

Test Results for Digital Data Acquisition Tool

**Voom Technologies
HardCopy 3P Hard Drive Capture Unit**

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1 Test Results for Digital Data Acquisition Tool

Tool Tested: HardCopy 3P
Version: 2-04
Run Environments: n/a (HardCopy 3P is a hardware device)
Supplier: Voom Technologies, Inc.
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Lakeland MN 55043
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2 Results Summary

The tested tool acquired all visible and hidden sectors completely and accurately from the test media without any anomalies.

3 Test Case Selection

Test cases are selected by comparing tool features to the assertions defined in [Digital Data Acquisition Tool Assertions and Test Plan Version 1.0](#). The list of tool assertions follows.

3.1 Assertions for Required Features

- DA-AM-01** The tool uses access interface SRC-AI to access the digital source.
- DA-AM-02** The tool acquires digital source DS.
- DA-AM-03** The tool executes in execution environment XE.
- DA-AM-04** If image file creation is specified, the tool creates an image file on filesystem type FS.
- DA-AM-06** All visible sectors are acquired from the digital source.
- DA-AM-07** All hidden sectors are acquired from the digital source.
- DA-AM-08** All sectors acquired from the digital source are acquired accurately.
- DA-AM-09** If unresolved errors occur while reading from the selected digital source. The tool notifies the user of the error type and location within the digital source.
- DA-AM-10** If unresolved errors occur while reading from the selected digital source, the tool uses a benign fill in the destination object in place of the inaccessible data.

3.2 Assertions for Optional Features

3.2.1 Assertions for Image Files

- DA-AO-01** If the tool creates an image file, the data represented by the image file is the same as the data acquired by the tool.
- DA-AO-02** If an image file format is specified, the tool creates an image file in the specified format.
- DA-AO-03** If there is an error while writing the image file, the tool notifies the user.
- DA-AO-04** If the tool is creating an image file and there is insufficient space on the image destination device to contain the image file, the tool shall notify the user.
- DA-AO-05** If the tool creates a multi-file image of a requested size then all the individual files shall be of the requested size, except that one file may be smaller.
- DA-AO-06** If the tool performs an image file integrity check on an image file that has not been changed since the file was created, the tool shall notify the user that the image file has not been changed.
- DA-AO-07** If the tool performs an image file integrity check on an image file that has been changed since the file was created, the tool shall notify the user that the image file has been changed.
- DA-AO-08** If the tool performs an image file integrity check on an image file that has been changed since the file was created, the tool shall notify the user of the affected locations.
- DA-AO-09** If the tool converts a source image file from one format to a target image file in another format, the acquired data represented in the target image file is the same as the acquired data in the source image file.
- DA-AO-10** If there is insufficient space to contain all files of a multi-file image and if destination device switching is supported, the image is continued on another device.

3.2.2 Assertions for Clone Creation

- DA-AO-11** If requested, a clone is created during an acquisition of a digital source.
- DA-AO-12** If requested, a clone is created from an image file.
- DA-AO-13** A clone is created using access interface DST-AI to write to the clone device.
- DA-AO-14** If an unaligned clone is created, each sector written to the clone is accurately written to the same disk address on the clone that the sector occupied on the digital source.
- DA-AO-15** If an aligned clone is created, each sector within a contiguous span of sectors from the source is accurately written to the same disk address on the clone device relative to the start of the span as the sector occupied on the original digital source. A span of sectors is defined to be either a mountable partition or a contiguous sequence of sectors not part of a mountable partition. Extended partitions, which may contain both mountable partitions and unallocated sectors, are not mountable partitions.
- DA-AO-16** If a subset of an image or acquisition is specified, all the subset is cloned.
- DA-AO-17** If requested, any excess sectors on a clone destination device are not modified.
- DA-AO-18** If requested, a benign fill is written to excess sectors of a clone.
- DA-AO-19** If there is insufficient space to create a complete clone, a truncated clone is created using all available sectors of the clone device.
- DA-AO-20** If a truncated clone is created, the tool notifies the user.
- DA-AO-21** If there is a write error during clone creation, the tool notifies the user.

3.2.3 Assertion for Tools Offering Block Hash Logging

DA-AO-22 If requested, the tool calculates block hashes for a specified block size during an acquisition for each block acquired from the digital source.

