OV
Broadband
Insights Report

OVBI • 4Q24

Introduction

A trifecta of consumption factors—average total usage of near-700 GB per month, accelerating upstream growth rates, and dramatic rises among power users—are collaborating to define the new broadband environment, according to the 4Q24 edition of the OpenVault Broadband Insights (OVBI) report.

Analysis of data collected by OpenVault's software-as-a-service (SaaS) technology solutions shows how historic correlations between broadband speeds and consumption continued to give way to new realities in the final quarter of 2024. Using data points from millions of individual subscribers, OpenVault has identified trends that will shape broadband strategies in 2025 and beyond, including:

- **Record average monthly total consumption of 698.2 GB**
- **A continued increase in the upstream growth rate to 14.6%**
- **Extreme Power Users' individual behavior that is as much as 53x downstream and 123x upstream the usage of the average subscriber**

While the linkage between faster speeds and higher consumption has weakened, the report shows that usage continues to grow—particularly among high-volume users. Since 4Q18, the percentages of Power Users of 1 TB or more and Super Power Users of 2 TB or more have grown dramatically—505% (6x) and 1650% (17.5x), respectively. Meanwhile, the category of Extreme Power Users of 5 TB or more has increased by 2.4x since initially being identified in 3Q23.

Record consumption, rapid upstream usage growth, and high-volume subscribers are driving a need for advanced QOE solutions.

As speed upgrades become less of a priority, providers are focusing new efforts on network health, performance, and Quality of Experience (QoE), all of which can impact revenue and customer satisfaction. This edition of the OVBI report includes a real-world example of the use of OpenVault's OV Advanced PMA™ as a way to improve capacity and performance in both the upstream and the downstream.

Key findings from the 4Q24 OVBI include:

Usage

The monthly average data consumed by subscribers in 4Q24 was 698.2 GB, up 8.9% from 4Q23's average of 641 GB.

Super Power Users

The category of Super Power Users consuming 2 TB or more per month increased by 26% year-over-year.

Speed Tiers

Average downstream speed was 569 Mbps, an increase of 11.9% from 4Q23. Average upstream speed was 32 Mbps, up 13.7% from 4Q23.
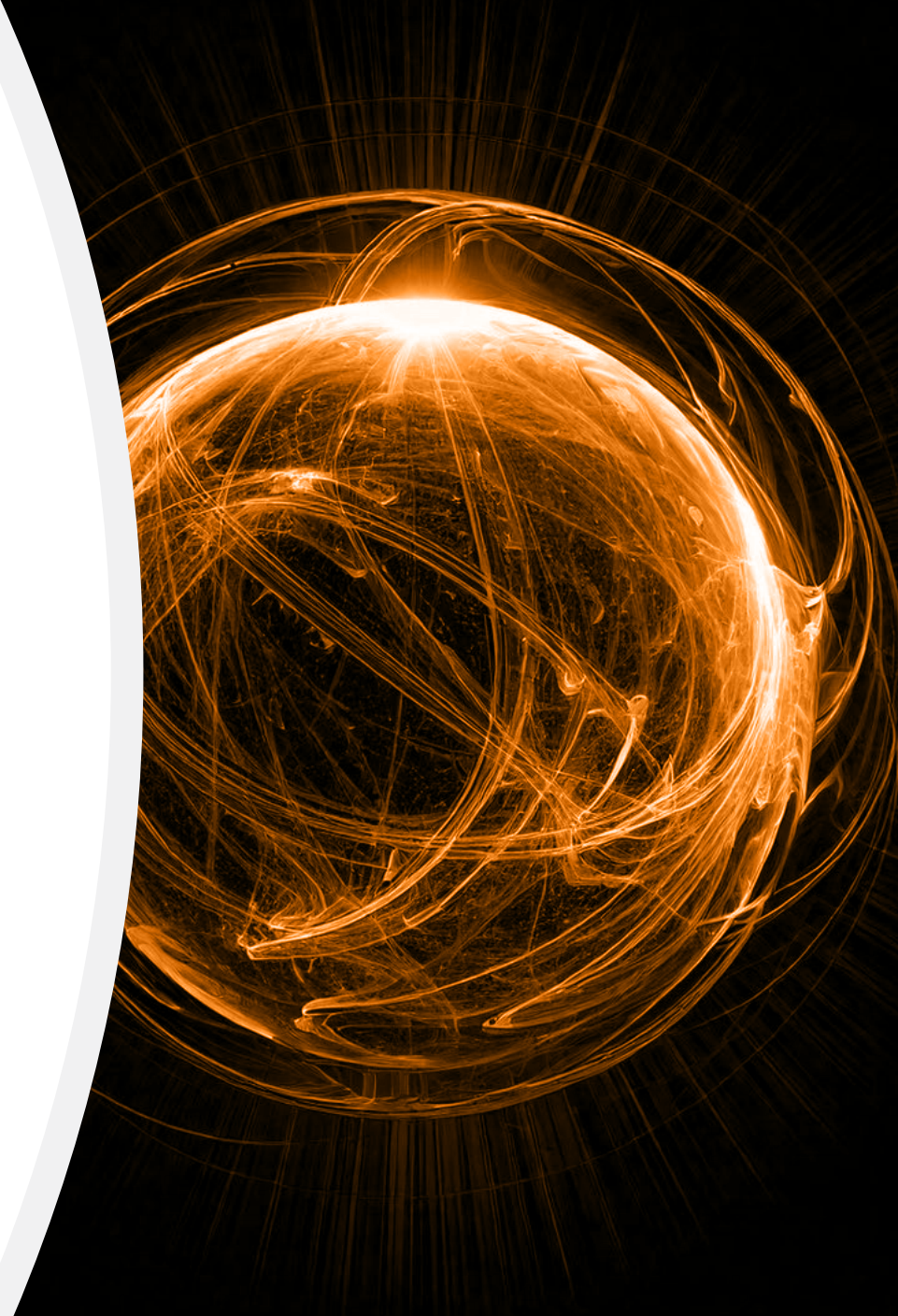
Extreme Power Users

