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Special REPORT

Test Results for Forensic Media Preparation Tool: Voom HardCopy II (Model XLHCPL-2PD Version 1-11)

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NCJ 228980

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Kristina Rose

Acting Director, National Institute of Justice

This report was prepared for the National Institute of Justice, U.S. Department of Justice, by the Office of Law Enforcement Standards of the National Institute of Standards and Technology under Interagency Agreement 2003–IJ–R–029.

The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance, the Bureau of Justice Statistics, the Office of Juvenile Justice and Delinquency Prevention, and the Office for Victims of Crime.

October 2009

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Voom HardCopy II (Model XLHCPL-2PD Version 1-11)

National Institute of
Standards and Technology
U.S. Department of Commerce

Contents

Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the National Institute of Justice (NIJ), the research and development organization of the U.S. Department of Justice (DOJ), and the National Institute of Standards and Technology's (NIST's) Office of Law Enforcement Standards and Information Technology Laboratory. CFTT is supported by other organizations, including the Federal Bureau of Investigation, the U.S. Department of Defense Cyber Crime Center, U.S. Internal Revenue Service Criminal Investigation Division Electronic Crimes Program, and the U.S. Department of Homeland Security's Bureau of Immigration and Customs Enforcement, U.S. Customs and Border Protection, and U.S. Secret Service. The objective of the CFTT program is to provide measurable assurance to practitioners, researchers, and other applicable users that the tools used in computer forensics investigations provide accurate results. Accomplishing this requires the development of specifications and test methods for computer forensics tools and subsequent testing of specific tools against those specifications.

Test results provide the information necessary for developers to improve tools, users to make informed choices, and the legal community and others to understand the tools' capabilities. The CFTT approach to testing computer forensic tools is based on well-recognized methodologies for conformance and quality testing. The specifications and test methods are posted on the CFTT Web site (http://www.cftt.nist.gov/) for review and comment by the computer forensics community.

This document reports the results from testing Voom Hardcopy II, against the *Forensic Media Preparation Tool Test Assertions and Test Plan Version 1.0*, available at the CFTT Web site (http://www.cftt.nist.gov/fmp-atp-pc-01.pdf).

Test results for other devices and software packages using the CFTT tool methodology can be found on NIJ's computer forensics tool testing Web page, http://www.ojp.usdoj.gov/nij/topics/technology/electronic-crime/cftt.htm.

Test Results for Forensic Media Preparation Tool

Tool Tested:	Voom HardCopy II
Version:	1–11
Serial No.	A001256
Run Environments:	Custom
Supplier:	Voom Technologies, Inc. 110 St. Croix Trail South Lakeland, Minnesota 5504**3**
Tel:	651–998–1618 651–436–4030 (fax)
Email:	info@voomtech.com
WWW:	http://www.voomtech.com/index.html

1. Results Summary

In all the test cases run against Voom HardCopy II Version 1–11, all visible sectors were successfully overwritten. For the test cases that used destination drives containing an HPA or DCO, the tool behaved as designed by the vendor. It removed any HPA or DCO and overwrote the sectors with zeros.

2. Test Case Selection

Voom HardCopy II was tested for its ability to overwrite sectors. The test cases selected were limited to only those test cases defined by *Forensic Media Preparation Tool Test Assertions and Test Plan Version 1.0* and applicable to features supported by this tool.

Since Voom HardCopy II does not support a secure erase mode those tests were omitted; All selected test cases were *WRITE* tests (cases FMP–01 and FMP–03).

Three hidden sector test cases (FMP–03) were included among the cases selected. They were included to measure the tool behavior in conjunction with hidden sectors.

The following cases were used in testing Voom HardCopy II:

- FMP–01–ATA28
- FMP–01–ATA48
- FMP–01–SATA28
- FMP–01–SATA48
- FMP–03–DCO
- FMP–03–DCO+HPA

- FMP–03–HPA

The following source interfaces were tested: ATA28, ATA48, SATA28, SATA48.

