Tool Validation Report
File Carving

X-Ways Forensics
Version 20.4

Released: 2 April 2022

Khyrenz Ltd

Contents

Executive Summary

X-Ways Forensics version 20.4, was run against the test image Khyrenz-FileCarvingImage-USB-logical-2GB-formatted.dd[1].

The below table is a summary of the test files that X-Ways Forensics carved from this image.

File Type	Number of Test Files	Exact match	Usable match	Not found	False positive	Invalid file
7z	5		5			
AVI	5	5				
BMP	6	5	1			
DOC	4	4				
DOCX	4	4				
GIF	5	5				
JPEG	7	7				
MOV	5	5				
MP3	5		5		1	
MP4	6	6				
PDF	6	5	1			
PNG	6	6				
PPT	3	3				
PPTX	3	3				2
TIFF	5	1	4			
WAV	6	6				
WMV	5	5				
XLS	3	3				
XLSX	3	3				
ZIP	5	5				
Total	**97**	**81**	**16**	**0**	**1**	**2**
Percentage		**83.51%**	**16.49%**	**0%**		

As this table shows, 83.51% of the test files were recovered exactly; the SHA1 file hashes were a match to the original files. In total, 100% of the original files were recovered in a usable state and could be successfully viewed. None of the original files could not be carved.

In addition, only three extra files were carved that were not any representation of any of the original files.

Introduction

Khyrenz Ltd is a Digital Forensic consultancy based in the UK. We provide this report to document our tool validation process against X-Ways Forensics version 20.4.

Scope

This report documents the results obtained by testing file carving capability within X-Ways Forensics, version 20.4, against the raw image file: Khyrenz-FileCarvingImage-USB-logical-2GB-formatted.dd. This image file, as well as a full list of files contained within deleted space in this image, are provided at: https://www.khyrenz.com/resources/.

X-Ways Forensics was run on a Windows 10 Professional 21H2 system and the default configuration was used. The following processing options were selected using the f10 menu:

- File header signature search (select all)
- Compute hash (MD5 and SHA1)

Measuring Test Results

How well the tool performs against expected results is categorized as follows:

1. Exact match: Number of carved files that match on SHA1 file hash to an original test file
2. Usable match: Number of carved files that can be successfully opened and viewed, and appear similar to an original test file, so can be reasonably determined to be a 'usable' version of an original
3. Not found: No carved files match the hash or appear similar to any original files
4. False positive: A carved file is a valid file and can be opened/viewed, but is not similar to an original file (for example, may be an embedded file within an original file)
5. Invalid file: A carved file that cannot be opened or viewed

Test Data

Test Image Creation Process

A selection of test files of varying file formats was collected or generated, and then copied onto a USB device, which had been formatted to contain a 2GB FAT16 volume. This volume was subsequently re-formatted using the built-in Windows 'quick format' process, in order to remove filesystem metadata.

A raw logical image of the USB device volume was generated using FTK Imager 4.2.0.13[2].

Test File Summary

A summary of test files added to the USB before it was re-formatted is provided below. A more detailed list of individual files is provided in Appendix 1 - Test Files to be Carved.

File Type	Number of Test Files
7z	5
AVI	5
BMP	6
DOC	4
DOCX	4
GIF	5
JPEG	7
MOV	5
MP3	5
MP4	6
PDF	6
PNG	6
PPT	3
PPTX	3
TIFF	5
WAV	6
WMV	5
XLS	3
XLSX	3
ZIP	5
Grand Total	**97**

Test Results

The table below shows details regarding the files carved from the test image by foremost.