The number of Extreme Power Users consuming 5 TB or more per month has increased by 2.4x since 3Q23.

Key Bandwidth Usage Insight

Monthly average upstream data usage growth, up 14.6% from 4Q23, continues to outpace average downstream usage growth (8.6%).
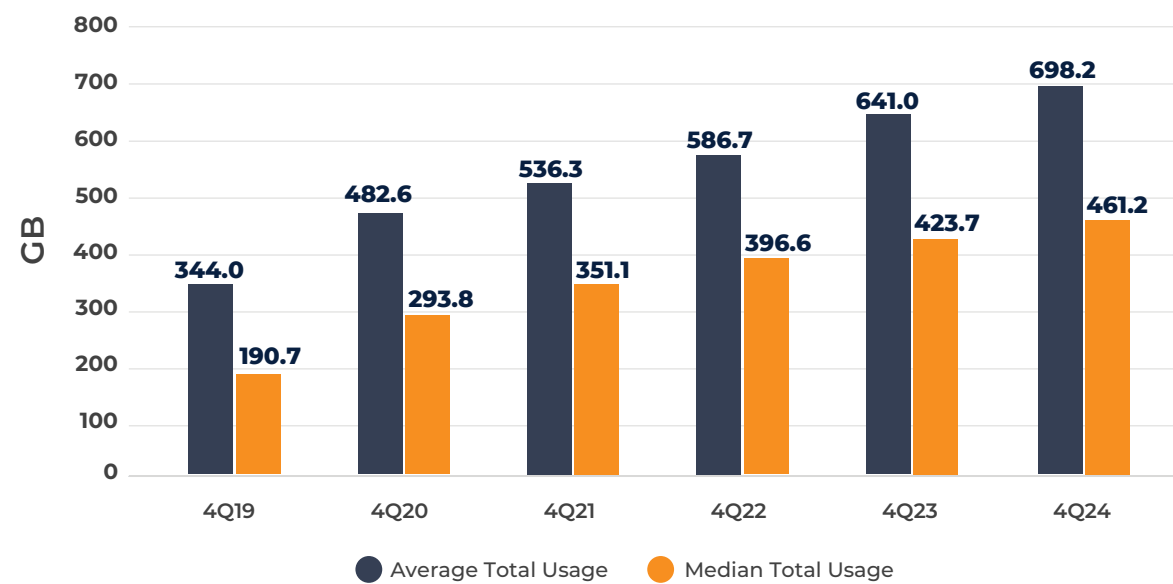
4Q24 Broadband Usage Key Findings

The following year-over-year and quarter-over-quarter trends were observed in 4Q24:

