Traffic Profiles generated by Peer-to-Peer Networking

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Since the millennium, peer-to-peer (P2P) applications became a main driver of increasing Internet traffic. File sharing often contributes a majority of the traffic volume on developing broadband access platforms in Europe and North America in recent years. Although unresolved legal issues still leave an uncertain future for a part of P2P activity, the spectrum of emerging and already established applications built on peer-to-peer overlays includes many legal and business cases (voice and video over IP, content distribution, online gaming, support of web communities with their specialized services etc.).

P2P protocols are able to distribute resources (storage, computation power, bandwidth) among large user communities with scalable adaptation to current demands and replications as needed. P2P overlays on IP allow to establish new services with a minimum of centralized server or network infrastructure to maintain control.

From the view point of IP network providers, P2P establishes routing on application layer, which may cause unnecessary backbone and peering traffic. Geographical distributions of data sources often depend on communities separated by language, social factors or local preferences for some protocol. On the other hand, P2P traffic profiles show smoothing effects including

- small sized traffic flows due to fragmentation of large files into data chunks to be downloaded from several sources in parallel,

- reduced variability of traffic on Internet links in short time scales as well as in daily profiles,

- reduced variability in local access pattern, since servers and data sources of changing popularity are instead distributed over widespread communities.

The talk will briefly summarize analysis methods for P2P traffic in IP platforms and show the expected smoothing effects in link measurement on broadband access platforms. Some current trends like possible usage of caches are also addressed.