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
7z	AVI-7z	fd4d1be9e8ffec39701d358898fed10437b0561b		000096.7z			
7z	BMP.7z	e13b931da505c1c51ed6653273de8d9d2df67dcc		000097.7z			
7z	DOC-XLS-PPT.7z	edb13fe1559ba71696bb309840bfcf0022228799		000098.7z			
7z	GIF.7z	a70caf5187b383aa5364cfc97b5db8287fa3aa54		000099.7z			
7z	JPEG.7z	4cceb50966356b852883b9925fcc9e58f410fa2a		000100.7z			
AVI	1280.avi	8351e1bd6f08fe3419907140edd6fcbf00acc46e	000101.avi				
AVI	Bubble Turning Into Ice.avi	85bc9cafcacdd41f9b81ace58bd33fba0c432c7d	000102.avi				
AVI	file_example_AVI_1920_2_3MG.avi	573400d5d649e6ce8d9c02723e70618a17cd631f	000103.avi				
AVI	file_example_AVI_480_750kB.avi	a188ed66e68f77729b8cfac92913427ab6b1677f	000104.avi				
AVI	sample-avi-file.avi	246eecb4053487a61914510389ec300bdaf7f3c6	000105.avi				
BMP	GRN.BMP	b367e7e0d95e6f1bd769f39bc0b5e2e7d4a6bb62	000001.bmp				
BMP	MARBLES.BMP	eec5e6afdd264d6ff867d038aa274c4bc42619b4	000002.bmp				
BMP	RAY.BMP	e44237a11ee0d4b1cb63e1876dc4040b805e43b6		000003.bmp			

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
BMP	sample_5184×3456.bmp	bf6c6aa681f20a1dd561bad7945d441d771b418a	000004.bmp				
BMP	Small Sample BMP Image File Download.bmp	1eb09379dfb4bc35511aa5a1db83e652c5c64604	000005.bmp				
BMP	Yellow_star.bmp	4f2e9da3e1a467fe0182d05d7accdd28ee7f76fb	000006.bmp				
DOC	file-sample_1MB.doc	8f3498bfbe75fb34e809fc7ced3f4cc6f4acc92c	000007.doc				
DOC	SampleDOCFile_200kb.doc	0f1e886f7399fe033c3190bcda7927550c22da8e	000015.doc				
DOC	SampleDOCFile_5000kb.doc	e9e798cac0a97648c95c21cfa9545659d6d0c2a3	000016.doc				
DOC	USB connection artifacts.doc	4665ec3e161f882f1430f862d7a14e6b12ddf6ec	000017.doc				
DOCX	15-MB-docx-file-download.docx	00da85c39ff564d6fc34b0449323a2ef253de8fc	000019.docx				
DOCX	file-sample_500kB.docx	9a0881226460bf5d0ea17b29a843c0320b9dd11e	000021.docx				
DOCX	sample-docx-file-for-testing.docx	37537e74599278cd26c2a29237cefe067e237f8d	000026.docx				
DOCX	Using WSL.docx	3661e7dd597f5931a494335a643513f0198efb6f	000028.docx				
GIF	giphy (1).gif	a6768bff9c6d5c9cbc37ce55bf432109f321fab9	000029.gif				
GIF	giphy (2).gif	d0012d8bf6f633972049e917ede588880d416b95	000030.gif				
GIF	giphy.gif	799521e3a568a270b6259fa7c1565d7adec96c18	000031.gif				

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
GIF	How+do+i+computer+i +decided+to+try+my+h ands_81418e_4707807.gi f	fd2911bff16a8522b7f07a 0eca1aeb08292b1b4f	000032.gif				
GIF	undefined - Imgur.gif	2c3f083d36904cc56f8c4 6cffb64108943d8d45a	000033.gif				
JPEG	file_example_JPG_500kB .jpg	25472d494500707b4510 868df469352dc7cd1845	000034.jpg				
JPEG	IMG_2375.JPG	967cac602f8e01eaf614b ee93b8b0c850f22936d	000036.jpg				
JPEG	IMG_3385_cropped.jpg	5fb543b4c8037b48c48fa df8a39f408046c6f7ee	000038.jpg				
JPEG	IMG_3973.JPG	e5f6d316d896db29eabb 073db8022eb2edc7d2fe	000040.jpg				
JPEG	IMG_3977.JPG	df58316a3b334379b88d bc41b1313a952810bd45	000042.jpg				
JPEG	istockphoto-1304263738-170667a.jpg	1febe282f23e1a15ac100 358eb2b700212eee44b	000044.jpg				
JPEG	photo-1533450718592-29d45635f0a9.jfif	f096a046c3692ab714c28 b267f94f4efe9a7c22b	000045.jpg				
MOV	720.mov	ac16247bc6746661d19e b5832b5b3eed397d97a 0	000046.mov				
MOV	Cloud Formation Video.mov	a5c0fbd44b6352161e5b 6f2aa26f00d5888a3951	000047.mov				
MOV	file_example_MOV_480_ 700kB.mov	682963a12b9b0742651e 486a5f697fa949f9daf2	000048.mov				
MOV	sample_960x400_ocean_ with_audio.mov	faa748ae6d2a31e21e4d 65a0bd17e425affed954	000049.mov				
MOV	sample-mov-file.mov	126fc405911d33832f88d 5dd2fc3942e9a71e896	000050.mov				