FIGURE 1

Data Usage Trends — 4Q19 to 4Q24 Monthly Average and Median
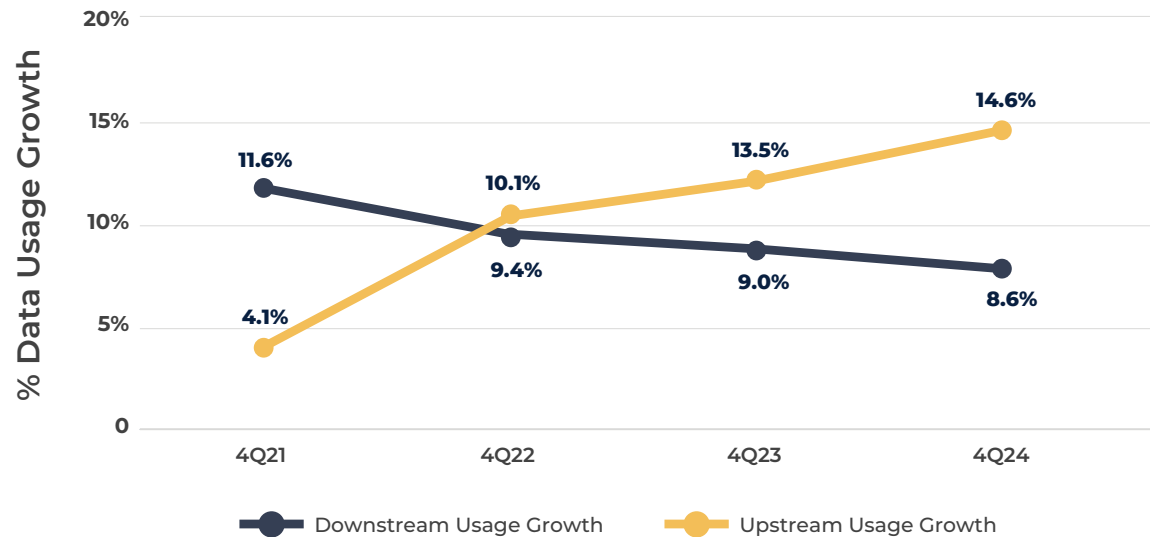

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- Subscribers' monthly average data consumption reached 698.2 GB in 4Q24, an all-time high that was up 8.9% from 641 GB in 4Q23.

- Growth in average household data usage peaked at 40.3% in 4Q20 but has since remained relatively consistent, averaging approximately 10% over the past three years.

- 4Q24's monthly median usage was 461.23 GB, also an increase of 8.9% from a year ago (423.7 GB).

Upstream vs. Downstream
Data Usage Growth Trends — 4Q21 to 4Q24

% Data Usage Growth

- Downstream: 11.6% (4Q21), 9.4% (4Q22), 9.0% (4Q23), 8.6% (4Q24)
- Upstream: 4.1% (4Q21), 10.1% (4Q22), 13.5% (4Q23), 14.6% (4Q24)

Downstream Usage Growth | Upstream Usage Growth

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- Upstream data usage continues to be an important metric for the industry. Upstream consumption reached an all-time high of 45.9 GB in 4Q24, a year-over-year increase of 14.6% from 40.1 GB one year ago.

- While upstream growth continues accelerating, the downstream growth rate has declined incrementally. Downstream data usage growth in 4Q24 increased by 8.6%, marginally less than in 4Q23 and 4Q22.