3.2.4 Assertion for Tools Creating a Log File

DA-AO-23 If the tool logs any significant information, the information is accurately recorded in the log file.

3.2.5 Assertion for Tools Offering Acquisition Without Requiring Write Protection of the Digital Source

DA-AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.

HardCopy3P images or clones entire physical devices. It cannot select a single partition, so test cases involving logical sources have been skipped. Also, HardCopy3P does not support all of the optional assertions. The most notable unsupported features are image file re-verification or manipulation or the creation of a truncated clone/image. Therefore, not all optional assertions are tested. Untested assertions: AO-05, AO-06, AO-07, AO-08, AO-09, AO-10, AO-12, AO-15, AO-16, AO-19, AO-20, AO-22, AO-24.

3.3 Selected Test Cases

Supported Assertions	Cases Selected For Execution
All mandatory assertions	DA-01, DA-04, DA-05, DA-06, DA-07, DA-08, DA-09, DA-10, DA-11, DA-12, DA-19
AO-01	DA-06, DA-07, DA-08, DA-09
AO-02	DA-10
AO-03	DA-11 (not executed due to unavailability of error generation)
AO-04	DA-12
AO-05	DA-06, DA-07, DA-08, DA-09, DA-10
AO-11	DA-01, DA-04, DA-19
AO-13	DA-01, DA-04, DA-19
AO-14	DA-01, DA-04, DA-19
AO-17	DA-01
AO-18	DA-19
AO-21	DA-05 (not executed due to unavailability of error generation)
AO-23	DA-06, DA-07, DA-08, DA-09, DA-10 (HardCopy3P only creates a file during image creation. All other output must be captured as the tests are run by reading HardCopy3P's LCD display or the RS-232 trace.)

Some test cases have variant forms to accommodate parameters within test assertions.

The following source interfaces were tested: SATA, PATA.

The following digital sources were tested: FAT32 and NTFS.

The image files were created on either FAT32 or NTFS partitions.

4 Testing Environment

The tests were run in the Voom Technologies lab.

4.1 Test Computer

Host **nistor2** has the following configuration:

Asus P5AD2-E Premium Motherboard

AMIBIOS v08.00.10

Intel Pentium 4 CPU 3.00Ghz stepping 04

Physical RAM: 2061376k, Swap: 3004112k

Optical drive: Sony DVD RW DRU-510A

Intel ICH6R South Bridge:

- 1 UDMA 100 Parallel ATA port
- 4 SATA ports

Silicon Image 3114R RAID controller:

- 4 SATA ports configured non-RAID

ITE 8212F IDE RAID controller:

- 2 UDMA 133 Parallel ATA ports configured non-RAID

Host **nistor2** is running Ubuntu Linux 10.04, kernel version 2.6.32-32-generic.

4.2 Test Drives

All hard drives had their parameters recorded by '`hdparm -I /dev/sdX`' where X is one of a, b, c, or d. The significant identifiers are listed below.

Label	Model	Serial #	Native LBA	Size
w74.1	WDC WD740GD-00FLA1	WD-WMAKE1374946	145226112	74355 MB
w250.1	WDC WD2500AAKX-001CA0	WD-WCAYUN777188	488397168	250059 MB
w250.2	WDC WD2500AAKX-001CA0	WD-WCAYUN693671	488397168	250059 MB
w250.3	WDC WD2500AAKX-001CA0	WD-WCAYUN979716	488397168	250059 MB
s40.1	SEAGATE ST340014A	5JXL8MSH	78165360	40020 MB
s250.1	SEAGATE ST3250312AS	6VYB2DXY	488397168	250059 MB
s250.2	SEAGATE ST3250312AS	6VMVMKT6	488397168	250059 MB
s1500.1	SEAGATE ST31500341AS	9VS0VXMG	2930277168	1500301 MB
s1500.2	SEAGATE ST31500341AS	9VS2BXTX	2930277168	1500301 MB
s1500.3	SEAGATE ST31500341AS	9VS0VY63	2930277168	1500301 MB

4.3 Support Software

The [FS-TST Release 2.0](#) package of programs to support test analysis was used.

