VODAFONE PRO 2 BROADBAND

CLAIMS SUBSTANTIATION

October 2022

Updated April 2025

Superfast broadband for less.

Guaranteed Wi-Fi in every room with Wi-Fi 6E.

Introduction

Vodafone introduced Pro 2 Broadband powered by the Ultra Hub and Super Wi-Fi 6E Booster and backed up with 4G Broadband Back-Up in October 2022.

Stay connected with our award-winning, reliable 4G Network.
The UK relies on Vodafone as a network provider as it:

- powers critical national infrastructure and 82% of Emergency Services (see our Public Sector Portal for further information),
- has coverage in 99% of UK homes,
- covers 96% of the UK's landmass; and
- has won numerous awards.

See full details and awards on our Network page:

Enjoy Superfast speeds throughout your home.
Superfast broadband offers speeds of 30Mbit/s or more as confirmed by Ofcom. Using superfast broadband means that you can:

- download things much faster.
- make high quality video calls over Wi-Fi.
- easily access online TV and music streaming services.
- have several people using the broadband connection at the same time in your home

We guarantee Wi-Fi in every room with Wi-Fi 6E:

1. Our Ultra Hub and Super Wi-Fi 6E Boosters are the only Wi-Fi 6E enabled broadband devices that are inclusive with customer broadband plans by any major home broadband providers - hub and boosters can be placed throughout a customer's home dependent on their requirements.
2. Wi-Fi 6E is a technical standard for Wi-Fi that introduced a frequency (6Ghz) over and above previous Wi-Fi standards (including Wi-Fi 6 and Wi-Fi5) that means there is a "fast lane" for compatible end-user devices.
3. Our Wi-Fi 6E end-user device testing results show that Vodafone's Pro 2's technology beats the competition in terms of Wi-Fi 5, 6 and 6E products.

What is Wi-Fi 6E?

Wi-Fi 6E is a standard of Wi-Fi chipsets that provides a faster connection for compatible end-user devices in the home.

The difference between Wi-Fi 6E versus other standards is explained in the table below:

Wi-Fi Specification	What it means?	Speeds supported
Wi-Fi 6E	Introduced a new frequency that creates a "fast lane" for compatible devices reducing load on the 5Ghz and 2.4Ghz frequencies allowing them to be more performant with devices throughout home. 6GHz offers faster data rates over shorter distances to devices with Wi-Fi 6E capability.	6Ghz – 4.8Gbps 5Ghz –4.8Gbps 2.4Ghz – 1.2Gbps Total available speed: 10.8Gbps
Wi-Fi 6	Introduced improved performance for the frequencies meaning faster Wi-Fi signals get throughout the home.	5Ghz -4.8Gbps 2.4Ghz – 1.2Gbps Total available speed: 6Gbps

Wi-Fi5	The most common Wi-Fi chipset in major internet service provider hubs. This chipset heralded dual band Wi-Fi frequencies which extended reach and capacity so that more devices could operate without a wired connection	5Ghz – 1.733Gbps 2.4Ghz- 433Mbps Total available speed: 2.2Gbps

Specification of our Ultra Hub versus other major providers, as detailed in the testing below.

The Ultra Hub Specification

- Class: Tri-Band Wi-Fi 6E
- Antennae: 4x4 + 4x4 + 4x4
- Ethernet Ports: 1 x 2.5G Ethernet 2 x 1G Ethernet
  Wireless encryption: WPA2 + WPA3

