
OpenVault
Broadband Insights Report (OVBI)
4Q23

Introduction

Average broadband data consumption easily eclipsed a new milestone in 2023, ending the year above 600 GB per month and setting the stage for average monthly usage to reach or exceed 700 GB by the end of 2024, according to the 4Q23 edition of the OpenVault Broadband Insights (OVBI) report.

Driven in part by a new and growing group of extreme power users who are using more than 5 TB monthly, average monthly consumption was 641 GB, up 9.3% from the 586.7 GB average at the end of 2022. With increased reliance on broadband for communications, entertainment, commercial and education, average usage has more than doubled in the last five years from 270 GB in 4Q18. The commercial market has helped to drive a 153.48% increase in overall upstream usage during the same five-year span, to 40.05 GB.

Since 2018, the percentages of power users and super power users have increased 437% and 1,285%, respectively.

This edition of the OVBI will take a deeper look into broadband usage in the commercial sector, and the opportunities and challenges for network operators. It will also explore how unprecedented usage increases are creating the need for an increased focus on overall subscriber Quality of Experience (QoE).

As with all editions of the OVBI, this 4Q23 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.

Key findings from the 4Q23 OVBI include:

Usage
The monthly average data consumed by subscribers in 4Q23 was 641 GB, up 9.3% from 4Q22's average of 586.7 GB.

Power Users
The super power user category consuming 2 TB or more per month increased by 37% since 4Q22.

Speed Tiers
The percentage of subscribers on gigabit speed tiers grew 29% year over year, with one-third of subscribers now provisioned for gigabit speeds.

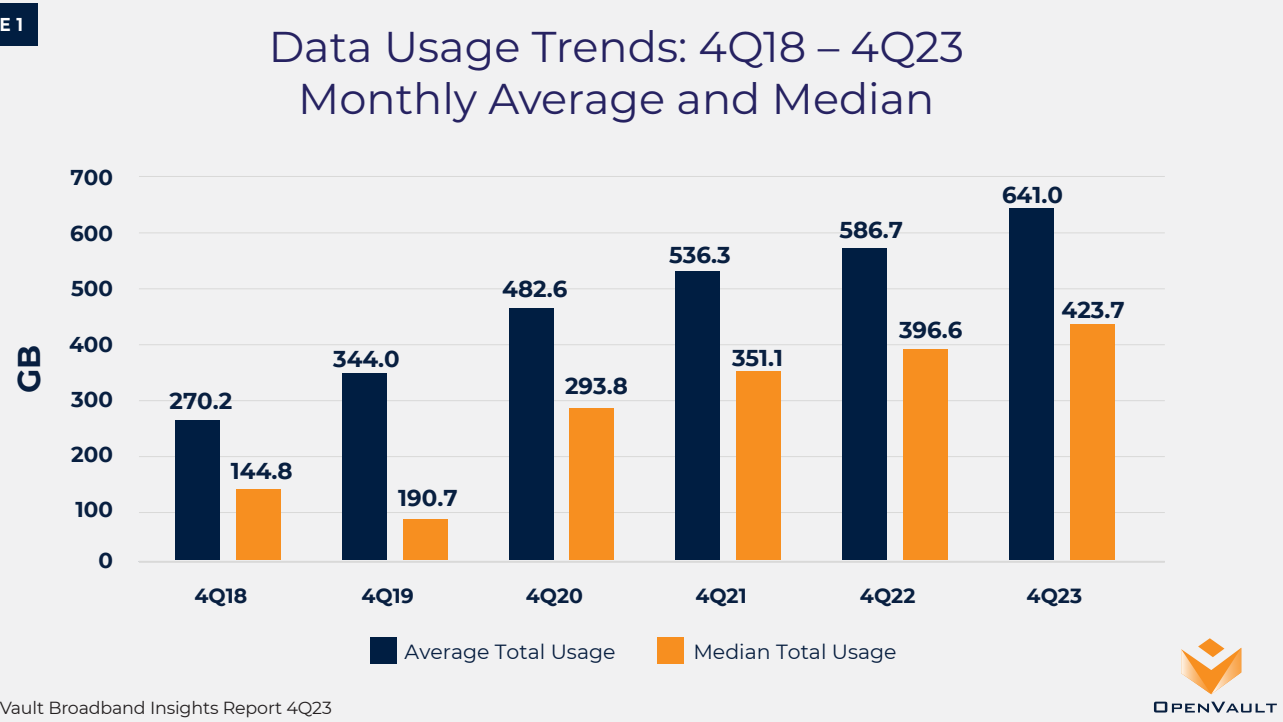
Extreme Power Users
The new category of extreme power users consuming 5 TB or more per month increased by 71% since 4Q22.