Case Identifier	DA-01-SATA	
	d328b80bba5f88a2f7a9b48d1cfd9aa8fce7dde7035010dc9f408bda602b5c3e sha256sum /dev/sdd (dst2): d328b80bba5f88a2f7a9b48d1cfd9aa8fce7dde7035010dc9f408bda602b5c3e	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a
	AM-04 A clone is created.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-11 A clone is created during acquisition.	as expected
	AO-13 Clone created using interface AI.	as expected
	AO-14 An unaligned clone is created.	as expected
	AO-17 Excess sectors are unchanged.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	not supported
	AO-24 Source is unchanged by acquisition.	as expected
	Analysis	The expected results were achieved.

Case Identifier	DA-01-SATAd
Case Summary	Acquire a physical device using access interface AI to an unaligned clone.
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-04 DA-AM-06 DA-AM-08 DA-AO-11 DA-AO-13 DA-AO-14 DA-AO-17 DA-AO-22 DA-AO-23 DA-AO-24
Test Date	Wed Jun 15 17:54:26 2011
Drives	src: w74.1 dst1: w250.2 dst2: w250.3
Setup	<p>src: Model (WDC WD740GD-00FLA1) serial # (WD-WMAKE1374946) 145226112 sectors wiped with B7 SHA-256: 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3</p> <p>dst1: Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN777188) 488397168 sectors wiped with FF</p> <p>dst2: Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN693671) 488397168 sectors wiped with FE</p>
Highlights	<p>diskcmp DA-01-SATAd nistor2 cpb /dev/sdb f1 /dev/sdc d1 (dst1): Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN777188) Sectors compared: 145226112 Sectors match: 145226112 Sectors differ: 0 Bytes differ: 0 Diffs range Source (145226112) has 343171056 fewer sectors than destination (488397168) Zero fill: 0 Src Byte fill (B7): 0 Dst Byte fill (FF): 343171056 Other fill: 0 Other no fill: 0 Zero fill range: Src fill range: Dst fill range: 145226112-488397167 Other fill range: Other not filled range: 0 source read errors, 0 destination read errors</p> <p>diskcmp DA-01d nistor2 cpb /dev/sdb f1 /dev/sdd d2 (dst2): Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN693671) Sectors compared: 145226112 Sectors match: 145226112 Sectors differ: 0 Bytes differ: 0</p>

Case Identifier	DA-01-SATAd																											
	<pre> Diffs range Source (145226112) has 343171056 fewer sectors than destination (488397168) Zero fill: 0 Src Byte fill (B7): 0 Dst Byte fill (FE): 343171056 Other fill: 0 Other no fill: 0 Zero fill range: Src fill range: Dst fill range: 145226112-488397167 Other fill range: Other not filled range: 0 source read errors, 0 destination read errors sha256sum /dev/sdb (src, post clone): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 sha256sum /dev/sdc (dst1): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 sha256sum /dev/sdd (dst1): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 </pre>																											
Results by Assertion	<table border="1"> <tr> <td data-bbox="347 968 1230 1024">AM-01 Source acquired using interface AI.</td> <td data-bbox="1230 968 1508 1024">as expected</td> </tr> <tr> <td data-bbox="347 1024 1230 1071">AM-02 Source is type DS.</td> <td data-bbox="1230 1024 1508 1071">as expected</td> </tr> <tr> <td data-bbox="347 1071 1230 1117">AM-03 Execution environment is XE.</td> <td data-bbox="1230 1071 1508 1117">n/a</td> </tr> <tr> <td data-bbox="347 1117 1230 1163">AM-04 A clone is created.</td> <td data-bbox="1230 1117 1508 1163">as expected</td> </tr> <tr> <td data-bbox="347 1163 1230 1209">AM-06 All visible sectors acquired.</td> <td data-bbox="1230 1163 1508 1209">as expected</td> </tr> <tr> <td data-bbox="347 1209 1230 1255">AM-08 All sectors accurately acquired.</td> <td data-bbox="1230 1209 1508 1255">as expected</td> </tr> <tr> <td data-bbox="347 1255 1230 1302">AO-11 A clone is created during acquisition.</td> <td data-bbox="1230 1255 1508 1302">as expected</td> </tr> <tr> <td data-bbox="347 1302 1230 1348">AO-13 Clone created using interface AI.</td> <td data-bbox="1230 1302 1508 1348">as expected</td> </tr> <tr> <td data-bbox="347 1348 1230 1394">AO-14 An unaligned clone is created.</td> <td data-bbox="1230 1348 1508 1394">as expected</td> </tr> <tr> <td data-bbox="347 1394 1230 1440">AO-17 Excess sectors are unchanged.</td> <td data-bbox="1230 1394 1508 1440">as expected</td> </tr> <tr> <td data-bbox="347 1440 1230 1486">AO-22 Tool calculates hashes by block.</td> <td data-bbox="1230 1440 1508 1486">not supported</td> </tr> <tr> <td data-bbox="347 1486 1230 1533">AO-23 Logged information is correct.</td> <td data-bbox="1230 1486 1508 1533">not supported</td> </tr> <tr> <td data-bbox="347 1533 1230 1577">AO-24 Source is unchanged by acquisition.</td> <td data-bbox="1230 1533 1508 1577">as expected</td> </tr> </table>		AM-01 Source acquired using interface AI.	as expected	AM-02 Source is type DS.	as expected	AM-03 Execution environment is XE.	n/a	AM-04 A clone is created.	as expected	AM-06 All visible sectors acquired.	as expected	AM-08 All sectors accurately acquired.	as expected	AO-11 A clone is created during acquisition.	as expected	AO-13 Clone created using interface AI.	as expected	AO-14 An unaligned clone is created.	as expected	AO-17 Excess sectors are unchanged.	as expected	AO-22 Tool calculates hashes by block.	not supported	AO-23 Logged information is correct.	not supported	AO-24 Source is unchanged by acquisition.	as expected
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AO-23 Logged information is correct.	not supported																											
AO-24 Source is unchanged by acquisition.	as expected																											
Analysis	The expected results were achieved.																											