FDM

Router Comparison | Router Review

Date collected: 05/10/2022

Router Launch Date	Vodafone WiFi6E Ultra Hub Oct-22	Vodafone WiFi Hub Jul-19	Sky Broadband Hub Sept-19	TalkTalk Amazon Eero Pro 6 Mar-22	TalkTalk Amazon Eero 6 Aug-21	TalkTalk WiFi Hub Jul-18	BT Smart Hub 2 Nov-18	Virgin Media Hub 3 2015/16	Virgin Media Hub 4 Sept-19	Virgin Media Hub 5 Oct-21
Class	Tri-Band Wi-Fi 6E 802.11ax	Dual Band 802.11ac	Dual Band 802.11ac	Tri-Band Wi-Fi 6 802.11ax	Dual Band 802.11ax	Dual Band 802.11ac (Wave 2)	Dual Band 802.11ac	Dual Band 802.11ac	Dual Band 802.11ac (Wave 2)	Dual Band 802.11ax
WiFi Spec	WiFi 6E	WiFi 5	WiFi 5	WiFi 6	WiFi 6	WiFi 5	WiFi 5	WiFi 5	WiFi 5	WiFi 6
2.4GHz | 5Ghz Antenna	4 x 4 | 4 x 4 | 4 x 4	3 x 3 | 4 x 4	4 x 4 | 4 x 4	2 x 2 | 2 x 2 | 4 x 4	2 x 2 | 4 x 4	3 x 3 | 4 x 4	3 x 3 | 4 x 4	3 x 3 | 4 x 4	3 x 3 | 4 x 4	3 x 3 | 4 x 4
Ethernet Ports Fast = 100Mbps Gigabit = 1,000Mbps	1 x 2.5G Ethernet 2 x 1G Ethernet	4x Gigabit	4x Gigabit	2 x 1G Ethernet	2 x 1 Gigabit	1x Gigabit	4x Gigabit	4x Gigabit	4x Gigabit	1x 2.5 Gigabit 3x Gigabit
USB Ports	2	2	1	1	1	0	1	0	0	0
Wireless Encryption	WPA2 + WPA3	WPS, WPA2 + WPA	WPA2-PSK, WPA2-AES	WPA2 + WPA3	WPA2-AES / WPA3	WEP / WPA & WPA2	WPA2-PSK, WPA2-AES	WEP/WPA/ WPA2	WEP/WPA/ WPA2	WEP/WPA/ WPA2

Data provided by FDM on 05/10/22

Please note, Virgin Media's Hub 5 was not tested as it was not widely available on the market when the testing took place. Also Virgin Media have confirmed at the time that the Hub 5 is not currently compatible with their Intelligent Wi-Fi Pods (Wi-Fi extender solution). Given the limited availability and lack of comparable propositions, we therefore excluded the Virgin Media Hub 5 from our testing. In our testing we aimed to compare Vodafone's Pro 2 technology with comparable hardware from other major home broadband providers; unlike Virgin Media, every customer who purchases or upgrades to a Vodafone Pro 2 plan, will get the Vodafone Ultra Hub AND Super Wi-Fi 6E Boosters, which has Wi-Fi-6E.

Vodafone Pro 2 Broadband - Testing

The testing was conducted by Cartesian, a highly-respected independent telecommunications consultancy company.

The tests were developed with consideration given to a number of different factors including; how customer's predominantly use Wi-Fi enabled devices, regulatory requirements to ensure compliance with advertising standards and industry standards.

Testing was carried out in several environments; firstly, controlled "laboratory" environment using Wi-Fi 6E enabled devices ("Test Type 1") and then secondly, in real homes ("Test Type 2").

Test Type 1: Controlled "laboratory" environment versus other major providers

We tested the following devices in the data labs:

Home broadband provider + Proposition name	Hardware Wi-Fi router	Wi-Fi extender / booster
Vodafone Pro 2 Broadband	Vodafone Ultra Hub	Vodafone Super Wi-Fi 6E Booster
BT Halo 3+	BT SmartHub2	Complete Wi-Fi Booster
Sky	Sky Q Hub	Booster
Talk Talk	eero Pro	Booster (E6)

In the test environments measurements were taken throughout the home at different locations and each data point was tested 3 times.

Given that the testing was looking to measure Wi-Fi performance, the Wi-Fi range was the variable in the test. Different locations were chosen within the test home to test the ranges of the routers. Each router was located in the same spot within the home, with the position on the table permanently marked to allow for repeatability. The three test end-user devices were then placed in these various locations, and the Wi-Fi signal tested for each of the routers.

