

## II. Uncovering the “P2P dilemma”: technical and economic background of P2P

This Chapter first discusses the technical nature of P2P against the backdrop of major judicial decisions related thereto, placing special emphasis on the effect of the latter in said technology’s evolution over time. This is followed by a brief economic analysis of P2P and additional background, which explores the impact of file-sharing on copyright industries and their business models, in an attempt to ascertain the economic significance of P2P uses. Such analysis will serve as the baseline for the detailed discussion on their legal qualification in the following Chapter as well as for our observations on related policy issues throughout this book.

### A. Technical background: jurisprudence driven technology?

P2P software works as a communication infrastructure for users to interact over digital networks, sharing tasks and workloads, typically without recourse to a centralized system or hierarchy.<sup>10</sup>

Interaction occurs via file-sharing of contents (e.g. works) within networks, encompassing—sometimes simultaneous<sup>11</sup>—acts of upload, download and streaming,<sup>12</sup> made possible by the use of specific access enabling software.<sup>13</sup>

- 10 For different definitions of P2P containing these basic elements *see: OECD Information Technology Outlook 2004 Peer to Peer Networks in OECD Countries (Pre-release of Section from Chapter 5 of the Information Technology Outlook)*, 2 (2004), <http://www.oecd.org/dataoecd/55/57/32927686.pdf> (last visited Jan. 31, 2012) [hereinafter **OECD 2004 Report**]; Lewinsky 2005, *supra* note 8; and Seth Ericsson, *The Recorded Music Industry and the Emergence of Online Music Distribution: Innovation in the Absence of Copyright (Reform)*, 79 GEO. WASH. L. REV. \_\_\_, 8 (2011); Max Planck Institute for Intellectual Property & Competition Law Research Paper No. 11-09, *available at* <http://ssrn.com/abstract=1850409> (last visited Jan. 31, 2012).
- 11 *See* ANNELIES HUYGEN ET AL., UPS AND DOWNS. ECONOMIC AND CULTURAL EFFECTS OF FILE SHARING ON MUSIC, FILM AND GAMES 52 (TNO Information and Communication Technology Series, 2009), <http://ssrn.com/abstract=1350451> (last visited Jan. 31, 2012) (referring that most recent P2P systems have a default automated mechanism that makes downloaded content immediately available to other network users).
- 12 This book will not address P2P streaming, but only the (currently) more relevant acts of upload and download. Note that considerations made for download will likely be applicable to streaming. On P2P streaming, *see* Ericsson *supra* note 10, at 9, and Rodrigo Rodrigues & Peter Druschel, *Peer-to-Peer Systems*, COMMUNICATIONS OF THE ACM, October 2010, at 74.

It constitutes a departure from the traditional client-server hierarchic computing model, as all computers in a P2P network share their resources, acting both as clients and servers.

Increased usage of P2P<sup>14</sup> is closely connected with the rise of the Internet and converging technological developments in the fields of digitalization, file compression and broadband access, allowing fast and efficient content transmission, which have greatly impacted the configuration of the content industry.<sup>15</sup>

Architecturally, P2P systems can be categorized under three “generations”<sup>16</sup> coexisting even today of centralized, decentralized and “third generation” systems,<sup>17</sup> the more detailed functioning of which can be seen in **Annex I** *infra*.<sup>18</sup>

Such “generational changes” are to a great extent the result of technology reacting to jurisprudence (and legislation) increasingly expanding the scope of infringement of copyright law, in such notorious cases on both sides of the Atlantic as *Napster*,<sup>19</sup> *MP3.com*,<sup>20</sup> *In re Aimster*,<sup>21</sup> *KaZaA*,<sup>22</sup> *Audiogalaxy*, *Grokster*,<sup>23</sup> *Limewire* and *Pirate Bay*.<sup>24</sup> The latter refers to the most popular file-sharing protocol in the world—BitTorrent—,<sup>25</sup> which allows that a final downloaded version of

See also Jay Anderson, *Stream Capture: Returning Control of Digital Music to the Users*, 25 HARV. J.L. & TECH. 159 (2011) (discussing streaming, “stream capture techniques” and applicable alternative compensation mechanisms).

13 See HUYGEN ET AL., *supra* note 11, at 115 (using a similar ‘catch-all’ definition of “file-sharing”).

14 For an overview of the chronological evolution of P2P see *Timeline of File Sharing*, WIKIPEDIA.COM, [http://en.wikipedia.org/wiki/Timeline\\_of\\_file\\_sharing](http://en.wikipedia.org/wiki/Timeline_of_file_sharing) (last visited Jan. 31, 2012).

15 See HUYGEN ET AL., *supra* note 11, at 9 and 118 (linking broadband introduction to the adoption of P2P). See also OECD 2004 Report, *supra* note 10, at 10 (connecting availability of broadband with susceptibility of P2P use, despite recognizing that the first is not a precondition for the second).

16 Note, however, that some authors already make reference to a fourth generation (see, e.g., M. Sakthivel, *4G Peer-to-Peer Technology – Is it Covered by Copyright?* 16 J. INTELL. PROP. RTS. 309 (2011)).

