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The User-Managed, Usage-Based Future of Broadband

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Over the past decade, the focus of broadband providers has been bringing more subscribers online and increasing the speed of their connections. Today, broadband is widely deployed, with more than 600 million subscribers worldwide. In the United States, approximately 68 percent of U.S. homes have active broadband connections, while 95 percent of U.S. homes have access to broadband, according to reports from the U.S. Department of Commerce.

As broadband penetration has increased, so has the capacity required by subscribers. The sharp rise in broadband consumption is being driven by new applications and services such as over-the-top (OTT) streaming video, cloud-based storage, online backup services, and consumer video conferencing, all of which are placing greater demands on network capacity.

With subscriber growth slowing at the same time broadband usage is exploding, providers face a new set of challenges, the most pressing of which is sustainability. The industry's traditional flat-fee pricing model, which was intended to encourage adoption, is no longer viable. Broadband internet revenues are not keeping pace with the increased capital and operational costs of relentless growth in network traffic, so providers must find a way to close the gap.

The solution is to transition to a usage-based pricing model. This requires technologies for accurately measuring broadband usage, providing clear visibility into subscriber consumption, and the ability to apply that information to more efficiently manage the delivery of broadband services.

Moving To Usage-Based Pricing

Operators have recognized their predicament and are signaling their readiness to move away from "all-you-can-eat" pricing and begin charging consumers on the basis of the amount of data they consume. This movement has gathered steam in the first half of 2012. Comcast announced that it will replace usage caps with improved data usage management approaches, while Time Warner has been piloting usage-based pricing in select markets. The government has also weighed in--FCC Chairman Julius Genachowski voiced his support for usage-based pricing in remarks at the Cable Show in May. In Canada, broadband providers including Rogers and Bell are already offering tiered, usage-based pricing.

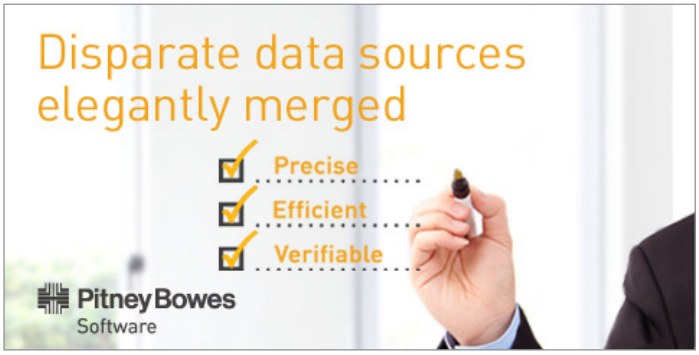
However, the move to usage-based services requires operators to adopt new technologies and practices that will enable them to collect and manage subscriber usage data as well as support mechanisms for sharing this data with their customers and allow them to actively participate in the management of their service. Usage data also serves as the foundation for effective traffic and congestion management.

Technology Requirements for Usage-Based Services

In order to transition to usage-based services,

broadband providers need a system to collect usage data from the network in an accurate and timely fashion. For cable operators, the IP Detail Record (IPDR) protocol is a highly efficient and scalable means of collecting usage and network performance data from subscribers' cable modems. Operators of other fixed-line broadband networks, such as DSL, can use RADIUS accounting to collect usage data.

But collecting the data is only part of the picture. Providers must have an operations support system in place that can efficiently process and store the massive volume of subscriber usage data collected. Consider that a large cable provider with millions of subscribers needs to collect, process and store millions of IPDRs every hour, which translates to tens of millions every day, hundreds of millions every week, and billions over the course of a year. That operator needs an operations support system (OSS) that is able to efficiently process and store hundreds of terabytes of detailed, per-subscriber usage data, and maintain the data for long retention cycles (typically a year) while providing fast access to it for reporting and analytics.



Usage Tiers and Quota Management

The highly granular, subscriber-centric data collected and stored by this system can be used to generate internet usage statistics that provide critical visibility into how subscribers are consuming broadband services. This information can be shared with subscribers via a web-based service portal featuring a broadband usage meter, which would allow subscribers to monitor their daily, monthly and historical data usage, and select the appropriate usage tier based on their needs.

For a given usage tier, subscriber usage can be continuously monitored and compared to allotted quota. As the subscriber approaches a usage tier threshold, the system can generate a notification via email or SMS alerting the subscriber. When the usage threshold is exceeded, the system can take action to modify the subscriber's service by throttling the speed of the subscriber's connection. At this point, the subscriber could have the option of topping-up their usage quota or permanently moving to a higher usage tier.

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Traffic and Congestion Management

Usage data can also serve as the foundation for more effective traffic and congestion management. In broadband networks, most congestion and performance problems are manifested in the local distribution network, so it's critical to have a fine-grained view of network performance down to the level of individual subscribers.

All broadband providers rely on statistical multiplexing to oversubscribe their networks, so there are going to be periods in the day when the network is under heavy load and congestion is likely. However, with accurate and real-time visibility into subscriber usage, broadband providers can implement more sophisticated proactive and reactive traffic management schemes to both avoid network congestion and manage it more effectively when it occurs.

Proactive traffic management ensures that usage conforms to a subscriber's service tier by imposing traffic management controls when a subscriber's usage exceeds certain thresholds as defined in his/her service profile. A proactive traffic management approach continuously monitors a subscriber's usage over a sliding time window relative to a predefined service profile, and triggers the application of policies to modify a subscriber's service level when certain

usage thresholds are exceeded. These policies typically modify service speed and other QoS-related service parameters.

Reactive traffic management addresses congestion conditions that typically arise during busy hours, regardless of whether subscriber usage is currently in conformance. This approach detects congestion by continuously monitoring network utilization and automatically taking action to reduce it when a certain threshold is exceeded. Before applying policies to impose traffic management, this method first determines who the heaviest users are by accessing subscriber usage data, and then applies the appropriate policies to manage traffic for only the top users, who are having the most impact on network performance.

This type of differentiated traffic management requires continuous monitoring of subscriber usage, but gives providers the ability to improve subscriber experience by dynamically modifying service levels to ensure that subscribers receive their fair share of bandwidth for their service tier.

Empowering Subscribers with Dynamic, User-Managed Services

Another use for subscriber-centric usage data is to deliver a new generation of broadband services that allow subscribers to dynamically activate and control services via web-based portals, as described above. In addition to providing subscribers with access to real-time information about their service usage, these portals can notify subscribers of usage-based service management or traffic control actions, and allow them to activate or modify services, while conducting financial transactions via credit card merchant processing to pay for these on demand. For example, a subscriber may decide to add capacity to his usage tier, or would like to move up to a higher tier, or may need to temporarily boost the speed of service. He could transact for these service modifications in real-time using a credit card, leveraging the same merchant processing technologies used by popular websites such as iTunes and Amazon.

In addition to empowering existing subscribers, this type of self-service system enables broadband providers to expand their market reach to customers who purchase broadband services on a prepaid basis. The web portal can be used to provision and activate broadband services for these consumers, who could choose from a pre-defined menu of service choices and pre-pay for those selections via credit card or prepaid voucher.

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For broadband providers, user-managed, usage-based service capabilities can result in more frequent subscriber transactions with the potential to increase subscriber spend.

Leveraging subscriber data to transition to a usage-based service model can confer many benefits for broadband service providers and their subscribers. Operators can grow revenues by offering new services, as well as expand into new markets, and improve subscriber experience. At the same time, they can increase profitability by improving network utilization, managing capacity demand, and reducing operational costs, while providing subscribers with greater choice and flexibility to meet their individual needs.