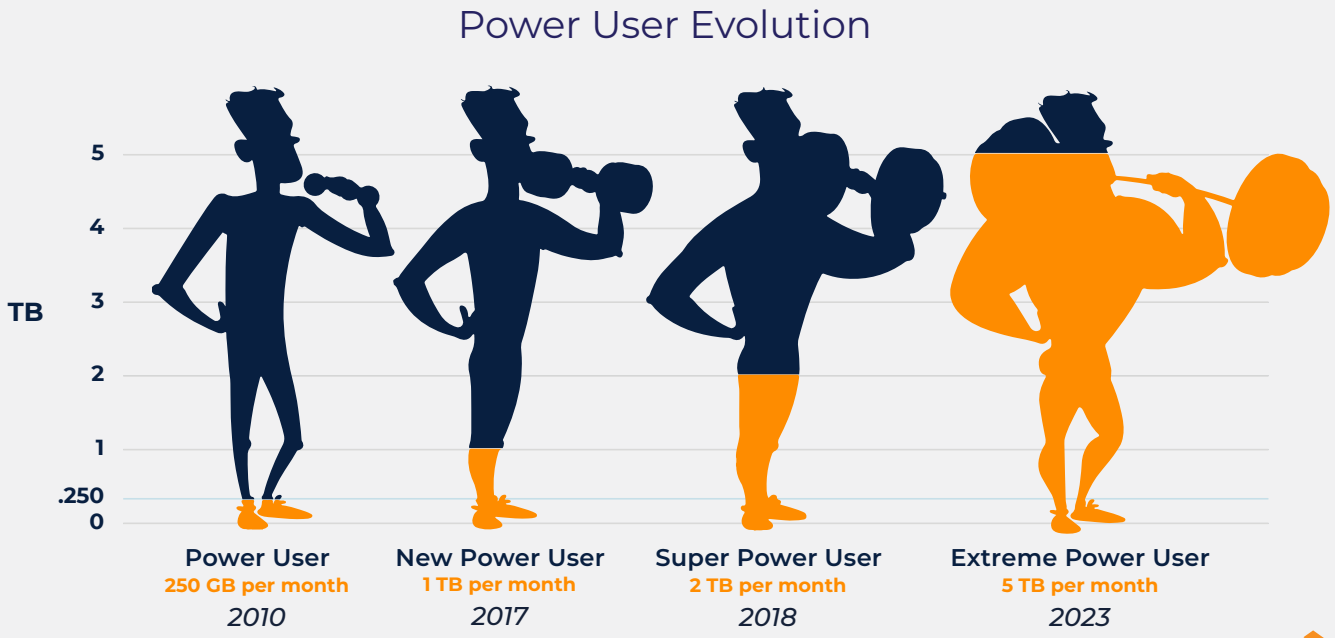
OpenVault

Broadband Insights Report (OVBI)

3Q23

Introduction

The definition of the broadband power user, which has evolved over more than a dozen years, has changed again with the emergence of a new group of subscribers who consume 5 TB or more of data each month. Using current data and historical power usage trends, the implications of these “extreme power users” are a focus of the latest edition of the OpenVault Broadband Insights (OVBI) report.



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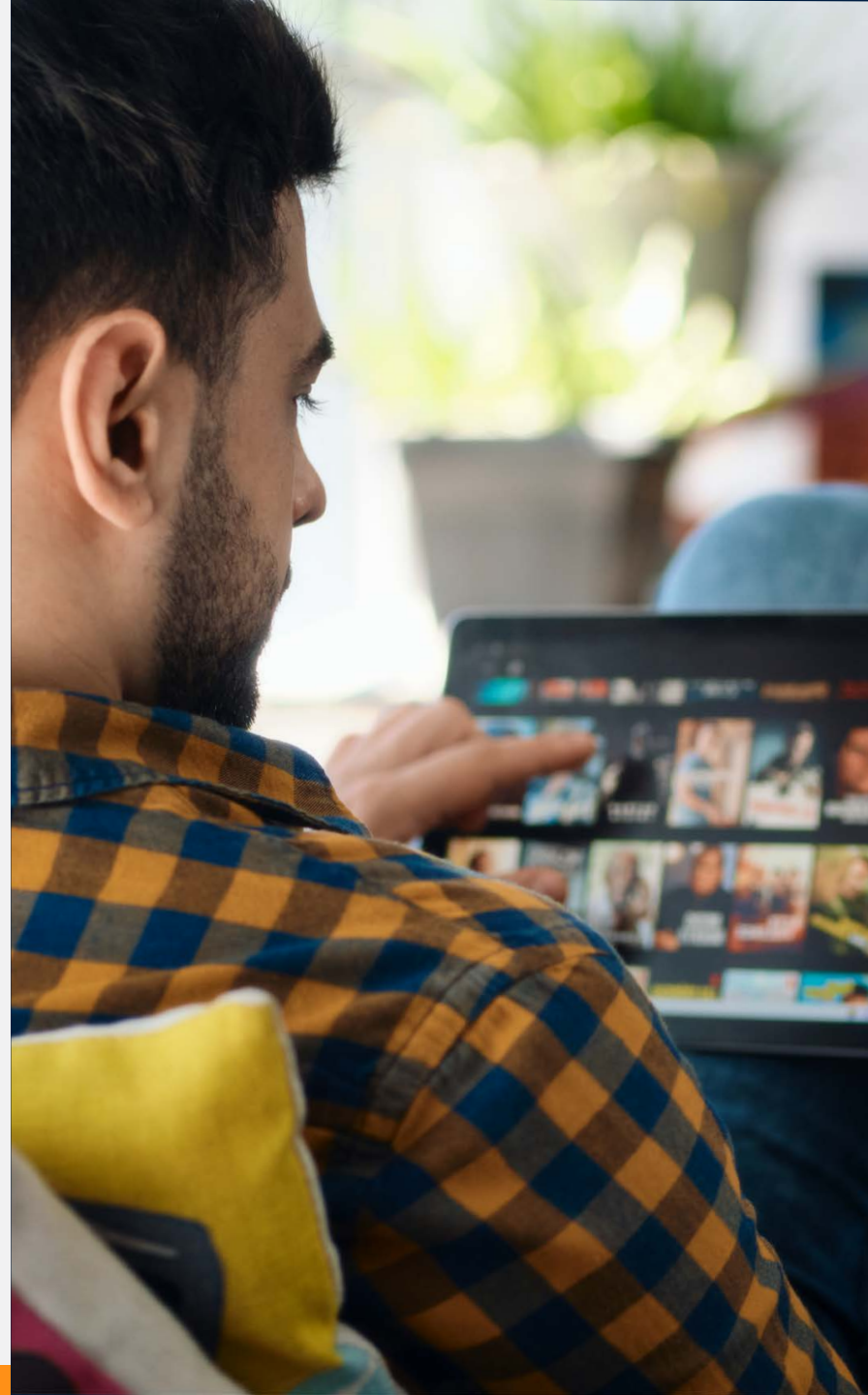
Introduction, continued