3. Test Materials

3.1 Support Software

Several programs were used in the setup and analysis of the test drives. These include **hdat2** (download from: http://www.hdat2.com/download.html), **dsumm** (download from: http://www.cftt.nist.gov/) and the **diskwipe** program from **FS-TST Release 2.0** (download from: http://www.cftt.nist.gov/diskimaging/fs-tst20.zip).

The **hdat2** program is used to create, remove and document hidden areas on a drive.

The **diskwipe** program initializes the hard drive with known content.

The **dsumm** program analyzes the content of a hard drive. It produces a summary of disk contents in terms of counts for each byte value present on the drive. For example, if a drive can contain 10GB (19531250 sectors of 512 bytes per sector) and the drive is wiped with zero bytes, then **dsumm** reports 10,000,000,000 zero bytes. The program also prints the first sector found with printable ASCII content.

3.2 Test Drive Creation

The following steps are used to setup a test drive:

1. The drive is initially filled with known content by the **diskwipe** program. The **diskwipe** program writes the sector address to each sector in both C/H/S and LBA format. The remainder of the bytes in each sector is set to a constant fill value unique for each drive. The fill value is noted in the **diskwipe** tool log file.
2. The **dsumm** program is run to capture and analyze the drive content. Each sector has unique content after the drive setup is complete.
3. If the destination drive is intended for a hidden area test (FMP–03), an HPA, a DCO or both are created.
4. The drive size after creation of a hidden area is recorded.

3.3 Test Drive Analysis

The following steps are used to analyze a test drive after it has been wiped by the tool under test:

1. The size of the drive is recorded. This determines if the tool changes the size of a hidden area.

2. Any hidden areas still present on the drive are removed.
3. The **dsumm** program is run to determine the final content of the drive.

3.4 Test Drives

The following hard drives were used in testing. The column labeled **Test Case** identifies the test case. The column labeled **Sectors** is the size of the drive with no DCO or HPA. The column labeled **Model** is the model of the drive as returned by the ATA IDENTIFY DEVICE command. The column labeled **Serial #** is the serial number as returned by the ATA IDENTIFY DEVICE command.

Test Case	Sectors	Model	Serial #
FMP–01–ATA28	156301488	WDC WD800BB–75CAA0	WD–WMA8E2108916
FMP–01–ATA48	488397168	WDC WD2500JB–00GVC0	WD–WCAL78188039
FMP–01–SATA28	234441648	WDC WD1200JD–00GBB0	WD–WMAES2049679
FMP–01–SATA48	312581808	ST9160310AS	5SV092JK
FMP–03–DCO	78140160	FUJITSU MHW2040BH	K10XT7B278AP
FMP–03–DCO+HPA	490234752	Maxtor 7Y250P0	Y63FSHTE
FMP–03–HPA	312581808	WDC WD1600JB–00GVC0	WD–WMAL94865344

For FMP–03 test cases the layout of visible and hidden sectors is as follows. The column labeled **Test Case** identifies the test case. The column labeled **Size** is the number of visible sectors presented to the device for the test case. The column labeled **Hidden** is the size in sectors of the hidden area.

Test Case	Size	Total	Hidden (DCO+HPA)
FMP–03–DCO	7814016	78140160	70326144
FMP–03–DCO+HPA	465234752	490234752	25000000 (10000000+15000000)
FMP–03–HPA	46887271	312581808	265694537

4. Test Results

The main item of interest for interpreting the test results is determining the conformance of the tool under test with the test assertions. Conformance with each assertion tested by a given test case is evaluated by examining the **Log Highlights** box of the test report summary.

4.1 Test Results Report Key

A summary of the actual test results is presented in this report. The following table presents a description of each section of the test report summary.

