EXCIPIO
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Tracing Protocol (Database Excerpt with Network Traffic)

Customer:	Crystalis Entertainment UG (haftungsbeschränkt)
Authorised Party:	Hedman Partners Attorneys
Title, Work:	Black Sails (IV.) [S01E04]
Archive Name (Torrent):	Black.Sails.S01E04.720p.HDTV.x264-KILLERS [PublicHD]
Hash value (Torrent):	44FD0BAF6D5D69ABDCCAB1F3C89F2F8D2096AAE5
IP Address:	84.250.83.179
Tracing Software:	NARS (Network Activity Recording and Supervision)
Network Monitoring Software:	tcpdump 4.0.0 (libpcap 1.0.0)

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Traced Legal Violation(s)

Our system has determined unauthorised distribution of the aforementioned copyright-protected titles/works on the aforementioned IP addresses during the following points in time by downloading a piece of a file contained in the relevant work and by recording the tracing procedures on the network level. If there are multiple hits related to the work mentioned here on the IP addresses mentioned here, i.e. several legal violations have been established and documented, the hits relevant to the procedure are highlighted in bold font. The time when the user transferred a certain piece to us on the IP address traced is identified as the "End of Download" and is delivered to our customer for the purposes of gaining information about the subscriber data.

Connection Established	Beginning of Download	End of Download	End of Connection	File Name
Jan 6, 2015 00:40:07	Jan 6, 2015 00:41:10	Jan 6, 2015 00:41:11	Jan 6, 2015 00:41:30	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 03:42:11	Jan 6, 2015 03:43:14	Jan 6, 2015 03:43:16	Jan 6, 2015 03:43:34	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 03:42:16	Jan 6, 2015 03:43:56	Jan 6, 2015 03:43:58	Jan 6, 2015 03:44:17	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 07:06:22	Jan 6, 2015 07:07:24	Jan 6, 2015 07:07:25	Jan 6, 2015 07:07:44	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 07:06:24	Jan 6, 2015 07:07:26	Jan 6, 2015 07:07:27	Jan 6, 2015 07:07:46	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 11:03:08	Jan 6, 2015 11:05:32	Jan 6, 2015 11:05:39	Jan 6, 2015 11:05:52	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 11:03:18	Jan 6, 2015 11:05:52	Jan 6, 2015 11:06:05	Jan 6, 2015 11:06:13	black.sails.s01e04.720p.hdtv.x264-killers.mkv
Jan 6, 2015 11:05:16	**Jan 6, 2015 11:06:18**	**Jan 6, 2015 11:06:32**	**Jan 6, 2015 11:06:39**	**black.sails.s01e04.720p.hdtv.x264-killers.mkv**

Network Traffic

The total TCP/IP data traffic between our tracing software and the internet connection identified on the basis of the traced IP address was recorded by the programme "Tcpdump" at the network level, signed as per the German signature law to ensure integrity and then archived on a WORM Tape (Write-Once-Read-Many) in an edit-proof way, i.e. the data can no longer be manipulated later and hence is counterfeit-proof.

On the basis of this data (network traffic), it is always possible to comprehend the complete tracing procedure including the download. The raw data are available in the form of the so-called PCAP data file for an expert assessment.

The network traffic displayed below constitutes the communication procedure, including data transfer (download) between the file-sharer or the traced internet connection and our systems. For security reasons, Excipio GmbH's systems are located between firewalls and are then replaced by the place holder "Excipio GmbH".

The following network traffic was recorded in relation to the hit relevant to the procedure:

#	Date, Time	Source (IP:Port)	Target (IP:Port)	Protocol	Description
1	Jan 6, 2015 11:05:16	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [SYN] Seq=0 Win=5840 Len=0 MSS=1460 SACK_PERM=1 TSval=518090197 TSecr=0 WS=512
2	**Jan 6, 2015 11:05:16**	**84.250.83.179:6881**	**Excipio GmbH**	**TCP**	**6881 > 11924 [SYN, ACK] Seq=0 Ack=1 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1 TSval=40904810 TSecr=518090197**
3	Jan 6, 2015 11:05:16	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=1 Ack=1 Win=6144 Len=0 TSval=518090202 TSecr=40904810
4	Jan 6, 2015 11:05:17	Excipio GmbH	84.250.83.179:6881	BitTorrent	Handshake Extended 44fd0baf6d5d69abdccab1f3c89f2f8d2096aae5
5	Jan 6, 2015 11:05:17	Excipio GmbH	84.250.83.179:6881	BitTorrent	[TCP Retransmission] Handshake Extended 44fd0baf6d5d69abdccab1f3c89f2f8d2096aae5
6	**Jan 6, 2015 11:05:17**	**84.250.83.179:6881**	**Excipio GmbH**	**BitTorrent**	**Handshake Extended Bitfield, Len:0x31 Have Port 44fd0baf6d5d69abdccab1f3c89f2f8d2096aae5**
7	Jan 6, 2015 11:05:17	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=147 Ack=681 Win=7680 Len=0 TSval=518090326 TSecr=40904934
8	Jan 6, 2015 11:05:18	Excipio GmbH	84.250.83.179:6881	BitTorrent	Port
9	Jan 6, 2015 11:05:18	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
10	Jan 6, 2015 11:05:18	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=154 Ack=687 Win=7680 Len=0 TSval=518090396 TSecr=40905004
11	Jan 6, 2015 11:05:18	84.250.83.179:6881	Excipio GmbH	BitTorrent	Extended
12	Jan 6, 2015 11:05:18	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=154 Ack=817 Win=8704 Len=0 TSval=518090401 TSecr=40905009
13	**Jan 6, 2015 11:06:17**	**Excipio GmbH**	**84.250.83.179:6881**	**BitTorrent**	**Interested**
14	**Jan 6, 2015 11:06:17**	**84.250.83.179:6881**	**Excipio GmbH**	**BitTorrent**	**Unchoke**
15	Jan 6, 2015 11:06:17	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=159 Ack=822 Win=8704 Len=0 TSval=518096365 TSecr=40910973
16	**Jan 6, 2015 11:06:18**	**Excipio GmbH**	**84.250.83.179:6881**	**BitTorrent**	**Request, Piece (Idx:0x179,Begin:0x0,Len:0x4000) BitTorrent**

17	Jan 6, 2015 11:06:18	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
18	Jan 6, 2015 11:06:18	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=2049 Win=11264 Len=0 TSval=518096435 TSecr=40911043
19	Jan 6, 2015 11:06:20	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
20	Jan 6, 2015 11:06:20	Excipio GmbH	84.250.83.179:6881	TCP	[TCP Dup ACK 84#1] 11924 > 6881 [ACK] Seq=180 Ack=2049 Win=11264 Len=0 TSval=518096629 TSecr=40911043 SLE=3497 SRE=4158
21	Jan 6, 2015 11:06:20	84.250.83.179:6881	Excipio GmbH	TCP	[TCP Retransmission] [TCP segment of a reassembled PDU]
22	Jan 6, 2015 11:06:20	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=3473 Win=14336 Len=0 TSval=518096659 TSecr=40911267 SLE=3497 SRE=4158
23	Jan 6, 2015 11:06:20	84.250.83.179:6881	Excipio GmbH	TCP	[TCP Retransmission] [TCP segment of a reassembled PDU]
24	Jan 6, 2015 11:06:20	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=4158 Win=16896 Len=0 TSval=518096664 TSecr=40911272 SLE=3497 SRE=4158
25	Jan 6, 2015 11:06:22	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
26	Jan 6, 2015 11:06:22	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=5582 Win=19968 Len=0 TSval=518096829 TSecr=40911437
27	Jan 6, 2015 11:06:22	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
28	Jan 6, 2015 11:06:22	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=6665 Win=22528 Len=0 TSval=518096829 TSecr=40911437
29	Jan 6, 2015 11:06:24	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
30	Jan 6, 2015 11:06:24	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
31	Jan 6, 2015 11:06:24	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=8089 Win=25600 Len=0 TSval=518097029 TSecr=40911637
32	Jan 6, 2015 11:06:24	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=8821 Win=28672 Len=0 TSval=518097029 TSecr=40911637
33	Jan 6, 2015 11:06:26	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
34	Jan 6, 2015 11:06:26	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
35	Jan 6, 2015 11:06:26	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=10245 Win=31232 Len=0 TSval=518097229 TSecr=40911837
36	Jan 6, 2015 11:06:26	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=10688 Win=34304 Len=0 TSval=518097229 TSecr=40911837
37	Jan 6, 2015 11:06:28	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
38	Jan 6, 2015 11:06:28	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
39	Jan 6, 2015 11:06:28	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=12112 Win=37376 Len=0 TSval=518097429 TSecr=40912037
40	Jan 6, 2015 11:06:28	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=12269 Win=39936 Len=0 TSval=518097429 TSecr=40912037
41	Jan 6, 2015 11:06:30	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
42	Jan 6, 2015 11:06:30	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
43	Jan 6, 2015 11:06:30	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=13693 Win=43008 Len=0 TSval=518097630 TSecr=40912237
44	Jan 6, 2015 11:06:30	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=14222 Win=45568 Len=0 TSval=518097630 TSecr=40912237
45	Jan 6, 2015 11:06:32	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
46	Jan 6, 2015 11:06:32	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=15646 Win=48640 Len=0 TSval=518097830 TSecr=40912438
47	Jan 6, 2015 11:06:32	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
48	Jan 6, 2015 11:06:32	84.250.83.179:6881	Excipio GmbH	TCP	[TCP segment of a reassembled PDU]
49	Jan 6, 2015 11:06:32	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=17070 Win=51712 Len=0 TSval=518097830 TSecr=40912438
50	Jan 6, 2015 11:06:32	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=17199 Win=54272 Len=0 TSval=518097830 TSecr=40912438
51	**Jan 6, 2015 11:06:32**	**84.250.83.179:6881**	**Excipio GmbH**	**BitTorrent**	**Piece, Idx:0x179,Begin:0x0,Len:0x4000**