We used a Lenovo E14 Gen 2 laptop which is Wi-Fi 6Ecompatible and benefits from the full capacity of Vodafone Pro II's technology. This is demonstrated in the test results which shows that Vodafone has the UK's fastest Wi-Fi technology when compared to other major home broadband providers.

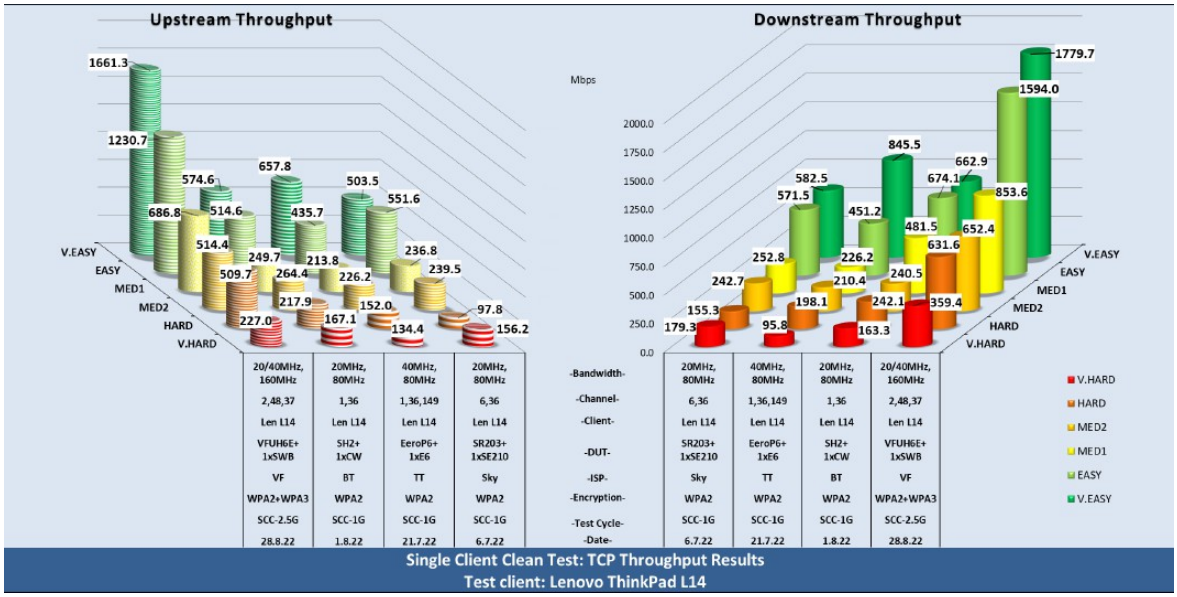
In each environment, 5 locations were tested. Each location was classified as such:

Classification	Distance of end-userdevice from router:
Very easy	Lobby (Line of Sight)
Easy	Bedroom 1
Medium 1	Kitchen
Medium 2	Bedroom 3
Hard	Utility Room

See floorplan in the Appendix 1 - "Test House (Brook Farm)"