In this 3Q23 edition of the report, OpenVault research shows how the 5 TB extreme power user category is beginning to warrant heightened scrutiny, just as did >250 GB in 2010, >1 TB in 2017, and the “super power user” category of 2 TB or more in 2018.

Today’s 5 TB extreme power users are streaming 13 times more data than users who consume 1 TB or less.

This edition of the OVBI report takes a close look at what applications they’re using, when they consume the most bandwidth, what speed tiers they subscribe to, and the impact they have on network health and available capacity.

As with all editions of the OVBI, this 3Q23 edition uses data points from millions of individual broadband subscribers, aggregated from OpenVault’s software-as-a-service (SaaS) technology solutions to pinpoint usage patterns that can affect network performance, operator revenue and customer satisfaction.



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Key findings from the 3Q23 OVBI include:

Usage
The monthly weighted average data consumed by subscribers in 3Q23 was 550.2 GB, up 11% from 3Q22's average of 495.5 GB.

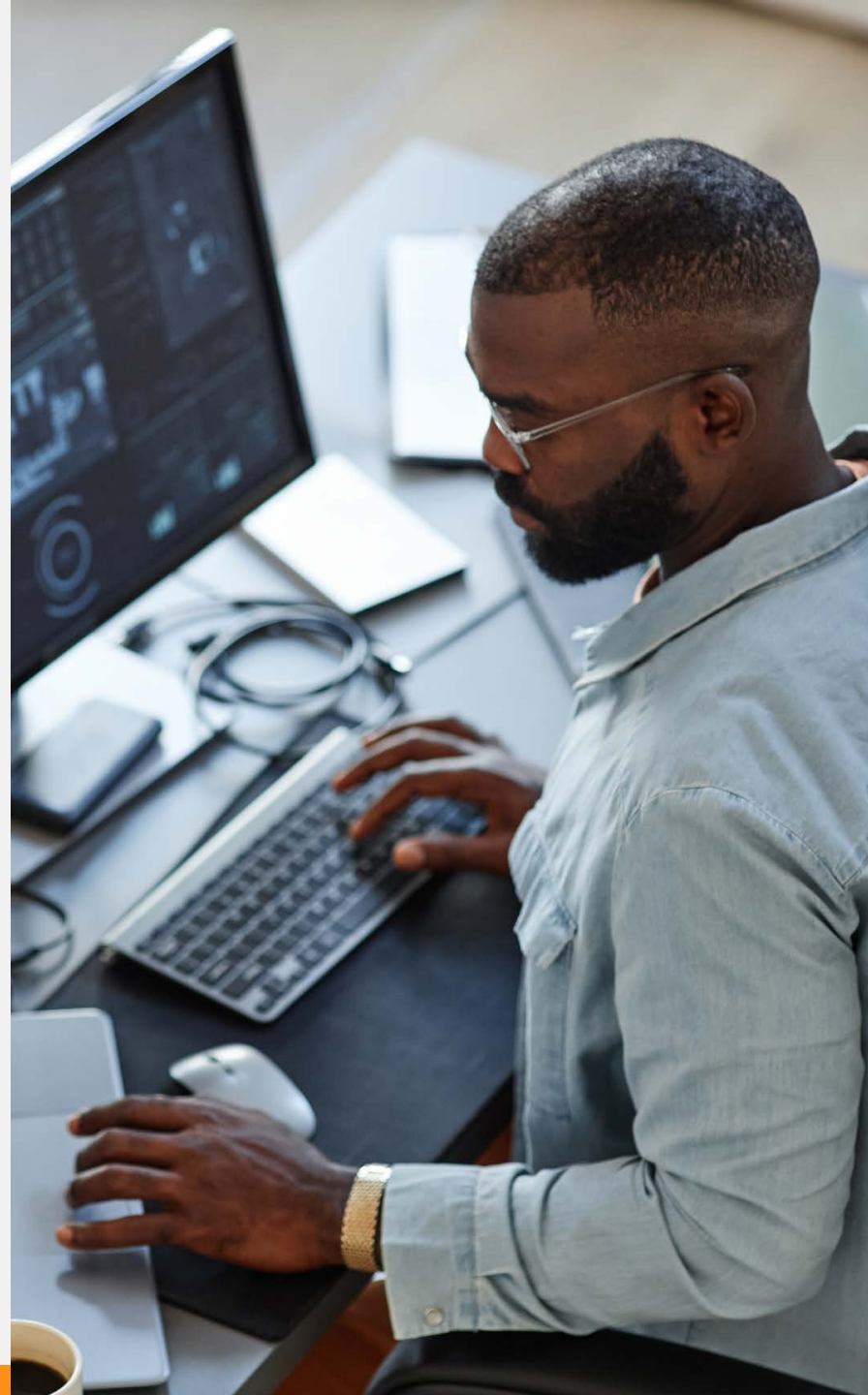
Key ARPU Insight
Flat rate billing (FRB) operators have 9x more subscribers on lower-ARPU speed tiers (50 Mbps or less) vs usage based billing (UBB) operators.

