2024 Adapt Competitive Testing

Whitepaper

Plume®

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Purpose

Providing a fast, reliable, and consistent WiFi connection for every device anywhere in the home is the foundation for high consumer Quality of Experience (QoE), especially in a world where consumers overwhelmingly access the internet through WiFi-enabled devices.

This study aims to demonstrate how Plume's Adapt service compares to other popular WiFi solutions in both the Communications Service Provider (CSP) and retail markets. The results of the initial edition[1] of this study proved that Plume's cloud-driven Adapt WiFi service —a key feature of the HomePass suite— provided the highest performance and most reliable connectivity among all the solutions tested.

In this second edition, which focuses on WiFi 6E technology, we have included new hardware and additional use cases to demonstrate the configurability of various systems and their ability to meet today's demands, by detecting different applications and devices. The results of each test are presented in this document, providing a comprehensive report on the strengths and weaknesses of the Plume solution compared to its competitors.

Systems tested

The following systems were tested and represent market-leading solutions within either CSP or retail markets.

Vendor	Description

Plume SuperPod with WiFi 6E	• Triband WiFi System:
	  • 2.4GHz, 2x2 - 40 MHz
	  • 5GHz, 4x4 - 160 MHz
	  • 6GHz, 4x4 - 160 MHz
	• Eth: 2.5Gig WAN + 1Gig LAN

Eero Pro 6E	• Triband WiFi System:
	  • 2.4GHz, 2x2 - 40 MHz
	  • 5GHz, 2x2 - 160 MHz
	  • 6GHz, 2x2 - 160 MHz
	• Eth: 2.5Gig WAN + 1Gig LAN

TP-Link Deco xe200	• Triband WiFi System:
	  • 2.4GHz, 2x2 - 40 MHz
	  • 5GHz, 8x8 - 160 MHz
	  • 6GHz, 8x8 - 160 MHz
	• Eth: 10Gig WAN + 2x1Gig LAN

Google Nest 6E	• Triband WiFi System:
	  • 2.4GHz, 2x2 - 40 MHz
	  • 5GHz, 2x2 - 160 MHz
	  • 6GHz, 2x2 - 160 MHz
	• Eth: 2xGig LAN

Test setup

Home setup

To ensure that particular setups or node distributions would not skew the results, the same tests were conducted in two different test houses; one in the in Menlo Park, USA (referred to as MPTH) and one in Europe (referred to as CxTH1). The tests strictly followed the manufacturers' recommendations for dimensioning, meaning the number of nodes used depended on the home layout and system vendor. A detailed description of house dimensions, layouts, and equipment used can be found in Appendix A,in Floor Plans.

Test cases

Each test case and its expected use case or QoE is summarized below:

Test Case	Description	Use case or expected QoE
Roaming	Tests the number of times data is lost when roaming between Access Points (APs) in the home.	The user should have uninterrupted service while roaming through the house and using real-time voice or video applications.
Coverage	Measures single device throughput observed in various areas of the home.	High-capacity connection should be available in every area of the home.
4-Corner load	Records simultaneous device throughput in each corner of the home to stress the overall system capacity.	The system should distribute capacity to the far reaches of the home under simultaneous load to meet future load demands.
Client steering	Verifies the capability and performance improvement of cloud or local-based steering of a device from one access point (AP) to another in order to increase performance.	Intelligent device steering decisions should maximize capacity and application performance by changing device connections within the home.
Fast interference response	Measures the time-to-respond and performance improvement gained when neighboring interference affects available airtime in a customer's home.	When the system is degraded due to outside interference, it should respond in less than 5 minutes to restore performance to allow for normal use.
Application prioritization	Checks the ability to automatically detect different application classes and prioritize the ones that have real-time needs.	Users can successfully watch a movie or participate in a conference call without interruptions from background/non-real-time applications.
Energy optimization	Monitors the energy consumed by access points when the network is idle, compared with the network fully loaded	Wireless systems automatically adapt their energy consumption to lower energy use when possible and match the user's requirements.
Simultaneous 4K video transmission	Four high-capacity 4K streams are run to four different devices to measure the system's ability to deliver them.	The capacity of the system should adapt to support households running four simultaneous 4K streaming sessions.
Latency under load	During the load of four 4K video streams, the latency of HTTP traffic requests is measured to determine the delay of traffic when the system is under heavy load.	When the system is under a high-capacity load, low bandwidth applications can be run with low latency to maintain a high QoE for the user.

Results summary ranking

The following table compares the relative ranking of each system based on the results from each of the two test houses.

WiFi 6E KPIs	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Google Nest
All test average	**1st**	**3rd**	**2nd**	**4th**
Normalized ranking	**95.4%**	**21.4%**	**33.4%**	**17.6%**
Roaming	**1st**	✗ 2nd	✗ 4th	✗ 3rd
Normalized ranking	100%	21%	0%	44%
Coverage	**2nd**	**3rd**	**1st**	**4th**
Normalized ranking	83%	56%	100%	0%
4-corner load	**1st**	**2nd**	**3rd**	**4th**
Normalized ranking	100%	53%	40%	0%
Client steering	✓	✗	✗	✗
Normalized ranking	100%	0%	0%	0%
Fast interference response	✓	✗	✗	✗
Normalized ranking	100%	0%	0%	0%
Application prioritization	✓	✗	✗	✗
Normalized ranking	100%	0%	0%	0%
Energy Awareness	**1st**	**4th**	**2nd**	**3rd**
Normalized ranking	100%	0%	61%	15%
Simultaneous 4K video streams	**2nd**	**3rd**	**4th**	**1st**
Normalized ranking	94%	6%	0%	100%
Latency under load	**2nd**	**3rd**	**1st**	**4th**
Normalized ranking	81%	58%	100%	0%

Test Result Details

Roaming tests

Roaming tests evaluate user experience in common scenarios where a device is on the move, such as walking around the house during a video call or moving a tablet that is streaming video.

Roaming time refers to the duration it takes for a device to re-establish connectivity when moving (roaming) between APs. In these tests, we assessed roaming time by, measuring the average time a device's connectivity is lost while transitioning between APs. We conducted ten roams per device per test house and averaged the results. The tests were performed with various devices since different devices can exhibit different behaviors when roaming between APs.