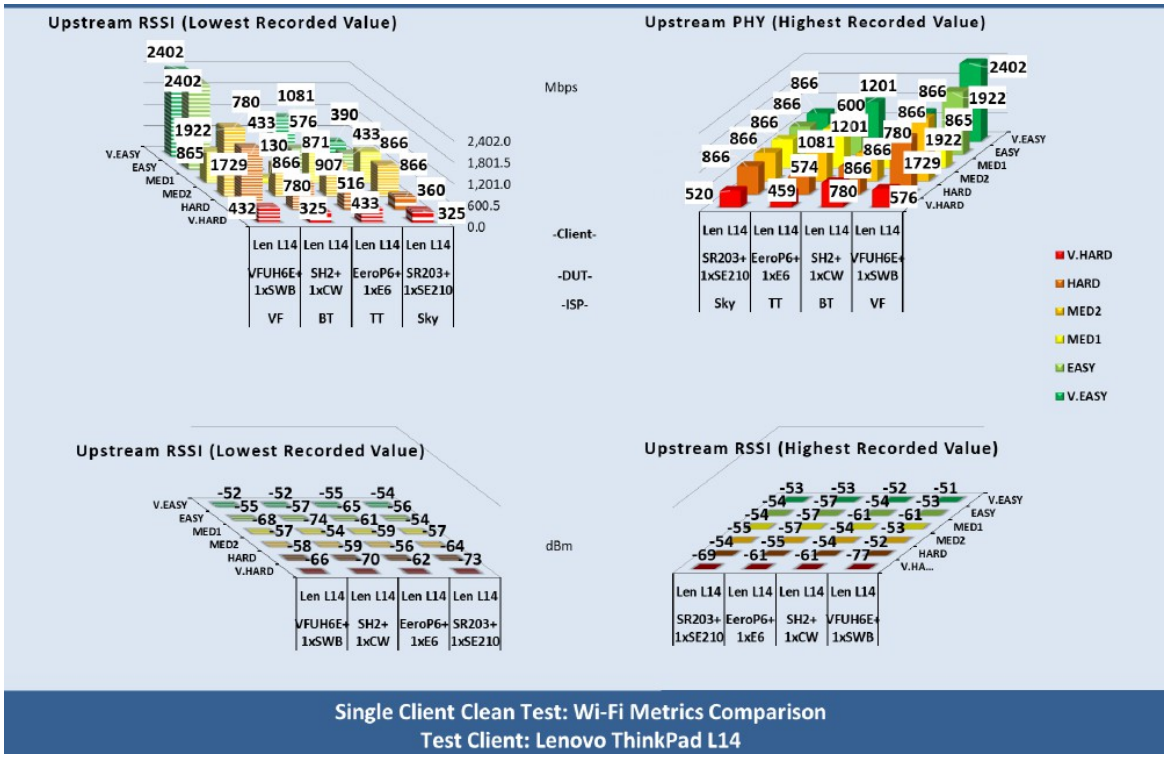
The summary of tests completed can be found in the images below.

Throughput is the speed (Mbps) that can be seen by a device at a location.



Received Signal Strength Indication (RSSI) is the strength of the signal in different locations

PHY rate is the speed at which data can be actually delivered to an end-user device



As part of this testing looked at:

1. The behavior of 10 different end-user devices (including laptops, smart phones and tablets) as these roamed around the Wi- Fi test house on a path.

	Attribute	Sky SR203+ 1xSE210	TalkTalk EeroP6+ 1xE6	BT SH2+ 1xCW	Vodafone UH6E+ 1xSWB
Roaming	10 Client Avg. Handover Speed (secs)	4	2	3	1
	Handover Speed recorded for the Fastest Client (secs)	4	3	2	1
	10 Client Avg. Min. Video throughput (Mbps)	3	2	4	1
	Packet Loss (%)	2	3	4	1
	Video Stream Timeout (Counter)	4	3	2	1

2. Count of simultaneous content Streams the Managed Wi-Fi solutions could support.

	Attribute		Sky SR203+1xSE210	TalkTalk EeroP6+1xE6	BT SH2+1xCW	Vodafone UH6E+1xSWB
Video Loading	No of UHD streams		2	4	3	1
	No of UHD + FHD streams		2	4	3	1
	No of UHD + FHD + HD streams		3	2	4	1
	No of UHD + FHD + HD + SD streams		3	4	2	1

S.No.	CPE	Maximum Video Streams Combination													
		UHD (25 Mbps)		UHD + FHD (25 Mbps + 15 Mbps)			UHD + FHD + HD (25 Mbps + 15 Mbps + 10 Mbps)				UHD + FHD + HD + SD (25 Mbps + 15 Mbps + 10 Mbps + 4 Mbps)				
		UHD	Total TP (Mbps)	UHD	FHD	Total TP (Mbps)	UHD	FHD	HD	Total TP (Mbps)	UHD	FHD	HD	SD	Total TP (Mbps)
1	Sky SR203+ 1xSE210	17	341.6	2	28	381.6	2	2	33	332.9	8	8	8	15	394.5
2	TalkTalk EeroP6+ 1xE6	15	310.5	2	25	362.1	2	2	36	369.0	6	6	6	6	274.1
3	BT SH2+ 1xCW	16	320.7	2	27	379.7	2	2	33	331.9	8	8	8	18	411.4
4	Vodafone UH6E+ 1xSWB	35	710	2	68	859.8	2	2	86	759.3	18	18	18	30	875.0

Since the Virgin Media solution (Hub 4 + Intelligent Wi-Fi Pods) required a live broadband connection, we tested this solution versus the Ultra Hub and Super Wi-Fi 6E boosters in a real Virgin Media home.