Power Users
The super power user category consuming 2 TB or more per month increased by 35% since 3Q22.

Key Bandwidth Usage Insight
Among extreme power users of 5 TB or more data per month, 89% of data usage is from streaming video.

Speed Tiers
As users continue to upgrade to faster speed tiers, the percentage of subscribers in tiers under 400 Mbps declined by 21%.

Key UBB vs FRB Insight
Usage levels have remained somewhat consistent between FRB and UBB subscribers, a new normal that has been observed over the last few quarters.



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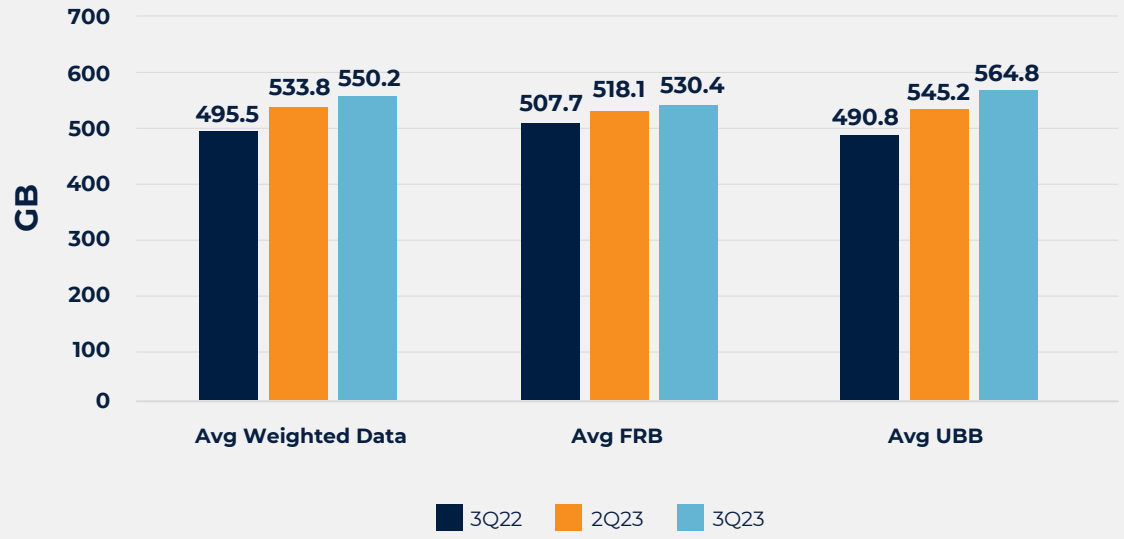
3Q23 Broadband Usage Key Findings

The following broadband usage trends were observed in 3Q23.

FIGURE 1

Data Usage Trends by Billing Type — 3Q23



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The monthly weighted average data consumed by subscribers in 3Q23 was 550.2 GB, up 11% from 3Q22's average of 495.5 GB and nominally higher (3%) compared to 2Q23 (533.8 GB).

- Year-over-year upstream data usage growth (13.7%) was slightly greater than downstream data usage growth (10.9%).
- Average consumption by UBB subscribers has increased 15.1% over the previous year and continues to outpace FRB annual growth (4.5% YoY).
- UBB subscribers continue to upgrade more rapidly than their FRB counterparts, widening the gap with 6% more data usage (564.8 GB vs. 530.4 GB among FRB subscribers). In 3Q22, UBB data usage was 3% lower than FRB usage.