FIGURE 3

Year-Over-Year Growth Rate:
## Downstream Usage vs. Speed — 4Q20 to 4Q24
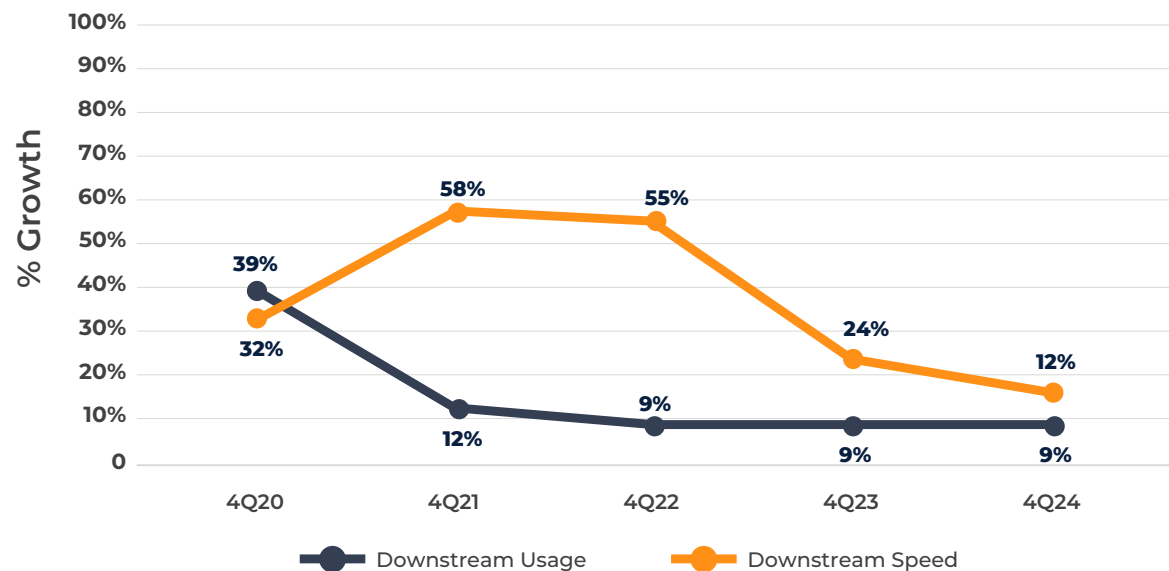
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The average provisioned download speed increased by 12% in 4Q24, a significant drop from the 24% growth rate observed in 4Q23. As growth in downstream data consumption has slowed, subscribers are upgrading to faster speeds at a much slower pace. Compared to the past, faster speeds have not driven a proportional rise in usage.