Heading	Description
First Line:	Test case ID, name, and version of tool tested.
Case Summary:	Test case summary from *Forensic Media Preparation Tool Test Assertions and Test Plan Version 1.0.*

Heading	Description
Assertions:	The test assertions applicable to the test case, selected from *Forensic Media Preparation Tool Test Assertions and Test Plan Version 1.0.*
Tester Name:	Name or initials of person executing test procedure.
Analysis Host:	Host used to setup test drive and analyze final drive state.
Test Host:	Host computer executing the test.
Test Date:	Time and date that test was started.
Test Drive:	Drive erased by the tool under test.
Source Setup:	Report of the native drive size, the size of any hidden areas, the apparent size of the drive (as reported by an ATA IDENTIFY DEVICE command) and an analysis of initial drive contents.
Log Highlights:	Report of the state of the drive after executing the tool under test, including the apparent drive size, size of hidden area and analysis of drive contents. The ASCII content of the first nonbinary-zero sector is reported.
Results:	Expected and actual results for each assertion tested.
Analysis:	Whether or not the expected results were achieved.

4.2 Test Details

4.2.1 FMP-01-ATA28

Test Case FMP-01-ATA28 Voom HardCopy II Version 1-11	
Case Summary:	FMP-01. Overwrite visible sectors using WRITE commands.
Assertions:	FMP-CA-01 All visible sectors shall be overwritten with the specified benign data.
Tester Name:	csr
Analysis host:	frank
Test host:	none
Test date:	Mon Jul 27 16:54:04 2009
Test drive:	56-IDE
Source Setup:	Initial setup size: 156301488 from total of 156301488 (with 0 hidden) IDE disk: Model (WDC WD800BB-75CAA0) serial # (WD-WMA8E2108916) Sector 0 is first sector with printable text ============= Start text ============= 00000/000/01 000000000000VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV ============= End text Sector 0 ============= 9 <new line> characters inserted for readability Totals for all sectors summary format: <count> <hex value> <(actual character if printable)> ... 156301488 00 156301488 20 ( ) 312602976 2F (/) 1092738319 30 (0) 445157427 31 (1) 274740905 32 (2)

<table>
<tr><th colspan="2">Test Case FMP-01-ATA28 Voom HardCopy II Version 1-11</th></tr>
<tr><td></td><td>274642393 33 (3)   272159917 34 (4)   262536293 35 (5)
225709546 36 (6)   215483146 37 (7)   215483143 38 (8)
215483135 39 (9) 75907021680 56 (V)
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...

80026361856 bytes, 156301488 sectors, 14 distinct values seen
156301488 sectors have printable text</td></tr>
<tr><td>Log Highlights:</td><td>Size after tool runs: 156301488 from total of 156301488 (with 0 hidden)
Analysis of tool result --
Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
80026361856 00
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...
80026361856 00

80026361856 bytes, 156301488 sectors, 1 distinct values seen
No sectors have printable text</td></tr>
<tr><td>Results:</td><td><table><tr><th>Assertion & Expected Result</th><th>Actual Result</th></tr><tr><td>FMP-CA-01 Visible sectors overwritten</td><td>as expected</td></tr></table></td></tr>
<tr><td>Analysis:</td><td>Expected results achieved</td></tr>
</table>