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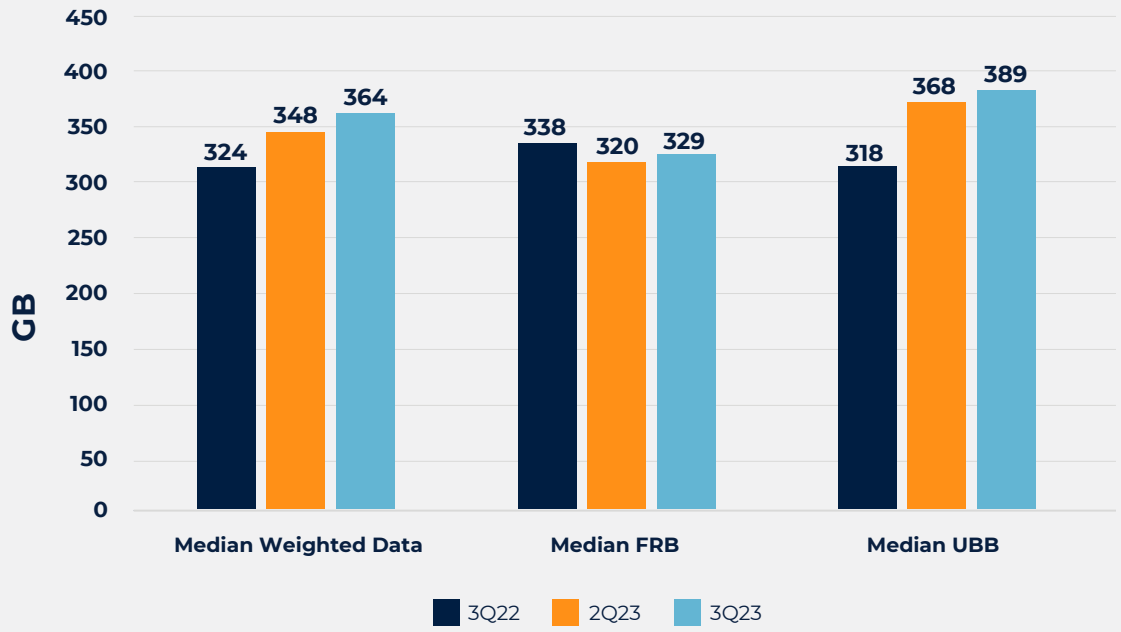
FIGURE 2

Median Usage Trends by Billing Type — 3Q23



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- The monthly weighted median usage in 3Q23 was 364 GB, up 12.3% from 324 GB a year ago.
- Similar to average weighted data usage, the gap in median usage continues to grow between UBB (389 GB) and FRB subscribers (329 GB).

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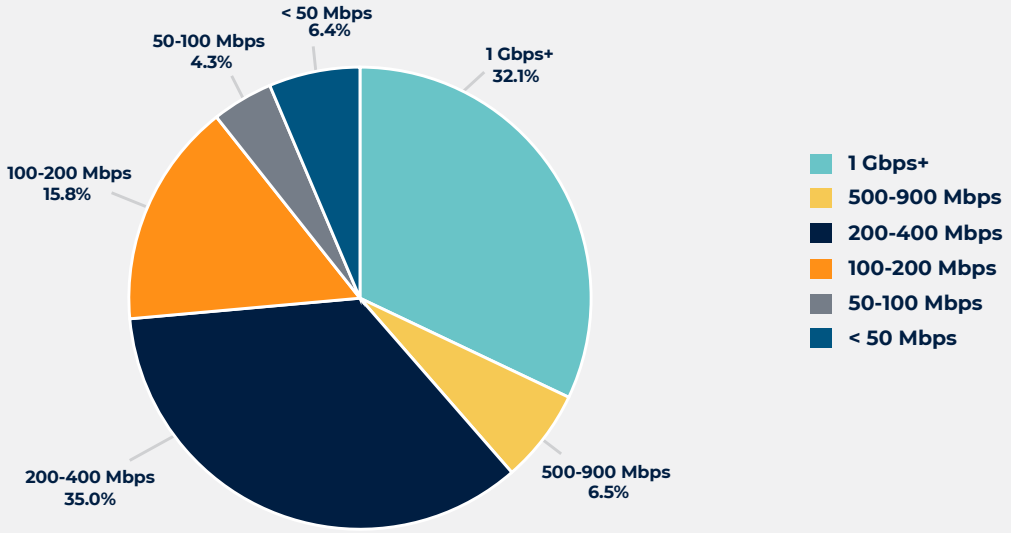
FIGURE 3

Provisioned Broadband Speeds — 3Q23



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- The percentage of subscribers on gigabit speed tiers held steady at 32.1% in 3Q23, building slightly on the all-time high observed last quarter (31.6%), and more than doubling the percentage observed one year ago (15.3%).
- The percentage of UBB subscribers provisioned for 1 Gbps or higher speeds is 45.1%, 3.5x more than the percentage of FRB subscribers provisioned for the same speed (13.2%).
- FRB operators have 9x more subscribers (13.5%) in the lowest-ARPU speed tiers of 50 Mbps or less compared to UBB operators (1.5%).
- The percentage of subscribers provisioned for speeds under 100 Mbps (10.1%) continues to decrease, dropping 22% since 3Q22.