Bandwidth Usage Trends on Christmas Day

Volume of Data Usage (GB) — X-axis: 12:00 AM through 11:00 PM

Legend: 12/25/2024 — 12/25/2022 — 12/25/2020
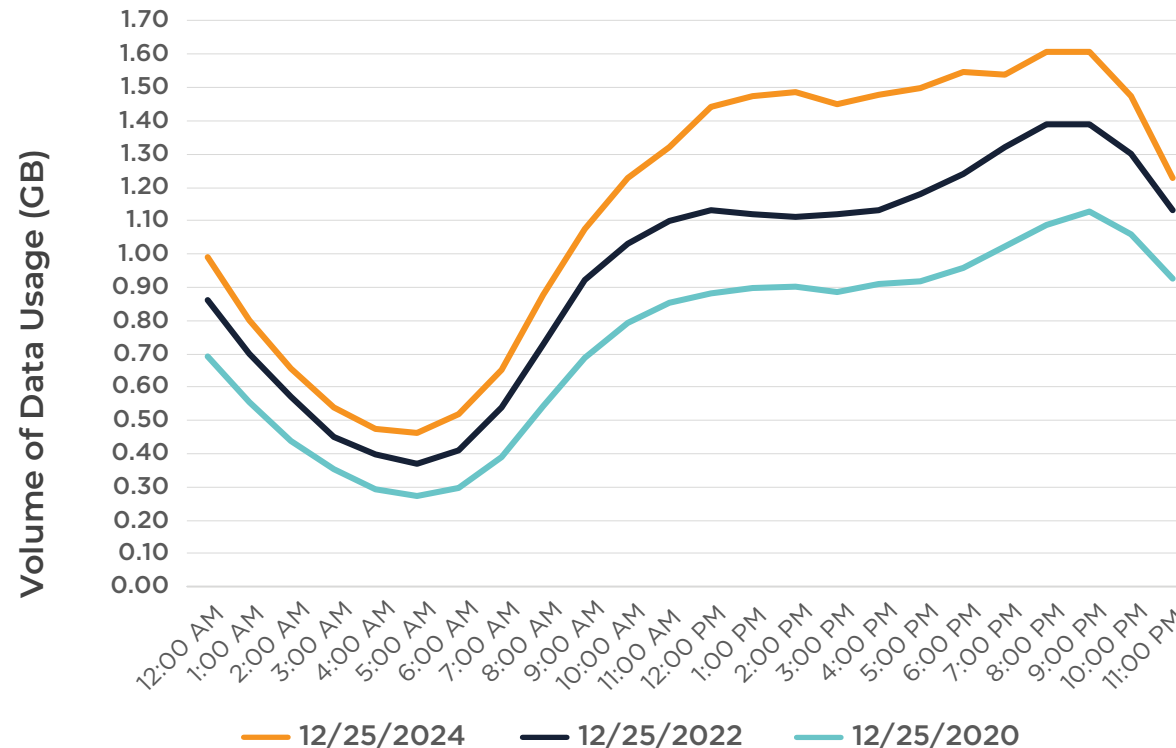
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Household bandwidth consumption peaks annually on Christmas Day, and each year's consumption historically has been higher than that of the year before. More than any other day of the year, families are gathered together and are simultaneously using the Internet for a range of activities—video conferencing with friends and family, streaming holiday movies, trying out new online games and connected devices, and more.
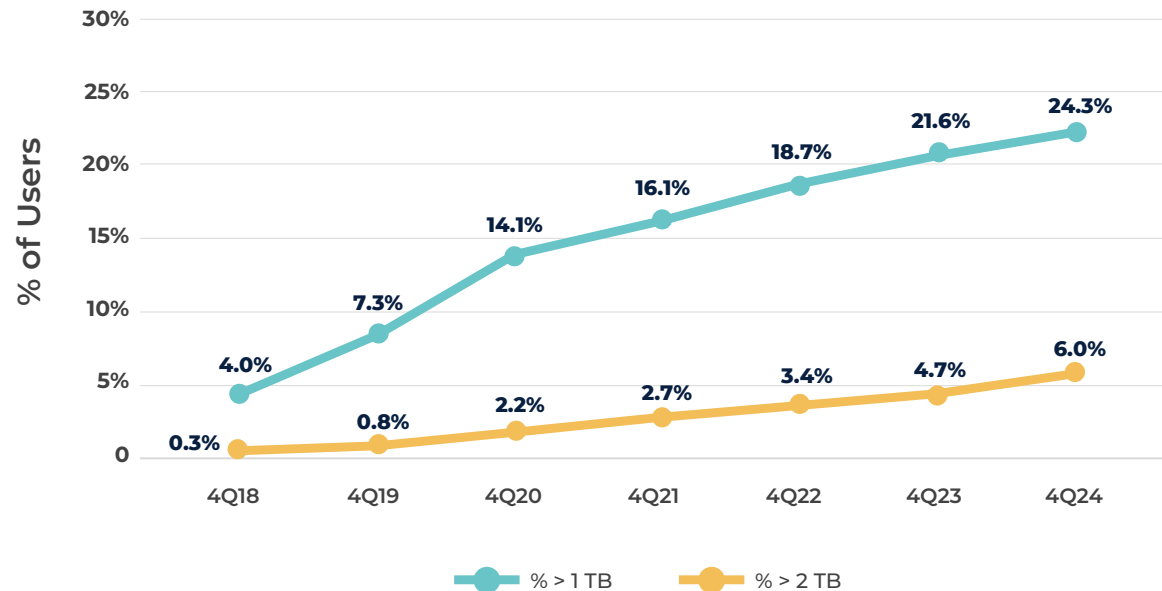
Figure 4 compares Christmas Day 4Q24 with that of 4Q22 and 4Q20 to show how Christmas Day data usage increases are consistent throughout the day. The period of heaviest usage is from 10 a.m. to 9 p.m. (ET). In 4Q24, data usage was 24% higher than on Christmas Day 4Q22 and 58% higher than in 4Q20.

Power Users Monthly Data Consumption Trends — 4Q24

Power User Consumption Trends — 4Q18 to 4Q24

% of Users

	4Q18	4Q19	4Q20	4Q21	4Q22	4Q23	4Q24
% > 1 TB	4.0%	7.3%	14.1%	16.1%	18.7%	21.6%	24.3%
% > 2 TB	0.3%	0.8%	2.2%	2.7%	3.4%	4.7%	6.0%