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
MP3	file_example_MP3_700KB.mp3	dae94d2ae419b398c977f27f4190680715ae10c3		000051.mp3			
MP3	Kalimba.mp3	ba795c011958b7c8c628abba468bd762beda403e		000053.mp3			
MP3	sample3.mp3	787cc2c7ef51d56d9118d723229d8fdafdbefad5		000054.mp3			
MP3	sample4.mp3	e3f539fd64c27bcb8f6fc68486761b6b1d16549a		000055.mp3			
MP3	Symphony No.6 (1st movement).mp3	9663ba6ca1d35c2ac59e94d51775ce775e518dac		000056.mp3			
MP3						000052.mp3	
MP4	file_example_MP4_1920_18MG.mp4	a8ddbbcacc224b427f5b7ca14bdf41b692291730	000057.mp4				
MP4	giphy360p (1).mp4	7a65df084f0400e89fac78f247a76fc4b45d851c	000058.3gp				
MP4	giphy360p.mp4	c578124221db590a00bb507202e2dbdb765dccc2	000059.3gp				
MP4	sample_1280x720_surfing_with_audio.mp4	406ecad499e84370fa8bfd3db88aa548eeddc3e1	000061.3gp				
MP4	sample_960x540.mp4	1ae8b2fcce5b37d8a0d6afe21a0ed9757cf78cbc	000062.3gp				
MP4	sample-mp4-file.mp4	bfe8feaec39f112dfcc53bbc98a1c17309e0f941	000060.3gp				
PDF	file-example_PDF_1MB.pdf	cec8ad914b1e9db83626b98e8d98512616975fdf	000063.pdf				
PDF	file-sample_150kB.pdf	6703901978dcb3dbf2d9915e1d3e066cfe712b0a	000064.pdf				
PDF	pdf.pdf	c1f95108a34228535a9262085e784d7c3e27fc68	000065.pdf				

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
PDF	PinePhone_Data_Locations_Cheatsheet_khedley.pdf	074e4fec07c65977f9e0281bae45377ebe800bd3		000066.pdf			
PDF	PinePhone_Poster_khedley.pdf	a403c9c57dff103b1893d27f1efe05bcaf9fbd9b	000067.pdf				
PDF	sample.pdf	bfd009f500c057195ffde66fae64f92fa5f59b72	000068.pdf				
PNG	2cd43b_16d40260a2274e6fb87d101c321eac17_mv2.png	32b7bf753e866e0d7b41419af529ab3c1ebe3aa3	000069.png				
PNG	2cd43b_daa95a985dde42a3af5a63b597f45ac9_mv2.png	045d49e8c7f4184ef19a69122f58aaa431f44e6a	000079.png				
PNG	pngwing.com (1).png	cc5bf259f661d72b5ca78b9e6f58efb3eeafee28	000071.png				
PNG	pngwing.com.png	8317e78a842bc9fdbbf3c83e66326693a489fe3d	000072.png				
PNG	transparent-maple-leaf-5f8ec1dd91fa41.5756612016031912615979.png	db0e388e61bf72e5742fedb5389e6ecf90f07372	000073.png				
PNG	transparent-owl-icon-autumn-icon-60b5ed32573f44.5876030416225354743574.png	29b523ab7c3dd585430e13f383293bcb84d7749d	000074.png				
PPT	file_example_PPT_1MB.ppt	3d30846c0c62832fd05d1c424fb650cf4da6ae23	000008.ppt				
PPT	file_example_PPT_250kB.ppt	cb8ea4114148bc57e7317b3d0aa72ebe53dbe386	000009.ppt				
PPT	PinePhone Forensics.ppt	74485b034c11b8c57d7c3a372e97a34adf02aa44	000012.ppt				