4.2.2 FMP-01-ATA48

Test Case FMP-01-ATA48 Voom HardCopy II Version 1-11	
Case Summary:	FMP-01. Overwrite visible sectors using WRITE commands.
Assertions:	FMP-CA-01 All visible sectors shall be overwritten with the specified benign data.
Tester Name:	Csr
Analysis host:	Frank
Test host:	None
Test date:	Thu Jul 30 16:38:39 2009
Test drive:	29-IDE
Source Setup:	Initial setup size: 488397168 from total of 488397168 (with 0 hidden) IDE disk: Model (WDC WD2500JB-00GVC0) serial # (WD-WCAL78188039) Sector 0 is first sector with printable text ============= Start text ============= 00000/000/01 000000000000)))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))) ============= End text Sector 0 ============= 9 <new line> characters inserted for readability Totals for all sectors summary format: <count> <hex value> <(actual character if printable)> ... 488397168 00 488397168 20 ( ) 237361023648 29 ()) 976794336 2F (/) 2735169210 30 (0) 1278997882 31 (1) 1192805876 32 (2) 933260747 33 (3) 905775911 34 (4) 805865997 35 (5) 749775664 36 (6) 718765480 37 (7) 716559080 38 (8) 707761849 39 (9) Totals for non-ASCII sectors summary format: <count> <hex value> <(actual character if printable)> ... 250059350016 bytes, 488397168 sectors, 14 distinct values seen 488397168 sectors have printable text
Log Highlights:	Size after tool runs: 488397168 from total of 488397168 (with 0 hidden) Analysis of tool result -- Totals for all sectors summary format: <count> <hex value> <(actual character if printable)> ... 250059350016 00 Totals for non-ASCII sectors summary format: <count> <hex value> <(actual character if printable)> ... 250059350016 00 250059350016 bytes, 488397168 sectors, 1 distinct values seen No sectors have printable text
Results:	**Assertion & Expected Result** **Actual Result** FMP-CA-01 Visible sectors overwritten as expected
Analysis:	Expected results achieved

4.2.3 FMP-01-SATA28

<table>
<tr><th colspan="2">Test Case FMP-01-SATA28 Voom HardCopy II Version 1-11</th></tr>
<tr><td>Case Summary:</td><td>FMP-01. Overwrite visible sectors using WRITE commands.</td></tr>
<tr><td>Assertions:</td><td>FMP-CA-01 All visible sectors shall be overwritten with the specified benign data.</td></tr>
<tr><td>Tester Name:</td><td>Csr</td></tr>
<tr><td>Analysis host:</td><td>Frank</td></tr>
<tr><td>Test host:</td><td>None</td></tr>
<tr><td>Test date:</td><td>Thu Jul 30 08:57:27 2009</td></tr>
<tr><td>Test drive:</td><td>1C-SATA</td></tr>
<tr><td>Source Setup:</td><td>Initial setup size: 234441648 from total of 234441648 (with 0 hidden)
IDE disk: Model (WDC WD1200JD-00GBB0) serial # (WD-WMAES2049679)

Sector 0 is first sector with printable text
============= Start text =============
00000/000/01 000000000000
============= End text Sector 0 =============
1 <new line> character inserted for readability

Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
   234441648 00   113938640928 1C   234441648 20 ( )
   468883296 2F (/)   1461085523 30 (0)   678339301 31 (1)
   497617498 32 (2)   407041791 33 (3)   391715334 34 (4)
   376075228 35 (5)   347651457 36 (6)   332766225 37 (7)
   332765657 38 (8)   332658242 39 (9)
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...

120034123776 bytes, 234441648 sectors, 14 distinct values seen
234441648 sectors have printable text</td></tr>
<tr><td>Log Highlights:</td><td>Size after tool runs: 234441648 from total of 234441648 (with 0 hidden)
Analysis of tool result --
Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
120034123776 00
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...
120034123776 00

120034123776 bytes, 234441648 sectors, 1 distinct values seen
No sectors have printable text</td></tr>
<tr><td>Results:</td><td><table><tr><th>Assertion & Expected Result</th><th>Actual Result</th></tr><tr><td>FMP-CA-01 Visible sectors overwritten</td><td>as expected</td></tr></table></td></tr>
<tr><td>Analysis:</td><td>Expected results achieved</td></tr>
</table>

