dagligstue	Apple	dc56e7468837	192.168.1.170	2x2 AC Dual	867 Mbps	8841fc4de220	221.27 Mbps	7.09 GB
➤ Chromecast-Ultra	Google	5460094f9320	192.168.1.134	2x2 AC Dual	867 Mbps	8841fc4de220	226.71 Mbps	6.84 GB
➤ Martins-MBP	Apple	784f4381bb02	192.168.1.113	3x3 AC Dual	1300 Mbps	8841fc4de220	262.50 Mbps	6.51 GB
➤ Stinasione8Plus	Apple	4098ad03ce76	192.168.1.124	2x2 AC Dual	867 Mbps	8841fc94c999	218.85 Mbps	5.82 GB
➤ StinaiPadkken	Apple	54ae2722300d	192.168.1.108	2x2 N Dual	300 Mbps	8841fc94ec71	139.94 Mbps	5.61 GB
➤ Stinas-Air	Apple	5cf93889aba0	192.168.1.103	2x2 AC Dual	867 Mbps	8841fc4de220	229.06 Mbps	5.20 GB
➤ FrederisiPadAir	Apple	34ab37928a46	192.168.1.109	2x2 AC Dual	867 Mbps	8841fc94ec71	228.99 Mbps	2.96 GB
➤ MartinspleWatch	Apple	f86fc1a4bc68	192.168.1.181	1x1 N 20MHz 2.4 GHz	72 Mbps	8841fc4de220	54.33 Mbps	1.81 GB
➤ amazon-d95ba07f2	Amazon	40b4cddb21d2	192.168.1.238	1x1 N 20MHz 2.4 GHz	72 Mbps	8841fc94bdf1	53.99 Mbps	1.57 GB
➤ 192.168.1.98	Amazon	34d27019fb2d	eth0.1	2x2 N Dual	300 Mbps	8841fc94ec71	139.77 Mbps	1.44 GB
➤ StinasApleWatch	Apple	347c25e413d4	192.168.1.215	1x1 N 20MHz 2.4 GHz	72 Mbps	8841fc94c999	54.06 Mbps	868.81 MB
➤ Google-Home-Mini	undefined	44070bbe2ba2	192.168.1.78	1x1 AC Dual	433 Mbps	8841fc4de220	206.12 Mbps	732.26 MB
➤ Google-Home	Google	20dfb98123ae	192.168.1.152	1x1 AC Dual	433 Mbps	8841fc94ec71	196.80 Mbps	731.26 MB
➤ HarmonyHub	Slim	000420e8a468	192.168.1.89	1x1 N 2.4 GHz	150 Mbps	8841fc94c999	59.58 Mbps	680.60 MB
➤ Argon	Frontier	0022611a77b4		1x1 N 20MHz Dual	72 Mbps	8841fc94c999	56.76 Mbps	669.59 MB