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
PPTX	160930-artificial-intelligence-template-16x9.pptx	4203a60c4b88f7aad96720be8d5171e2afacf10e	000020.pptx				
PPTX	pptx1.pptx	c666363ec2d45b7a1c911427f7690c1bb6313c2a	000024.pptx				
PPTX	pptx2.pptx	c3f3e076c62eee7bf82ed32325faa0d5f79f1596	000025.pptx				
PPTX							2
TIFF	CCITT_1.TIF	a21eef750984d91aaddba931361bbebe44a23568		000075.tif			
TIFF	file_example_TIFF_10MB.tiff	837ae56fd74b69427b7b9511f1065616ffbc3b9e		000076.tif			
TIFF	FLAG_T24.TIF	4c06fdc1b38c4283835b8f89687390042f84a92b	000077.tif				
TIFF	Sample-Tiff-File-download-for-Testing.tiff	3c560462efd9f4182b0da5c3192258384390424c		000078.tif			
TIFF	Tiff-Image-File-Download.tiff	dd85696006a32f8f7fa25755f8cef99c8150196f		00079.tif			
WAV	BabyElephantWalk60.wav	b816c31a23ae448bb0890f5221f256a90d0e9745	000080.wav				
WAV	bird_caw2.wav	49f1e127edbcef4adf8ad89a297a8adca5735b63	000081.wav				
WAV	crickets.wav	fb7ece704403a47692b6c2625324d2b11764ed6d	000082.wav				
WAV	Fanfare60.wav	762d3a658519190f4b5f1374964f959d419cf875	000083.wav				
WAV	file_example_WAV_5MG.wav	40955508715da2d5bd78546fc8ed9edcca07100e	000084.wav				
WAV	taunt.wav	2988a818ebd6a373ca37ecd0a0bf9123880c5758	000085.wav				

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Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
WMV	1280.wmv	814a49657d5e01a0f1716 34ddebc664c98a8a6ec	000086.wmv				
WMV	file_example_WMV_480 _1_2MB.wmv	1c4d2e7cce26714dcda8 7cc52fbca695b377b389	000087.wmv				
WMV	sample_3840x2160.wmv	6ee26e2c8d98aa6d3e62 dc323ec48e03ba392a2b	000089.wmv				
WMV	sample-wmv-file.wmv	a59d51d161b52196aeb de4f9c1585c206a9b08a 3	000088.wmv				
WMV	Video2.WMV	66d457ecfcb8ee65c9f84 1f77ae737ab91aaa11c	000090.wmv				
XLS	file_example_XLS_10.xls	e0cdb9c8a7da39f97877 29345fd9bd617d02d539	000010.xls				
XLS	file_example_XLS_5000. xls	3a0d4a8ecb77244d1580 b15cb9f0766c8317b073	000011.xls				
XLS	USB_artifacts.xls	39a4a8f0a789578d55951 d3fc3e00a5ec86d6b16	000018.xls				
XLSX	file_example_XLSX_100 0.xlsx	0dce77a811e9f631913c8 8e1b04391a868fcc93d	000022.xlsx				
XLSX	file_example_XLSX_50.x lsx	c94997094ad00f9f38017f d94a1d44a1241003b6	000023.xlsx				
XLSX	sample3.xlsx	4c82c22ee2a7478fc0d0 ddea5d3c9565ff269520	000027.xlsx				
ZIP	DOCX-XLSX-PPTX.zip	3bc958d3d36c67342d4a 209def63d69a3b9c55ca	000091.zip				
ZIP	MOV.zip	d45075b85ebb217305a b6bac10e7f6e9a1edceb 9	000092.zip				
ZIP	MP3.zip	7a144bc05232c3e69366 9e1ef6121ac3b94d3128	000093.zip				

Type	Filename	SHA1	Exact match	Usable match	Not found	False positive	Invalid file
ZIP	PDF.zip	a1aa6a40d9161d0dc9fc546c8b239689055cb464	000094.zip				
ZIP	PNG.zip	0a342d01ac70cb9cae28252805bceed415f949f9	000095.zip				
		Totals	81	16	0	1	2