Case Identifier	DA-01-PATA																											
	<p>Source (78165360) has 410231808 fewer sectors than destination (488397168)</p> <p>Zero fill: 0</p> <p>Src Byte fill (B7): 0</p> <p>Dst Byte fill (FE): 410231808</p> <p>Other fill: 0</p> <p>Other no fill: 0</p> <p>Zero fill range:</p> <p>Src fill range:</p> <p>Dst fill range: 78165360-488397167</p> <p>Other fill range:</p> <p>Other not filled range:</p> <p>0 source read errors, 0 destination read errors</p> <p>sha256sum /dev/sdb (src, post clone): f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277</p> <p>sha256sum /dev/sdc (dst1): f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277</p> <p>sha256sum /dev/sdd (dst1): f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277</p>																											
Results by Assertion	<table border="1"> <tr> <td data-bbox="342 940 1230 993">AM-01 Source acquired using interface AI.</td> <td data-bbox="1230 940 1508 993">as expected</td> </tr> <tr> <td data-bbox="342 993 1230 1045">AM-02 Source is type DS.</td> <td data-bbox="1230 993 1508 1045">as expected</td> </tr> <tr> <td data-bbox="342 1045 1230 1098">AM-03 Execution environment is XE.</td> <td data-bbox="1230 1045 1508 1098">n/a</td> </tr> <tr> <td data-bbox="342 1098 1230 1150">AM-04 A clone is created.</td> <td data-bbox="1230 1098 1508 1150">as expected</td> </tr> <tr> <td data-bbox="342 1150 1230 1203">AM-06 All visible sectors acquired.</td> <td data-bbox="1230 1150 1508 1203">as expected</td> </tr> <tr> <td data-bbox="342 1203 1230 1255">AM-08 All sectors accurately acquired.</td> <td data-bbox="1230 1203 1508 1255">as expected</td> </tr> <tr> <td data-bbox="342 1255 1230 1308">AO-11 A clone is created during acquisition.</td> <td data-bbox="1230 1255 1508 1308">as expected</td> </tr> <tr> <td data-bbox="342 1308 1230 1360">AO-13 Clone created using interface AI.</td> <td data-bbox="1230 1308 1508 1360">as expected</td> </tr> <tr> <td data-bbox="342 1360 1230 1413">AO-14 An unaligned clone is created.</td> <td data-bbox="1230 1360 1508 1413">as expected</td> </tr> <tr> <td data-bbox="342 1413 1230 1465">AO-17 Excess sectors are unchanged.</td> <td data-bbox="1230 1413 1508 1465">as expected</td> </tr> <tr> <td data-bbox="342 1465 1230 1518">AO-22 Tool calculates hashes by block.</td> <td data-bbox="1230 1465 1508 1518">not supported</td> </tr> <tr> <td data-bbox="342 1518 1230 1570">AO-23 Logged information is correct.</td> <td data-bbox="1230 1518 1508 1570">not supported</td> </tr> <tr> <td data-bbox="342 1570 1230 1541">AO-24 Source is unchanged by acquisition.</td> <td data-bbox="1230 1570 1508 1541">as expected</td> </tr> </table>		AM-01 Source acquired using interface AI.	as expected	AM-02 Source is type DS.	as expected	AM-03 Execution environment is XE.	n/a	AM-04 A clone is created.	as expected	AM-06 All visible sectors acquired.	as expected	AM-08 All sectors accurately acquired.	as expected	AO-11 A clone is created during acquisition.	as expected	AO-13 Clone created using interface AI.	as expected	AO-14 An unaligned clone is created.	as expected	AO-17 Excess sectors are unchanged.	as expected	AO-22 Tool calculates hashes by block.	not supported	AO-23 Logged information is correct.	not supported	AO-24 Source is unchanged by acquisition.	as expected
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AO-17 Excess sectors are unchanged.	as expected																											
AO-22 Tool calculates hashes by block.	not supported																											
AO-23 Logged information is correct.	not supported																											
AO-24 Source is unchanged by acquisition.	as expected																											
Analysis	The expected results were achieved.																											