— % > 1 TB   — % > 2 TB
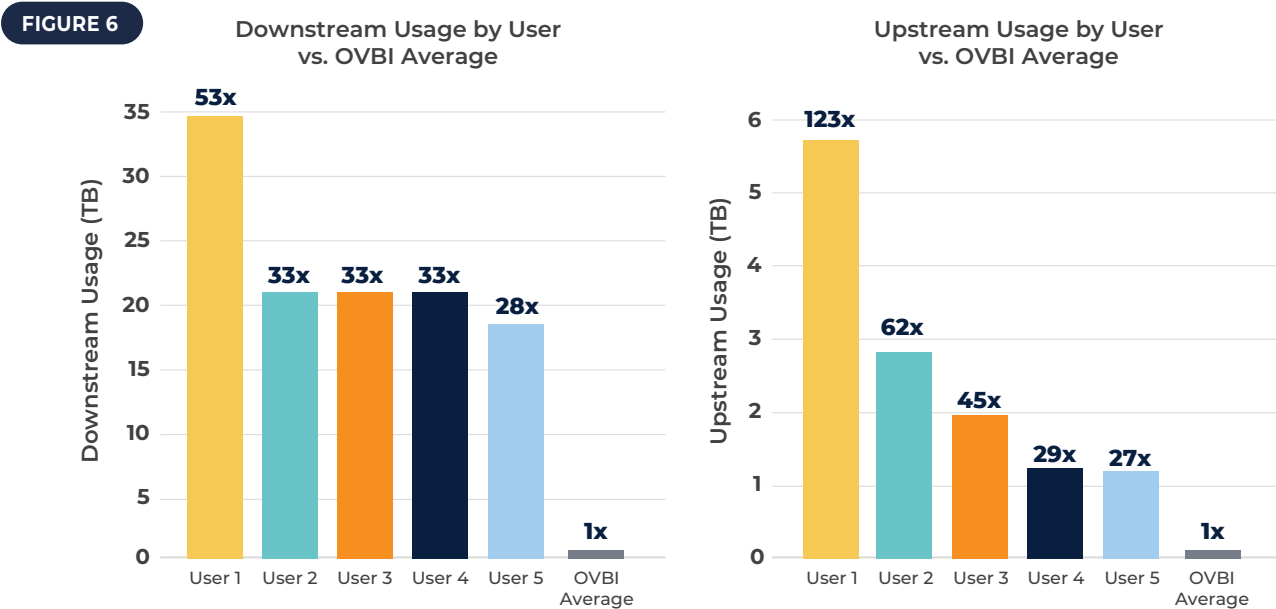
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- The percentage of Power Users consuming 1 TB or more per month in 4Q24 was 24.3%, a year-over-year increase of 12.8% and more than triple the pre-pandemic percentage of 7.3%.

- Super Power Users consuming 2 TB or more per month increased to 6% in 4Q24, a growth rate of 26.3% since 4Q23.

- Since 4Q18, the percentage of Power Users has increased by 505% (6x), and the percentage of Super Power Users has increased by 1,650% (17.5x).

Top Five Extreme Power Users Use More Data Than Average

The 3Q23 edition of the OVBI report introduced the Extreme Power Users who consume 5 TB or more of data each month. This group is now 2.4x larger than it was in 3Q23. Although they are a relatively small percentage of users, they significantly impact network congestion.

OpenVault used insights from its network optimization and subscriber usage analytics solutions to identify and analyze the top five Extreme Power Users for both downstream and upstream data. The results are captured in Figure 6.

FIGURE 6

Downstream Usage by User vs. OVBI Average

Upstream Usage by User vs. OVBI Average

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The subscriber with the highest downstream data usage consumed 34 TB in 4Q24—53x the average downstream usage of 652.3 GB per subscriber. The top individual upstream usage was 5.5 TB, a staggering 123x the average upstream usage of 45.9 GB in 4Q24.

Extreme Power Users put a strain on resources that can significantly impact the Quality of Experience (QoE) of hundreds of other subscribers on an operator's network. OpenVault offers tools to quickly identify heavy utilization, isolate and adjust bandwidth for the heavy user, and ensure a balanced and high QoE for all subscribers on the network.

# An Example of Network Traffic Distribution Before and After PMA Deployment

OpenVault's Advanced PMA™ solution checks network performance periodically throughout the day and creates optimized profile sets to open up more usable bandwidth.

Figure 7 shows how one network operator's upstream DOCSIS 3.1 network was optimized after deploying OV Advanced PMA™, based on the distribution of upstream traffic by Interval Usage Code (IUC). A lower IUC value represents better performance, but this also depends on the modulation level (QAM) associated with each IUC. The goal is to have as many customers as possible on more performant IUCs, such as IUC 9 or 10, while minimizing customers that have to utilize IUC 13, which is typically used in more challenging network conditions. This shift significantly improves customers' Quality of Experience (QoE).

In this example, throughput increased 27% from 201 Mbps to 255 Mbps after deploying OV Advanced PMA™. This increase in capacity was achieved by reducing the percentage of traffic traveling over IUC 13 by more than 67% and moving that usage to more efficient IUCs that support higher speeds. This additional bandwidth could allow 10 to 15 more high-definition programs to be streamed on Netflix. This newly available bandwidth could now be used by subscribers on that part of the network, improving their QoE. In some cases, the added capacity also allows operators to postpone node splits.