4.2.4 FMP-01-SATA48

<table>
<tr><th colspan="2">Test Case FMP-01-SATA48 Voom HardCopy II Version 1-11</th></tr>
<tr><td>Case Summary:</td><td>FMP-01. Overwrite visible sectors using WRITE commands.</td></tr>
<tr><td>Assertions:</td><td>FMP-CA-01 All visible sectors shall be overwritten with the specified benign data.</td></tr>
<tr><td>Tester Name:</td><td>Csr</td></tr>
<tr><td>Analysis host:</td><td>Frank</td></tr>
<tr><td>Test host:</td><td>None</td></tr>
<tr><td>Test date:</td><td>Tue Jul 28 15:50:27 2009</td></tr>
<tr><td>Test drive:</td><td>21-LAP</td></tr>
<tr><td>Source Setup:</td><td>Initial setup size: 312581808 from total of 312581808 (with 0 hidden)
IDE disk: Model (ST9160310AS) serial # (5SV092JK)

Sector 0 is first sector with printable text
============= Start text =============
00000/000/01 000000000000!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!
!!
!!
!!
!!
!!
!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
============= End text Sector 0 =============
9 <new line> characters inserted for readability

Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
   312581808 00   312581808 20 ( ) 151914758688 21 (!)
   625163616 2F (/)   1850492169 30 (0)   906528227 31 (1)
   696435016 32 (2)   541016511 33 (3)   522787395 34 (4)
   514450557 35 (5)   478352540 36 (6)   458495114 37 (7)
   458481159 38 (8)   449761088 39 (9)
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...

160041885696 bytes, 312581808 sectors, 14 distinct values seen
312581808 sectors have printable text</td></tr>
<tr><td>Log Highlights:</td><td>Size after tool runs: 312581808 from total of 312581808 (with 0 hidden)
Analysis of tool result --
Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
160041885696 00
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...
160041885696 00

160041885696 bytes, 312581808 sectors, 1 distinct values seen
No sectors have printable text</td></tr>
<tr><td>Results:</td><td><table><tr><th>Assertion & Expected Result</th><th>Actual Result</th></tr><tr><td>FMP-CA-01 Visible sectors overwritten</td><td>as expected</td></tr></table></td></tr>
<tr><td>Analysis:</td><td>Expected results achieved</td></tr>
</table>

4.2.5 FMP-03-DCO

Test Case FMP-03-DCO Voom HardCopy II Version 1-11	
Case Summary:	FMP-03. Overwrite hidden sectors using WRITE commands.
Assertions:	FMP-CA-01 All visible sectors shall be overwritten with the specified benign data. FMP-AO-01 If there is a hidden area present and the tool supports overwriting sectors contained in a hidden area, then all sectors contained in the hidden area shall be overwritten with the specified benign data. FMP-AO-02 A hidden area may optionally be removed from the storage device.
Tester Name:	Csr
Analysis host:	Frank
Test host:	None
Test date:	Mon Aug 3 11:16:26 2009
Test drive:	24-LAP

Source Setup:

```
Initial setup size: 7814016 from total of 78140160 (with 70326144 hidden)
IDE disk: Model (FUJITSU MHW2040BH) serial # (K10XT7B278AP)

Sector 0 is first sector with printable text
============= Start text =============
00000/000/01 000000000000$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
============= End text Sector 0 =============
9 <new line> characters inserted for readability

Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
     7814016 00          7814016 20 ( )   3797611776 24 ($)
    15628032 2F (/)     70255912 30 (0)     15793560 31 (1)
    14411539 32 (2)     12727549 33 (3)     12384049 34 (4)
    10812309 35 (5)      9905387 36 (6)      9216849 37 (7)
     8259015 38 (8)      8142183 39 (9)
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...

4000776192 bytes, 7814016 sectors, 14 distinct values seen
7814016 sectors have printable text
```

Log Highlights:

```
Size after tool runs: 78140160 from total of 78140160 (with 0 hidden)
Analysis of tool result --
Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
 40007761920 00
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...
 40007761920 00

40007761920 bytes, 78140160 sectors, 1 distinct values seen
No sectors have printable text
```

Results:

Assertion & Expected Result	**Actual Result**
FMP-CA-01 Visible sectors overwritten	as expected
FMP-AO-01 Hidden sectors overwritten	as expected
FMP-AO-02 Hidden area final state is	removed

Analysis: Expected results achieved

4.2.6 FMP-03-DCO+HPA

Test Case FMP-03-DCO+HPA Voom HardCopy II Version 1-11	
Case Summary:	FMP-03. Overwrite hidden sectors using WRITE commands.
Assertions:	FMP-CA-01 All visible sectors shall be overwritten with the specified benign data. FMP-AO-01 If there is a hidden area present and the tool supports overwriting sectors contained in a hidden area, then all sectors contained in the hidden area shall be overwritten with the specified benign data. FMP-AO-02 A hidden area may optionally be removed from the storage device.
Tester Name:	csr
Analysis host:	frank
Test host:	none
Test date:	Wed Aug 5 13:43:20 2009
Test drive:	2A-IDE
Source Setup:	Size with DCO: 480234752 245.88 GB (10000000 sectors in DCO) Size with HPA: 465234752 238.20 GB (15000000 sectors in HPA) Initial setup size: 465234752 from total of 490234752 (with 25000000 hidden) IDE disk: Model (Maxtor 7Y250P0) serial # (Y63FSHTE) Sector 0 is first sector with printable text ============= Start text ============= 00000/000/01 000000000000*********************************** ** ** ** ** ** ** ** ******************************* ============= End text Sector 0 ============= 9 <new line> characters inserted for readability Totals for all sectors summary format: <count> <hex value> <(actual character if printable)> ... 480234752 00 480234752 20 ( ) 233394089472 2A (*) 960469504 2F (/) 2688406892 30 (0) 1262709725 31 (1) 1176182573 32 (2) 913616218 33 (3) 886219489 34 (4) 794684344 35 (5) 739530848 36 (6) 709039708 37 (7) 699165650 38 (8) 695609097 39 (9) Totals for non-ASCII sectors summary format: <count> <hex value> <(actual character if printable)> ... 245880193024 bytes, 480234752 sectors, 14 distinct values seen 480234752 sectors have printable text
Log Highlights:	Size after tool runs: 490234752 from total of 490234752 (with 0 hidden) Analysis of tool result -- Totals for all sectors summary format: <count> <hex value> <(actual character if printable)> ... 251000193024 00 Totals for non-ASCII sectors summary format: <count> <hex value> <(actual character if printable)> ... 251000193024 00 251000193024 bytes, 490234752 sectors, 1 distinct values seen No sectors have printable text
Results:	**Assertion & Expected Result** **Actual Result** FMP-CA-01 Visible sectors overwritten as expected FMP-AO-01 Hidden sectors overwritten as expected FMP-AO-02 Hidden area final state is removed
Analysis:	Expected results achieved

4.2.7 FMP-03-HPA

<table>
<tr><th colspan="2">Test Case FMP-03-HPA Voom HardCopy II Version 1-11</th></tr>
<tr><td>Case Summary:</td><td>FMP-03. Overwrite hidden sectors using WRITE commands.</td></tr>
<tr><td>Assertions:</td><td>FMP-CA-01 All visible sectors shall be overwritten with the specified benign data.
FMP-AO-01 If there is a hidden area present and the tool supports overwriting sectors contained in a hidden area, then all sectors contained in the hidden area shall be overwritten with the specified benign data.
FMP-AO-02 A hidden area may optionally be removed from the storage device.</td></tr>
<tr><td>Tester Name:</td><td>csr</td></tr>
<tr><td>Analysis host:</td><td>frank</td></tr>
<tr><td>Test host:</td><td>none</td></tr>
<tr><td>Test date:</td><td>Tue Aug 4 13:35:18 2009</td></tr>
<tr><td>Test drive:</td><td>53-IDE</td></tr>
<tr><td>Source Setup:</td><td>Initial setup size: 46887271 from total of 312581808 (with 265694537 hidden)
IDE disk: Model (WDC WD1600JB-00GVC0) serial # (WD-WMAL94865344)