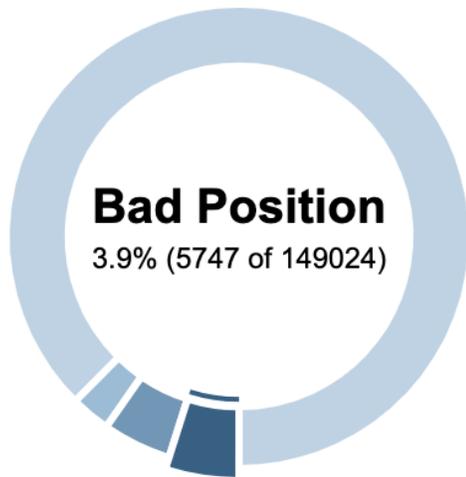
Installation Health

Client Warnings

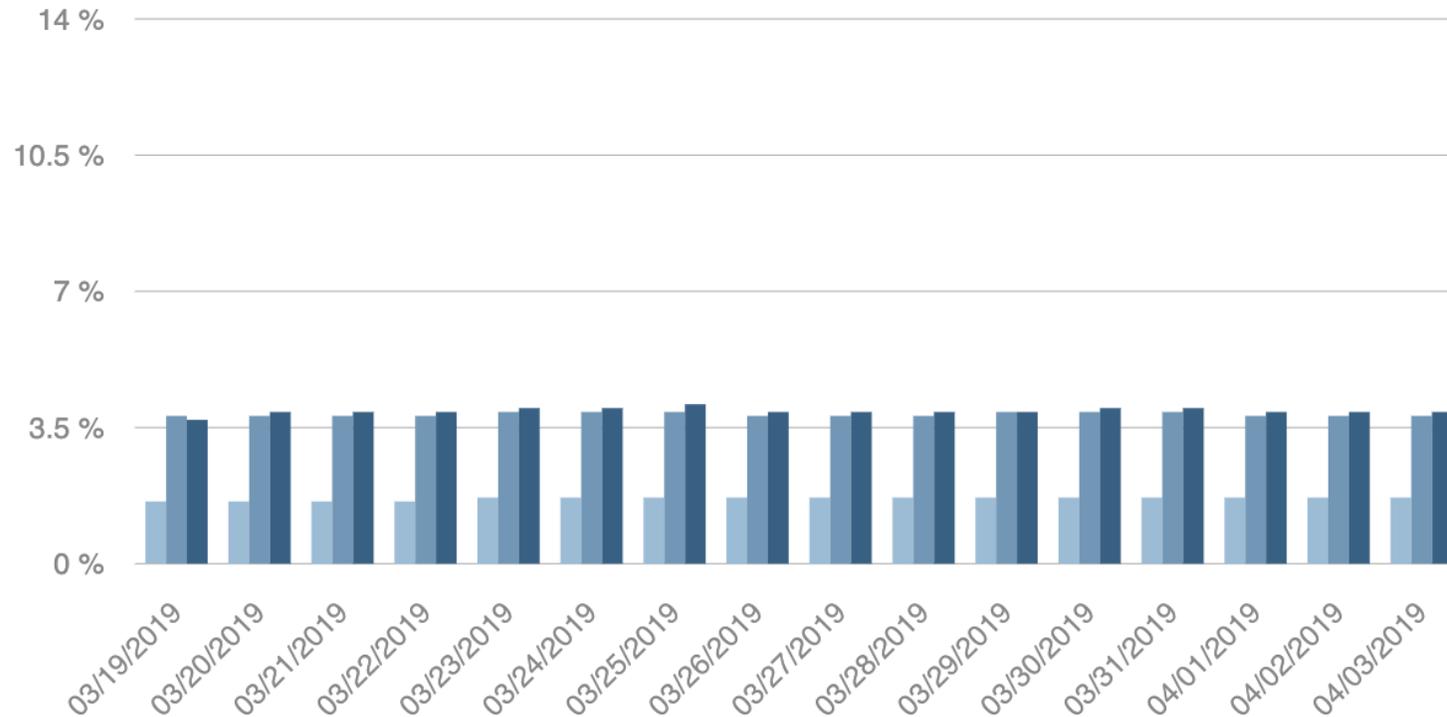
DFS

## Installation Alarms

Healthy Nodes   Too Close   Weak Position   Bad Position



Report Date: 04/03/2019 





## Please Select an Item

### Wi-Fi Performance Reports

- Airtime Analysis Reports
- Homes that need Broadband Upgrade
- Homes with Coverage Problems
- Homes that need wireless device upgrade
- Homes that have coverage problems and need extenders**
- Generic Consolidated Dashboard

### Channel Reports

### Device-Hardware Reports

### Client Reports

### Installation Reports

### Top 100 Device Lists

- Reboot Analysis Reports
- Channel Change Reports for 5GHz
- Channel Change Reports for 2.4GHz
- 5GHz Airtime Analysis Reports
- 2.4GHz Airtime Analysis Reports
- Client RSSI Report
- Legacy Client Connected Devices

## Description

Related report contains all homes that need wireless network upgrade according to wireless client's coverage problems. Home details contains domain-id, wan-ip, ethernet-mac, serial and percentage of coverage problem.

## Start Date

Select Date...

## End Date

Select Date...

[FILE-LIST](#)

# SMART WIFI - RESULTS

## Success

- More than **95%** of the WiFi units are used.
- Our competitors copied our concept.
- And the products are now being sold in retail.