Case Identifier	DA-04					
Case Summary	Acquire a physical device to a truncated clone.					
Assertions	DA-AM-01	DA-AM-02	DA-AM-03	DA-AM-04	DA-AM-06	DA-AM-08
	DA-AO-11	DA-AO-13	DA-AO-14	DA-AO-19	DA-AO-20	DA-AO-22
	DA-AO-23	DA-AO-24				
Test Date	Thu Jun 16 09:08:09 2011					
Drives	src: w250.1 dst: w74.1					
Setup	No special setup was performed.					
Highlights	HardCopy3P: not enough space for clone					
Results by Assertion	AM-01 Source acquired using interface AI.				as expected	
	AM-02 Source is type DS.				as expected	
	AM-03 Execution environment is XE.				n/a	
	AM-04 A clone is created.				not created	
	AM-06 All visible sectors acquired.				not created	
	AM-08 All sectors accurately acquired.				not created	
	AO-11 A clone is created during acquisition.				not created	
	AO-13 Clone created using interface AI.				not created	
	AO-14 An unaligned clone is created.				not created	
	AO-19 Truncated clone is created.				not created	
	AO-20 User notified that clone is truncated.				not created	
	AO-22 Tool calculates hashes by block.				not supported	
	AO-23 Logged information is correct.				not supported	
	AO-24 Source is unchanged by acquisition.				as expected	
Analysis	HardCopy3P does not try to clone a source device if the destination device is not large enough to hold the entire source.					

Case Identifier	DA-06-SATA
Case Summary	Acquire a physical device using access interface AI to an image file.
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AM-06 DA-AM-08 DA-AO-01 DA-AO-05 DA-AO-22 DA-AO-23 DA-AO-24
Test Date	Fri Jun 17 13:55:47 2011
Drives	src: w74.1 dst1: s250.2 dst2: s250.1
Setup	<p>src: Model (WDC WD740GD-00FL) serial # (WD-WMAKE1374946) 145226112 sectors wiped with B7 SHA-256: 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3</p> <p>dst1: Model (ST3250312AS) serial # (6VMVMKT6) 488397168 sectors wiped with FF</p> <p>dst2: Model (ST3250312AS) serial # (6VYB2DXY) 488397168 sectors wiped with FE</p>
Highlights	<p>data001.txt (excerpt, created by HardCopy3P): [Title] text=DA-06-SATA</p> <p>[Geometry] ModelNumber=WDC WD740GD-00FLA1 SerialNumber=WD-WMAKE1374946 MaximumLBA=145226112</p> <p>[Capture] Retries=0 ReadErrors=0 WriteErrors=0 MaximumLBA=145226112 Source SHA=8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 Status=complete</p> <p>[NTFS CRCs] 00000000-00406f3f=d7a15b10 00406f40-00806b3f=fbf3ac71 00806b40-00c0673f=8cb18cce . . . 08007140-08406d3f=cea8bed8 08406d40-0880693f=c4687276 08806940-08a7f97f=3577e79f</p> <p>sha256sum /dev/sdb (src, post image): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3</p>

Case Identifier	DA-06-SATA	
	sha256sum /mnt/data001.dd (image): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 sha256sum /mnt2/data001.dd (image): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a
	AM-05 An image file is created on file system type FS.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-01 Image file is complete and accurate.	as expected
	AO-05 Multifile image created.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	The expected results were achieved.	