Sector 0 is first sector with printable text
============= Start text =============
00000/000/01 000000000000SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
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============= End text Sector 0 =============
9 <new line> characters inserted for readability

Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
   312581808 00   312581808 20 ( )   625163616 2F (/)
  1850492169 30 (0)   906528227 31 (1)   696435016 32 (2)
   541016511 33 (3)   522787395 34 (4)   514450557 35 (5)
   478352540 36 (6)   458495114 37 (7)   458481159 38 (8)
   449761088 39 (9) 151914758688 53 (S)
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...

160041885696 bytes, 312581808 sectors, 14 distinct values seen
312581808 sectors have printable text</td></tr>
<tr><td>Log Highlights:</td><td>Size after tool runs: 312581808 from total of 312581808 (with 0 hidden)
Analysis of tool result --
Totals for all sectors
summary format: <count> <hex value> <(actual character if printable)> ...
160041885696 00
Totals for non-ASCII sectors
summary format: <count> <hex value> <(actual character if printable)> ...
160041885696 00

160041885696 bytes, 312581808 sectors, 1 distinct values seen
No sectors have printable text</td></tr>
<tr><td>Results:</td><td><table><tr><th>Assertion & Expected Result</th><th>Actual Result</th></tr><tr><td>FMP-CA-01 Visible sectors overwritten</td><td>as expected</td></tr><tr><td>FMP-AO-01 Hidden sectors overwritten</td><td>as expected</td></tr><tr><td>FMP-AO-02 Hidden area final state is</td><td>removed</td></tr></table></td></tr>
<tr><td>Analysis:</td><td>Expected results achieved</td></tr>
</table>

About the National Institute of Justice

NIJ is the research, development, and evaluation agency of the U.S. Department of Justice. NIJ's mission is to advance scientific research, development, and evaluation to enhance the administration of justice and public safety. NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 U.S.C. §§ 3721–3723).

The NIJ Director is appointed by the President and confirmed by the Senate. The Director establishes the Institute's objectives, guided by the priorities of the Office of Justice Programs, the U.S. Department of Justice, and the needs of the field. The Institute actively solicits the views of criminal justice and other professionals and researchers to inform its search for the knowledge and tools to guide policy and practice.

Strategic Goals

NIJ has seven strategic goals grouped into three categories:

Creating relevant knowledge and tools

1. Partner with State and local practitioners and policymakers to identify social science research and technology needs.
2. Create scientific, relevant, and reliable knowledge—with a particular emphasis on terrorism, violent crime, drugs and crime, cost-effectiveness, and community-based efforts—to enhance the administration of justice and public safety.
3. Develop affordable and effective tools and technologies to enhance the administration of justice and public safety.

Dissemination

4. Disseminate relevant knowledge and information to practitioners and policymakers in an understandable, timely, and concise manner.
5. Act as an honest broker to identify the information, tools, and technologies that respond to the needs of stakeholders.

Agency management

6. Practice fairness and openness in the research and development process.
7. Ensure professionalism, excellence, accountability, cost-effectiveness, and integrity in the management and conduct of NIJ activities and programs.

Program Areas

In addressing these strategic challenges, the Institute is involved in the following program areas: crime control and prevention, including policing; drugs and crime; justice systems and offender behavior, including corrections; violence and victimization; communications and information technologies; critical incident response; investigative and forensic sciences, including DNA; less-than-lethal technologies; officer protection; education and training technologies; testing and standards; technology assistance to law enforcement and corrections agencies; field testing of promising programs; and international crime control.

In addition to sponsoring research and development and technology assistance, NIJ evaluates programs, policies, and technologies. NIJ communicates its research and evaluation findings through conferences and print and electronic media.

To find out more about the National Institute of Justice, please visit:

http://www.ojp.usdoj.gov/nij

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