Key Bandwidth Usage Insight
Commercial subscribers use 74% more upstream data than residential subscribers.

4Q23 Broadband Usage Key Findings

The following broadband usage trends were observed from 4Q18 to 4Q23.

FIGURE 1



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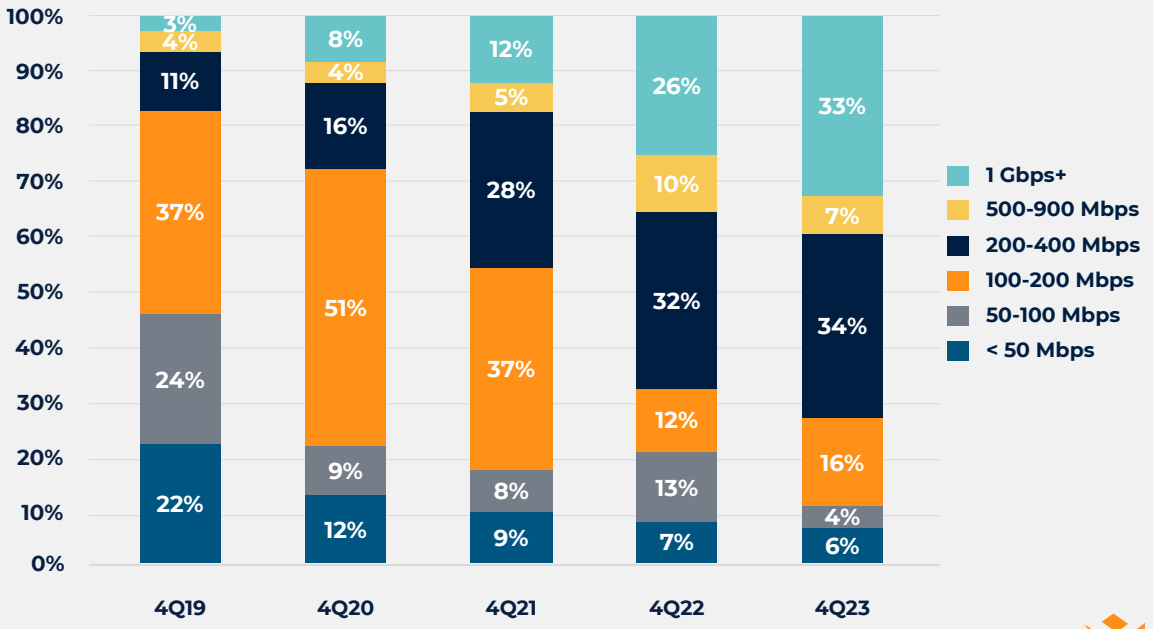
Subscribers' monthly average data consumption reached 641 GB in 4Q23, up 9.3% from 4Q22's average and continuing the trend of 9%+ annual increases over the last three years.

- If the current growth trajectory persists, household data usage will reach 700 GB by the close of 2024 and a terabyte by the end of 2028.
- Consumption continues to be broad-based, with the monthly median usage of 423.7 in 4Q23 up 6.8% from 396.6 GB a year ago.
- Year-over-year upstream data usage growth (13.5%) was greater than downstream data usage growth (9%), ending 2023 at 40.05 GB vs. 35.3 GB at the end of 2022.