Case Identifier	DA-06-PATA
Case Summary	Acquire a physical device using access interface AI to an image file.
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AM-06 DA-AM-08 DA-AO-01 DA-AO-05 DA-AO-22 DA-AO-23 DA-AO-24
Test Date	Mon Jun 20 13:12:23 2011
Drives	src: s40.1 dst: w250.1 dst2: w250.2
Setup	<p>src: Model (ST340014A) serial # (5JXL8MSH) 78165360 sectors wiped with B7 SHA-256: f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277</p> <p>dst1: Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN777188) 488397168 sectors wiped with FF</p> <p>dst2: Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN693671) 488397168 sectors wiped with FE</p>
Highlights	<p>data001.txt (excerpt, created by HardCopy3P): [Title] text=DA-06-PATA</p> <p>[Geometry] ModelNumber=ST340014A SerialNumber=5JXL8MSH MaximumLBA=78165360</p> <p>[Capture] Retries=0 ReadErrors=0 WriteErrors=0 MaximumLBA=78165360 Source SHA=f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277 Status=complete</p> <p>[NTFS CRCs] 00000000-00406f3f=d7a15b10 00406f40-00806b3f=fbf3ac71 00806b40-00c0673f=8cb18cce . . . 04003340-04402f3f=79e36bd4 04402f40-04802b3f=4cabf982 04802b40-04a8b56f=903e4e8f</p> <p>sha256sum /dev/sdb (src, post image): f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277</p>

Case Identifier	DA-06-PATA	
	sha256sum /mnt/data001.dd (image): f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277 sha256sum /mnt2/data001.dd (image): f3f1c6ad7b60d7c1bb5f82fc8aa49499fdac74f022981fd06aa7f9903bf14277	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a
	AM-05 An image file is created on file system type FS.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-01 Image file is complete and accurate.	as expected
	AO-05 Multifile image created.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	The expected results were achieved.	

Case Identifier	DA-07-NT	
Case Summary	Acquire a digital source of type DS to an image file.	
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AM-06 DA-AM-08 DA-AO-01 DA-AO-05 DA-AO-22 DA-AO-23 DA-AO-24	
Test Date	Tue Jun 21 14:35:41 2011	
Drives	src: w74.1 dst: w250.2	
Setup	src: Model (WDC WD740GD-00FL) serial # (WD-WMAKE1374946) N Start LBA Length Start C/H/S End C/H/S boot Partition type 1 P 000000063 145211472 0000/001/01 1023/254/63 07 NTFS SHA-256: 0c5ad95da7e16f32cc7375eb8d946975a1e0b6b745b07a62f2a51285f8cfa0b0	
Highlights	data001.txt (excerpt, created by HardCopy3P): [Title] text=DA-07-NT [Geometry] ModelNumber=WDC WD740GD-00FLA1 SerialNumber=WD-WMAKE1374946 MaximumLBA=145226112 [Capture] Retries=0 ReadErrors=0 WriteErrors=0 MaximumLBA=145226112 Source SHA=0c5ad95da7e16f32cc7375eb8d946975a1e0b6b745b07a62f2a51285f8cfa0b0 Status=complete [NTFS CRCs] 00000000-00406f3f=d7a15b10 00406f40-00806b3f=fbf3ac71 00806b40-00c0673f=8cb18cce . . . 08007140-08406d3f=cea8bed8 08406d40-0880693f=c4687276 08806940-08a7f97f=3577e79f sha256sum /dev/sdb (src, post image): 0c5ad95da7e16f32cc7375eb8d946975a1e0b6b745b07a62f2a51285f8cfa0b0 sha256sum /mnt/data001.dd (image): 0c5ad95da7e16f32cc7375eb8d946975a1e0b6b745b07a62f2a51285f8cfa0b0	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a

Case Identifier	DA-07-NT	
	AM-05 An image file is created on file system type FS.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-01 Image file is complete and accurate.	as expected
	AO-05 Multifile image created.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	The expected results were achieved.	

