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Test Results for Digital Data Acquisition Tool:  
Tableau Imager (TIM) Version 1.11

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**MARCH 2011**

**Test Results for Digital Data Acquisition Tool:  
Tableau Imager (TIM) Version 1.11**



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## Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the National Institute of Justice (NIJ), the Department of Homeland Security (DHS), and the National Institute of Standards and Technology's (NIST's) Office of Law Enforcement Standards (OLES) and Information Technology Laboratory (ITL). 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, the Bureau of Immigration and Customs Enforcement 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 the Tableau Imager (TIM) Version 1.11, against the *Digital Data Acquisition Tool Assertions and Test Plan Version 1.0*, available at the CFTT Web site (<http://www.cftt.nist.gov/DA-ATP-pc-01.pdf>).

Test results from other tools and 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>.

## How to Read This Report

This report is divided into five sections. The first section is a summary of the results from the test runs. This section is sufficient for most readers to assess the suitability of the tool for the intended use. The remaining sections of the report describe how the tests were conducted, discuss any anomalies that were encountered and provide documentation of test case run details that support the report summary. Section 2 gives justification for the selection of test cases from the set of possible cases defined in the test plan for Digital Data Acquisition tools. The test cases are selected, in general, based on features offered by the tool. Section 3 describes in more depth any anomalies summarized in the first section. Section 4 lists hardware and software used to run the test cases with links to additional information about the items used. Section 5 contains a description of each test case run. The description of each test run lists all test assertions used in the test case, the

expected result and the actual result. Please refer to the vendor's owner manual for guidance on using the tool.



# Test Results for Digital Data Acquisition Tool

Tool Tested: Tableau Imager (TIM)  
Software Version: Version 1.11

Supplier: Guidance Software, Inc.

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Waukesha, WI 53186

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WWW: <http://www.tableau.com/>

## 1 Results Summary

The Tableau Imager is designed to work only with Tableau write block devices. This allows the Tableau Imager to exploit features of the Tableau write block devices.

Except for two test cases, DA-09-FW and DA-09-USB, the tested tool acquired all visible and hidden sectors completely and accurately from the test media without anomaly. The following behavior was observed:

- If the tool is executed with the *quick recovery* option specified and the tool encounters a defective sector, some readable sectors near the defective sector are replaced by zeros in the created image file (test cases DA-09-FW and DA-09-USB). This is the behavior intended for the tool by the software vendor.

## 2 Test Case Selection

Test cases used to test disk imaging tools are defined in *Digital Data Acquisition Tool Assertions and Test Plan Version 1.0*. To test a tool, test cases are selected from the *Test Plan* document based on the features offered by the tool. Not all test cases or test assertions are appropriate for all tools. There is a core set of base cases (e.g., DA-06 and DA-08) that are executed for every tool tested. Tool features guide the selection of additional test cases. If a given tool implements a given feature then the test cases linked to that feature are run. Table 1 lists the features available in the Tableau Imager (TIM) Version 1.11 and the linked test cases selected for execution. Table 2 lists the features not available in the Tableau Imager (TIM) Version 1.11 and the test cases not executed.

**Table 1 Selected Test Cases**

Supported Optional Feature	Cases selected for execution
Base Cases	06 & 08
Read error during acquisition	09
Insufficient space for image file	12

**Table 2 Omitted Test Cases**

<b>Unsupported Optional Feature</b>	<b>Cases omitted (not executed)</b>
Create a clone during acquisition	01
Create an unaligned clone from a digital source	02
Create a truncated clone from a physical device	04
Create an image of a partition	07
Create cylinder aligned clones	03, 15, 21 & 23
Create an image file in more than one format	10
Convert an image file from one format to another	26
Insufficient space for image file	12
Destination Device Switching	13
Device I/O error generator available	05, 11 & 18
Fill excess sectors on a clone device	20, 21, 22 & 23
Create a clone from an image file	14 & 17
Create a clone from a subset of an image file	16
Detect a corrupted (or changed) image file	24 & 25
Fill excess sectors on a clone acquisition	19

Some test cases have variant forms to accommodate parameters within test assertions. These variations cover the acquisition interface to the source drive and how the tool treats faulty sectors encountered on source media.

The following source interfaces were tested: ESATA28, ESATA48, FW, USB, FW to SCSI drive, and USB to SCSI drive. These are noted as variations on test case DA-06 and DA-09.

For test case DA-09 the Tableau Imager (TIM) Version 1.11 offers two options for treating faulty sectors encountered on source media:

- Quick recovery – may skip some good sectors, and
- Complete recovery – retries reading faulty sectors.

### **3 Results by Test Assertion**

A test assertion is a verifiable statement about a single condition after an action is performed by the tool under test. A test case usually checks a group of assertions after the action of a single execution of the tool under test. Test assertions are defined and linked to test cases in *Digital Data Acquisition Tool Assertions and Test Plan Version 1.0*. Table 3 summarizes the test results for all the test cases by assertion. The column labeled **Assertions Tested** gives the text of each assertion. The column labeled **Tests** gives the

number of test cases that use the given assertion. The column labeled **Anomaly** gives the section number in this report where any observed anomalies are discussed.

See section 2 for a discussion of source access interface and digital source.

**Table 3 Assertions Tested**

<b>Assertions Tested</b>	<b>Tests</b>	<b>Anomaly</b>
AM-01 The tool uses access interface SRC-AI to access the digital source.	12	
AM-02 The tool acquires digital source DS.	12	
AM-03 The tool executes in execution environment XE.	12	
AM-05 If image file creation is specified, the tool creates an image file on file system type FS.	12	
AM-06 All visible sectors are acquired from the digital source.	11	3.1
AM-07 All hidden sectors are acquired from the digital source.	2	
AM-08 All sectors acquired from the digital source are acquired accurately.	11	
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.	3	
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	
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.	11	
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.	1	
AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.	11	
AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.	12	
AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.	12	

Two test assertions only apply in special circumstances. The assertion AO-22 is checked only for tools that create block hashes. Because the Tableau Imager (TIM) Version 1.11 does not compute block hashes, assertion AO-22 is not checked. The assertion AO-24 is only checked if the tool is executed in a run time environment that does not modify attached storage devices, such as MS DOS. Table 4 lists the assertions that were not tested, usually due to the tool not supporting some optional feature, e.g., creation of cylinder aligned clones.