The summary of tests completed can be found in the images below.

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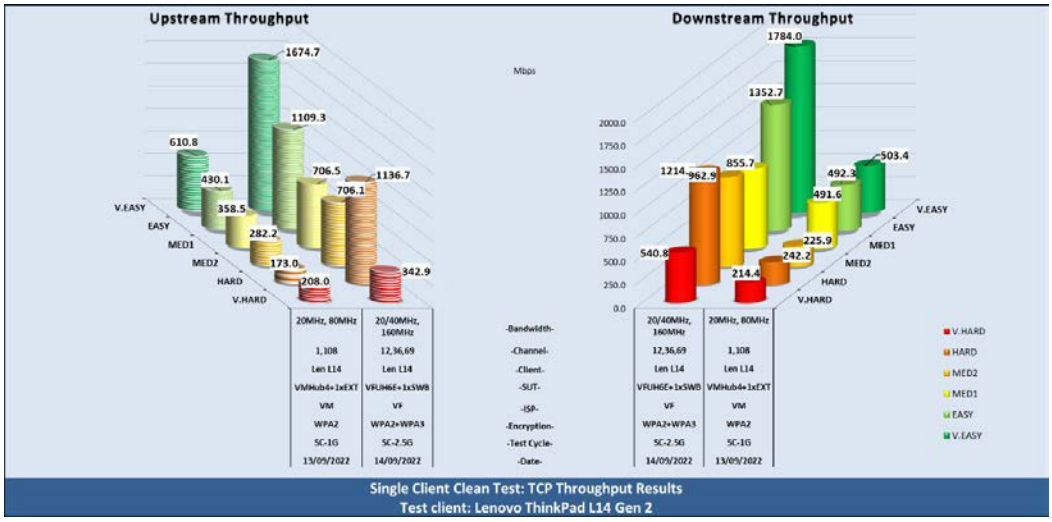
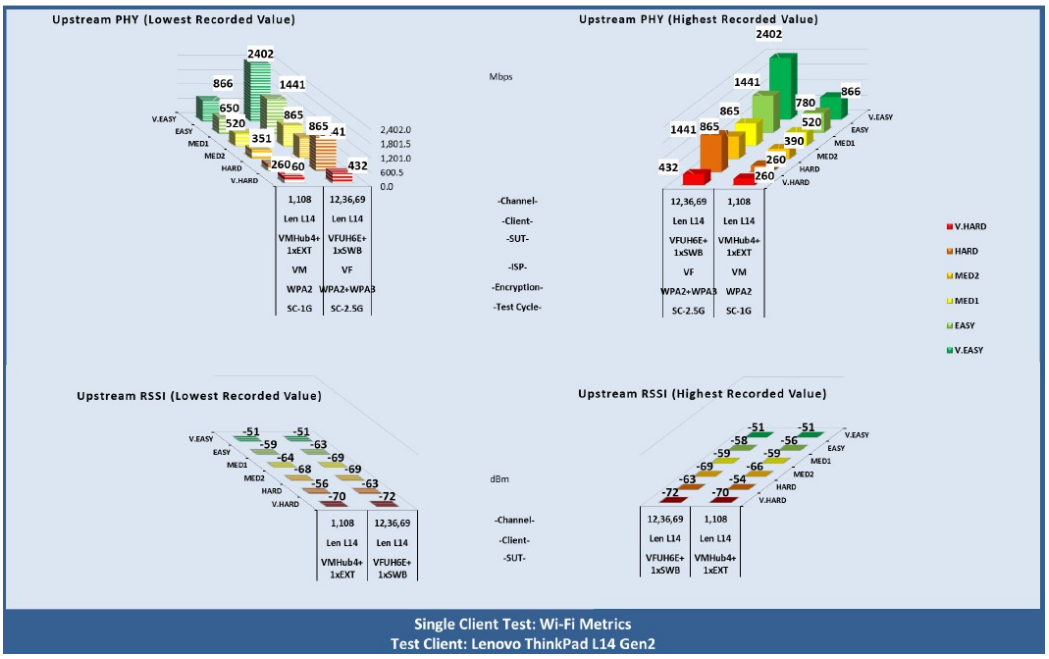