Case Identifier	DA-07-FAT	
Case Summary	Acquire a digital source of type DS to an image file.	
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AM-06 DA-AM-08 DA-AO-01 DA-AO-05 DA-AO-22 DA-AO-23 DA-AO-24	
Test Date	Tue Jun 21 14:32:53 2011	
Drives	src: s40.1 dst: w250.1	
Setup	src: Model (ST340014A) serial # (5JXL8MSH) N Start LBA Length Start C/H/S End C/H/S boot Partition type 1 P 000000063 078156162 0000/001/01 1023/254/63 Boot 0C Fat32X SHA-256: a6ad00713ca73a047a0d7ac12c759aed99855d05ad4c4c43b39d0463b106dfef	
Highlights	DATA001.TXT (excerpt, created by HardCopy3P): [Title] text=DA-07-NT [Geometry] ModelNumber=ST340014A SerialNumber=5JXL8MSH MaximumLBA=78165360 [Capture] Retries=0 ReadErrors=0 WriteErrors=0 MaximumLBA=78165360 Source SHA=a6ad00713ca73a047a0d7ac12c759aed99855d05ad4c4c43b39d0463b106dfef Status=complete [FAT32 CRCs] FILE.000=5c459223 FILE.001=5da532ee FILE.002=0f70b017 . . . FILE.015=c5bbe228 FILE.016=37228f10 FILE.017=1c782e8a sha256sum /dev/sdb (src, post image): a6ad00713ca73a047a0d7ac12c759aed99855d05ad4c4c43b39d0463b106dfef cat FILE.* sha256sum (image): a6ad00713ca73a047a0d7ac12c759aed99855d05ad4c4c43b39d0463b106dfef	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a

Case Identifier	DA-07-FAT	
	AM-05 An image file is created on file system type FS.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-01 Image file is complete and accurate.	as expected
	AO-05 Multifile image created.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	The expected results were achieved.	

Case Identifier	DA-08
Case Summary	Acquire a physical drive with hidden sectors to an image file.
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AM-06 DA-AM-07 DA-AM-08 DA-AO-01 DA-AO-05 DA-AO-22 DA-AO-23 DA-AO-24
Test Date	Wed Jun 22 14:56:42 2011
Drives	src: w74.1 dst: w250.2
Setup	A MS-DOS program called HDAT2 v4.71 was used to put an HPA and a DCO on the source drive. HPA at LBA 130000000 DCO at LBA 140000000 There is no linux tool available to read past the DCO, so a source SHA is not available pre or post image.
Highlights	data001.txt (excerpt, created by HardCopy3P): [Title] text=DA-08 [Geometry] ModelNumber=WDC WD740GD-00FLA1 SerialNumber=WD-WMAKE1374946 MaximumLBA=145226112 DCOStartLBA=140000000 DCOSectors=5226112 DCOSize=2675769344 HPAStartLBA=130000000 HPASectors=10000000 HPASize=825032704 [Capture] Retries=0 ReadErrors=0 WriteErrors=0 MaximumLBA=145226112 Source SHA=f6aedd719732db80b4d264b2e0a65dddc5e949587699498904f81fcc16ebe4e8 Image1 SHA=f6aedd719732db80b4d264b2e0a65dddc5e949587699498904f81fcc16ebe4e8 Status=complete [NTFS CRCs] 00000000-00406f3f=33355c6c 00406f40-00806b3f=fbf3ac71 00806b40-00c0673f=8cb18cce . . . 08007140-08406d3f=cea8bed8 08406d40-0880693f=b0942df8 08806940-08a7f97f=7d0f46b1

Case Identifier	DA-08	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a
	AM-05 An image file is created on file system type FS.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-07 All hidden sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-01 Image file is complete and accurate.	as expected
	AO-05 Multifile image created.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	The expected results were achieved.	