**Table 4 Assertions not Tested**

<b>Assertions not Tested</b>
AM-04 If clone creation is specified, the tool creates a clone of the digital source.
AO-02 If an image file format is specified, the tool creates an image file in the specified format.
AO-03 If there is an error while writing the image file, the tool notifies the user.
AO-06 If the tool performs an image file integrity check on an image file that has not been changed since

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<b>Assertions not Tested</b>
the file was created, the tool shall notify the user that the image file has not been changed.
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.
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.
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.
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.
AO-11 If requested, a clone is created during an acquisition of a digital source.
AO-12 If requested, a clone is created from an image file.
AO-13 A clone is created using access interface DST-AI to write to the clone device.
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.
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.
AO-16 If a subset of an image or acquisition is specified, all the subset is cloned.
AO-17 If requested, any excess sectors on a clone destination device are not modified.
AO-18 If requested, a benign fill is written to excess sectors of a clone.
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.
AO-20 If a truncated clone is created, the tool notifies the user.
AO-21 If there is a write error during clone creation, the tool notifies the user.
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.

### **3.1 Acquisition of Faulty Sectors**

Tableau Imager (TIM) Version 1.11 offers two options for treating faulty sectors encountered on source media:

- Quick recovery – may skip some good sectors, and
- Complete recovery – retries reading faulty sectors.

For test cases DA-09-FW and DA-09-USB *quick recovery* is specified and some readable sectors are missed. For test case DA-09-ESATA, *complete recovery* was specified and all readable sectors were acquired. This is the behavior intended for the tool by the software vendor.

## **4 Testing Environment**

The tests were run in the NIST CFTT lab. This section describes the test computers available for testing, using the support software, and notes on other test hardware.

The following operating systems were used:

- MS Windows 7 (Version 6.1.7600),
- MS Windows Vista (Version 6.0.6000) and
- MS Windows XP (Version 5.1.2600).

<b>Test Case</b>	<b>Operating System</b>
da-06-esata28	Microsoft Windows 7
da-06-esata48	Microsoft Windows 7
da-06-fw	Microsoft Windows 7
da-06-fw2scsi	Microsoft Windows XP
da-06-usb	Microsoft Windows Vista
da-06-usb2scsi	Microsoft Windows Vista
da-08-dco	Microsoft Windows XP
da-08-hpa	Microsoft Windows XP
da-09-esata	Microsoft Windows 7
da-09-fw	Microsoft Windows XP
da-09-usb	Microsoft Windows Vista
da-12	Microsoft Windows Vista

The following write blockers were used:

<b>Test Case</b>	<b>Write Blocker</b>
da-06-esata28	Tableau T35es
da-06-esata48	Tableau T35es
da-06-fw	Tableau T9
da-06-fw2scsi	Tableau T4
da-06-usb	Tableau T35e
da-06-usb2scsi	Tableau T4
da-08-dco	Tableau T14
da-08-hpa	Tableau T5
da-09-esata	Tableau T35es
da-09-fw	Tableau T5
da-09-usb	Tableau T3u
da-12	Tableau T15

## **4.1 Test Computers**

Three computers were used to run the tool: **Freddy**, **CheFong** and **WoFat**.

**Freddy** has the following configuration:

Intel Desktop Motherboard D865GB/D865PERC (with ATA-6 IDE on board controller)  
BIOS Version BF86510A.86A.0053.P13  
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Adaptec SCSI BIOS V3.10.0  
Intel® Pentium™ 4 CPU 3.4Ghz  
2577972KB RAM  
SONY DVD RW DRU-530A, ATAPI CD/DVD-ROM drive  
1.44 MB floppy drive  
Two slots for removable IDE hard disk drives  
Two slots for removable SATA hard disk drives  
Two slots for removable SCSI hard disk drives

**CheFong** and **WoFat** have the following configuration:

Intel® Desktop Motherboard DX48BT2  
BIOS Version BTX3810J.86A.1554.2008.0501.1628  
Intel® Core™ 2 Extreme QX9770 CPU 3.20Ghz  
4GB DDR3 RAM  
Diamond Radeon™ HD3450 PCI-E graphics card  
SIIG® 3-Port IEEE1395 PCI-E card  
LG Blu-Ray Super multi drive BD/HD-DVD/DVD/CD  
Three slots for removable SATA hard disk drives  
Two slots for removable IDE hard disk drives

## **4.2 Support Software**

A package of programs to support test analysis, FS-TST Release 2.0, was used. The software can be obtained from: <http://www.cftt.nist.gov/diskimaging/fs-tst20.zip>.

## **4.3 Test Drive Creation**

There are three ways that a hard drive may be used in a tool test case: as a source drive that is imaged by the tool, as a media drive that contains image files created by the tool under test, or as a destination drive on which the tool under test creates a clone of the source drive. In addition to the operating system drive formatting tools, some tools (diskwipe and diskhash) from the FS-TST package are used to setup test drives.

To setup a media drive, the drive is formatted with one of the supported file systems. A media drive may be used in several test cases.

The setup of most source drives follows the same general procedure, but there are several steps that may be varied depending on the needs of the test case.

1. The drive is filled with known data by the **diskwipe** program from FS-TST. The **diskwipe** program writes the sector address to each sector in both C/H/S and LBA format. The remainder of the sector bytes is set to a constant fill value unique for each drive. The fill value is noted in the **diskwipe** tool log file.
2. The drive may be formatted with partitions as required for the test case.
3. An operating system may optionally be installed.

4. A set of reference hashes is created by the FS-TST **diskhash** tool. These include both SHA1 and MD5 hashes. In addition to full drive hashes, hashes of each partition may also be computed.
5. If the drive is intended for hidden area tests (DA-08), an HPA, a DCO or both may be created. The **diskhash** tool is then used to calculate reference hashes of just the visible sectors of the drive.

The source drives for DA-09 are created such that there is a consistent set of faulty sectors on the drive. Each of these source drives is initialized with **diskwipe** and then their faulty sectors are activated. For each of these source drives, a second drive of the same size with the same content as the faulty sector drive, but with no faulty sectors serves as a reference drive for images made from the faulty drive.

To setup a destination drive, the drive is filled with known data by the **diskwipe** program from FS-TST. Partitions may be created if the test case involves restoring from the image of a logical acquire.

#### **4.4 Test Drive Analysis**

For test cases that create a clone of a physical device, e.g., DA-01, DA-04, etc., the destination drive is compared to the source drive with the **diskcmp** program from the FS-TST package; for test cases that create a clone of a logical device, i.e., a partition, e.g., DA-02, DA-20, etc., the destination partition is compared to the source partition with the **partcmp** program. For a destination created from an image file, e.g., DA-14, the destination is compared, using either **diskcmp** (for physical device clones) or **partcmp** (for partition clones), to the source that was acquired to create the image file. Both **diskcmp** and **partcmp** note differences between the source and destination. If the destination is larger than the source it is scanned and the excess destination sectors are categorized as either, undisturbed (still containing the fill pattern written by **diskwipe**), zero filled or changed to something else.