52	Jan 6, 2015 11:06:32	Excipio GmbH	84.250.83.179:6881	TCP	11924 > 6881 [ACK] Seq=180 Ack=17324 Win=54272 Len=0 TSval=518097849 TSecr=40912458
53	**Jan 6, 2015 11:06:39**	**84.250.83.179:6881**	**Excipio GmbH**	**TCP**	**6881 > 11924 [RST, ACK] Seq=17324 Ack=180 Win=0 Len=0**

Description of the columns from network traffic

#	Continuous packet numbering
Date, Time	Time of communication. All time information is in UTC.
Source (IP:Port), Target (IP:Port)	Source describes the sender of a data packet, the target describes the recipient of a data packet.
Protocol	Describes the network protocol through which the packet was sent.
Description	Brief information on the network packet exchanged.

Description of the rows from network traffic

Row #	Description (All time information is in UTC)
2	Beginning of the connection with the counterpart.
6	Opponent sent information about pieces that already have been downloaded successfully.
13	The tracing software expresses interest in the relevant work.
14	The file-sharer confirms to us that we can make enquiries.
16	The tracing software makes an inquiry about a piece.
51	The file-sharer sends a piece from the requested file, which contains the work from our customer (for download).
53	End of connection with the counterpart.

Time Synchronisation

The system is constantly synchronised with several German time servers with the aid of the network time protocol (at least every 16 seconds). These time servers are the servers from PTB (Physikalisch-Technische Bundesanstalt, the National Metrology Institute of Germany).

To guarantee the best security possible for synchronisation, two of our own strata-1 time servers are also in operation and they are directly synchronised by separate GPS sources.

By doing this it is always guaranteed that the system clock and the tracing data (time of legal violation) are synchronous with UTC time and deviations are only in milliseconds, which cannot be avoided technically and are also not relevant because between the start of the connection ("connection established") and the beginning of the download, and between the end of the download the end of connection is always a buffer of at least 2 seconds.

In relation to the current legal violations, no significant deviations were established with the time synchronisation. In the concrete case, deviations were (information in seconds):

Point in time when synchronisation is measured:: 06.01.2015 11:05:12

Time Server	Time mismatch (information in seconds)
ptbtime2.ptb.de	0.002260
ntp1.sul.t-onli	0.000152
ntps1-1.eecsit.tu-berlin.de	0.000039
rustime01.rus.uni-stuttgart.de	0.000162
ntp1.belwue.de	-0.000311
ntp0.rrze.uni-erlangen.de	0.004520

Point in time when synchronisation is measured:: 06.01.2015 11:07:01

Time Server	Time mismatch (information in seconds)
ptbtime2.ptb.de	0.002266
ntp1.sul.t-onli	0.000060
ntps1-1.eecsit.tu-berlin.de	0.000039
rustime01.rus.uni-stuttgart.de	0.000162
ntp1.belwue.de	-0.000311
ntp0.rrze.uni-erlangen.de	0.004520