Case Identifier	DA-09	
Case Summary	Acquire a digital source that has at least one faulty data sector.	
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AM-06 DA-AM-08 DA-AM-09 DA-AM-10 DA-AO-01 DA-AO-05 DA-AO-22 DA-AO-23 DA-AO-24	
Test Date	Fri Jun 24 10:11:34 2011	
Drives	none	
Setup	No special setup was performed.	
Highlights	This test was not performed.	
Results by Assertion	AM-01 Source acquired using interface AI.	not performed
	AM-02 Source is type DS.	not performed
	AM-03 Execution environment is XE.	n/a
	AM-05 An image is created on file system type FS.	not performed
	AM-06 All visible sectors acquired.	not performed
	AM-08 All sectors accurately acquired.	not performed
	AM-09 Error Logged.	not performed
	AM-10 Benign fill replaces inaccessible sectors.	not performed
	AO-01 Image file is complete and accurate.	not performed
	AO-05 Multifile image created.	not performed
	AO-20 User notified that clone is truncated.	not performed
	AO-22 Tool calculates hashes by block.	not performed
	AO-23 Logged information is correct.	not performed
AO-24 Source is unchanged by acquisition.	not performed	
Analysis	Due to the unavailability of a hard drive with bad sectors, this test was not performed.	

Case Identifier	DA-12	
Case Summary	Attempt to create an image file where there is insufficient space.	
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-05 DA-AO-04 DA-AO-23 DA-AO-24	
Test Date	Wed Aug 19 10:04:37 2009	
Drives	src: w250.1 dst: w74.1	
Setup	No special setup was performed.	
Highlights	HardCopy3P: not enough space for image	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a
	AM-05 An image file is created on file system type FS.	not created
	AO-04 User notified if space exhausted.	as expected
	AO-23 Logged information is correct.	not supported
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	HardCopy3P does not try to image a source device if the destination device is not large enough to hold the entire source.	

Case Identifier	DA-19
Case Summary	Acquire a physical device to an unaligned clone, filling excess sectors.
Assertions	DA-AM-01 DA-AM-02 DA-AM-03 DA-AM-04 DA-AM-06 DA-AM-08 DA-AO-11 DA-AO-13 DA-AO-14 DA-AO-18 DA-AO-22 DA-AO-23 DA-AO-24
Test Date	Thu Jun 23 11:57:26 2011
Drives	src: w74.1 dst: w250.2
Setup	src: Model (WDC WD740GD-00FL) serial # (WD-WMAKE1374946) 145226112 sectors wiped with B7 SHA-256: 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 dst: Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN693671) 488397168 sectors wiped with FF
Highlights	diskcmp DA-19 nistor2 cpb /dev/sdb d1 /dev/sdc 64: Model (WDC WD740GD-00FL) serial # (WD-WMAKE1374946) Destination Drive /dev/sdc 30400/254/63 (max cyl/hd values) 30401/255/63 (number of cyl/hd) 488397168 total number of sectors Non-IDE disk Model (WDC WD2500AAKX-0) serial # (WD-WCAYUN693671) Sectors compared: 145226112 Sectors match: 145226112 Sectors differ: 0 Bytes differ: 0 Diffs range Source (145226112) has 343171056 fewer sectors than destination (488397168) Zero fill: 343171056 Src Byte fill (B7): 0 Dst Byte fill (FF): 0 Other fill: 0 Other no fill: 0 Zero fill range: 145226112-488397167 Src fill range: Dst fill range: Other fill range: Other not filled range: 0 source read errors, 0 destination read errors sha256sum /dev/sdb (src, post clone): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3 dd if=/dev/sdc bs=512 count=145226112 sha256sum (dst): 8ba4d8d4a282461784cd2ffb246454cb7990c3759afd99ef7d9d1aa3dc5062e3

Case Identifier	DA-19	
Results by Assertion	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	n/a
	AM-04 A clone is created.	as expected
	AM-06 All visible sectors acquired.	as expected
	AM-08 All sectors accurately acquired.	as expected
	AO-11 A clone is created during acquisition.	as expected
	AO-13 Clone created using interface AI.	as expected
	AO-14 An unaligned clone is created.	as expected
	AO-18 Excess sectors are filled.	as expected
	AO-22 Tool calculates hashes by block.	not supported
	AO-23 Logged information is correct.	not supported
	AO-24 Source is unchanged by acquisition.	as expected
Analysis	The expected results were achieved.	