Roaming time latencies below 300 ms do not impact real-time apps and services, while latencies above 300 ms will be noticeable to in the call or session. The test was conducted on devices that support 802.11kv as well as those that do not to measure the difference. Devices not supporting 802.11kv are not expected to roam in less than 300 ms; however, variations in the roaming algorithms can help limit roaming time latency to optimize the user experience.

Roaming experience was tested on each test setup using the default, automatic topology setting on each system. To test, we performed 10 rounds of roaming and removed the worst performing test, to keep the 90% percentile we used in this model and eliminate any potential outliers. Then the average and worst roam of these 9 rounds was calculated and presented in the table below.
A passing test is the one with 9 latencies below 300ms.

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
Avg/Max roamtime	✓	✗	✗	✗
MPTH	35ms/200ms	172ms/600ms	203ms/1250ms	203ms/450ms
CxTH1	67ms/150ms	244ms/850ms	294ms/1200ms	119ms/350ms
Notes	In MPTH the MacBook Pro remained sticky during the roaming tests for Eero, TP-Link and the Plume SuperPod. Considering this, only the S21, iPhone 13 and iPad 6E have been used for the average calculations. If we assign a high penalty to the sticky MBP (2s), the ranking remains the same, with Plume first followed by Eero and TP-Link.			

It is worth noting the improvement that Eero shows between MPTH and CxTH1 is partially due to their 2024 firmware update (version 7.1.1-16), which achieved an average roaming time of 171.6ms, compared to 1038ms with 2023 firmware (6.15.1-410).

Additionally, it is interesting that roaming results for both test houses are very similar, indicating that the roaming performance may not depend son different test house materials and sizes.
Full roaming results can be found In Appendix A, under roaming tests.

Coverage tests

The objective of the six-client coverage tests was to measure the throughput of a single client in multiple locations within a home. This test assesses the individual throughput a device can provide, essentially serving as a "horsepower" test. In each home we used six pre-determined client positions and kept the clients in the same locations while measuring the throughput of each system. For this test, end devices could use 5 or 6 GHz bands, allowing the devices to choose the best band for connection.

The throughput measured is the average throughput for all clients in the downlink direction. Including uplink results does not significantly affect the outcomes, but makes the calculation less clear.

Coverage results

The default configuration for TP-Link uses the 6GHz band for backhaul and leaves the 5GHz band for users. We have not modified that setting.

Conversely, Eero uses the 5 GHz band for the backhaul and reserves the 6GHz band for clients, which is an unusual choice since most clients are 5GHz only. This configuration requires sharing the backhaul. For this specific test, where clients are only 6GHz, they have an unfair advantage.

It is worth noting that Plume closely follows Netgear in maximum throughput for one customer, despite being only a 2x2 stream access point compared to the of 8x8 stream access point of TP-Link. The ranking remains consistent across both test houses, with the throughput of both systems being lower in CxTH1 due to the larger size and different construction materials used in Europe.

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
Downlink coverage throughput per test house location				
Ranking	**2nd**	**3rd**	**1st**	**4th**
Avg. throughput MPTH	1223 Mbps	941 Mbps	1333 Mbps	384 Mbps
Avg. throughput CxTH1	855 Mbps	858 Mbps	1129 Mbps	610 Mbps
Normalized ranking	83%	56%	100%	0

The table above summarizes the downlink results from each test house, and provides rankings for each system. Full graphs with downlink and uplink results can be found in the Appendix, under coverage tests.

4-corner load tests

In a 4-corner load scenario, we tested how well the WiFi system handles simultaneous, full capacity load from 4 different corners or locations in the house. This test stresses the system's ability to maximize the available WiFi spectrum and share the load simultaneously without collapsing the overall system capacity.

The result represents the sum of the downlink throughput (in Mbps) for the 4 corners measured.

4-Corner load results

We were surprised by the poor results of the TP-Link Deco XE200 in MPTH, particularly after its good results in single client tests. To verify, we repeated the test four times, consistently obtaining similar results, around 800 Mbps. The results for TP-Link in CxTH1 were better and, in fact, were the highest for CxTH1. This improvement was due to a more favorable topology, as Plume established a daisy chain that resulted in non-optimal throughput, but it was the only feasible topology given the AP locations. The high value obtained by Plume is partly thanks to a feature implemented in 2023 that uses different radio configurations for fronthauls and backhauls.

Multiple Client	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
Average simultaneous throughput per test house location				
Ranking	**1st**	**2nd**	**4th**	**3rd**
Total throughput MPTH	2122 Mbps	1291 Mbps	834 Mbps	896 Mbps
Total throughput CxTH1	1013 Mbps	964 Mbps	1001 Mbps	631 Mbps
Normalized ranking	100	53	39	0

Detailed test results can be found in the appendix for 4 corner tests.

