

Internet Study 2007

The Impact of P2P File Sharing, Voice over IP, Skype, Joost, Instant Messaging, One-Click Hosting and Media Streaming such as YouTube on the Internet

Overview

ipoque has analyzed the Internet traffic in five regions of the world between August and September 2007. Comprehensive statistics about user behavior provide a unique overview of the Internet's current state. While the emphasis of last year's ipoque survey was on peer-to-peer (P2P) file sharing, this study also includes data about Internet telephony (VoIP), Skype, video streaming, instant messaging (IM), file hosting and encrypted P2P protocols. Three petabytes of anonymous data representing over one million users in Australia, Eastern Europe, Germany, the Middle East and Southern Europe have been analyzed. The data were gathered using ipoque's PRX Traffic Manager installed at customer sites.

Content Type Analysis

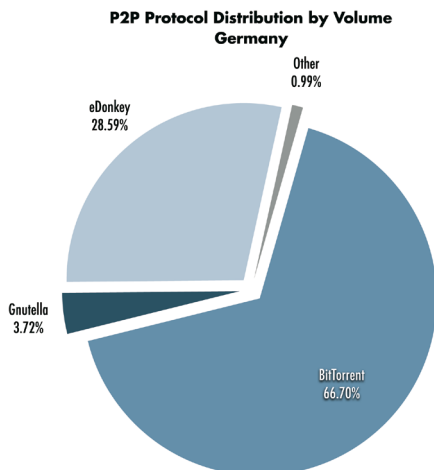
The content type classification uses the same methodology as the 2006 survey. As BitTorrent and eDonkey are the most popular P2P networks by a wide margin, and the content analysis involves a substantial amount of manual work, the classification has been limited to these two. This is not really a limitation as the two protocols combined account for between 70% and 97% of all P2P traffic, depending on the region. All transferred files have been classified based on the two-tier scheme with categories and subcategories listed below:

- Video: Movie, Music, Anime, Porn, TV
- Audio: Music, Audio book (aBook)
- Software: Application, Game
- eBook: eBook
- Picture: Porn, Other

Goal of this study is to provide an as comprehensive as possible overview of shared content in P2P networks. More than half of all encountered files could be classified down according to category and subcategory (55% of BitTorrent and 60% of eDonkey files) representing 70% respectively 80% of the BitTorrent and eDonkey traffic. Thus, the observed sample clearly exceeds the significance threshold. Nearly all of the top-5000 files have been classified.

Protocol Distribution

P2P is still producing more traffic in the Internet than all other applications combined. Its average proportion during the measurement period regionally varies between 49% in the Middle East and 83% in Eastern Europe.



Protocol	Germany
P2P	69.25%
HTTP	10.05%
Media Streaming	7.75%
DDL	4.29%
VoIP/Skype	0.92%
IM	0.32%
E-Mail	0.37%
FTP	0.50%
NNTP	0.08%
Tunnel/Encryption	0.32%

The complete protocol distribution is only available for Germany and the Middle East. In both regions, Web browsing accounts for the the second-most traffic with a share of 26% in the Middle East and 10% in Germany. These numbers do not include any audio or video streaming content embedded in Web pages like YouTube. This media streaming content is counted separately. In Germany, it ranks third with a proportion of about 8%. In the Middle East it is negligible with less than 0.1%. Possible reasons include lower-speed Internet access and less media-rich content on local-language Web sites.

The following picture provides the detailed percentages for all monitored protocol classes in Germany. It provides the detailed percentages for all monitored protocol classes and regions.

Direct Download Links – aka. One-Click File Hosting

The third position in the Middle East and the fourth in Germany is taken by a new file sharing phenomenon that has risen in the past few years. The term direct download links (DDL) refers to a service offered by so-called one-click file hosters such as RapidShare.com and MegaUpload.com. 62 file hosting services have been included in this study. It is remarkable that these few content providers are responsible for nearly 9% of the Internet traffic in the Middle East and over 4% in Germany. RapidShare.com currently is the most popular DDL service with a 55% volume share relative to the overall DDL traffic. MegaUpload.com holds the second position with a 17% share. This may be relevant to the current discussion on net neutrality, as a few, profit-oriented service operators are responsible for an over-proportionally high traffic volume.

User Number Statistics

This study also includes approximations of the relative number of Internet users utilizing a certain protocol or protocol type. Unsurprisingly, Web browsing (HTTP) is the application with the highest number of users with a share of 99% respectively 94% of all Internet users in Germany and the Middle East. Only about 20% of the Internet users are file sharers and thus responsible for up to 70% of the overall Internet traffic. Between 10% and 17% use DDL services.

Comparing Germany and the Middle East also reveals, that VoIP is much more popular in Germany and IM in the Middle East. The lower popularity of VoIP in the Middle East can almost certainly be attributed to voice quality issues resulting from lower-speed and higher-latency Internet connectivity. This performance limitation does not affect instant messaging applications, which can explain their popularity. In addition, Germans have never been as enthusiastic users of instant messaging.