Appendix 1 - Test Files to be Carved

Type	Filename	Origin	Size (KB)	SHA1
7z	AVI-7z	Created from AVI folder containing files above	20,393	fd4d1be9e8ffec39701d35 8898fed10437b0561b
7z	BMP.7z	Created from BMP folder containing files above	35,524	e13b931da505c1c51ed66 53273de8d9d2df67dcc
7z	DOC-XLS-PPT.7z	Created from DOC-XLS-PPT folder containing files above	6,933	edb13fe1559ba71696bb3 09840bfcf0022228799
7z	GIF.7z	Created from GIF folder containing files above	10,674	a70caf5187b383aa5364cfc 97b5db8287fa3aa54
7z	JPEG.7z	Created from JPEG folder containing files above	10,790	4cceb50966356b852883b 9925fcc9e58f410fa2a
AVI	1280.avi	https://www.appsloveworld.com/avi-video-clips-free-download/	11,006	8351e1bd6f08fe34199071 40edd6fcbf00acc46e
AVI	Bubble Turning Into Ice.avi	https://www.appsloveworld.com/avi-video-clips-free-download/	8,850	85bc9cafcacdd41f9b81ac e58bd33fba0c432c7d
AVI	file_example_AVI_1920_2_3MG.avi	https://file-examples.com/index.php/sample-video-files/sample-avi-files-download/	2,227	573400d5d649e6ce8d9c0 2723e70618a17cd631f
AVI	file_example_AVI_480_750kB.avi	https://file-examples.com/index.php/sample-video-files/sample-avi-files-download/	726	a188ed66e68f77729b8cfa c92913427ab6b1677f
AVI	sample-avi-file.avi	https://www.learningcontainer.com/sample-avi-video-file-download/	8,130	246eecb4053487a619145 10389ec300bdaf7f3c6
BMP	GRN.BMP	https://www.fileformat.info/format/bmp/sample/index.htm	85	b367e7e0d95e6f1bd769f3 9bc0b5e2e7d4a6bb62
BMP	MARBLES.BMP	https://www.fileformat.info/format/bmp/sample/index.htm	4,165	eec5e6afdd264d6ff867d0 38aa274c4bc42619b4
BMP	RAY.BMP	https://www.fileformat.info/format/bmp/sample/index.htm	1,407	e44237a11ee0d4b1cb63e 1876dc4040b805e43b6
BMP	sample_5184×3456.bmp	https://filesamples.com/formats/bmp	52,489	bf6c6aa681f20a1dd561ba d7945d441d771b418a
BMP	Small Sample BMP Image File Download.bmp	https://www.learningcontainer.com/sample-bmp-file-for-testing/	977	1eb09379dfb4bc35511aa 5a1db83e652c5c64604

Type	Filename	Origin	Size (KB)	SHA1
BMP	Yellow_star.bmp	Created by khedley	574	4f2e9da3e1a467fe0182d05d7accdd28ee7f76fb
DOC	file-sample_1MB.doc	https://file-examples.com/index.php/sample-documents-download/sample-doc-download/	1,003	8f3498bfbe75fb34e809fc7ced3f4cc6f4acc92c
DOC	SampleDOCFile_200kb.doc	https://sample-videos.com/download-sample-doc-file.php	200	0f1e886f7399fe033c3190bcda7927550c22da8e
DOC	SampleDOCFile_5000kb.doc	https://sample-videos.com/download-sample-doc-file.php	5,001	e9e798cac0a97648c95c21cfa9545659d6d0c2a3
DOC	USB connection artifacts.doc	Created by khedley	42	4665ec3e161f882f1430f862d7a14e6b12ddf6ec
DOCX	15-MB-docx-file-download.docx	https://www.learningcontainer.com/sample-docx-file-for-testing/	32,913	00da85c39ff564d6fc34b0449323a2ef253de8fc
DOCX	file-sample_500kB.docx	https://file-examples.com/index.php/sample-documents-download/sample-doc-download/	539	9a0881226460bf5d0ea17b29a843c0320b9dd11e
DOCX	sample-docx-file-for-testing.docx	https://www.learningcontainer.com/sample-docx-file-for-testing/	3,818	37537e74599278cd26c2a29237cefe067e237f8d
DOCX	Using WSL.docx	Created by khedley	15	3661e7dd597f5931a494335a643513f0198efb6f
GIF	giphy (1).gif	https://giphy.com/gifs/hatutah-seasame-street-yippers-GsiBgbwZAsWsq	4,224	a6768bff9c6d5c9cbc37ce55bf432109f321fab9
GIF	giphy (2).gif	https://giphy.com/gifs/bicycle-besta-howtomob-O7YL1FFrCxXi0	4,862	d0012d8bf6f633972049e917ede588880d416b95
GIF	giphy.gif	https://giphy.com/gifs/internet-pizza-computer-ZH5o2lacOA8Te	274	799521e3a568a270b6259fa7c1565d7adec96c18
GIF	How+do+i+computer+i+decided+to+try+my+hands_81418e_4707807.gif	https://funnyjunk.com/channel/ponytime/How+do+I+computer/rwwsGej/	766	fd2911bff16a8522b7f07a0eca1aeb08292b1b4f
GIF	undefined - Imgur.gif	https://imgur.com/gallery/NVoF3Zi	611	2c3f083d36904cc56f8c46cffb64108943d8d45a
JPEG	file_example_JPG_500kB.jpg	https://file-examples-com.github.io/uploads/2017/10/file_example_JPG_500kB.jpg	543	25472d494500707b4510868df469352dc7cd1845
JPEG	IMG_2375.JPG	Created by khedley	4,264	967cac602f8e01eaf614bee93b8b0c850f22936d