For test case DA-09, imaging a drive with known faulty sectors, the program **anabad** is used to compare the faulty sector reference drive to a cloned version of the faulty sector drive.

For test cases such as DA-06 and DA-07 any acquisition hash computed by the tool under test is compared to the reference hash of the source to check that the source is completely and accurately acquired.

#### **4.5 Note on Test Drives**

The testing uses several test drives from a variety of vendors. The drives are identified by an external label that consists of a two digit hexadecimal value and an optional tag, e.g., 25-SATA. The combination of hex value and tag serves as a unique identifier for each drive. The two digit hex value is used by the FS-TST **diskwipe** program as a sector fill value. The FS-TST compare tools, **diskcmp** and **partcmp**, count sectors that are filled

with the source and destination fill values on a destination that is larger than the original source.

## 5 Test Results

The main item of interest for interpreting the test results is determining the conformance of the device 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.

### 5.1 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. The Tester Name, Test Host, Test Date, Drives, Source Setup and Log Highlights sections for each test case are populated by excerpts taken from the logfiles produced by the tool under test and the FS-TST tools that were executed in support of test case setup and analysis.

Heading	Description
First Line:	Test case ID, name, and version of tool tested.
Case Summary:	Test case summary from <i>Digital Data Acquisition Tool Assertions and Test Plan Version 1.0</i> .
Assertions:	The test assertions applicable to the test case, selected from <i>Digital Data Acquisition Tool Assertions and Test Plan Version 1.0</i> .
Tester Name:	Name or initials of person executing test procedure.
Test Host:	Host computer executing the test.
Test Date:	Time and date that test was started.
Drives:	Source drive (the drive acquired), destination drive (if a clone is created) and media drive (to contain a created image).
Source Setup:	Layout of partitions on the source drive and the expected hash of the drive.
Log Highlights:	Information extracted from various log files to illustrate conformance or non-conformance to the test assertions.
Results	Expected and actual results for each assertion tested.
Analysis	Whether or not the expected results were achieved.

### 5.2 Test Details

#### 5.2.1 DA-06-ESATA28

Test Case DA-06-ESATA28 Tableau Imager (TIM) 1.11	
Case Summary:	DA-06 Acquire a physical device using access interface AI to an image file.
Assertions:	AM-01 The tool uses access interface SRC-AI to access the digital source.



Test Case DA-06-ESATA28 Tableau Imager (TIM) 1.11					
	<p>AM-02 The tool acquires digital source DS.  AM-03 The tool executes in execution environment XE.  AM-05 If image file creation is specified, the tool creates an image file on file system type FS.  AM-06 All visible sectors are acquired from the digital source.  AM-08 All sectors acquired from the digital source are acquired accurately.  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.  AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.  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.  AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.  AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>				
Tester Name:	jrl				
Test Host:	CheFong				
Test Date:	Tue Jul 6 14:40:12 2010				
Drives:	src(01-ide) dst (none) other (10-fu)				
Source Setup:	<pre>src hash (SHA1): &lt; A48BB5665D6DC57C22DB68E2F723DA9AA8DF82B9 &gt; src hash (MD5): &lt; F458F673894753FA6A0EC8B8EC63848E &gt; 78165360 total sectors (40020664320 bytes) Model (0BB-00JHC0 ) serial # ( WD-WMAMC74171) N Start LBA Length Start C/H/S End C/H/S boot Partition type 1 P 000000063 020980827 0000/001/01 1023/254/63 0C Fat32X 2 X 020980890 057175335 1023/000/01 1023/254/63 0F extended 3 S 000000063 000032067 1023/001/01 1023/254/63 01 Fat12 4 X 000032130 002104515 1023/000/01 1023/254/63 05 extended 5 S 000000063 002104452 1023/001/01 1023/254/63 06 Fat16 6 X 002136645 004192965 1023/000/01 1023/254/63 05 extended 7 S 000000063 004192902 1023/001/01 1023/254/63 16 other 8 X 006329610 008401995 1023/000/01 1023/254/63 05 extended 9 S 000000063 008401932 1023/001/01 1023/254/63 0B Fat32 10 X 014731605 010490445 1023/000/01 1023/254/63 05 extended 11 S 000000063 010490382 1023/001/01 1023/254/63 83 Linux 12 X 025222050 004209030 1023/000/01 1023/254/63 05 extended 13 S 000000063 004208967 1023/001/01 1023/254/63 82 Linux swap 14 X 029431080 027744255 1023/000/01 1023/254/63 05 extended 15 S 000000063 027744192 1023/001/01 1023/254/63 07 NTFS 16 S 000000000 000000000 0000/000/00 0000/000/00 00 empty entry 17 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry 18 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry 1 020980827 sectors 10742183424 bytes 3 000032067 sectors 16418304 bytes 5 002104452 sectors 1077479424 bytes 7 004192902 sectors 2146765824 bytes 9 008401932 sectors 4301789184 bytes 11 010490382 sectors 5371075584 bytes 13 004208967 sectors 2154991104 bytes 15 027744192 sectors 14205026304 bytes</pre>				
Log Highlights:	<pre>===== ../tableau-1_11/da-06-esata28 ===== Write Block: Tableau T35es (#63)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: WDC WD400BB-00JHC0 S/N: WD-WMAMC7417100 Capacity in bytes reported Pwr-ON: 40,020,664,320 (40.0 GB) Capacity in bytes reported by HPA: 40,020,664,320 (40.0 GB) Capacity in bytes reported by DCO: 40,020,664,320 (40.0 GB) ===== Hash of Acquired Data ===== MD5: f458f673894753fa6a0ec8b8ec63848e SHA1: a48bb5665d6dc57c22db68e2f723da9aa8df82b9</pre>				
Results:	<table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Assertion & Expected Result	Actual Result		
Assertion & Expected Result	Actual Result				

Test Case DA-06-ESATA28 Tableau Imager (TIM) 1.11		
	AM-01 Source acquired using interface AI.	as expected
	AM-02 Source is type DS.	as expected
	AM-03 Execution environment is XE.	as expected
	AM-05 An image 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.	option not available
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	not checked
Analysis:	Expected results achieved	