Received Signal Strength Indication (RSSI) is the strength of the signal in different locations.

PHY rate is the speed at which data can be delivered to a device.



See floorplan in Appendix 2 - “VM Connected Test House”

Test Type 2: Real Homes we tested the Vodafone Pro 2 Broadband technology and measured throughput through the locations on three devices:

Two devices tested:

1. Google Pixel 6 mobile phone
2. Lenovo E14 Gen2 laptop

The summary of tests completed can be found in the table below showing average throughput (Upload & Download) seen throughout the home

Real Home Environments

Summary of Real Home performance			
	House Description	**Number of Extenders**	**Level of co-channel interference** (<-10 = HIGH)
Home 1	2 floor, 6 bedroom house	3	MEDIUM
Home 2	2 floor, 3 bedroom house, with conservatory	1	HIGH
Home 3	1 floor, 3 bedroom flat	0	MEDIUM
Home 4	1 floor, 1 bedroom flat	0	MEDIUM
Home 5	4 floor, 6 bedroom, with garage	3	HIGH
Home 6	2 floor, 2 bedroom house	2	MEDIUM
Home 7	2 floor, 6 bedroom house	2	HIGH
Home 8	1 floor, 2 bedroom flat	1	HIGH
Home 9	3 floor, 5 bedroom house, with garage	2	HIGH
Home 10	2 floor, 3 bedroom house, with garage	2	MEDIUM

Average throughput performance across 9 locations and two end-user devices expressed as a % of broadband line speed into the home.

Throughput	Home 1	Home 2	Home 3	Home 4	Home 5	Home 6	Home 7	Home 8	Home 9	Home 10	Overall %
Access Line Speed (Mbps)											
Download	1000	550	80	550	80	550	80	550	550	1000	
Upload	115	75	20	75	20	75	20	75	550	1000	
Maximum user throughput speed (Mbps)											
Download	940	517	75	517	75	517	75	517	517	940	
Upload	108	71	19	71	19	70.50	19	70.50	517	940	
Results: % is Average of throughput throughout the home/ Maximum user throughput speed											
Download	61%	78%	95%	94%	87%	93%	93%	83%	82%	63%	83%
Upload	90%	98%	99%	99%	99%	100%	79%	100%	70%	79%	91%

In conclusion:

Vodafone Pro 2 provides Superfast broadband for less. Guaranteed Wi-Fi in every room with Wi-Fi 6E. It brings a Wi-Fi 6E chipset to our Ultra Hub and Super Wi-Fi 6E boosters, which can be physically placed throughout a customer home to optimise their Wi-Fi experience.