17 See OECD 2004 Report, *supra* note 10, at 3.

18 Annex I: P2P “Generations” contains a depiction and description of a *P2P Centralized Model* (Fig. I.1.), a *P2P Decentralized Model* (Fig. I.2.) and of *P2P Third Generation Models* (Figs. I.3.a) and I.3.b)).

19 *A&M Records, Inc. v Napster, Inc* 239 F. Supp. 3d 1004 (9th Cir. 2001) [*Napster*].

20 *UMG Recording, Inc v MP3.com, Inc* 92 F. Supp. 2d 349 (S.D.N.Y. 2000) [*MP3.com*].

21 *In Re Aimster Copyright Litigation* 334 F. 3d 643 (7th Cir. 2003) [*In Re Aimster*].

22 HR Dec. 19, 2003, AN7253, case no.CO2/186 (Buma & Stemra/KaZaA) (Neth.) [*KaZaA*].

23 *Metro-Goldwyn-Mayer Studios, Inc v Grokster, Ltd* 125 S. Ct 2764 [*Grokster*].

24 Tingsrätt [TR] Stockholm [District Court of Stockholm] 2009-04-17 Case no. B 13301-06 (Swed.) [*Pirate Bay*].

25 See ENVISIONAL TECHNICAL REPORT: AN ESTIMATE OF INFRINGING USE OF THE INTERNET 7 (2011), [http://documents.envisional.com/docs/Envisional-Internet\\_Usage-Jan2011.pdf](http://documents.envisional.com/docs/Envisional-Internet_Usage-Jan2011.pdf) (last visited Jan. 31, 2012) [hereinafter **Envisional Report**].

a file is constituted by the combination of contributions of several uploaded files.  
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This evolution of P2P systems can therefore be viewed as an attempt to escape the grasp of judicial decisions through legal or judicial safe harbors (e.g., *Sony v. Universal*<sup>27</sup> in the U.S.), be it from the more straightforward decisions of direct infringement (*Napster*), to the increasing more complex cases of secondary infringement, under theories of contributory infringement (*Napster*, *In re Aimster* and *KaZaA*), vicarious liability, inducement liability (*Grokster*) and, in some instances, criminal sanctions (*Pirate Bay*).<sup>28</sup> Although this writing does not focus on the liability of P2P software providers or ISPs, it is essential to have this issue in mind when discussing P2P networks and their evolution, not in the least given its continued actuality, as recently shown in much publicized cases, such as *UMG v. Veoh*<sup>29</sup> (in the U.S.) and *Scarlet Extended* (in the E.U.).<sup>30</sup>

By all accounts, this technological flexibility of P2P has meant not only remarkable innovation but also its survival for over a decade—a lifetime in Internet age—, there being no signs that the foreseeable future will bring its obsolescence.

## B. Economic background

Considered in isolation, file-sharing is a lawful activity representing an innovative technological solution with potential for further lawful uses<sup>31</sup> and raising consumer

- 26 See **Annex I** for further details. See also, for a description of the Pirate Bay service, Jerker Edström & Henrik Nilsson, *The Pirate Bay Verdict – Predictable and Yet...*, 31 EURO. INTELL. PROP. REV. 9:483, 483-484 (2009).
- 27 Sony Corp v Universal City Studios, Inc 464 U.S. 417, at 423, 104 S. Ct 774 (1984) [**Sony v. Universal**].
- 28 For an overview of the mentioned decisions prior to *Grokster*, see Patricia Akester, *Copyright and the P2P Challenge*, 27 EURO. INTELL. PROP. REV. 106, 106-110 (2005). For an analysis of *Grokster* see Paul Ganley, *Surviving Grokster: Innovation and future of Peer-to-Peer*, 28 EURO. INTELL. PROP. REV. 15 (2006). For an analysis of *Pirate Bay* see Edström & Nilsson, *supra* note 26, at 487-487.
- 29 *UMG Recordings, Inc., v. Veoh Networks, Inc.*, Nos. 09-55902, 09-56777, 10-55732, 2011 U.S. App. WL 6357788, (9th Cir. Dec. 20, 2011).
- 30 Case C-70/10, *Scarlet Extended SA v. Sabam*, 2011 (*available at*: <http://curia.europa.eu>) [**Scarlet Extended**]. In *Scarlet Extended* the ECJ held that, under E.U. law, it is not possible for a national court to impose on ISPs (here: an access provider) an injunction requiring it to install (at its own cost), a comprehensive system for filtering all electronic communications containing protected works passing via its services, in particular those involving the use of P2P software, with the purpose of blocking the transfer of infringing files.
- 31 See BART CAMMAERTS & BINGCHUN MENG, MEDIA POLICY BRIEF 1: CREATIVE DESTRUCTION AND COPYRIGHT PROTECTION – REGULATORY RESPONSES TO FILE-SHARING 9, LSE Media Policy Project (2011), <http://www.scribd.com/doc/51217629/LSE-MPPbrief1-creative-destruction-and-copyright-protection> (last visited Jan. 31, 2012).