## 5.2.2 DA-06-ESATA48

Test Case DA-06-ESATA48 Tableau Imager (TIM) 1.11																									
Case Summary:	DA-06 Acquire a physical device using access interface AI to an image file.																								
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>AM-06 All visible sectors are acquired from the digital source.</p> <p>AM-08 All sectors acquired from the digital source are acquired accurately.</p> <p>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.</p> <p>AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																								
Tester Name:	jrl																								
Test Host:	CheFong																								
Test Date:	Tue Jul 13 09:04:31 2010																								
Drives:	src(4c) dst (none) other (08-fu)																								
Source Setup:	<pre>src hash (SHA1): &lt; 8FF620D2BEDCCAFE8412EDAAD56C8554F872EFBF &gt; src hash (MD5): &lt; D10F763B56D4CEBA2D1311C61F9FB382 &gt; 390721968 total sectors (200049647616 bytes) 24320/254/63 (max cyl/hd values) 24321/255/63 (number of cyl/hd) IDE disk: Model (WDC WD2000JB-00KFA0) serial # (WD-WMAMR1031111)   N  Start LBA Length      Start C/H/S End C/H/S   boot Partition type   1  P 000000063 390700737 0000/001/01 1023/254/63 Boot 07 NTFS   2  P 000000000 000000000 0000/000/00 0000/000/00    00 empty entry   3  P 000000000 000000000 0000/000/00 0000/000/00    00 empty entry   4  P 000000000 000000000 0000/000/00 0000/000/00    00 empty entry 1 390700737 sectors 200038777344 bytes</pre>																								
Log Highlights:	<pre>===== ../tableau-1_11/da-06-esata48 ===== Write Block: Tableau T35es (#63)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: WDC WD2000JB-00KFA0 S/N: WD-WMAMR1031111 Capacity in bytes reported Pwr-ON: 200,049,647,616 (200.0 GB) Capacity in bytes reported by HPA: 200,049,647,616 (200.0 GB) Capacity in bytes reported by DCO: 200,049,647,616 (200.0 GB) ===== Hash of Acquired Data ===== SHA1: 8ff620d2bedccafe8412edaad56c8554f872efbf</pre>																								
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<b>Test Case DA-06-ESATA48 Tableau Imager (TIM) 1.11</b>	
Analysis:	Expected results achieved

## 5.2.3 DA-06-FW

Test Case DA-06-FW Tableau Imager (TIM) 1.11																							
Case Summary:	DA-06 Acquire a physical device using access interface AI to an image file.																						
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>AM-06 All visible sectors are acquired from the digital source.</p> <p>AM-08 All sectors acquired from the digital source are acquired accurately.</p> <p>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.</p> <p>AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																						
Tester Name:	jrl																						
Test Host:	CheFong																						
Test Date:	Fri Jul 16 09:29:22 2010																						
Drives:	src(63-fu2) dst (none) other (0b-fu)																						
Source Setup:	<pre>src hash (SHA256): &lt; EC8EF011494BA6DA18F74C47547C3E74E7180585096A830F9247A98EF613BB1D &gt; src hash (SHA1): &lt; F7069EDCBEAC863C88DECED82159F22DA96BE99B &gt; src hash (MD5): &lt; EE217BC4FA4F3D1B4021D29B065AA9EC &gt; 117304992 total sectors (60060155904 bytes) Model (SP0612N ) serial # ( ) N Start LBA Length Start C/H/S End C/H/S boot Partition type 1 P 000000063 004192902 0000/001/01 0260/254/63 Boot 06 Fat16 2 X 004192965 113097600 0261/000/01 1023/254/63 0F extended 3 S 000000063 113097537 0261/001/01 1023/254/63 0B Fat32 4 S 000000000 000000000 0000/000/00 0000/000/00 00 empty entry 5 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry 6 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry 1 004192902 sectors 2146765824 bytes 3 113097537 sectors 57905938944 bytes</pre>																						
Log Highlights:	<pre>===== ../tableau-1_11/da-06-fw ===== Write Block: Tableau T9 (#64)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: DMI SAMS UNG SP0612N S/N: Capacity in bytes reported Pwr-ON: 60,060,155,904 (60.0 GB) ===== Hash of Acquired Data ===== MD5: ee217bc4fa4f3d1b4021d29b065aa9ec SHA1: f7069edcbeac863c88deced82159f22da96be99b</pre>																						
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AO-23 Logged information is correct.	as expected																						

<b>Test Case DA-06-FW Tableau Imager (TIM) 1.11</b>		
	AO-24 Source is unchanged by acquisition.	not checked
Analysis:	Expected results achieved	

## 5.2.4 DA-06-FW2SCSI

Test Case DA-06-FW2SCSI Tableau Imager (TIM) 1.11																									
Case Summary:	DA-06 Acquire a physical device using access interface AI to an image file.																								
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>AM-06 All visible sectors are acquired from the digital source.</p> <p>AM-08 All sectors acquired from the digital source are acquired accurately.</p> <p>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.</p> <p>AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																								
Tester Name:	jrl																								
Test Host:	Freddy																								
Test Date:	Thu Jul 8 16:06:39 2010																								
Drives:	src(e0) dst (none) other (10-fu)																								
Source Setup:	<p>src hash (SHA1): &lt; 4A6941F1337A8A22B10FC844B4D7FA6158BECB82 &gt;</p> <p>src hash (MD5): &lt; A97C8F36B7AC9D5233B90AC09284F938 &gt;</p> <p>17938985 total sectors (9184760320 bytes)</p> <p>Model (ATLAS10K2-TY092J) serial # (169028142436)</p>																								
Log Highlights:	<p>===== ../tableau-1_11/da-06-fw2scsi =====</p> <p>Write Block: Tableau T4 (#53)</p> <p>===== Extract from Tableau Imager log.txt file =====</p> <p>Source drive:            Model: QUANTUM ATLAS10K2-TY092J            S/N:            Capacity in bytes reported Pwr-ON: 9,184,760,320 (9.1 GB)</p> <p>===== Hash of Acquired Data =====</p> <p>SHA1: 4a6941f1337a8a22b10fc844b4d7fa6158becb82</p>																								
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AO-24 Source is unchanged by acquisition.	not checked																								
Analysis:	Expected results achieved																								

## 5.2.5 DA-06-USB

Test Case DA-06-USB Tableau Imager (TIM) 1.11																									
Case Summary:	DA-06 Acquire a physical device using access interface AI to an image file.																								
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.            AM-02 The tool acquires digital source DS.            AM-03 The tool executes in execution environment XE.            AM-05 If image file creation is specified, the tool creates an image file on file system type FS.            AM-06 All visible sectors are acquired from the digital source.            AM-08 All sectors acquired from the digital source are acquired accurately.            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.            AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.            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.            AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.            AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																								
Tester Name:	jrl																								
Test Host:	WoFat																								
Test Date:	Tue Jun 29 17:24:54 2010																								
Drives:	src(01-sata) dst (none) other (05-fu)																								
Source Setup:	<p>src hash (SHA1): &lt; &gt;            src hash (MD5): &lt; 0A49B13D91FA9DA87CEEE9D006CB6FD6 &gt;            156301488 total sectors (80026361856 bytes)            Model (0JD-32HKA0 ) serial # (WD-WMAJ91448529)</p>																								
Log Highlights:	<pre> ===== ../tableau-1_11/da-06-usb ===== Write Block: Tableau T35e (#56)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: WDC WD80 0JD-32HKA0 S/N: WD-WMAJ91448529 Capacity in bytes reported Pwr-ON: 80,026,361,856 (80.0 GB) Capacity in bytes reported by HPA: 80,026,361,856 (80.0 GB) Capacity in bytes reported by DCO: 80,026,361,856 (80.0 GB) ===== Hash of Acquired Data ===== MD5: 0a49b13d91fa9da87ceee9d006cb6fd6           </pre>																								
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Analysis:	Expected results achieved																								