Using OV Advanced PMA™ can also increase the network resiliency, which is vital given operators' need to maximize their DOCSIS 3.1 investments. An example looks at five partial service D3.1 modems. ("Partial service" modems are those that are relegated to a DOCSIS 3.0 network due to their inability to utilize the available DOCSIS 3.1 network). OV Advanced PMA™ successfully restored these five modems onto the 3.1 portion of the network. This restoration unlocked higher speeds for the modems, reduced strain on the capacity-constrained DOCSIS 3.0 network, and efficiently delivered the reliable, high-speed experience D3.1 subscribers expect.

Distribution of Daily Network Traffic by IUC

	Before PMA	After PMA
IUC 9	11%	19%
IUC 10	18%	43%
IUC 11	22%	21%
IUC 12	21%	8%
IUC 13	28%	9%
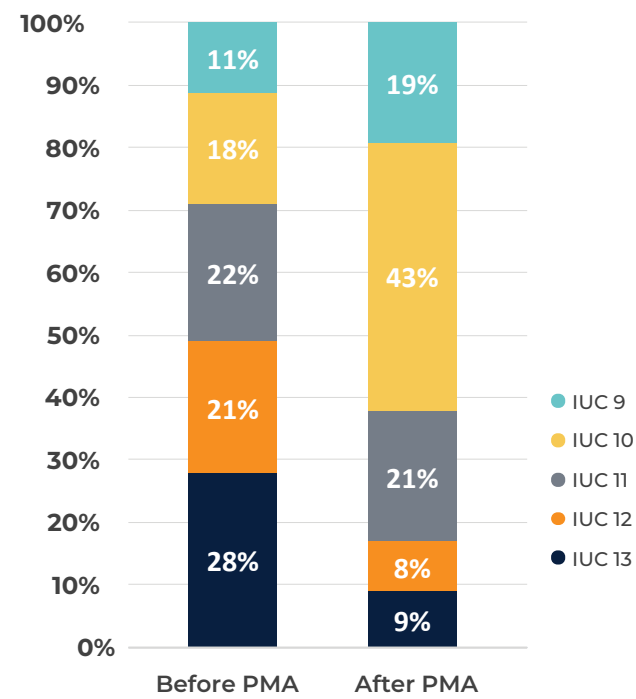
Result:

	Before PMA	After PMA
Throughput	201 Mbps	255 Mbps
Partial Service Modems	5	0

FIGURE 7

Industry Observations

Below are recent milestones or data equivalences that put the observations noted in this 4Q24 OVBI report into perspective.

19 Million
Number of subscribers
Netflix added in 4Q24

Source: Netflix

30+ Million
Users on the social media
platform, Bluesky

Source: CNET

55 Billion
Minutes of Bluey
streamed in 2024

Source: Forbes

68%
American households
that own a Smart TV

Source: Parks Associates

82.1 Million
Americans that pay for
on-demand music streaming

Source: Musical Pursuits

500 Billion
Devices expected to be
connected to the internet by 2030

Source: Cisco

OpenVault's Average Broadband Household Index — 4Q24

A snapshot of the average U.S. broadband household.

698.2 GB
Average Bandwidth Usage

652.3 GB
Average Downstream Usage

45.9 GB
Average Upstream Usage

569 Mbps
Average Downstream Speed

32 Mbps
Average Upstream Speed

Conclusion

The final quarter of 2024 highlights significant shifts in broadband usage patterns that continue to reshape the landscape of network performance and subscriber experience. While average data consumption reached a new milestone of 698.2 GB, the rate of upstream data growth outpaced the rate of downstream growth, reflecting broader changes in user behavior. As subscribers upgrade to faster speeds at a slower pace, the focus is moving away from speed improvements and toward maintaining optimal network health, performance, and Quality of Experience (QoE).

The rise of Power Users, Super Power Users, and the growing category of Extreme Power Users underscores how these high-consumption groups are putting increasing pressure on network infrastructure. To address these challenges, broadband providers must adopt proactive strategies to optimize network capacity and mitigate congestion, ensuring a consistent and high-quality experience for all users. OpenVault's real-world examples—such as the success of OpenVault's OV Advanced PMA™ in optimizing network traffic distribution—demonstrate the importance of data-driven solutions in maintaining performance.

By leveraging advanced monitoring tools and understanding shifting usage patterns, broadband operators can effectively manage network resources, balancing the needs of diverse user segments while sustaining high QoE amidst evolving data consumption trends.