Type	Filename	Origin	Size (KB)	SHA1
JPEG	IMG_3385_cropped.jpg	Created by khedley	138	5fb543b4c8037b48c48fad f8a39f408046c6f7ee
JPEG	IMG_3973.JPG	Created by khedley	3,519	e5f6d316d896db29eabb0 73db8022eb2edc7d2fe
JPEG	IMG_3977.JPG	Created by khedley	1,725	df58316a3b334379b88db c41b1313a952810bd45
JPEG	istockphoto-1304263738-170667a.jpg	https://unsplash.com/s/photos/jpg	203	1febe282f23e1a15ac1003 58eb2b700212eee44b
JPEG	photo-1533450718592-29d45635f0a9.jfif	https://unsplash.com/s/photos/jpg	450	f096a046c3692ab714c28b 267f94f4efe9a7c22b
MOV	720.mov	https://www.appsloveworld.com/sample-mov-file-download/	5,512	ac16247bc6746661d19eb 5832b5b3eed397d97a0
MOV	Cloud Formation Video.mov	https://www.appsloveworld.com/sample-mov-file-download/	13,066	a5c0fbd44b6352161e5b6f 2aa26f00d5888a3951
MOV	file_example_MOV_480_700kB.mov	https://file-examples.com/index.php/sample-video-files/sample-mov-files-download/	694	682963a12b9b0742651e4 86a5f697fa949f9daf2
MOV	sample_960x400_ocean_with_audio.mov	https://filesamples.com/formats/mov	17,111	faa748ae6d2a31e21e4d65 a0bd17e425affed954
MOV	sample-mov-file.mov	https://www.learningcontainer.com/mp4-sample-video-files-download/	14,123	126fc405911d33832f88d5 dd2fc3942e9a71e896
MP3	file_example_MP3_700KB.mp3	https://file-examples.com/index.php/sample-audio-files/sample-mp3-download/	747	dae94d2ae419b398c977f2 7f4190680715ae10c3
MP3	Kalimba.mp3	https://www.learningcontainer.com/sample-audio-file/	8,218	ba795c011958b7c8c628a bba468bd762beda403e
MP3	sample3.mp3	https://filesamples.com/formats/mp3	1,654	787cc2c7ef51d56d9118d7 23229d8fdafdbefad5
MP3	sample4.mp3	https://filesamples.com/formats/mp3	3,821	e3f539fd64c27bcb8f6fc68 486761b6b1d16549a
MP3	Symphony No.6 (1st movement).mp3	https://filesamples.com/formats/mp3	11,378	9663ba6ca1d35c2ac59e9 4d51775ce775e518dac
MP4	file_example_MP4_1920_18MG.mp4	https://file-examples.com/index.php/sample-video-files/sample-mp4-files/	17,422	a8ddbbcacc224b427f5b7 ca14bdf41b692291730
MP4	giphy360p (1).mp4	https://giphy.com/explore/download	198	7a65df084f0400e89fac78f 247a76fc4b45d851c