## 5.2.6 DA-06-USB2SCSI

Test Case DA-06-USB2SCSI Tableau Imager (TIM) 1.11																									
Case Summary:	DA-06 Acquire a physical device using access interface AI to an image file.																								
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.            AM-02 The tool acquires digital source DS.            AM-03 The tool executes in execution environment XE.            AM-05 If image file creation is specified, the tool creates an image file on file system type FS.            AM-06 All visible sectors are acquired from the digital source.            AM-08 All sectors acquired from the digital source are acquired accurately.            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.            AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.            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.            AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.            AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																								
Tester Name:	jrl																								
Test Host:	WoFat																								
Test Date:	Tue Jun 29 17:24:00 2010																								
Drives:	src(e0) dst (none) other (05-fu)																								
Source Setup:	<p>src hash (SHA1): &lt; 4A6941F1337A8A22B10FC844B4D7FA6158BECB82 &gt;            src hash (MD5): &lt; A97C8F36B7AC9D5233B90AC09284F938 &gt;            17938985 total sectors (9184760320 bytes)            Model (ATLAS10K2-TY092J) serial # (169028142436)</p>																								
Log Highlights:	<pre> ===== ../tableau-1_11/da-06-usb2scsi ===== Write Block: Tableau T4 (#53)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: QUANTUM ATLAS10K2-TY092J S/N: Capacity in bytes reported Pwr-ON: 9,184,760,320 (9.1 GB) ===== Hash of Acquired Data ===== MD5: a97c8f36b7ac9d5233b90ac09284f938 SHA1: 4a6941f1337a8a22b10fc844b4d7fa6158becb82           </pre>																								
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AO-23 Logged information is correct.	as expected																								
AO-24 Source is unchanged by acquisition.	not checked																								
Analysis:	Expected results achieved																								

## 5.2.7 DA-08-DCO

Test Case DA-08-DCO Tableau Imager (TIM) 1.11																											
Case Summary:	DA-08 Acquire a physical drive with hidden sectors to an image file.																										
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.            AM-02 The tool acquires digital source DS.            AM-03 The tool executes in execution environment XE.            AM-05 If image file creation is specified, the tool creates an image file on file system type FS.            AM-06 All visible sectors are acquired from the digital source.            AM-07 All hidden sectors are acquired from the digital source.            AM-08 All sectors acquired from the digital source are acquired accurately.            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.            AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.            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.            AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.            AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																										
Tester Name:	jrl																										
Test Host:	Freddy																										
Test Date:	Fri Jul 16 11:02:51 2010																										
Drives:	src(5l-ide) dst (none) other (10-fu)																										
Source Setup:	<p>src hash (SHA1): &lt; B9186B6373E5D4C15706D624FF8D3029F4E49C3D &gt;            src hash (MD5): &lt; 28B8DD3FDA3392823C5F6596B9AB3A80 &gt;            312581808 total sectors (160041885696 bytes)            19456/254/63 (max cyl/hd values)            19457/255/63 (number of cyl/hd)            IDE disk: Model (WDC WD1600JB-00GVC0) serial # (WD-WMAL94887547)</p> <p>Hashes with HPA in place for 5l-IDE            Maximum Addressable Sector: 270,000,000            MD5: A7DA2CF45B122C972BE42E4F454F583D</p>																										
Log Highlights:	<p>===== ../tableau-1_11/da-08-dco =====            Write Block: Tableau T14</p> <p>===== Extract from Tableau Imager log.txt file =====            Source drive:            Model: WDC WD16 00JB-00GVC0            S/N: WD-WMAL94887547            Capacity in bytes reported Pwr-ON: 160,041,885,696 (160.0 GB)            Capacity in bytes reported by HPA: 160,041,885,696 (160.0 GB)            Capacity in bytes reported by DCO: 160,041,885,696 (160.0 GB)            ===== Hash of Acquired Data =====            MD5: 28b8dd3fda3392823c5f6596b9ab3a80            SHA1: b9186b6373e5d4c15706d624ff8d3029f4e49c3d</p>																										
Results:	<table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-01 Source acquired using interface AI.</td> <td>as expected</td> </tr> <tr> <td>AM-02 Source is type DS.</td> <td>as expected</td> </tr> <tr> <td>AM-03 Execution environment is XE.</td> <td>as expected</td> </tr> <tr> <td>AM-05 An image is created on file system type FS.</td> <td>as expected</td> </tr> <tr> <td>AM-06 All visible sectors acquired.</td> <td>as expected</td> </tr> <tr> <td>AM-07 All hidden sectors acquired.</td> <td>as expected</td> </tr> <tr> <td>AM-08 All sectors accurately acquired.</td> <td>as expected</td> </tr> <tr> <td>AO-01 Image file is complete and accurate.</td> <td>as expected</td> </tr> <tr> <td>AO-05 Multifile image created.</td> <td>as expected</td> </tr> <tr> <td>AO-22 Tool calculates hashes by block.</td> <td>option not available</td> </tr> <tr> <td>AO-23 Logged information is correct.</td> <td>as expected</td> </tr> <tr> <td>AO-24 Source is unchanged by acquisition.</td> <td>not checked</td> </tr> </tbody> </table>	Assertion & Expected Result	Actual Result	AM-01 Source acquired using interface AI.	as expected	AM-02 Source is type DS.	as expected	AM-03 Execution environment is XE.	as expected	AM-05 An image 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.	option not available	AO-23 Logged information is correct.	as expected	AO-24 Source is unchanged by acquisition.	not checked
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AO-05 Multifile image created.	as expected																										
AO-22 Tool calculates hashes by block.	option not available																										
AO-23 Logged information is correct.	as expected																										
AO-24 Source is unchanged by acquisition.	not checked																										

Test Case DA-08-DCO Tableau Imager (TIM) 1.11	
Analysis:	Expected results achieved

