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Since the introduction of widespread peer-to-peer networks, network service providers have been trying to determine how to deal with the massive consumption of network resources consumed by these applications. Often, the true concern isn't necessarily the applications' use of the network, but rather the impact the application has on other network subscribers. The bulletin board systems of the 80s and 90s and dial up access network had their own methods of managing heavy users, simply by terminating the subscribers' network connection if the subscriber appeared 'dormant.' However, with today's P2P applications, and the always-on aspect of broadband access networks, a single subscriber may utilize a vast percentage of network resources without even sitting at their machine.

There are several solutions being proposed that tries to alleviate the congestion problems caused by p2p applications. Camiant proposes a solution that is not unlike the solution that involves topology awareness as discussed in the P4P organization, but with several enhancements/considerations which enable the operator to optimize the p2p traffic path based on several other considerations, including network congestion state, access network vs. aggregation/core, as well as time of day.

Policy management is a new area of technology that is being deployed by operators/service providers across different access technologies. Policy management enables the operator to control in real time the network for optimal delivery of applications over a converged IP network. Policy can be utilized to provide QoS for latency sensitive applications such as VoIP and is standardized in 3GPP, TISPAN, ITU and Cablelabs. A key function of policy management is its ability to provide topology abstraction for applications, so applications do not have to be specifically aware of the underlying network when it is requesting for policy/QoS from the network. In order to deliver multiple bandwidth and latency demanding applications, the network cannot be treated as a 'black box'. Policy management enables the applications to become network aware.

The work being performed by Pando and the P4P efforts provide a tremendous assistance for back-haul operations costs, allowing the P2P application to determine the relative location of other nodes within the network. Utilizing policy, the operator can determine the relative importance of core transport, or access network, resources. For example, some operators may wish to maintain all P2P file sharing on-net, minimizing the impact of off-net peering costs with the back-haul network provider. The use of P4P allows the application to utilize all "local" nodes with the desired content first, and only allow off-net searching and file transfer if the content is not locally available. Switching the paradigm a bit, if an operator is not as concerned with back-haul resource availability as they are with edge resources, they may wish to direct the P2P applications to focus on nodes that reside on under-utilized networks. In addition, using policy management, resources can be allocated to p2p applications based on time of day. As parts of the

network become less congested based on time of the day, the policy management infrastructure can be leveraged to enable the p2p application to pick peers that utilize the under-utilized parts of the network. In this way, policy management can enable p2p applications to perform better, as well as provide a fair share of resources for other applications that are contending for the same network resources.