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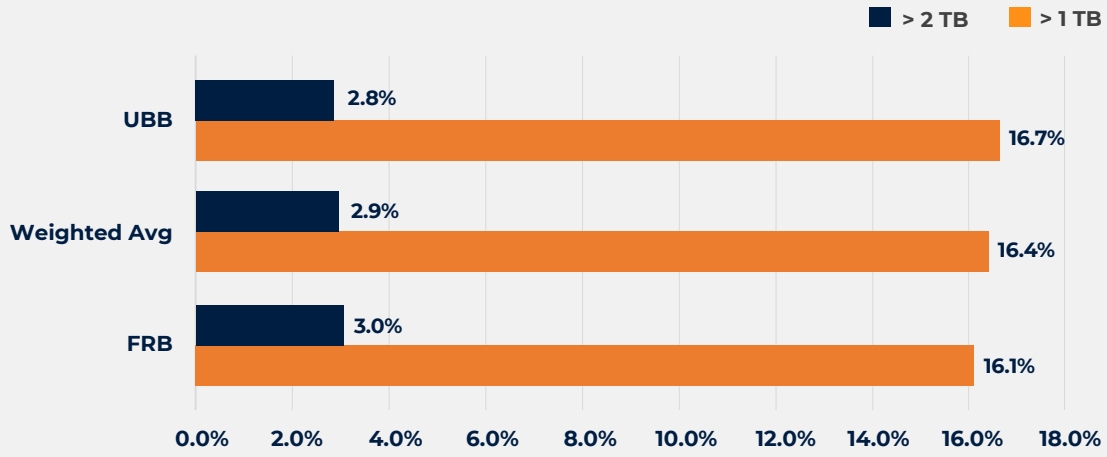
FIGURE 4

Power Users Monthly Consumption — 3Q23



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- The percentage of power users consuming 1 TB or more per month in 3Q23 was 16.4%, a year-over-year increase of 19.7%.
- Super power users consuming 2 TB or more per month increased by 35% to 2.9% in 3Q23.

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Bandwidth Usage by Extreme Power Users

While the percentage of subscribers consuming 1 TB+ of data has increased 19.7% YoY, the percentage of subscribers consuming less than 1 TB has declined by 3% over the same period. This has been a well emphasized trend in previous OVBI reports as subscribers continue to upgrade to faster speeds. Increasing at an even faster rate (60% YoY) is a subset of power users who consume data at an extremely higher rate, even relative to other power users. Because of this growth and the impact they have on network congestion, it's important to give this segment a closer look.

For the first time, the 3Q23 OVBI zooms in on the extreme power users who use 5 TB or more monthly. This cohort of subscribers has grown by over 60% YOY.

Hourly data usage patterns for extreme power users generally parallel those of other user segments, but are at significantly higher levels. Although they make up a small portion of subscribers, extreme power users, on average, consume data at a rate that is 14x that of the average subscriber.

Another observation – that more than 7% of extreme power users remain on bandwidth package speeds of 100 Mbps or slower – represents a monetization opportunity for broadband providers. Upgrading to a faster speed plan would provide these subscribers with a much better experience given their usage consumption, while the operator would increase revenues from this cohort, which has a significant impact on network health.

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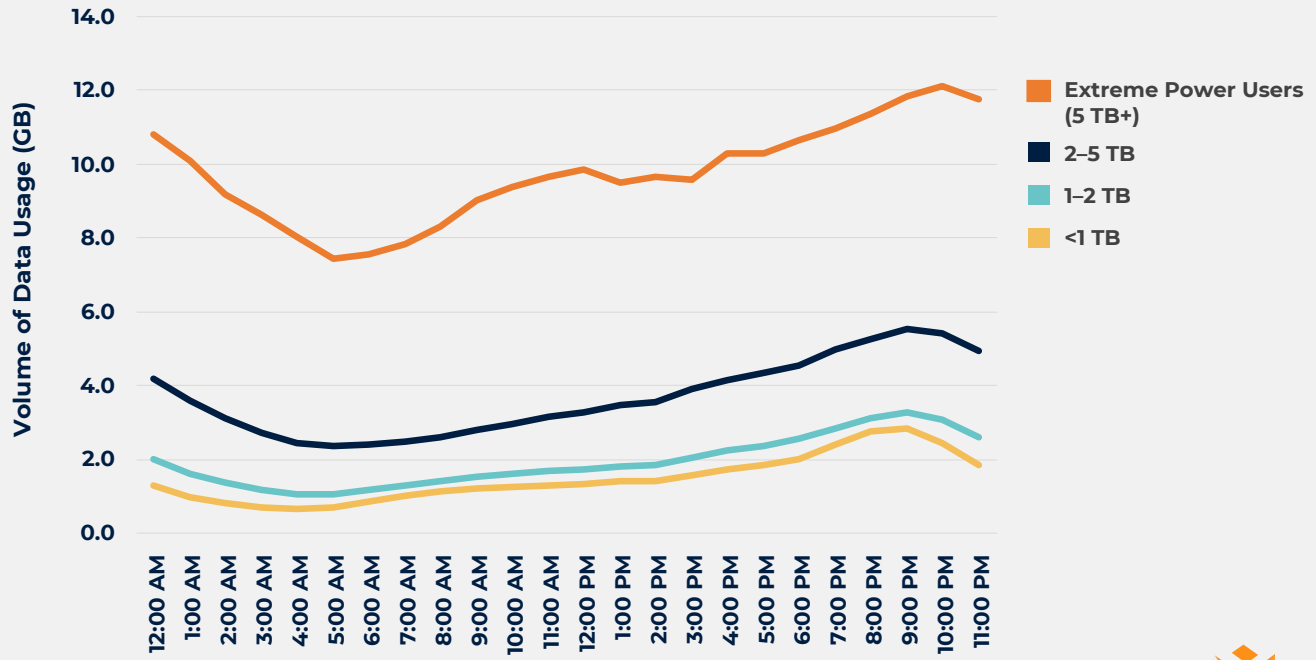
An Initial Glimpse at Peak Hourly Usage by Extreme Power Users