## 5.2.8 DA-08-HPA

Test Case DA-08-HPA Tableau Imager (TIM) 1.11																									
Case Summary:	DA-08 Acquire a physical drive with hidden sectors to an image file.																								
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.            AM-02 The tool acquires digital source DS.            AM-03 The tool executes in execution environment XE.            AM-05 If image file creation is specified, the tool creates an image file on file system type FS.            AM-06 All visible sectors are acquired from the digital source.            AM-07 All hidden sectors are acquired from the digital source.            AM-08 All sectors acquired from the digital source are acquired accurately.            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.            AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.            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.            AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.            AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																								
Tester Name:	jrl																								
Test Host:	Freddy																								
Test Date:	Tue Jul 13 09:02:55 2010																								
Drives:	src(7E) dst (none) other (81-fu2)																								
Source Setup:	<pre>src hash (SHA1): &lt; 60A77A87F1FA085B1808A88B19F6B36AECE52381 &gt; src hash (MD5): &lt; 62F17D0DF3EB0562E008A736154F71CF &gt; 78177792 total sectors (40027029504 bytes) 65534/015/63 (max cyl/hd values) 65535/016/63 (number of cyl/hd) IDE disk: Model (MAXTOR 6L040J2) serial # (662201136780)  HPA created  Hashes with HPA in place Maximum Addressable Sector: 70,000,000 sha1: CC0CFFDE461D774228370DBAD1E4BD5C8413C346</pre>																								
Log Highlights:	<pre>===== ../tableau-1_11/da-08-hpa ===== Write Block: Tableau T5 (#29)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: MAXTOR 6 L040J2 S/N: 662201136780 Capacity in bytes reported Pwr-ON: 40,027,029,504 (40.0 GB) Capacity in bytes reported by HPA: 40,027,029,504 (40.0 GB) Capacity in bytes reported by DCO: 40,027,029,504 (40.0 GB) ===== Hash of Acquired Data ===== MD5: 62f17d0df3eb0562e008a736154f71cf SHA1: 60a77a87f1fa085b1808a88b19f6b36aece52381</pre>																								
Results:	<table border="1"> <thead> <tr> <th>Assertion &amp; Expected Result</th> <th>Actual Result</th> </tr> </thead> <tbody> <tr> <td>AM-01 Source acquired using interface AI.</td> <td>as expected</td> </tr> <tr> <td>AM-02 Source is type DS.</td> <td>as expected</td> </tr> <tr> <td>AM-03 Execution environment is XE.</td> <td>as expected</td> </tr> <tr> <td>AM-05 An image is created on file system type FS.</td> <td>as expected</td> </tr> <tr> <td>AM-06 All visible sectors acquired.</td> <td>as expected</td> </tr> <tr> <td>AM-07 All hidden sectors acquired.</td> <td>as expected</td> </tr> <tr> <td>AM-08 All sectors accurately acquired.</td> <td>as expected</td> </tr> <tr> <td>AO-01 Image file is complete and accurate.</td> <td>as expected</td> </tr> <tr> <td>AO-05 Multifile image created.</td> <td>as expected</td> </tr> <tr> <td>AO-22 Tool calculates hashes by block.</td> <td>option not available</td> </tr> <tr> <td>AO-23 Logged information is correct.</td> <td>as expected</td> </tr> </tbody> </table>	Assertion & Expected Result	Actual Result	AM-01 Source acquired using interface AI.	as expected	AM-02 Source is type DS.	as expected	AM-03 Execution environment is XE.	as expected	AM-05 An image 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.	option not available	AO-23 Logged information is correct.	as expected
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AO-22 Tool calculates hashes by block.	option not available																								
AO-23 Logged information is correct.	as expected																								

Test Case DA-08-HPA Tableau Imager (TIM) 1.11		
	AO-24 Source is unchanged by acquisition.	not checked
Analysis:	Expected results achieved	

## 5.2.9 DA-09-ESATA

Test Case DA-09-ESATA Tableau Imager (TIM) 1.11	
Case Summary:	DA-09 Acquire a digital source that has at least one faulty data sector.
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>AM-06 All visible sectors are acquired from the digital source.</p> <p>AM-08 All sectors acquired from the digital source are acquired accurately.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>
Tester Name:	jrl
Test Host:	CheFong
Test Date:	Thu Jul 8 15:05:48 2010
Drives:	src(ed-bad-cpr1) dst (50-sata) other (09-fu)
Source Setup:	<p>No before hash for ED-BAD-CPR1</p> <p>120103200 total sectors (61492838400 bytes)</p> <p>Drive with known bad sectors</p> <p>Vendor: Maxtor Model: DiamondMax Plus 9</p> <p>Known Bad Sector List for ED-CPR-BAD-1</p> <p>Manufacturer: Maxtor</p> <p>Model: 6Y060L0 DiamondMax Plus 9</p> <p>Serial Number: Y27KR6CE</p> <p>Capacity: 60GB</p> <p>Interface: PATA</p> <p>54 faulty sectors</p> <p>10069095, 10069911, 12023808, 18652594, 18656041, 18656857, 18660303, 18661119, 19746716-19746717, 22233904, 23098370, 23383001, 24102466-24102467, 24104250, 24106656, 24107458, 28959971-28959972, 41825791, 41828995, 52654580, 52655318, 60522984, 68643842-68643843, 69973290, 72714626, 72715293, 82148809, 82148810, 83810525, 85310861, 85313430, 85314038-85314039, 86321211, 86323780, 87186066, 87856313, 87856922, 97191260-97191261, 100093150-100093151, 103861021, 109706975-109706976, 110347947, 110350122-110350123, 115664758, 115835518</p>
Log Highlights:	<pre>===== ../tableau-1_11/da-09-esata ===== ===== Destination drive setup ===== 156301488 sectors wiped with 50  ===== Comparision of original to clone drive ===== Sectors compared: 120103200 Sectors match: 120103146 Sectors differ: 54 Bytes differ: 27594 Diffs range 10069095, 10069911, 12023808, 18652594, 18656041, 18656857, 18660303, 18661119, 19746716-19746717, 22233904, 23098370, 23383001, 24102466-24102467, 24104250,</pre>