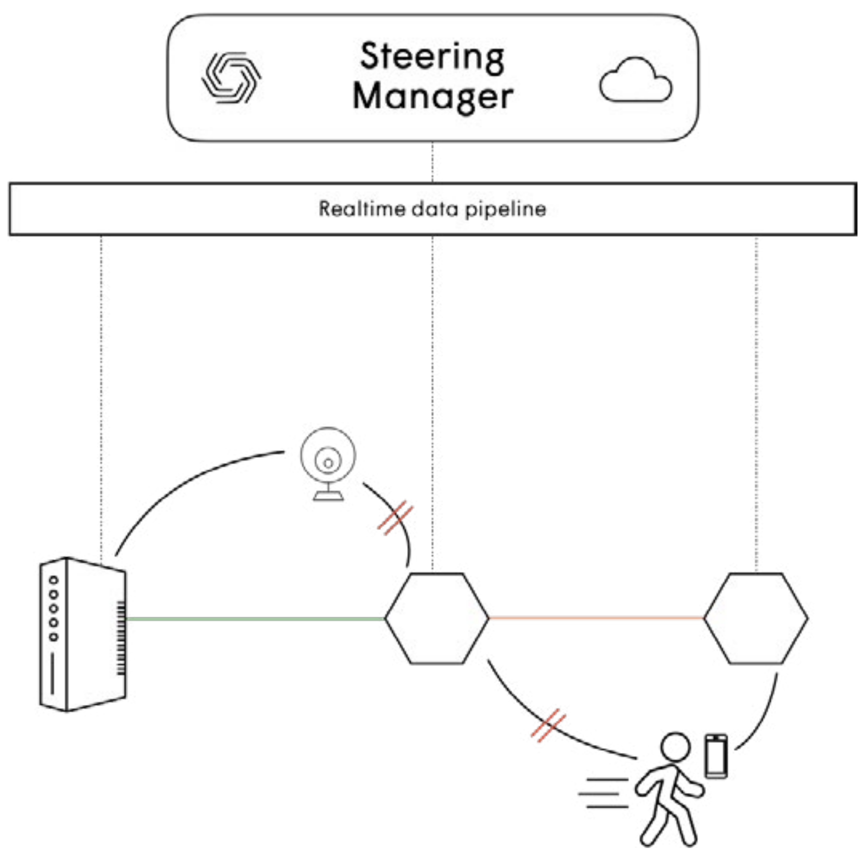
Client steering tests

It is not uncommon for some stationary or near-stationary devices (e.g. Amazon Fire TV Stick, Roku, or a smart TV) to connect to the first AP they probe. This can occur when the device is powered on or when the network booting up, either during set up or after recovering from a power outage or internet disconnection. In such cases, the device might connect to a suboptimal AP, negatively affecting throughput and Quality of Experience (QoE). Other times, in a multihop backhaul mesh topology, the device may connect to the closest AP. However, connecting to the optimal AP is crucial, as a connection further away could still improve throughput.

We define client steering as the ability to optimize client's connectivity by leveraging throughput estimations across the entire network, providing an improvement over standard signal-based approaches.

The objective of the client steering test is to verify if the System Under Test (SUT) can steer stationary devices — or so-called sticky clients — to the access point capable of providing higher throughput. Ideally, we want the system to meet the two key performance indicators (KPIs):

- A device must be steered to another access point with better performance within 10 minutes of the access point's eligibility.
- The throughput of the new connection should be at least 25% greater than the original connection.



Client steering results

Plume's Adapt system was the only one that actively (and automatically) steered devices from suboptimal connections to throughput-optimized connections. The other systems did not perform any steering in either MPTH or CxTH1.

To maintain consistency with previous tests, we have considered the throughput gain in the downlink (DS) direction, although we have observed higher gains for Plume in the uplink (US) path

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
Average throughput increase per test house location after client steer				
MPTH	✓	✗	✗	✗
Throughput increase	207%	-[1]	-[1]	-[1]
Normalized ranking	100%	-	-	-
CxTH1				
Throughput increase				
Normalized ranking				

[1] No client steering was observed for these systems.

Detailed results of the client steering results are located in the appendix.

Fast interference mitigation

WiFi interference occurs when any signal outside the configured WiFi network impairs normal operation. Typically, users will experience slower speeds, higher latency, frequent disconnects and reconnects, and sometimes a complete inability to connect when high levels of interference are present. Therefore, detecting and responding to interference quickly is essential to ensure a good user experience. In the following tests, two items were measured:

- The system response time against high levels of interference.
- The throughput improvement, if any, after the system reconfiguration was completed.

The objective of the fast interference mitigation test case was to benchmark the system's ability to avoid interference on both the backhaul and fronthaul channels from hampering the performance of the system. Since in this test we are measuring interference in 6GHz as well as 5GHz, we have changed the methodology of measuring fronthaul (FH) and backhaul (BH) differently to measuring 5GH and 6GHz, as often the same radio can and will be used for both FH and BH.

Fast interference and mitigation results

We observed that Plume's Adapt system was the only one that detected fast interference and adapted the configuration to avoid degradation for the customer. Our tests show that the other systems did not perform any interference mitigation within 30 minutes of the start of the interference. Therefore, we, concluded that the other systems do not react neighboring interference within a reasonable time-frame to preserve customer QoE.

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
High interference system reaction time and increase in throughput as a result of network reconfiguration				
MPTH	✓	✗	✗	✗
Reaction time	< 5 min	No	No	No
Tput increase 5GHz Tput increase 6GHz	67% 40%	-	-	-
CxTH1	✓	✗	✗	✗
Interference reaction	< 5 min	No	No	No
Tput increase 5GHz Tput increase 6GHz	174% 158%	-	-	-

Detailed results of the Fast interference test can be found in the appendix for each test house.

Application prioritization

This test evaluates the system's ability to detect and prioritize different applications running in the network, ensuring users can participate in a conference call without interruptions from background applications. The performance was assessed with the following objectives:

- Prioritize video streaming.
- As this test is environment-independent it was conducted solely in MPTH.

To perform the test, a 4k YouTube video is played, and then the airtime is saturated with background traffic. Throughout the test, no pixelations or other artifacts should be observed in the conference call. The video-streaming quality is recorded in the table below.

Application prioritization results

Plume is the only system that consistently maintains YouTube quality under heavy traffic. The other systems did not appear to prioritize YouTube streaming at all. Despite Eero's purported prioritization of "videoconferencing and gaming", similar results were observed when the test was repeated with a Zoom call, indicating no discernible priority applied.

In attempts to improve system functionality, we introduced a chariot with the appropriate DSCP settings for video and voice traffic. Despite these efforts and the generation of traffic, we did not observe improved results for these systems.

.

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
MPTH	✓	✗	✗	✗
Pixelation?	No	Yes	Yes	Yes

The detailed results for Application Prioritization are located in the appendix.

Seamless topology changes

This assessment evaluates the system's ability to change topology without disrupting clients. During this evaluation while the Fast Interference test was ongoing, we conducted a ping to gauge the impact of the topology change. For a transition to be deemed seamless, the traffic loss must be lower than 250ms.

This test was conducted exclusively in MPTH.

Seamless topology changes results

Only Plume's system actively responds to interference by changing channels, making it the only system assessed in this test. In earlier versions, topology changes could lead to disruptions lasting several seconds From version 5.8 and onwards, the impact has been minimized to 1-2 ping loss (100-200ms).

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
MPTH	✓	✗[1]	✗[1]	✗[1]
Pixelation?	200ms	-	-	-

[1] No topology change (radio/band) was observed for these systems.

Energy Awareness

The power consumption of an access point is heavily influenced by its characteristics. A robust, high-performance access point typically consumes more power than a smaller one. Simply ranking devices based on their power consumption alone is not a fair comparison, as access points with different capabilities offer different levels of performance. For instance, a small 2x2 dual band WiFi 5 access point that cannot adequately cover the needs of a house shouldn't be ranked higher than another access point serving the advanced needs of multiple users with the latest technology and antenna support.