Looking more closely at the extreme power user category, OpenVault has observed usage from a mid-tier operator that highlights the contrast – particularly during the peak hours of 7-10 PM – between extreme power users and those who consume 1 TB or less (Figure 5).

FIGURE 5 Average Hourly Data Usage by Usage Tier — 3Q23



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- During peak hours, extreme power users consume data at a rate that is 7x that of those in the 1 TB or less category.
- Thus, extreme power users exert significant strain on broadband networks at a time when subscriber demand is at its highest, creating the need for network optimization and resiliency.

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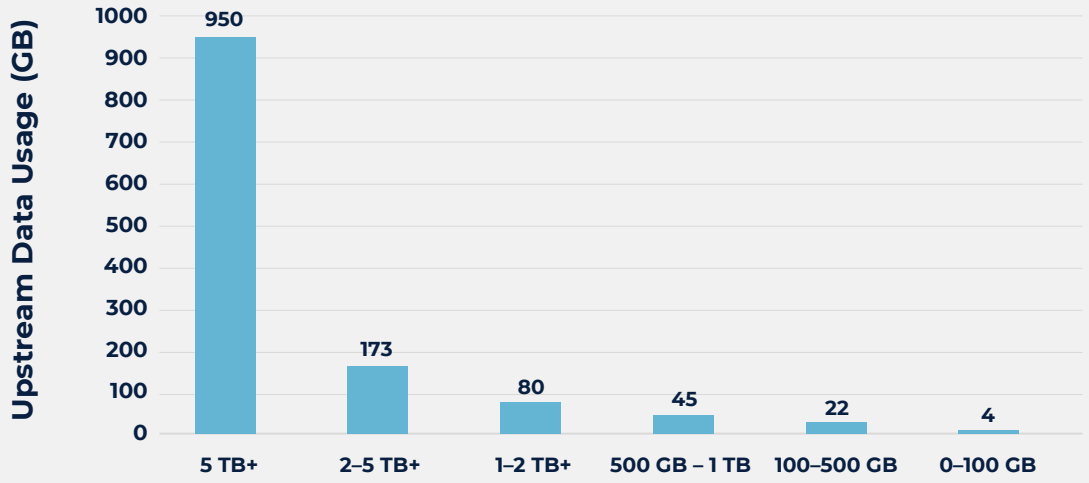
FIGURE 6

Upstream Data Usage by Usage Tier — 3Q23



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Average upstream data usage by extreme power users is almost 1 TB on average, 5.5x the amount of upstream data consumed by 2 TB super power users and 12x that of 1 TB power users. This is highly significant because of the limited capacity in many broadband upstream networks and the potential to create congestion and subscriber satisfaction issues.