FIGURE 2

Provisioned Broadband Speed Tier Trends — 4Q19 to 4Q23



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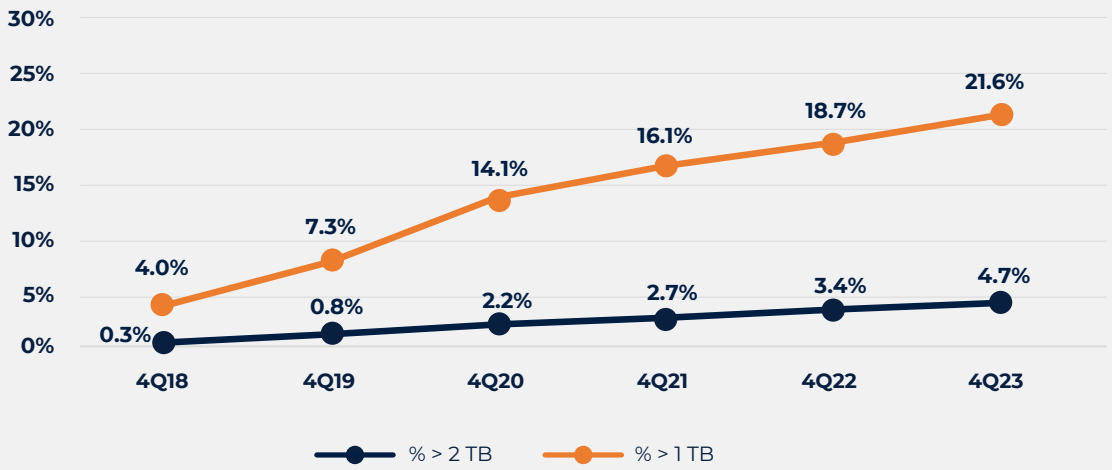
- As the adoption of faster speed tiers continues to advance, one-third of subscribers are now provisioned for gigabit speeds. This surpasses the previous high of 32.1% observed last quarter and marks a substantial 29% increase over 4Q22.
- Meanwhile, the proportion of subscribers on speeds below 100 Mbps has dwindled to 10%, representing a 48% decrease from one year ago and a 77% drop from the same period in 4Q19.

FIGURE 3

Power User Consumption Trends — 4Q18 to 4Q23



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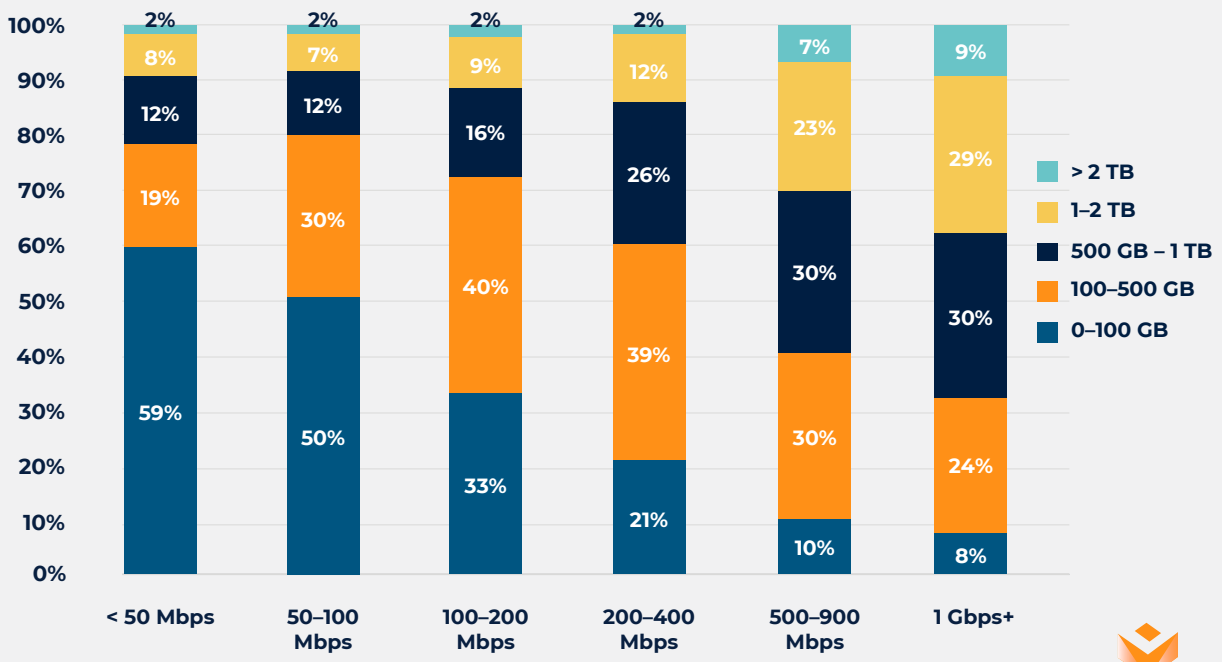
- The percentage of power users consuming 1 TB or more per month in 4Q23 was 21.6%, a year-over-year increase of 15.2%.
- Super power users consuming 2 TB or more per month increased by 37% to 4.7% in 4Q23.
- Since 4Q18, the percentage of power users has increased by 437% and the percentage of super power users has increased by 1,285%.