**Test Case DA-09-ESATA Tableau Imager (TIM) 1.11**

```

24106656, 24107458, 28959971-28959972, 41825791, 41828995,
52654580, 52655318, 60522984, 68643842-68643843, 69973290,
72714626, 72715293, 82148809-82148810, 83810525, 85310861,
85313430, 85314038-85314039, 86321211, 86323780, 87186066,
87856313, 87856922, 97191260-97191261, 100093150-100093151,
103861021, 109706975-109706976, 110347947, 110350122-110350123,
115664758, 115835518
Source (120103200) has 36198288 fewer sectors than destination (156301488)
Zero fill: 0
Src Byte fill (ED): 0
Dst Byte fill (50): 36198288
Other fill: 0
Other no fill: 0
Zero fill range:
Src fill range:
Dst fill range: 120103200-156301487
Other fill range:
Other not filled range:
0 source read errors, 0 destination read errors

===== Tool Settings: =====
error recovery: complete

Write Block: Tableau T35es (#63)

===== Extract from Tableau Imager log.txt file =====
Source drive:
Model: Maxtor 6Y060L0
S/N: Y27KR6CE
Capacity in bytes reported Pwr-ON: 61,492,838,400 (61.4 GB)
Capacity in bytes reported by HPA: 61,492,838,400 (61.4 GB)
Capacity in bytes reported by DCO: 61,492,838,400 (61.4 GB)
Total errors: 44
Error # 1: Read error (source), byte offset=5155376640, byte length=512
Error # 2: Read error (source), byte offset=5155794432, byte length=512
Error # 3: Read error (source), byte offset=6156189696, byte length=512
Error # 4: Read error (source), byte offset=9550128128, byte length=512
Error # 5: Read error (source), byte offset=9551892992, byte length=512
.
.
.
Error # 40: Read error (source), byte offset=56169971200, byte length=1024
Error # 41: Read error (source), byte offset=56498148864, byte length=512
Error # 42: Read error (source), byte offset=56499262464, byte length=1024
Error # 43: Read error (source), byte offset=59220356096, byte length=512
Error # 44: Read error (source), byte offset=59307785216, byte length=512
===== Summary of Sectors not acquired =====
2 different run lengths observed in 44 runs
34 runs of length 1
10 runs of length 2
54 sectors differ
    54 zero filled and 0 varying non-zero filled
    
```

Results:

Assertion & Expected Result	Actual Result
AM-01 Source acquired using interface AI.	as expected
AM-02 Source is type DS.	as expected
AM-03 Execution environment is XE.	as expected
AM-05 An image 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
AM-09 Error logged.	as expected
AM-10 Benign fill replaces inaccessible sectors.	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.	option not available
AO-23 Logged information is correct.	as expected
AO-24 Source is unchanged by acquisition.	not checked

Test Case DA-09-ESATA Tableau Imager (TIM) 1.11	
Analysis:	Expected results achieved



## 5.2.10 DA-09-FW

Test Case DA-09-FW Tableau Imager (TIM) 1.11	
Case Summary:	DA-09 Acquire a digital source that has at least one faulty data sector.
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>AM-06 All visible sectors are acquired from the digital source.</p> <p>AM-08 All sectors acquired from the digital source are acquired accurately.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>
Tester Name:	jrl
Test Host:	Freddy
Test Date:	Tue Jun 29 17:25:40 2010
Drives:	src(ed-bad-cpr1) dst (none) other (09-fu)
Source Setup:	<p>No before hash for ED-BAD-CPR1</p> <p>120103200 total sectors (61492838400 bytes)</p> <p>Drive with known bad sectors</p> <p>Vendor: Maxtor Model: DiamondMax Plus 9</p> <p>Known Bad Sector List for ED-CPR-BAD-1</p> <p>Manufacturer: Maxtor</p> <p>Model: 6Y060L0 DiamondMax Plus 9</p> <p>Serial Number: Y27KR6CE</p> <p>Capacity: 60GB</p> <p>Interface: PATA</p> <p>54 faulty sectors</p> <p>10069095, 10069911, 12023808, 18652594, 18656041, 18656857, 18660303, 18661119, 19746716-19746717, 22233904, 23098370, 23383001, 24102466-24102467, 24104250, 24106656, 24107458, 28959971-28959972, 41825791, 41828995, 52654580, 52655318, 60522984, 68643842-68643843, 69973290, 72714626, 72715293, 82148809, 82148810, 83810525, 85310861, 85313430, 85314038-85314039, 86321211, 86323780, 87186066, 87856313, 87856922, 97191260-97191261, 100093150-100093151, 103861021, 109706975-109706976, 110347947, 110350122-110350123, 115664758, 115835518</p>
Log Highlights:	<pre>===== ../tableau-1_11/da-09-fw ===== ===== Destination drive setup ===== 156301488 sectors wiped with 50  ===== Comparision of original to clone drive ===== Sectors compared: 120103200 Sectors match:    120100384 Sectors differ:   2816 Bytes differ:     1438976 Diffs range 10069056-10069119, 10069888-10069951, 12023808-12023871, 18652544-18652607, 18656000-18656063, 18656832-18656895, 18660288-18660351, 18661056-18661119, 19746688-19746751,</pre>

**Test Case DA-09-FW Tableau Imager (TIM) 1.11**

```

22233856-22233919, 23098368-23098431, 23382976-23383039,
24102464-24102527, 24104192-24104255, 24106624-24106687,
24107456-24107519, 28959936-28959999, 41825728-41825791,
41828992-41829055, 52654528-52654591, 52655296-52655359,
60522944-60523007, 68643840-68643903, 69973248-69973311,
72714624-72714687, 72715264-72715327, 82148800-82148863,
83810496-83810559, 85310848-85310911, 85313408-85313471,
85313984-85314047, 86321152-86321215, 86323776-86323839,
87186048-87186111, 87856256-87856319, 87856896-87856959,
97191232-97191295, 100093120-100093183, 103860992-103861055,
109706944-109707007, 110347904-110347967, 110350080-110350143,
115664704-115664767, 115835456-115835519
Source (120103200) has 36198288 fewer sectors than destination (156301488)
Zero fill: 0
Src Byte fill (ED): 0
Dst Byte fill (50): 36198288
Other fill: 0
Other no fill: 0
Zero fill range:
Src fill range:
Dst fill range: 120103200-156301487
Other fill range:
Other not filled range:
0 source read errors, 0 destination read errors

==== Tool Settings: ====
error recovery: quick

Write Block: Tableau T5 (#29)

==== Extract from Tableau Imager log.txt file ====
Source drive:
Model: Maxtor 6 Y060L0
S/N: Y27KR6CE
Capacity in bytes reported Pwr-ON: 61,492,838,400 (61.4 GB)
Capacity in bytes reported by HPA: 61,492,838,400 (61.4 GB)
Capacity in bytes reported by DCO: 61,492,838,400 (61.4 GB)
==== Hash of Acquired Data ====
MD5: f7537808758654f5d3bd66d0bc0ee827
SHA1: da0cd3533e0caca29820fad998031099ac8e6255
Total errors: 44
Error # 1: Read error (source), byte offset=5155356672, byte length=32768
Error # 2: Read error (source), byte offset=5155782656, byte length=32768
Error # 3: Read error (source), byte offset=6156189696, byte length=32768
Error # 4: Read error (source), byte offset=9550102528, byte length=32768
Error # 5: Read error (source), byte offset=9551872000, byte length=32768
.
.
.
Error # 40: Read error (source), byte offset=56169955328, byte length=32768
Error # 41: Read error (source), byte offset=56498126848, byte length=32768
Error # 42: Read error (source), byte offset=56499240960, byte length=32768
Error # 43: Read error (source), byte offset=59220328448, byte length=32768
Error # 44: Read error (source), byte offset=59307753472, byte length=32768
==== Summary of Sectors not acquired ====
1 different run lengths observed in 44 runs
44 runs of length 64
2816 sectors differ
2816 zero filled and 0 varying non-zero filled