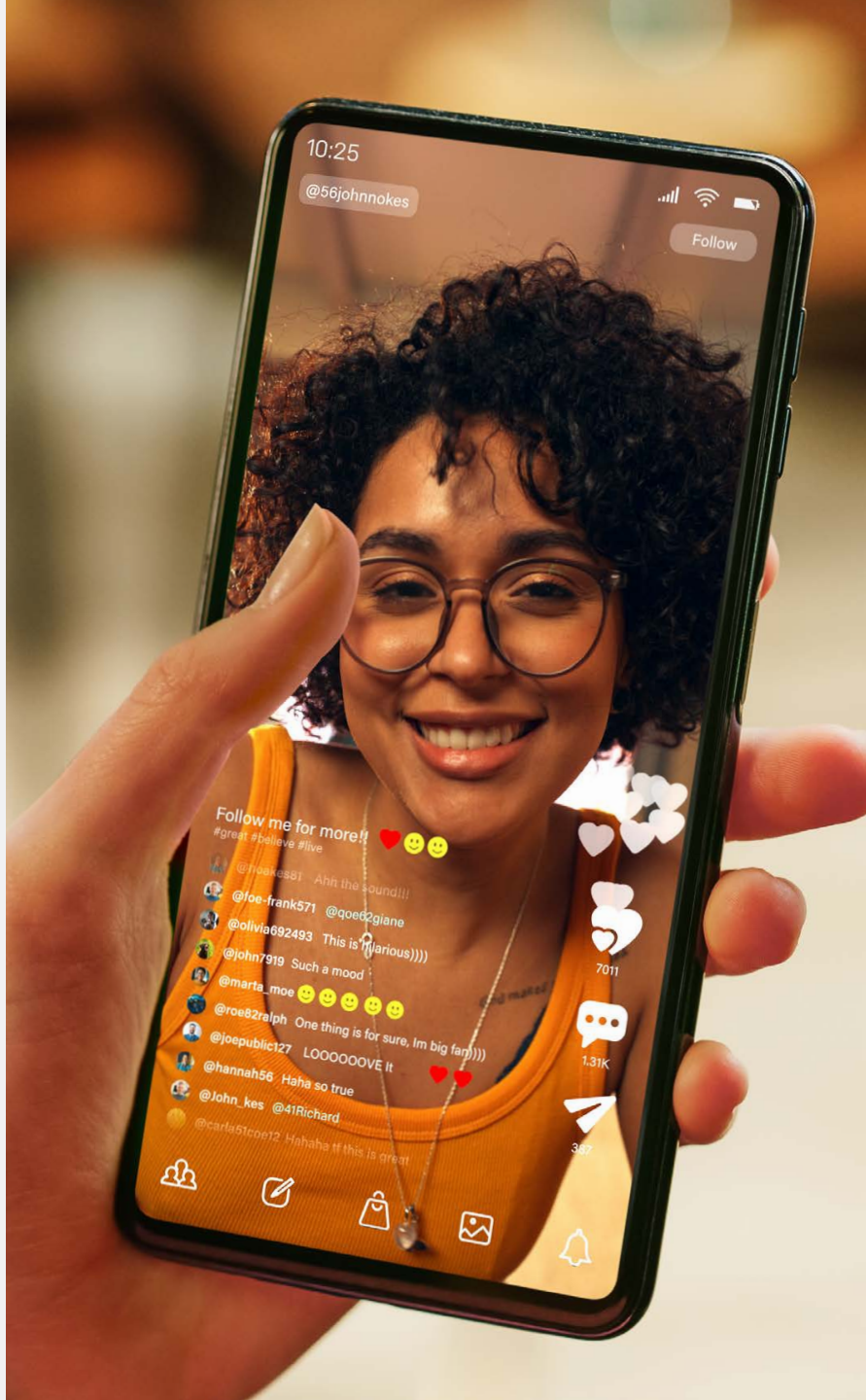

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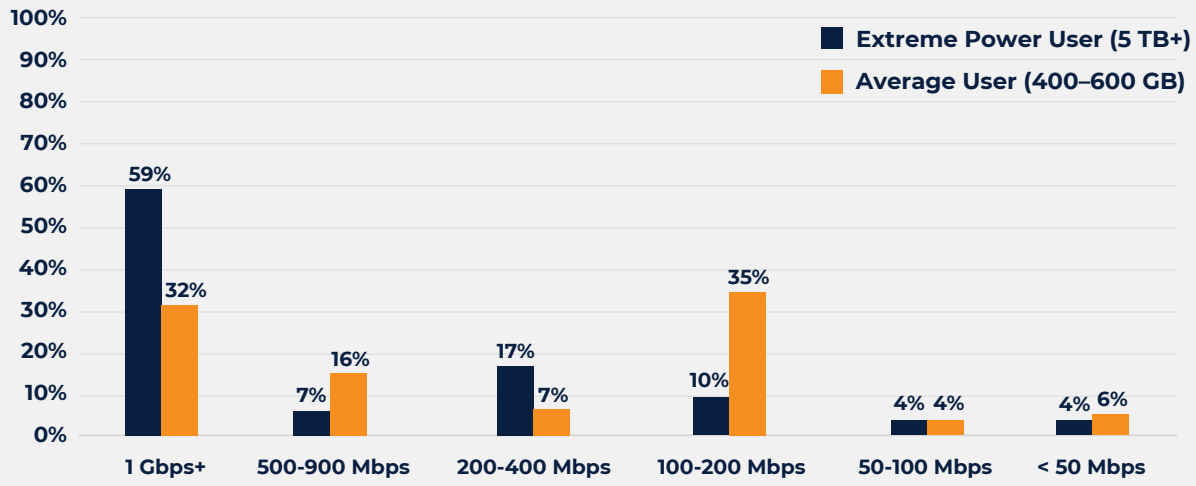
FIGURE 7

Speed Tier by Subscriber Type — 3Q23



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The majority of extreme power users (59%) are provisioned at gigabit speed tiers, nearly twice the percentage of average users (32%).

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Applications Driving Data Consumption by Subscriber Segment

OpenVault's analysis of the primary application categories driving data traffic shows that streaming accounts for the largest proportion of data consumed by all subscribers by far. Extreme power users stream nearly twice as much data on a monthly basis as those who consume 2-5 TB per month, the second biggest users of streaming, and 13 times more data than those who consume 1 TB or less.

Extreme power users and users who consume 2-5 TB per month participate more often in online gaming than do other subscriber segments. Extreme power users consume six times more data for online gaming than do users of 1 TB or less per month.

Users of 1-2 TB per month are more likely to consume social media than they are gaming data. Of the three most voracious user segments, extreme power users consume the least amount of social media data.