## NPS

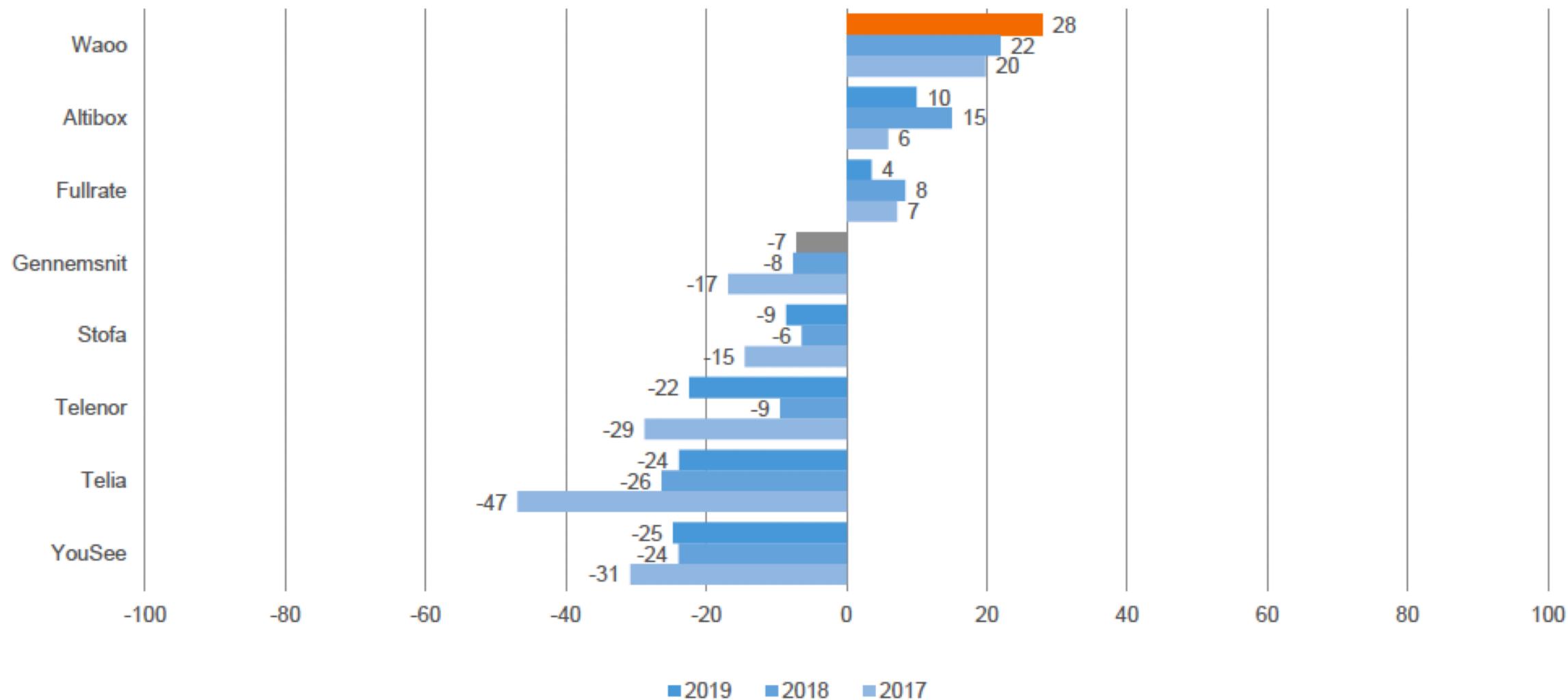
- Net Promotor Score from **20 to 28**

## Awards

- Won the Wi-Fi Now 2016 award for Best In Home WiFi Product



# Net Promoter Score®



# SMART WIFI

- Almost 100% increase in two top tiers.
- Before about 20% in top tiers. Now 40%

## WAOO FIBER BASIC

- 100/100 Mbit/s
- Wao Standard WiFi
- Sikkerhedspakke

## WAOO FIBER EXTRA

- 300/300 Mbit/s
- Wao Smart WiFi
- Sikkerhedspakke
- 25 GB online harddisk
- Wao Udvidet Installation

## WAOO FIBER FULL

- 500/500 Mbit/s
- Wao Smart WiFi
- Sikkerhedspakke
- 100 GB online harddisk
- Wao Udvidet Installation
- Altid det nyeste Wao-udstyr



# SMART WIFI - LEARNINGS

- Educate customers that WiFi will not provide 100% of their needs.
- Better to have full coverage and stable connection vs. max speed.

**WAWO**

# SMART WIFI NEXT

## Next Gen.

- WiFi 6 (802.11ax) - Higher speeds, better coverage, better battery usage, more clients
- Push notifications to users in App
- Better start-up installations process
- Focus on Gamers (low latency)

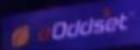
# GEN.



ELGIGANTEN



ELGIGANTEN



ELGIGANTEN



ELGIGANTEN



GANTEN



ELGIGANTEN





# WAOO FOR GAMER

Waoo has massive focus on eSports

- Sponsor CS:GO Pro Team **TRICKED**
- Sponsor of FIFA Pro Team **AGF**
- Sponsor of **FIFA LEAGUE** Denmark
- Sponsor of **WAOO CS:GO LEAGUE**



## Important factors for gamers

- Low latency and Ping – Ping is king
  - **Latency** is the time it takes for data packets to reach your device from a server.
  - **Ping** is the time it takes a data packet to leave your device, reach a server, and return.
  - Basically, they both measure “lag.”
- Stable connection
- High speed (for downloads)



# STREAMING OVER WIFI



## High Quality WiFi

- 4K streaming
- Multiple devices









# DESIGN





INTERNET AS IT  
SHOULD BE