Type	Filename	Origin	Size (KB)	SHA1
MP4	giphy360p.mp4	https://giphy.com/explore/download	185	c578124221db590a00bb507202e2dbdb765dccc2
MP4	sample_1280x720_surfing_with_audio.mp4	https://filesamples.com/formats/mp4	70,072	406ecad499e84370fa8bfd3db88aa548eeddc3e1
MP4	sample_960x540.mp4	https://filesamples.com/formats/mp4	1,290	1ae8b2fcce5b37d8a0d6afe21a0ed9757cf78cbc
MP4	sample-mp4-file.mp4	https://www.learningcontainer.com/mp4-sample-video-files-download/	10,300	bfe8feaec39f112dfcc53bbc98a1c17309e0f941
PDF	file-example_PDF_1MB.pdf	https://file-examples.com/index.php/sample-documents-download/sample-pdf-download/	1,018	cec8ad914b1e9db83626b98e8d98512616975fdf
PDF	file-sample_150kB.pdf	https://file-examples.com/index.php/sample-documents-download/sample-pdf-download/	140	6703901978dcb3dbf2d9915e1d3e066cfe712b0a
PDF	pdf.pdf	http://www.pdf995.com/samples/pdf.pdf	424	c1f95108a34228535a9262085e784d7c3e27fc68
PDF	PinePhone_Data_Locations_Cheatsheet_khedley.pdf	Created by khedley	204	074e4fec07c65977f9e0281bae45377ebe800bd3
PDF	PinePhone_Poster_khedley.pdf	Created by khedley	1,152	a403c9c57dff103b1893d27f1efe05bcaf9fbd9b
PDF	sample.pdf	http://www.africau.edu/images/default/sample.pdf	3	bfd009f500c057195ffde66fae64f92fa5f59b72
PNG	2cd43b_16d40260a2274e6fb87d101c321eac17_mv2.png	https://www.freepngs.com/dragon-png-images	787	32b7bf753e866e0d7b41419af529ab3c1ebe3aa3
PNG	2cd43b_daa95a985dde42a3af5a63b597f45ac9_mv2.png	https://www.freepngs.com/dragon-png-images	101	045d49e8c7f4184ef19a69122f58aaa431f44e6a
PNG	pngwing.com (1).png	https://www.pngwing.com/en/free-png-zwfuf	2,955	cc5bf259f661d72b5ca78b9e6f58efb3eeafee28
PNG	pngwing.com.png	https://www.pngwing.com/en/free-png-byvsx	548	8317e78a842bc9fdbbf3c83e66326693a489fe3d
PNG	transparent-maple-leaf-5f8ec1dd91fa41.575661201603191261597 9.png	https://www.subpng.com/png-daqbfi/	3,048	db0e388e61bf72e5742fedb5389e6ecf90f07372
PNG	transparent-owl-icon-autumn-icon-60b5ed32573f44.587603041622 5354743574.png	https://www.subpng.com/png-iqhvv2/	794	29b523ab7c3dd585430e13f383293bcb84d7749d

Type	Filename	Origin	Size (KB)	SHA1
PPT	file_example_PPT_1MB.ppt	https://file-examples.com/index.php/sample-documents-download/sample-ppt-file/	1,005	3d30846c0c62832fd05d1c424fb650cf4da6ae23
PPT	file_example_PPT_250kB.ppt	https://file-examples.com/index.php/sample-documents-download/sample-ppt-file/	243	cb8ea4114148bc57e7317b3d0aa72ebe53dbe386
PPT	PinePhone Forensics.ppt	Created by khedley	5,446	74485b034c11b8c57d7c3a372e97a34adf02aa44
PPTX	160930-artificial-intelligence-template-16x9.pptx	https://www.free-power-point-templates.com/free-machine-learning-powerpoint-template/	1,224	4203a60c4b88f7aad96720be8d5171e2afacf10e
PPTX	pptx1.pptx	https://www.appsloveworld.com/sample-pptx-file/	1,618	c666363ec2d45b7a1c911427f7690c1bb6313c2a
PPTX	pptx2.pptx	https://www.appsloveworld.com/sample-pptx-file/	5,885	c3f3e076c62eee7bf82ed32325faa0d5f79f1596
TIFF	CCITT_1.TIF	https://www.fileformat.info/format/tiff/sample/	18	a21eef750984d91aaddba931361bbebe44a23568
TIFF	file_example_TIFF_10MB.tiff	https://file-examples.com/index.php/sample-images-download/sample-tiff-download/	9,914	837ae56fd74b69427b7b9511f1065616ffbc3b9e
TIFF	FLAG_T24.TIF	https://www.fileformat.info/format/tiff/sample/	46	4c06fdc1b38c4283835b8f89687390042f84a92b
TIFF	Sample-Tiff-File-download-for-Testing.tiff	https://www.learningcontainer.com/sample-tiff-file-for-testing/	79	3c560462efd9f4182b0da5c3192258384390424c
TIFF	Tiff-Image-File-Download.tiff	https://www.learningcontainer.com/sample-tiff-file-for-testing/	17,155	dd85696006a32f8f7fa25755f8cef99c8150196f
WAV	BabyElephantWalk60.wav	https://www2.cs.uic.edu/~i101/SoundFiles/	2,585	b816c31a23ae448bb0890f5221f256a90d0e9745
WAV	bird_caw2.wav	https://www.wavsource.com/animals/animals.htm	46	49f1e127edbcef4adf8ad89a297a8adca5735b63
WAV	crickets.wav	https://www.wavsource.com/animals/animals.htm	222	fb7ece704403a47692b6c2625324d2b11764ed6d
WAV	Fanfare60.wav	https://www2.cs.uic.edu/~i101/SoundFiles/	2,585	762d3a658519190f4b5f1374964f959d419cf875
WAV	file_example_WAV_5MG.wav	https://file-examples.com/index.php/sample-audio-files/sample-wav-download/	5,105	40955508715da2d5bd78546fc8ed9edcca07100e
WAV	taunt.wav	https://www2.cs.uic.edu/~i101/SoundFiles/	90	2988a818ebd6a373ca37ecd0a0bf9123880c5758