Streaming data

Gaming data

Social media data

"Other" Data

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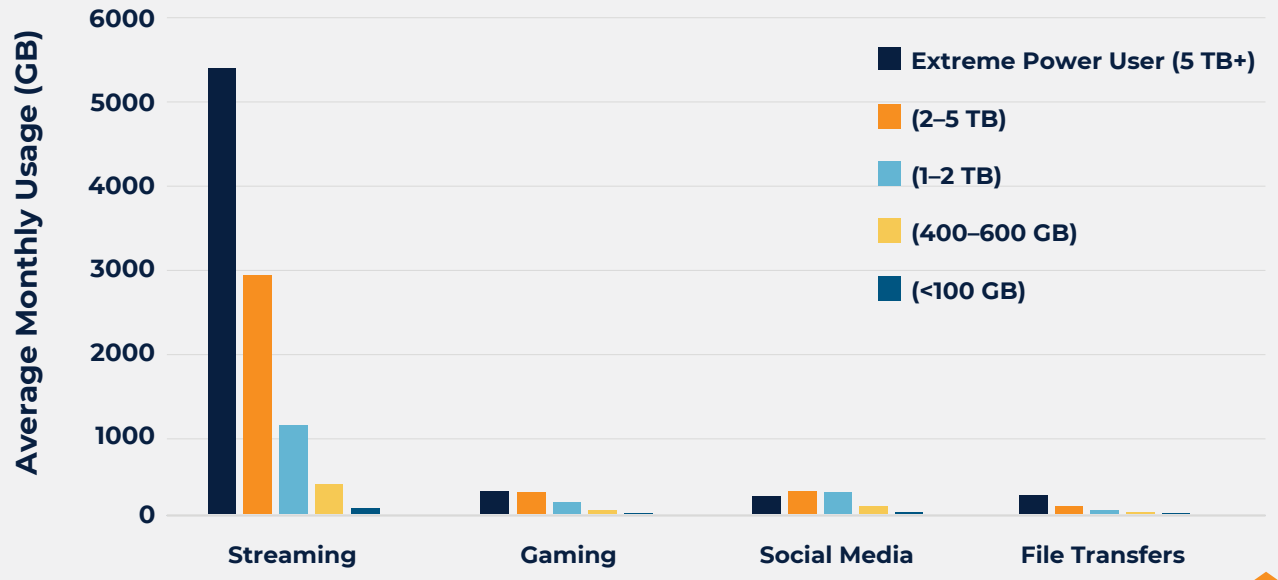
FIGURE 8

Applications Driving Data Traffic by Subscriber Segment — 3Q23



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Industry Observations

Below are recent milestones or data equivalences that put the observations noted in this 3Q23 OVBI report into perspective.

18 Billion

Minutes of “Suits” viewed on Netflix in July 2023

Source: NPR

$483 Billion

Global enterprise IoT market forecasted by 2027, +140% compared to 2022

Source: Banklesstimes.com

1.7 Million

Games sold on Steam per day

Source: VG Insights

83%

Percentage of US households with at least one video streaming subscription

Source: Exploding Topics

161.7 Million

Amazon Prime members in 2023

Source: Statista

810.2 Million

Unique global visitors using Zoom as of April 2023

Source: Statista

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OpenVault's Average Broadband Household Index — 3Q23

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

550.2 GB
Average Bandwidth Usage

514.4 GB
Average Downstream Usage

35.9 GB
Average Upstream Usage

498 Mbps
Average Downstream Speed

28 Mbps
Average Upstream Speed

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Conclusion

Although extreme power users that average 5 TB or more monthly currently make up a modest fraction of subscribers, their numbers are steadily increasing in tandem with the widespread adoption of faster speed tiers. Their heavy usage patterns – particularly in the upstream – will increasingly impact network performance, potentially resulting in subpar experiences for many customers, especially when they don't receive the speeds they were promised. Operators must proactively monitor and maintain their networks to ensure a consistently satisfactory experience for all subscribers, irrespective of their usage or speed tier.

By better understanding extreme power users, a carrier can monetize or manage and optimize bandwidth by relying on several different tools or solutions. This includes usage based billing, right-sizing bandwidth speeds, fair use policy enforcement, and ensuring optimal capacity and network resiliency.

Today's 5 TB extreme power users are streaming 13 times more data than users who consume 1 TB or less.

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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 provider face as indicated in this OVBI. Among those solutions are:

OpenVault Profile Management Application

A closed-loop and automated data-driven solution that dynamically creates bandwidth without human intervention

OpenVault Proactive Network Maintenance

Swiftly detect and capture RF impairments, optimizing resource allocation for precise issue resolution

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.

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Additional Product Information

OpenVault Profile Management Application

Close up

Through persistent analysis of data from each CM and CMTS, our OpenVault Profile Management Application (OV PMA) learns the state of the system and creates optimized profile sets tailored to the unique real-world environment of each OFDM/OFDMA channel and opening up more usable bandwidth.

Providers and fully benefit from the investment of their DOCSIS 3.1 network by improving performance and resiliency without incremental capital investment.

- **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**

OpenVault Proactive Network Maintenance

Close up

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 impairment sources, 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.

- **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**

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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.

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Unlocking the potential of broadband