FIGURE 4

Data Usage by Provisioned Speed Tier – 4Q23



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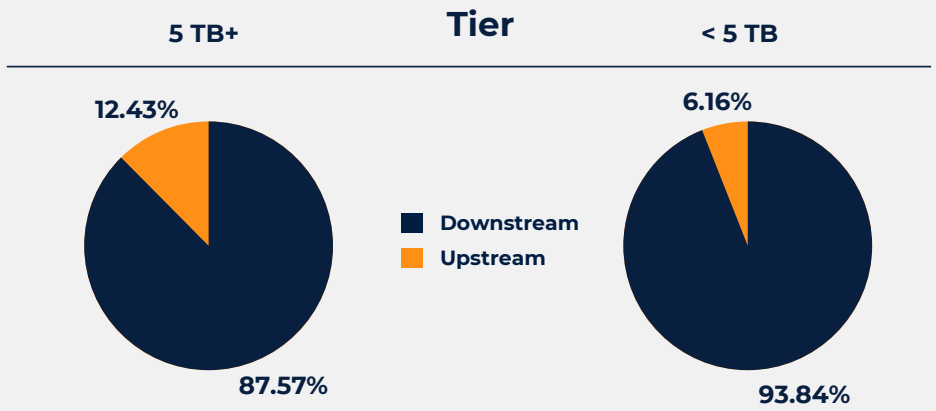
- Among all subscribers provisioned for speed tiers of 100 Mbps or less, 10% are power users consuming 1 TB or more of data each month. Considering such high usage levels, these subscribers would significantly improve their online experience by upgrading to a faster speed plan.
- Power users make up 38% of all users provisioned for gigabit speed.

FIGURE 5

Average Monthly Extreme Power Users Data Usage — 4Q23



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- The 3Q23 edition of the OVBI report identified extreme power users for the first time. This segment of subscribers consumes 5 TB or more of data each month and grew 71% in 4Q23 compared to the same period last year.
- Extreme power users consume, on average, 6.6 TB of downstream and nearly 1 TB of upstream data. That's 7x more downstream and 15x more upstream data compared to users that consume less than 1 TB monthly. This has significant implications for network performance, as it heightens the risk of congestion and dissatisfaction among subscribers.
- Nearly 15% of extreme power users are provisioned at speeds under 200 Mbps. This high-usage group would benefit greatly from an upgrade to a faster speed tier.

Commercial vs. Residential Data Usage and Speed Tiers — 4Q23

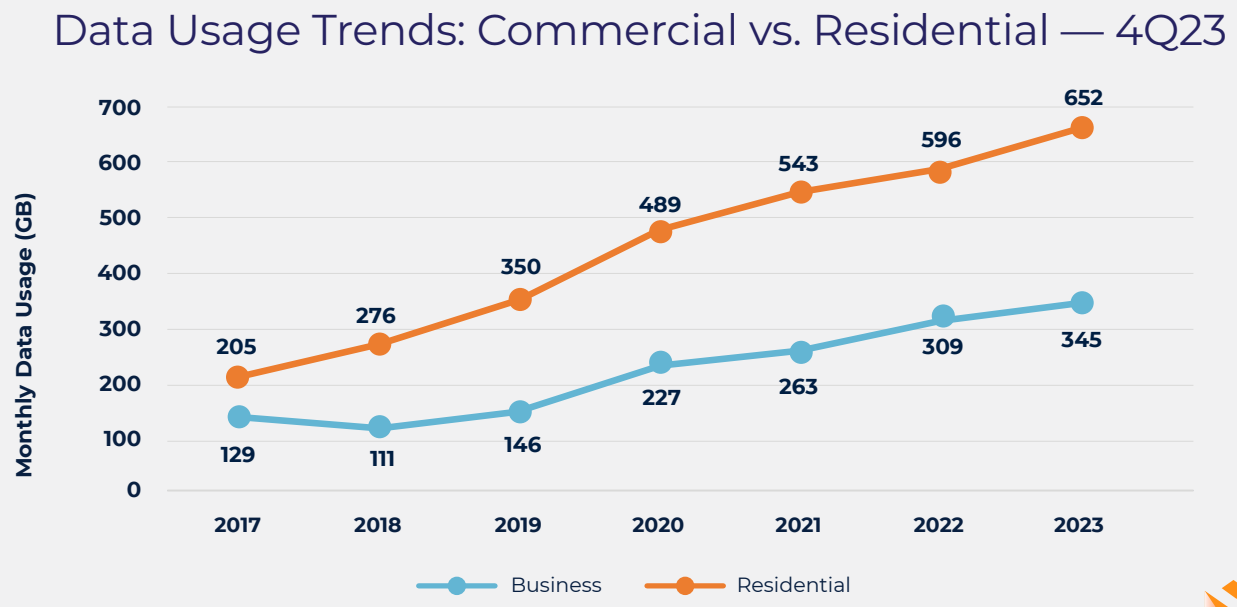
This edition of the OVBI examines differences between commercial and residential users. Although residential usage averages twice the data volume of commercial usage, year-over-year growth in average data consumption among the two is on a similar trajectory.