Using OV Advanced PMA™, one broadband provider increased throughput by

27%

OpenVault Solutions to Address This Report's Insights

OpenVault is the world's only solutions provider focused exclusively on optimizing networks and driving revenue for broadband operators.

Offering a full suite of analytic and proactive solutions, OpenVault applies its deep domain knowledge to address the significant challenges providers face, as indicated in this OVBI report

OpenVault's unique cross-section of data can identify, measure, and solve problems that impact network performance and subscriber experiences. OpenVault's tools can measure and boost QoE in many new ways:

▶ **Congestion:** One Extreme Power User can account for 90% of total usage during a peak weekend hour and impact the experience of hundreds of other subscribers on the network. OpenVault offers tools to quickly identify heavy utilization, isolate, and adjust bandwidth for the heavy user, and ensure a balanced and high QoE for all subscribers on the network.

▶ **Speed Clipping:** When subscribers reach the maximum speed of their service plan, they can experience slow loading speeds, choppy video streaming, etc. More often than not, customers need more speed than they originally signed up for. OpenVault offers a tool to identify subscribers who are using (or approaching) the maximum speed available to them. This allows the operator to generate proactive upgrade campaigns, resulting in higher ARPU and a greater QoE for the subscriber. In one example, this tool identified more than 2,400 subscribers of one network operator who were using at least 80% of their maximum service plan speed for a portion of a month.

▶ **Impairment Impacts:** Network impairments like loose connections or outside influences from weather, water, or rodents can impact network performance. OpenVault can identify impairment issues and prioritize bandwidth around the impairment to optimize network performance until the problem is resolved.

OpenVault Product Information

OpenVault is the industry leader in providing products designed specifically to optimize new generations of DOCSIS 3.1 and DOCSIS 4.0 networks. These include:

OV Advanced PMA™ (Profile Management Application)

A closed-loop, automated, data-driven, vendor-agnostic solution that dynamically creates bandwidth without human intervention. Through persistent analysis of data from each CM and CMTS, OpenVault's industry-leading Profile Management Application (OV Advanced PMA™) learns the state of the system and creates optimized profile sets tailored to the unique real-world environment of each OFDM/OFDMA channel, opening up more usable bandwidth. Providers can realize the full benefit of their investment in their DOCSIS 3.1 network by improving performance and resiliency without incremental capital investment.

OV PNM (Proactive Network Maintenance)

Swiftly detect and locate RF impairments, optimizing resource allocation for precise issue resolution. OpenVault Proactive Network Maintenance (OV PNM) enhances subscriber quality of experience while minimizing workforce-related costs. The user-friendly interface is well-suited for plant technicians, facilitating seamless adoption across large-scale deployments. With its intuitive design, OV PNM enables technicians to quickly identify RF impairments, reducing repair times and the potential for system outages. It serves as a versatile tool for both proactive and reactive maintenance needs, adaptable to various situations.

▶ **Features**

OV ADVANCED PMA™

- **Dynamically control** network resources to alleviate congestion
- **Enhance** overall network capacity by up to 40%
- **Improve** the resiliency of DOCSIS 3.1 modems by ensuring they use the OFDM(A) channels in the presence of impairments

OV PNM

- **Detect** and analyze noise impairments in the upstream RF plant with Upstream Triggered Spectrum Capture (UTSC) Analyzer, which provides enhanced upstream monitoring capabilities tailored for Distributed Access Architecture (DAA) deployments
- **Combine** service assurance processes, field force management, and field find-and-fix capabilities into a single pane of glass
- **Optimize** truck roll efficiency, minimizing Mean Time to Repair (MTTR) and Operational Expenditure (OPEX)
- **Identify** in-home vs. outside-plant impairments

In addition, by combining PNM and PMA tools, cable operators can proactively identify and mitigate impairments, provide optimal bandwidth to customers, and schedule necessary repairs to enhance the overall network performance and customer experience.

Learn more about these and other revenue-increasing and network management solutions at OpenVault.com.

About OpenVault

OpenVault is a market-leading source of broadband technology solutions and data-driven insights into worldwide broadband consumption patterns. OpenVault's cloud-based SaaS solutions and tools help service providers optimize network performance, increase revenue, and improve subscriber satisfaction. OpenVault aggregates and analyzes the resulting market data to provide unparalleled granular views of consumer usage that can be used to anticipate residential and business broadband trends. This data analysis drives a suite of actionable and automated solutions, providing operators with tremendous value through software and avoiding the need for large-scale infrastructure spending.

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OpenVault
Unlocking the potential of broadband