Type	Filename	Origin	Size (KB)	SHA1
WMV	1280.wmv	https://www.appsloveworld.com/sample-wmv-video-file-free-download/	13,846	814a49657d5e01a0f171634ddebc664c98a8a6ec
WMV	file_example_WMV_480_1_2MB.wmv	https://file-examples.com/index.php/sample-video-files/sample-wmv-files-download/	1,149	1c4d2e7cce26714dcda87cc52fbca695b377b389
WMV	sample_3840x2160.wmv	https://filesamples.com/formats/wmv	32,726	6ee26e2c8d98aa6d3e62dc323ec48e03ba392a2b
WMV	sample-wmv-file.wmv	https://www.learningcontainer.com/sample-wmv-video-file-download/	5,833	a59d51d161b52196aebde4f9c1585c206a9b08a3
WMV	Video2.WMV	https://www.lehman.edu/faculty/hoffmann/itc/techteach/video/Video_samples.html	85	66d457ecfcb8ee65c9f841f77ae737ab91aaa11c
XLS	file_example_XLS_10.xls	https://file-examples.com/index.php/sample-documents-download/sample-xls-download/	9	e0cdb9c8a7da39f9787729345fd9bd617d02d539
XLS	file_example_XLS_5000.xls	https://file-examples.com/index.php/sample-documents-download/sample-xls-download/	657	3a0d4a8ecb77244d1580b15cb9f0766c8317b073
XLS	USB_artifacts.xls	Created by khedley	28	39a4a8f0a789578d55951d3fc3e00a5ec86d6b16
XLSX	file_example_XLSX_1000.xlsx	https://file-examples.com/index.php/sample-documents-download/sample-xls-download/	42	0dce77a811e9f631913c88e1b04391a868fcc93d
XLSX	file_example_XLSX_50.xlsx	https://file-examples.com/index.php/sample-documents-download/sample-xls-download/	8	c94997094ad00f9f38017fd94a1d44a1241003b6
XLSX	sample3.xlsx	https://filesamples.com/formats/xlsx	13	4c82c22ee2a7478fc0d0ddea5d3c9565ff269520
ZIP	DOCX-XLSX-PPTX.zip	Created from DOCX-XLSX-PPTX folder containing files above	45,381	3bc958d3d36c67342d4a209def63d69a3b9c55ca
ZIP	MOV.zip	Created from MOV folder containing files above	47,973	d45075b85ebb217305ab6bac10e7f6e9a1edceb9
ZIP	MP3.zip	Created from MP3 folder containing files above	25,633	7a144bc05232c3e693669e1ef6121ac3b94d3128
ZIP	PDF.zip	Created from PDF folder containing files above	2,646	a1aa6a40d9161d0dc9fc546c8b239689055cb464
ZIP	PNG.zip	Created from PNG folder containing files above	8,002	0a342d01ac70cb9cae28252805bceed415f949f9

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[1] https://www.khyrenz.com/resources/
[2] https://www.exterro.com/ftk-imager