In this assessment, we measure the access point's ability to adapt to the changing needs of the household, and calculate the percentage of energy used in idle versus when it is fully utilized. Additionally, we record energy consumption in different usage states (idle, low usage such as a Zoom call, moderate usage such as a 4K stream, and fully utilized) for informational purposes only.

Since this test is independent of the environment, it was conducted exclusively in MPTH.

The ranking is determined based on the percentage of energy used in idle versus full throttle.

Energy Awareness results

TP-Link announced an "eco mode" for certain models, such as Deco Deco M4 v1&v2, (https://www.tp-link.com/us/support/faq/3578/) for some models , which are WiFi 5 systems. Although TP-Link has indicated plans to extend support to mode models through firmware upgrades, this feature is not yet supported by the TP-Link system. It's worth noting that this eco mode is manual or fixed-scheduled, unlike Plume's advanced automatic prediction and seamless reaction.

Further details can be found in the Appendix.

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
MPTH	**1st**	**2nd**	**4th**	**3rd**
% power idle	54.7%	70.2%	60.7%	67.9%
% power in low usage (zoom call)	54.7%	71.0%	62.2%	70.5%
% power in medium (4k)	74.7%	70.2%	64.1%	69.7%
Normalized ranking	100%	0%	60.74%	15%

The detailed results for Application Awareness are located in the appendix.

Simultaneous 4K video transmission test

In this test, we simulated four parallel and simultaneous 4K video streams to four clients. Each client was requested to download a 1 MByte file every 0.32 seconds, totaling 3.125 MByte/s or 25 Mbps of throughput, which is typically required for high quality 4K HDR video streaming. The target throughput for each connected device was 25 Mbps, and the system needed to successfully deliver 95% of the requested capacity to each individual client simultaneously.

We conducted three different runs in both locations and selected the best run out of three for each platform.

Simultaneous 4K video transmission results

	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
MPTH	✓	✗	✗	✗
All 4K streams delivered?	Yes	No	No	Yes
CxTH1	✓	✓	✓	✓
All 4K streams delivered?	Yes	Yes	Yes	Yes

The detailed results for Simultaneous 4K Video Transmission are located in the appendix.

Latency under load test

Latency is a critical factor in the performance of real time applications, such as voice or video calls. This test measured the 90th worst percentile of latency on a device under heavy system load, specifically running four parallel 4K video streams as demonstrated in the previous test.

The 90th percentile measurement provides a practical, worst-case value by eliminating outliers that can skew the results. The appendix contains the worst latency results from this test.

For each test, three different rounds were conducted. For each round, the average and maximum latencies were calculated., Subsequently, the average latency of each round and the highest latency number of all three runs were extracted.

Latency under load results

The variations in the numbers observed are attributed to the different topologies established by each vendor in each location.

Plume, for instance, demonstrated that a linear topology was the optimal way to establish mesh connectivity, which contributed to the increased latency observed in CxTH1.

Max 90th percentile latency	SuperPod with WiFi 6E	Eero Pro 6E	TP-Link Deco xe200	Nest 6E
MPTH	195.30ms	698.6 ms	278.8 ms	300.6 ms
CxTH1	531.1 ms	300.1 ms	225.0 ms	1380.8 ms
Avg MPTH + CxTH1	**2nd** 363.2 ms	**3rd** 499.4 ms	**1st** 251.9 ms	**4th** 840.7 ms

Detailed results for the latency under load test for each device and test house are located in the appendix.

Conclusion

In this testing we have observed a significant improvement in performance, both for end devices and access points. Regarding clients, whereas in 2022, where only Plume's platform achieved roaming devices reconnect under 300 ms on average, all of tested platforms now accomplished this. However, it's worth noting that the maximum roam times still exceeded the threshold for the other companies, suggesting there remains room for improvement in this aspect. Additionally, Plume has managed to further reduce both average and maximum latencies during roaming, demonstrating enhanced performance in this regard as well.

In terms of capacity, the utilization of the 6GHz frequency band has surpassed the 1 Gbps barrier for a single client. Plume and TP-Link achieved speeds of over 1.2 Gbps. In previous competitive testing using WiFi 6, Plume received the highest value at 610Mbps. This indicates that Plume has continued to improve alongside its competitors.

The six client coverage test ultimately serves as a "horsepower'' test, measuring the radio and CPU capabilities. TP-Link obtained 8% more throughput despite using an 8x8 system. However, for multiple client testing (4 corner load), the total capacity has increased significantly, from 800 Mbps in past WiFi 6 testing to over 2Gbps, representing a 250% increase. This was made possible byo the implementation of 2x2 @ 160Mhz in the fronthaul. However, in scenarios where airtime management plays a more prominent role, TP-Link, which excelled in the single client test, plummeted to 800 Mbps, scoring the worst in the test.

Despite advancements in competing platforms, there is still a noticeable lack of capabilities where more intelligence is required. None of the competing platforms reacted against fast interference or performed client steering to optimize access points, functionalities crucial for addressing day-to-day challenges like interference-induced degradation of user experience.

In terms of more advanced capabilities, there has been improvement among competitors, with some offering advanced application or device awareness capabilities (such as Eero and Nest). However, enabling prioritization features like "videoconferencing and gaming" for products like Eero hasn't shown significant benefits, highlighting the complexity of achieving real user benefits beyond basic queue management. It requires deep learning from devices and applications, detecting individual flows, and categorizing them accurately.

Similarly, for energy awareness, TP-Link's advertising focuses on "schedule based" energy savings. With the potential inclusion of such capabilities in WiFi 8, vendors are positioning themselves as environmentally conscious.. Plume boasts the most advanced feature set among the tested systems, automatically monitoring and to customers' requirements. However, there is a need to collaborate with chipset manufacturers to reduce power usage in idle mode.

> Currently, Plume uses 54% of the total power when idling, while TP-Link uses 64% and Google Nest 68%.

All in all, Plume Remains the top among the platforms tested for delivering the best quality of experience in WiFi for any user.