Commercial subscribers' 68 GB of monthly upstream usage is 74% higher than that of residential subscribers' 39 GB. Contributing factors include businesses spending more time uploading large volumes of data by transferring large files, making video calls, using VoIP, or critical cloud- and web-based applications.

Commercial subscribers' **68 GB** of monthly upstream usage is **74%** higher than that of residential subscribers' **39 GB**

The gap between commercial and residential data usage expanded in 2020 because of the shift to working from home during the pandemic. With remote work becoming a common practice, a significant volume of business-specific data consumption remains on residential internet plans.

FIGURE 6



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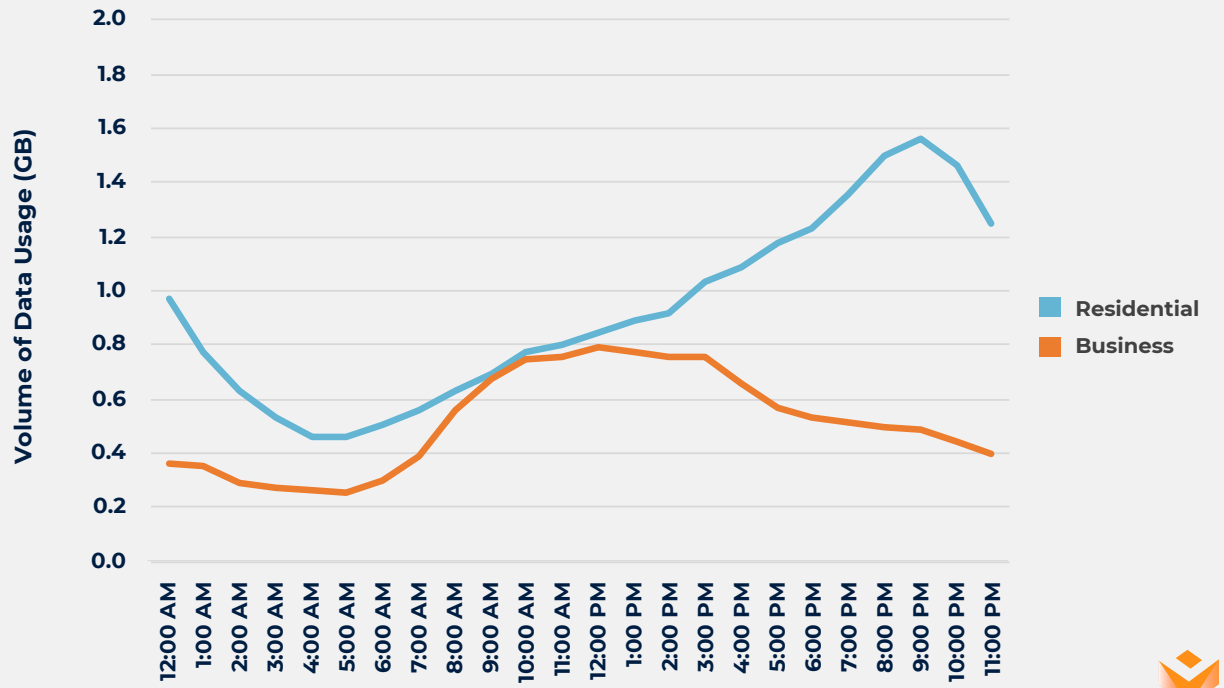
Average hourly usage between commercial and residential subscribers is nearly at parity from 8 AM to 12 PM. As typical business hours end and online activities increase at home (e.g., streaming, gaming, social media, etc.), the gap in usage widens with the difference peaking between 8–9 PM.

