



Network Management Practices

Packerland manages its network to ensure all of its customers have a great online experience *every time* they use our high-speed Internet services. The Internet is changing all of our lives and we want our customers to enjoy all that it has to offer—from up-to-date news and information, online shopping, communications tools, movies, streaming video, music, gaming and an array of online services that help us organize our digital assets. For more than a decade, Packerland has been at the forefront of bringing the Internet into millions of people's homes and has invested in a high-capacity fiber-optic network that is fast, safe, reliable and affordable.

Like any other Internet service provider, we manage our network for many reasons including growing, upgrading and optimizing the network; removing spam, viruses and malicious content; and managing network traffic congestion when it occurs. While congestion is not the normal state of any network, when it happens, just like being stuck in a traffic jam on the highway, it can be frustrating. So, Packerland actively manages congestion to minimize the impact of temporary broadband traffic jams.

Our new congestion management technique will only impact *a tiny fraction of our customers who consume extraordinary amounts of bandwidth*. Over the past several months, our real world consumer trials have shown that on average less than 1% of our customers would likely be impacted by this congestion management technique. Instead, the new technique actually helps ensure that *all* customers get their fair share of bandwidth.

What is the purpose of this technique?

Packerland's broadband network, like many networks, is shared. Our customers share upstream and downstream bandwidth with their neighbors. Although the available bandwidth is substantial, so, too, is the demand. Thus, when a relatively small number of customers in a neighborhood place disproportionate demands on network bandwidth, they can heavily contribute to congestion that degrades their neighbors' Internet experience. The goal of Packerland's congestion management practices will be to enable all users of network resources to access a fair share of that bandwidth and helps ensure a high-quality online experience for all of Packerland's broadband customers.

How will the new technique work?

The new congestion management practice works as follows:

If a certain area of the network nears a state of congestion, then it will identify which customer accounts, or modems, are using the greatest amounts of bandwidth, and the Internet traffic of these customer accounts will be temporarily managed. Customers will still be able to do anything they want to online, and many activities will be unaffected, but, in the event the network reaches levels of actual congestion, managed customers could experience longer times to download or upload files, surfing the Web may seem somewhat slower, and playing games online may seem somewhat sluggish. We manage those customer accounts that are using a disproportionate amount of network resources in order to maintain the online experience of all users on the network. This prevents the unusually high usage of a few customers to adversely affect the experience for others.



The new technique does not manage congestion based on the online activities, protocols or applications a customer uses. Rather it only focuses on the heaviest users in real time, so the periods of congestion could be very fleeting and sporadic.

It is important to note that the effect of this technique is temporary and it has nothing to do with aggregate monthly data usage. Rather, it is dynamic and based on prevailing network conditions as well as very recent data usage.

The new technique could be referred to as "protocol-agnostic," which means it does not manage congestion based on the type of applications being used by customers. Instead, customer traffic is congestion-managed and is not based on their applications, but based on current network conditions and recent bytes transferred by users.

Our congestion management approach will change over time, as we continue to study and enhance our practices and as new technologies emerge. We will actively participate in industry-wide technical forums such as the Internet Engineering Task Force (IETF), where congestion management and other matters are under continuous review, development, and improvement.