



BitTorrent, eDonkey or Gnutella – regardless of the peer-to-peer (P2P) protocol being used, file sharing still is very popular and generates by far the most Internet traffic. According to ipoque's Internet Study 2007, every fifth Internet user utilizes P2P for file sharing. The average proportion of P2P traffic varies between 49 percent in the Middle East and 84 percent in Eastern Europe. At nighttime, P2P rises up to 95 percent in some regions. This heavy usage incurs not only increasing infrastructure and communication costs, but also leads to frequent copyright infringements as file sharing networks are massively used to distribute copyright-protected material.

### **“We wanted to stop the cease-and-desist letters”**

The Center for Computing and Communication (CCC) of the RWTH Aachen is the central hub and pivotal point for the university's IT services. It is responsible for providing services and support ensuring security. RWTH Aachen plays an important role in the German research network Deutsches Forschungsnetz (DFN). This brings along an immense amount of Internet traffic, which needs to be managed. But the particular challenge in Aachen was the high volume of P2P traffic with copyrighted content. The CCC was burdened with up to ten complaints about copyright infringements per day. It was a full-time job for one employee to answer all the annoying mail. Jens Hektor, responsible employee at the CCC, says: “We wanted to stop the cease-and-desist letters from lawyers about copyright infringements.”

### **Intelligent Traffic Management of P2P File Sharing**

ipoque provided the solution. With its PRX-1000 Traffic Manager, the vendor of Internet traffic management solutions offered exactly the features the CCC needed: an effective, powerful and fail-proof system for Internet traffic management. ipoque's PRX Traffic Managers combine deep packet inspection (DPI) technology with bandwidth management. They enable effective analysis and optimization of applications. PRX Traffic Manager detects applications with a combination of layer-7 deep packet inspection (DPI) and behavioral traffic analysis. All major protocols – including P2P file sharing, instant messaging, media streaming and Internet telephony – are supported. The integrated QoS management allows prioritization and bandwidth control of classified traffic. Extensive accounting features provide in-depth application- and subscriber-aware network visibility.



### **Challenges at RWTH Aachen:**

- Over 60% P2P traffic
- Many copyright infringements by file sharers
- Near gigabit data rates
- Many concurrent users

### **The ipoque Solution:**

- Effective P2P management
- Enforced legal file sharing with BitTorrent tracker whitelisting
- True gigabit wire speed at over 600,000 packets per second
- Over 20 million concurrent connections and 500,000 new connections per second

## Fair Bandwidth Management with BitTorrent Whitelisting

RWTH Aachen has been using two PRX-1000 for more than three years. One of the PRX Traffic Managers has been deployed in the link connecting the student dorms and another at the VPN access. P2P traffic is rigorously throttled in order to avoid overloading the network and to reduce communication costs. The PRX BitTorrent tracker whitelisting feature ensures that unobjectionable P2P content can be downloaded without limitations.

Unlike most other P2P file sharing networks, BitTorrent is used to offer a substantial amount of legal content. Prominent examples are Linux distributions, computer games and NASA imagery. BitTorrent uses a central instance, the so-called tracker, to coordinate the data exchange between the participating peers without exchanging any content data itself. The operator of such a tracker decides which files are being exchanged. Thus, if this operator is a trusted party, whitelisting its trackers while limiting access to others is a very effective means of allowing access only to guaranteed legal BitTorrent content.

"Students can always suggest BitTorrent trackers for the whitelisting. If they are not critical, they are cleared in a short time," Hektor explains the simple method. This way, the RWTH Aachen is providing unrestricted access for instance to FreeBSD, OpenSuse Linux, Ubuntu Linux, legaltorrents.com and NASA Torrents. The students know about the PRX Traffic Managers, and because of this transparency, communication with the students works very well.

## Successful Cooperation

RWTH Aachen was one of the first customers of ipoque and cooperated from the beginning in performance and functionality tests. ipoque tests its beta firmware versions at Aachen. PRX Traffic Manager has an integrated hardware bypass which is automatically activated in case of a system failure guaranteeing uninterrupted network connectivity at all times. With the extremely high traffic load at the university, the network is predestined for load tests with real-world traffic. Such conditions can hardly be emulated in a laboratory setting, but they are essential for the development of ipoque's products.

## Conclusion

The deployment of PRX-1000 resulted in a substantial reduction of P2P traffic in the university's network. PRX-1000 minimizes the load of the whole network. Components like firewalls, which are quickly overloaded if P2P is not curbed, especially benefit from this.

At the same time, there are no complaints about copyright infringements anymore. This again has significantly increased staff productivity by relieving them from the burden of dealing with the infringements, leaving them with more time to focus on more important duties.

"Our highly dynamic university environment makes an active security management essential. ipoque has provided a solution to proactively prevent undesired usage of the available bandwidth in our network."

*Univ.-Prof. Christian Bischof, Ph.D.  
Director, Center for Computing and Communication,  
RWTH Aachen*



"The cooperation with ipoque in our education and research environment has been very productive and successful for both parties."

*Dipl.-Inform. Andreas Schreiber  
Communications Division – Head of Operations,  
Center for Computing and Communication  
RWTH Aachen*



"Students can always suggest BitTorrent trackers for the whitelisting. If they are not critical, they are cleared in a short time."

*Dipl.-Phys. Jens Hektor  
Communications Division – Network Operations,  
Center for Computing and Communication  
RWTH Aachen*

## About the RWTH Aachen

With almost 30,000 students, RWTH Aachen, the technical university of the Rhineland-Westphalian city of Aachen is widely recognized as one of Europe's most distinguished technological seats of learning. The university's Center for Computing and Communication offers a wide range of computing and communication services for all institutes, employees and students. The tasks range from planning and operating the infrastructure to providing centralized data and processing facilities and the services which run on them.

More information at <http://www.rwth-aachen.de>.

## About ipoque

ipoque is the leading European provider of deep packet inspection (DPI) solutions for Internet traffic management and analysis. 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), tunneling and media streaming, but also many legacy applications.

More information at <http://www.ipoque.com>