FIGURE 7

Average Hourly Data Usage on Weekdays: Business vs. Residential — 4Q23



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Industry Observations

Below are recent milestones or data equivalences that put the observations noted in this 4Q23 OVBI report into perspective.

23 Million

Viewers of Kansas City Chiefs vs. Miami Dolphins on Peacock, the most streamed live event in United States history

Source: NBC/Universal

30%

The AFC Wild Card game was the largest Internet event ever, consuming 30% of all Internet traffic during the game

Source: NBC/Universal

16.3 Million

Devices concurrently streaming the AFC Wild Card Game

Source: NBC/Universal

5.3 Billion

People around the world were using the Internet at the start of 4Q23

Source: Dataportal.com

$500 Million

WWE Deal to Move 'Monday Night Raw' to Netflix in 2025

Source: Variety

47%

Percentage of internet users reported abandoning a website if it takes more than three seconds to load

Source: Forbes

OpenVault's Average Broadband Household Index — 4Q23

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

641 GB
Average Bandwidth Usage

600.9 GB
Average Downstream Usage

40.05 GB
Average Upstream Usage

508 Mbps
Average Downstream Speed

28 Mbps
Average Upstream Speed

Quality of Experience Matters

The competitive landscape for broadband service providers is evolving. With a surge in broadband funding, numerous fiber network operators are extending their infrastructures to reach previously underserved and unserved communities, enabling gigabit speeds and greater service reliability. At the same time, 5G and LTE fixed wireless services have made significant inroads into many U.S. residential markets.

Internet speed alone is not as much of a competitive advantage as it once was. Even gigabit subscribers experience lagging at unpredictable times. Surges in data usage demand will continue to impact network performance, which profoundly influences the customer experience. Studies show that slow or inconsistent internet speed and repeated connection issues erode customer satisfaction and loyalty more than any other factor. Subscribers often complain that their connection is spotty, goes in and out, or that it's sometimes good and sometimes bad.

In most Pivot Group customer satisfaction surveys, at least 40% of rural broadband customers say improvements to speed, speed consistency and/or connection reliability would have the greatest positive impact on their satisfaction. In addition, most indicated a willingness to pay extra for those performance enhancements. Those particularly affected are households with children or multiple internet users, as well as individuals working from home.

Broadband providers know the source of many Quality of Experience (QoE) problems is often in the network. A single power user consuming 90% of total capacity can significantly impede experiences for other subscribers. Speed clipping, in which a customer continually exceeds the limits of the service plan, can lead to dissatisfaction and service calls. Impairments, such as loose connections or damage from weather, water, or rodents, can impact QoE for an entire service area. With the increased deployment of DOCSIS 3.1 and DOCSIS 4.0 networks, the value of Profile Management Application (PMA), Proactive Network Maintenance (PNM) and other tools is increasing as ways to optimize both network performance and subscriber experiences.

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Conclusion

Five years is ancient history in broadband. Since 2018, average consumption has exploded from under 300 GB per month to a record 641 GB in 4Q23, with 700 GB anticipated this year and projected monthly average usage of a terabyte by 2028. Power usage has been redefined: the percentage of subscribers consuming 1 TB per month and 2 TB per month have risen 437% and 1,285% since 4Q18, while a new category of extreme power users consuming 5 TB or more per month has emerged.

Commercial traffic – whether on residential networks or dedicated commercial services – is contributing to the strain on broadband networks. While commercial customers' traffic is significantly less overall than residential consumption, it is rising at a similar pace. Moreover, commercial customers' upstream usage of 68 GB is 74% more than that of residential consumers (39 GB).

Increased strain on upstream and downstream capacity is amplifying the need for increased operator focus on network performance and Quality of Experience (QoE).

The combined impact of these growth factors is amplifying the need for increased operator focus on network performance and Quality of Experience (QoE), especially as operators deploy DOCSIS 3.1 and DOCSIS 4.0 technologies. The use of Profile Management Application (PMA), Proactive Network Maintenance (PNM) solutions and other tools is key to ensuring peak subscriber experiences and satisfaction.

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.

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 discover 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 over 2,400 subscribers of one network operator who were utilizing 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 the new generations of DOCSIS 3.1 and DOCSIS 4.0 networks. These include:

OpenVault PMA
(Profile Management Application)

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

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

Close up

- **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 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.

Close up

- **Combine service assurance processes, field force management and field find-and-fix capabilities into single panel 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.

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