Appendix A: Test houses

Dimensions and Number of Access Points

	MPTH	CxTH1
Location	California, US	Slovenia, EU
Number of Floors	2	3
Number of Rooms	6 (including garage)	6
Home Size	2,100 sq ft	3,600 sq ft
Construction Type	Wood and Drywall	Steel and concrete

Number of APs used for testing:

	MPTH	CxTH1
SuperPod with WiFi 6E	3	4
Eero Pro 6E	3	3
TP-Link Deco xe200	2	2
Nest 6E	3	3
Construction Type	Wood and Drywall	Steel and concrete

Floor plans

MPTH, located in Palo Alto, US

CxTH1, located in Slovenia, EU

Devices used for testing

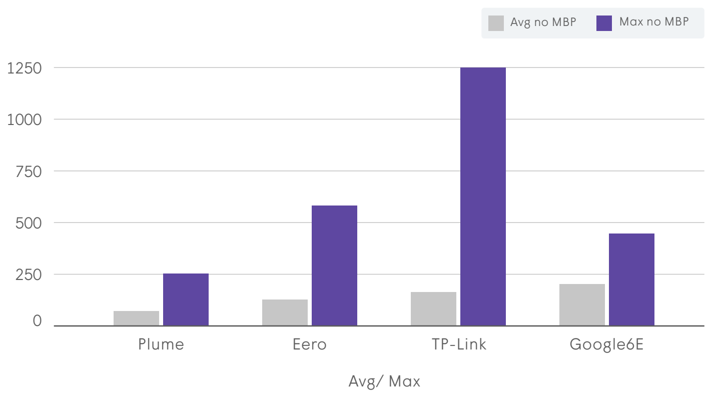
	MPTH	CxTH1
Device 1	Samsung S21 Ultra	Samsung Galaxy S22 Ultra
Device 2	Apple MacBook Pro 6E (M2)	Apple iPhone 14
Device 3	Apple iPhone 13	Apple iPhone 15 pro
Device 4	Apple iPad 6E	

Appendix B: Test Details

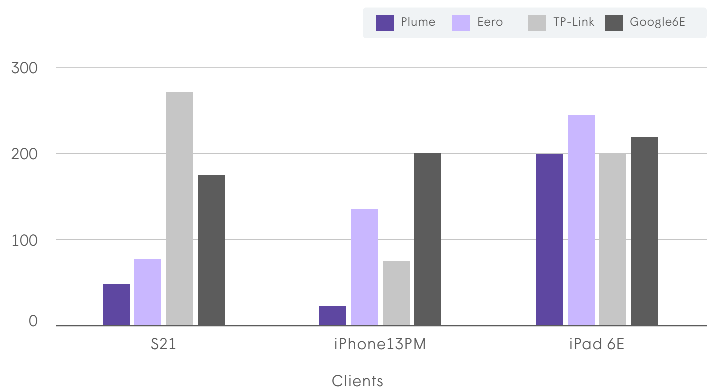
Roaming tests

MPTH

Avg no MBP and Max no MBP

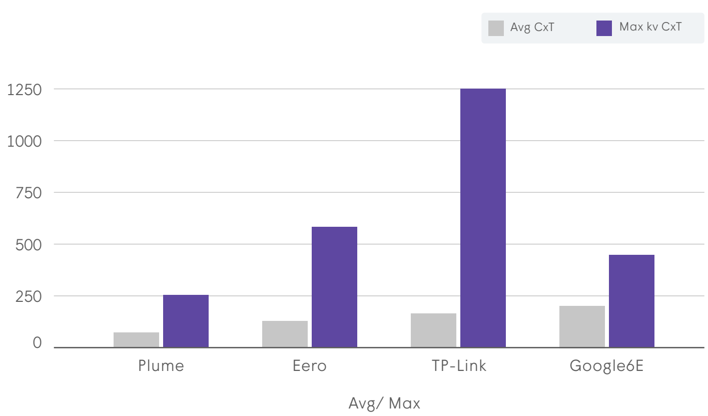


Avg roam time per client

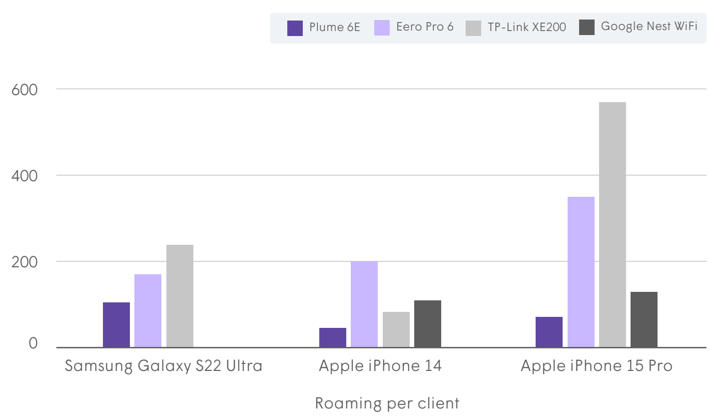


CxTH1

Avg kv and Max kv CxT



Samsung Galaxy S22 Ultra, Apple iPhone 14 and Apple iPhone 15 Pro

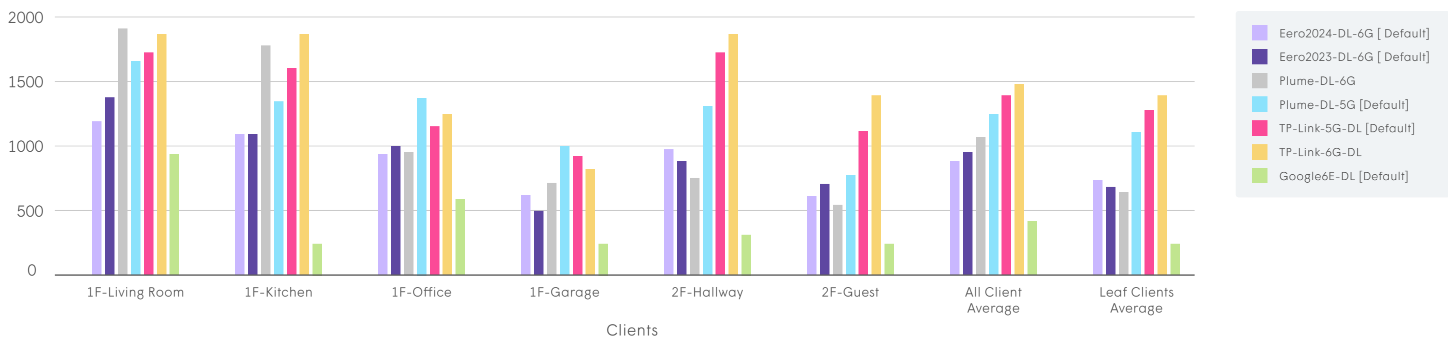


Coverage tests (6 client tests)