P2P File Sharing

P2P file sharing still is the application class producing, by a wide margin, most Internet traffic. Its share varies, in our observations, between 48% in the Middle East and 80% in Eastern Europe. These percentage numbers are averages calculated over the course of the roughly four week measurement period in August and September. Some measurement points experienced P2P shares of over 95% at certain times.

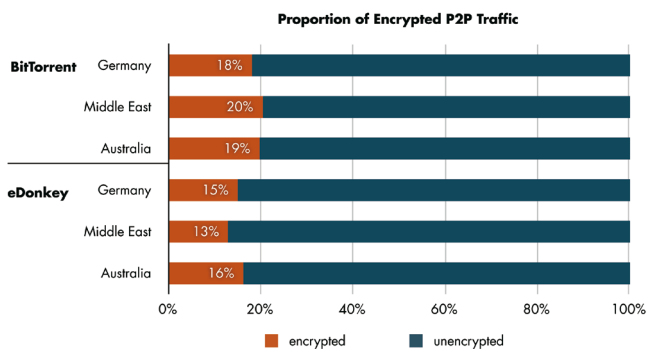
The amount of P2P has increased proportionally with the overall Internet traffic. P2P has still grown, but different from last year, it did not outperform the overall traffic growth. Instead, some file sharers are turning to alternative services such as DDL instead.

Most Popular P2P Protocols

The trend of growing BitTorrent popularity observed in ipoque's 2006 survey continued. BitTorrent has become the by far most popular P2P protocol worldwide. Only in Southern Europe eDonkey still is the dominating protocol with a share of 57% of all P2P traffic. Notable are also the high amount of DirectConnect traffic in Eastern Europe (29%) and Gnutella traffic in Australia (9%). In Australia, the eDonkey and BitTorrent traffic volumes are particularly extreme with only 14% eDonkey and as much as 73% BitTorrent.

P2P Encryption and Obfuscation

This study for the first time includes statistics about the prevalence of encrypted P2P traffic. Some eDonkey clients, such as eMule, started implementing protocol obfuscation using encryption and similar methods to hide from detection in 2006. Several BitTorrent clients, including BitComet and Azureus, started to offer various forms of encryption in 2005. Along with the content industry's struggle with P2P file sharing as a tool to distribute copyright-protected content, a growing number of users is facilitating these obfuscation and encryption features to evade detection. While many detection systems are fooled by these measures, ipoque's application detection engine reliably identifies all forms of obfuscation and encryption used by these protocols. The following pictures show the proportion of encrypted P2P traffic.

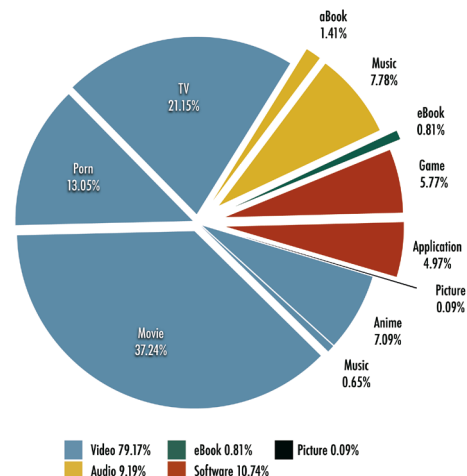


P2P Content Type Analysis

As in 2006, this year's study again looked at the content types exchanged in P2P file sharing networks. The content analysis is based on data from three different regions: Germany, the Middle East and Southern Europe. Based on the methodology described above, the majority of all transferred files could be classified.

The following pie charts provide an overview of the content types exchanged with BitTorrent and eDonkey in Germany. Categories (audio, video, software, picture, e-book) are represented by different colors and subcategories by individual pie slices. The leading BitTorrent content are video files with a share between 62% in Southern Europe and 79% in Germany. Southern Europe has a particularly high amount of software traffic – 26% compared to 6% in Germany and the Middle East. German BitTorrent users download more porn (13%) than the other regions (2% and 5%).

**Traffic Volume per Content Type
Germany, BitTorrent**



Voice over IP and Skype

Internet telephony – or Voice over IP (VoIP) – has become a commodity application, not least based on the enormous success of Skype with its ease of use and resilience to restrictive network environments due to widespread firewalling and network address translation (NAT). While standards-based VoIP systems using SIP, H.323 and IAX require manual configuration to get around the resulting limitations, Skype has many built-in mechanisms to automatically deal with such network conditions and to offer an as seamless as possible operation in most environments.

The success of this strategy is reflected in the analysis results. They show that 30% of all monitored Internet users in Germany use Skype. In the Middle East, the number is with only 7% much lower. SIP follows far behind with only 1% users in Germany and in the Middle East. The user numbers for H.323 and IAX are negligible.

about ipoque

ipoque is the leading European provider of Internet traffic management solutions. Designed for Internet service providers, enterprises and educational institutions, ipoque's PRX Traffic Manager allows to effectively monitor, shape and optimize network applications. These include the most critical and hard-to-detect protocols used for peer-to-peer file sharing (P2P), instant messaging (IM), Voice over IP (VoIP), including the popular Skype, and media streaming.

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