APPENDIX 1

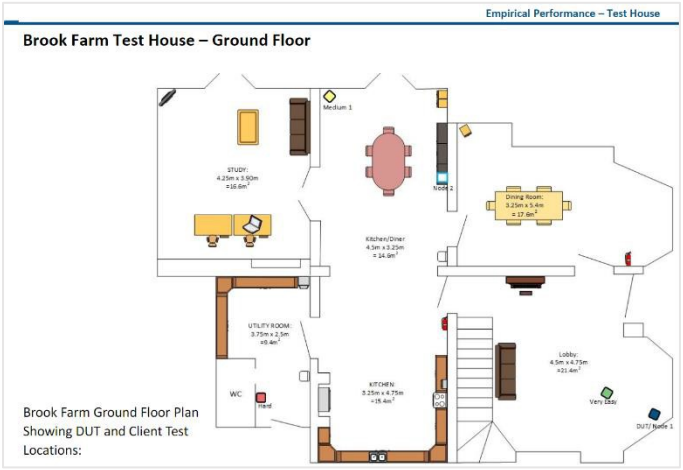
Test House (Brook Farm) –

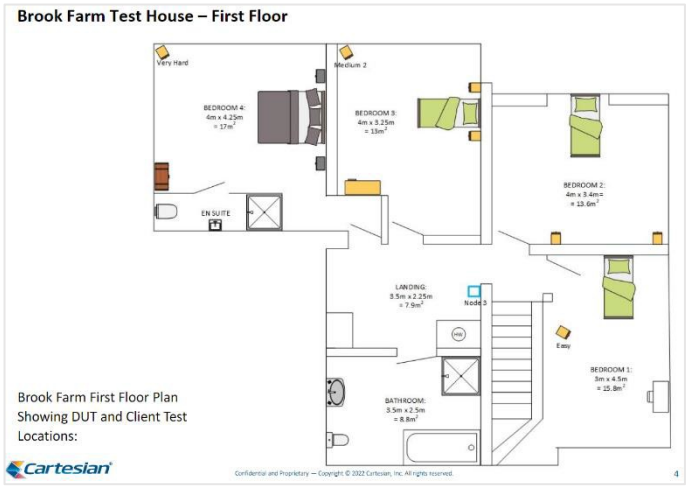
Overview Mesh testing completed in Brook farm, locations and floorplans below

Brook Farm Test House

Overview

- Cartesian's Wi-Fi test house at Little Kimble, a two-storey, four-bedroom brick built building.
- Located in a quiet rural location in the south of England.
- Originally built in 1840, the house was extended in more recent times.
- A detached house, with a large garden and open arable land at the rear.

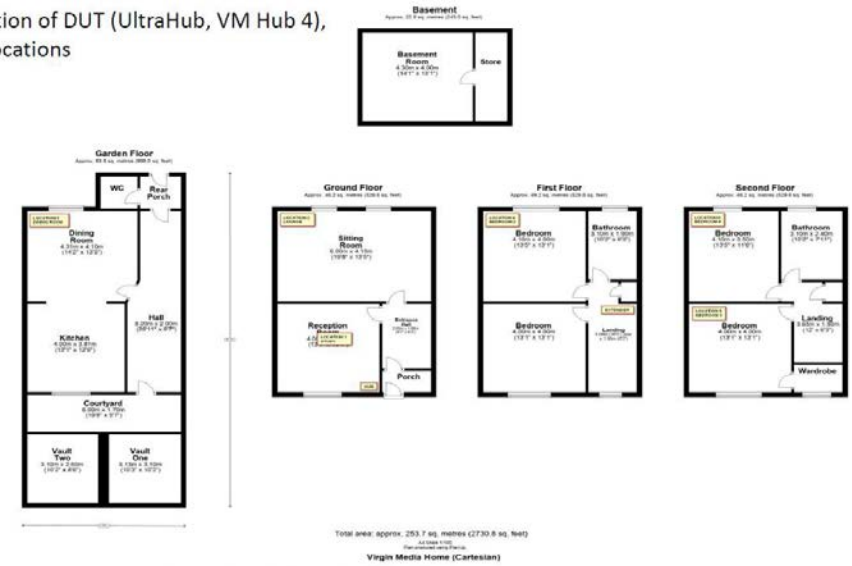




APPENDIX 2

- The VM test house is located in Bath
- Is a narrow 5-storey terraced house
- Built with brick walls and built c1840.
- It is set back from a major road and has a park to the rear.
- NOTE: This is not a Wi-Fi clean house due to presence of neighbouring Wi-Fi and other interferences.

Floor plan – showing location of DUT (UltraHub, VM Hub 4), extender and test client locations



Total area: approx. 253.7 sq. metres (2730.8 sq. feet)

Virgin Media Home (Cartesian)

Cartesian