Downlink

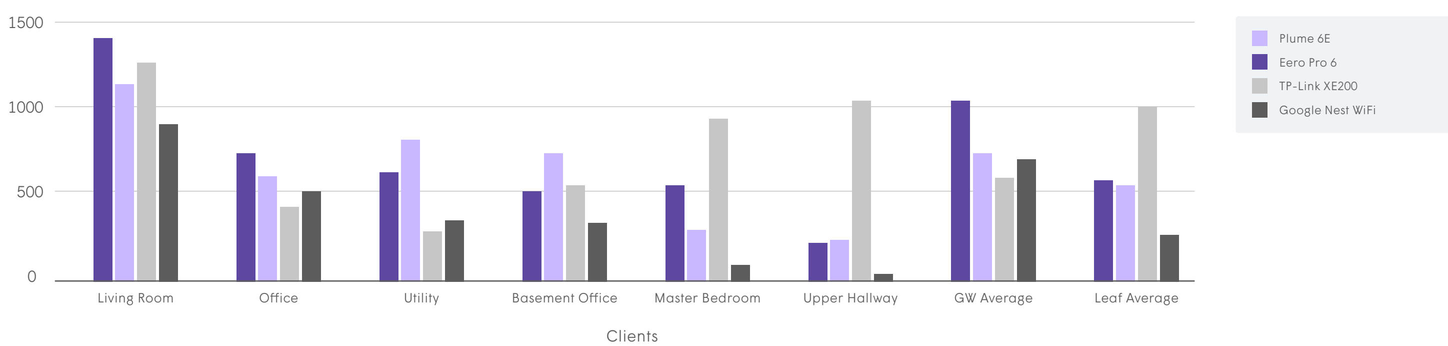
MPTH

Coverage Downlink



CxTH1

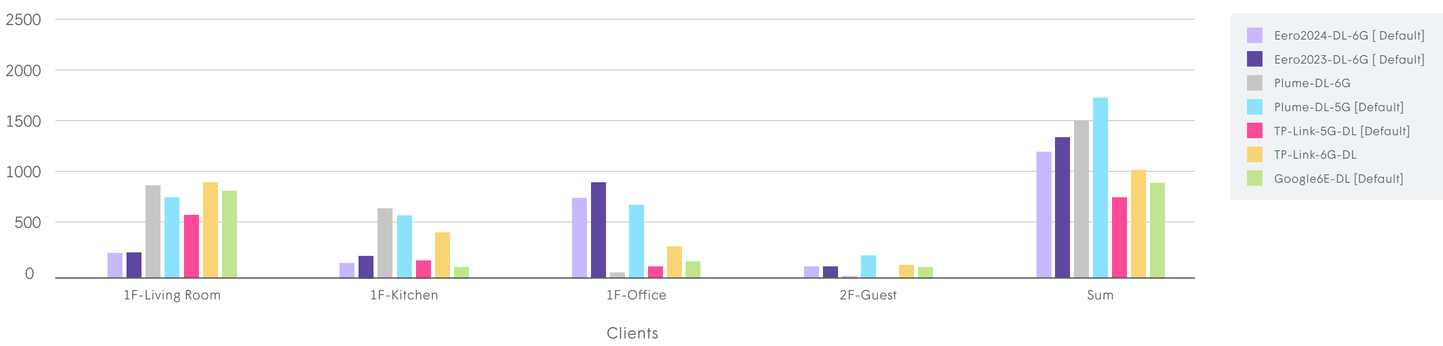
6 Client coverage test (CxTH1)



4 Corner load tests

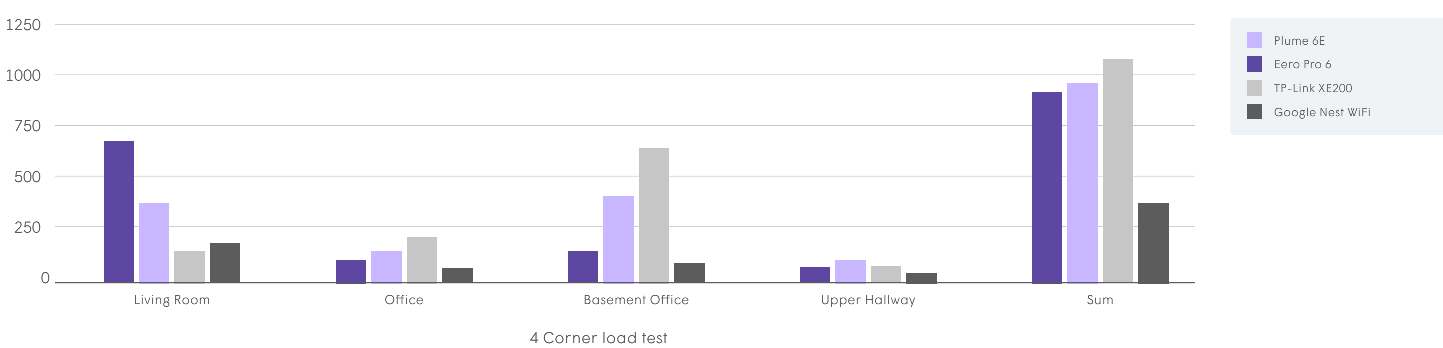
MPTH

Coverage Downlink



CxTH1

4 Corner load test (CxTH1)



Client steering tests

Client Steering	Plume 6E	Eero	TP-Link	Nest
MPTH	132.00	0.00	0.00	0.00
CxT	282.00	0.00	0.00	0.00
Average	**207.00**	**0.00**	**0.00**	**0.00**
Norm. avg (%)	**100.00**	**0.00**	**0.00**	**0.00**

Fast Interference Mitigation tests

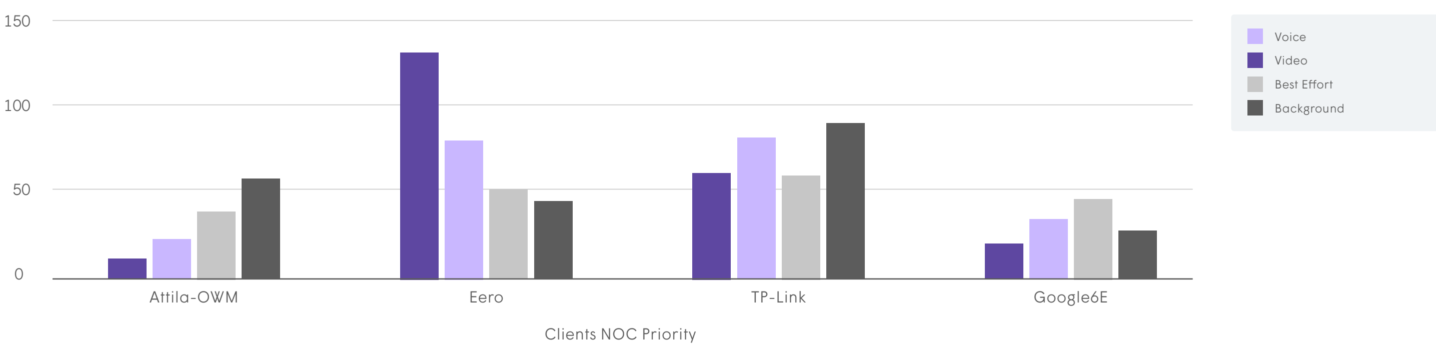
Int.response 5GHz	Plume 6E	Eero	TP-Link	Nest	Int.response 6GHz	Plume 6E	Eero	TP-Link	Nest
MPTH	67.00	0.00	0.00	0.00	MPTH	40.00	0.00	0.00	0.00
CxT	173.95	0.00	0.00	0.00	CxT	157.98	0.00	0.00	0.00
Average	**120.48**	**0.00**	**0.00**	**0.00**	Average	**98.99**	**0.00**	**0.00**	**0.00**

	Plume 6E	Eero	TP-Link	Nest
Average 5+6GHz	109.73	0.00	0.00	0.00
Norm. avg (%)	100.00	0.00	0.00	0.00

Application Awareness Tests

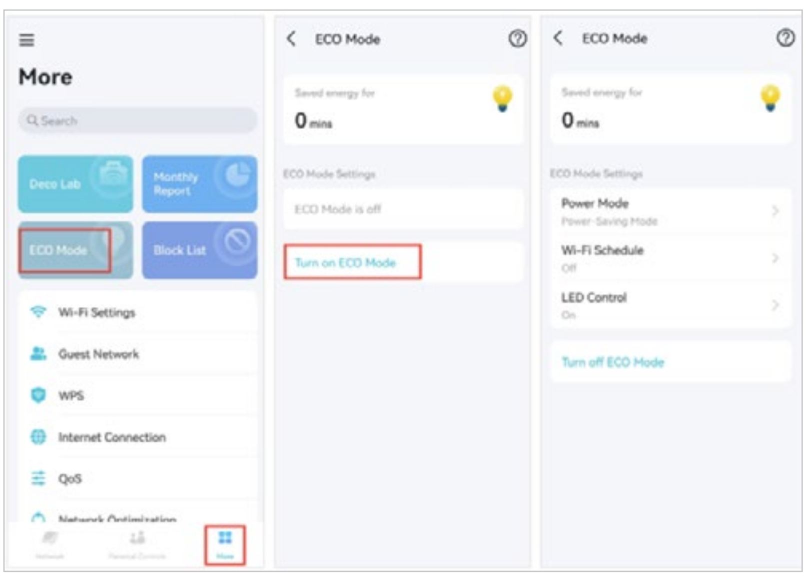
Since we didn't get good results by playing YouTube or using Zoom in a saturated network with competitor's systems, we used a chariot to generate traffic marked with different DSCP settings. Thus, the traffic was placed in different WMM queues (voice, video). Results in the table below:

WMM (Attila - FW5.6)



Energy Awareness tests

It is worth noting that TP-Link has announced a feature that allows users to save energy. Details are here: https://www.tp-link.com/us/support/faq/3578/ This feature unfortunately is only currently supported in their M4 platform (WiFi 5). Users have to manually enable it, disable it, or set up a schedule for low-power mode.

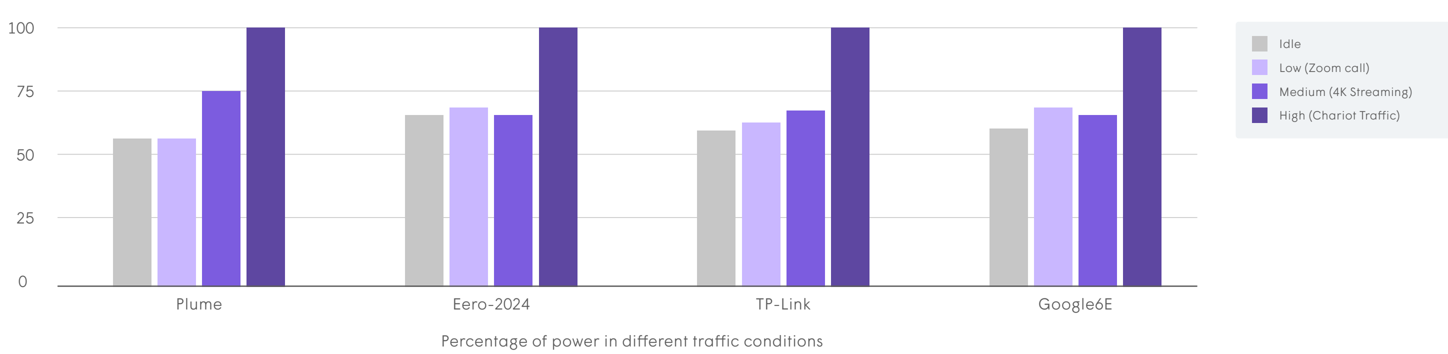


Results in MPTH

Percentage of power in different traffic conditions	Attila	Eero-2024	TP-Link	Google6E
Idle	54.66666667	70.1754386	60.75471698	67.85714286
Low (Zoom call)	54.66666667	71.05263158	62.26415094	70.53571429
Medium (4K Streaming)	74.66666667	70.1754386	64.1509434	69.64285714
High (Chariot Traffic)	100	100	100	100
Normalized % idle full	**100.00**	**0.00**	**60.74**	**14.95**

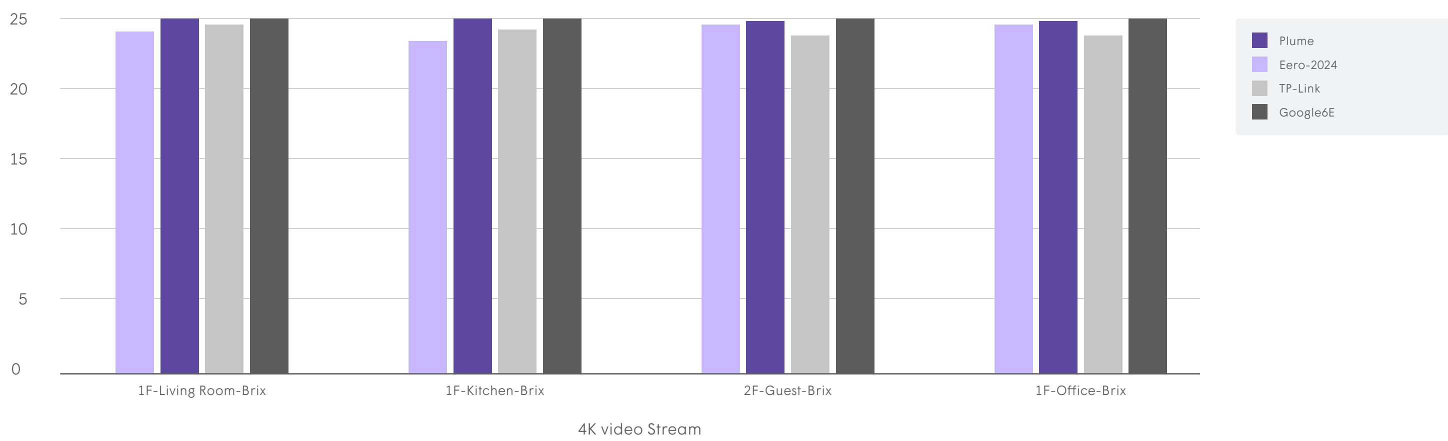
Power vs traffic	Attila	Eero-2024	TP-Link	TP-Link
Idle	8.2	8	16.1	7.6
Low (Zoom call)	8.2	8.1	16.5	7.9
Medium (4K Streaming)	11.2	8	17	7.8
High (Chariot Traffic)	15	11.4	26.5	11.2

Idle, Low (Zoom call), Medium (4K Streaming) and High (Chariot Traffic)

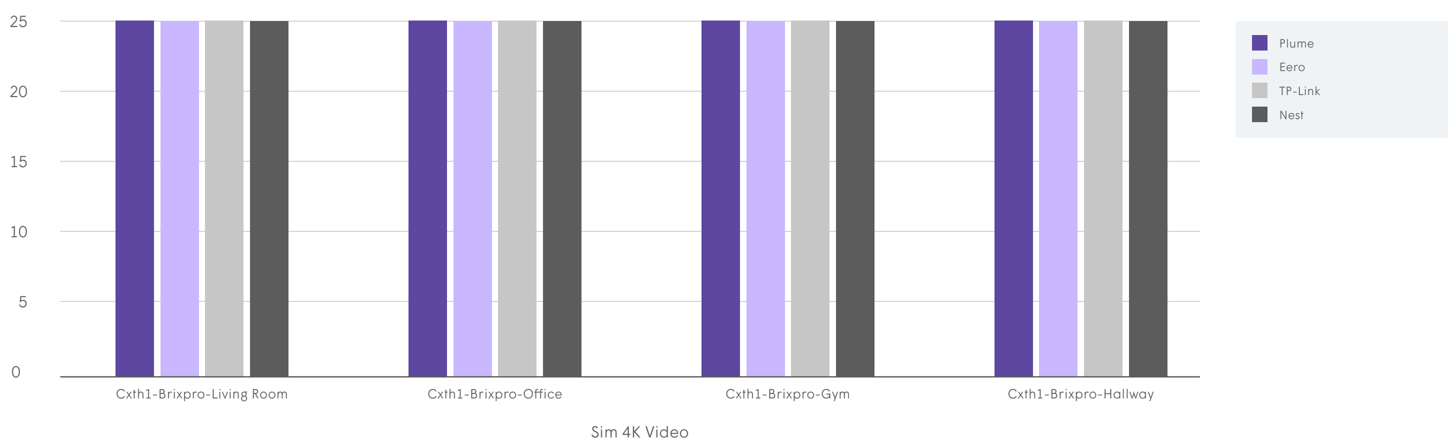


Simultaneous 4K Video Transmission Tests

MPTH

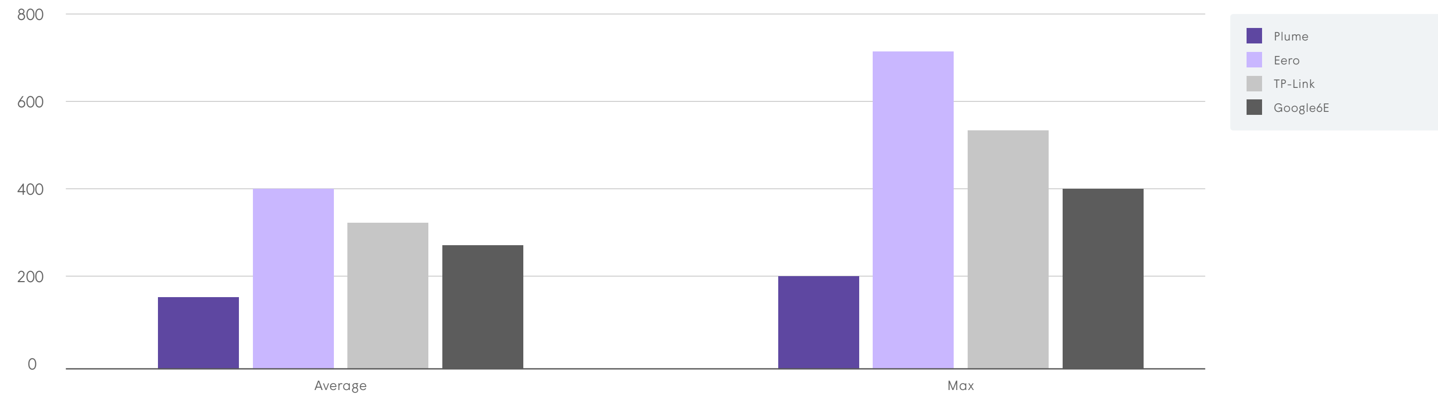


CxTH1



Latency under load (90% percentile)

MPTH



CxTH1