```

Results:

Assertion & Expected Result	Actual Result
AM-01 Source acquired using interface AI.	as expected
AM-02 Source is type DS.	as expected
AM-03 Execution environment is XE.	as expected
AM-05 An image is created on file system type FS.	as expected
AM-06 All visible sectors acquired.	some sectors skipped
AM-08 All sectors accurately acquired.	as expected
AM-09 Error logged.	as expected
AM-10 Benign fill replaces inaccessible sectors.	as expected

Test Case DA-09-FW Tableau Imager (TIM) 1.11		
	AO-01 Image file is complete and accurate.	as expected
	AO-05 Multifile image created.	as expected
	AO-22 Tool calculates hashes by block.	option not available
	AO-23 Logged information is correct.	as expected
	AO-24 Source is unchanged by acquisition.	not checked
Analysis:	Expected results not achieved	

## 5.2.11 DA-09-USB

Test Case DA-09-USB Tableau Imager (TIM) 1.11	
Case Summary:	DA-09 Acquire a digital source that has at least one faulty data sector.
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>AM-06 All visible sectors are acquired from the digital source.</p> <p>AM-08 All sectors acquired from the digital source are acquired accurately.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>AO-05 If the tool creates a multi-file image of a requested size then all the individual files shall be no larger than the requested size.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>
Tester Name:	jrl
Test Host:	WoFat
Test Date:	Tue Jul 13 08:58:35 2010
Drives:	src(ed-bad-cpr4) dst (50-sata) other (05-fu)
Source Setup:	<p>No before hash for ED-BAD-CPR4</p> <p>Known Bad Sector List for ED-BAD-CPR4</p> <p>Manufacturer: Maxtor            Model: DiamondMax Plus 9            Serial Number: Y23EGSJE            Capacity: 60GB            Interface: SATA</p> <p>35 faulty sectors</p> <p>6160328, 6160362, 10041157, 10041995, 10118634, 10209448, 11256569,            14115689, 14778391, 14778392, 14778449, 14778479, 14778517, 14778518,            14778519, 14778520, 14778521, 14778551, 14778607, 14778626, 14778627,            14778650, 14778668, 14778669, 14778709, 14778727, 14778747, 14778772,            14778781, 14778870, 14778949, 14778953, 14779038, 14779113, 14779321</p>
Log Highlights:	<pre>===== ../tableau-1_11/da-09-usb ===== ===== Destination drive setup ===== 156301488 sectors wiped with 50  ===== Comparision of original to clone drive ===== Sectors compared: 120103200 Sectors match:    120101984 Sectors differ:   1216 Bytes differ:     621376 Diffs range 6160320-6160383, 10041152-10041215, 10041984-10042047, 10118592-10118655, 10209408-10209471, 11256512-11256575, 14115648-14115711, 14778368-14778879, 14778944-14779135, 14779264-14779327 Source (120103200) has 36198288 fewer sectors than destination (156301488) Zero fill:                0 Src Byte fill (ED):       0 Dst Byte fill (50):      36198288</pre>

Test Case DA-09-USB Tableau Imager (TIM) 1.11																													
	<pre> Other fill:                0 Other no fill:             0 Zero fill range: Src fill range: Dst fill range: 120103200-156301487 Other fill range: Other not filled range: 0 source read errors, 0 destination read errors  ===== Tool Settings: ===== error recovery: quick  Write Block: Tableau T3u (#33)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: Maxtor 6 Y060M0 S/N: Y23EGSJE Capacity in bytes reported Pwr-ON: 61,492,838,400 (61.4 GB) Capacity in bytes reported by HPA: 61,492,838,400 (61.4 GB) Capacity in bytes reported by DCO: 61,492,838,400 (61.4 GB) ===== Hash of Acquired Data ===== MD5: 025160ec76ff63ecb9c1cf37707ca192 SHA1: a3e740331c9794c4a51123f2ad4a616186182ffa Total errors: 19 Error # 1: Read error (source), byte offset=3154083840, byte length=32768 Error # 2: Read error (source), byte offset=5141069824, byte length=32768 Error # 3: Read error (source), byte offset=5141495808, byte length=32768 Error # 4: Read error (source), byte offset=5180719104, byte length=32768 Error # 5: Read error (source), byte offset=5227216896, byte length=32768 . . . Error # 15: Read error (source), byte offset=7566753792, byte length=32768 Error # 16: Read error (source), byte offset=7566819328, byte length=32768 Error # 17: Read error (source), byte offset=7566852096, byte length=32768 Error # 18: Read error (source), byte offset=7566884864, byte length=32768 Error # 19: Read error (source), byte offset=7566983168, byte length=32768 ===== Summary of Sectors not acquired ===== 3 different run lengths observed in 10 runs 8 runs of length 64 1 runs of length 192 1 runs of length 512 1216 sectors differ 1216 zero filled and 0 varying non-zero filled </pre>																												
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Analysis:	Expected results not achieved																												

## 5.2.12 DA-12

Test Case DA-12 Tableau Imager (TIM) 1.11																	
Case Summary:	DA-12 Attempt to create an image file where there is insufficient space.																
Assertions:	<p>AM-01 The tool uses access interface SRC-AI to access the digital source.</p> <p>AM-02 The tool acquires digital source DS.</p> <p>AM-03 The tool executes in execution environment XE.</p> <p>AM-05 If image file creation is specified, the tool creates an image file on file system type FS.</p> <p>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.</p> <p>AO-23 If the tool logs any log significant information, the information is accurately recorded in the log file.</p> <p>AO-24 If the tool executes in a forensically safe execution environment, the digital source is unchanged by the acquisition process.</p>																
Tester Name:	jrl																
Test Host:	WoFat																
Test Date:	Fri Jul 16 09:49:16 2010																
Drives:	src(01-sata) dst (none) other (81-fu2)																
Source Setup:	<p>src hash (SHA1): &lt; &gt;</p> <p>src hash (MD5): &lt; 0A49B13D91FA9DA87CEEE9D006CB6FD6 &gt;</p> <p>156301488 total sectors (80026361856 bytes)</p> <p>Model (0JD-32HKA0 ) serial # (WD-WMAJ91448529)</p>																
Log Highlights:	<pre> ===== ../tableau-1_11/da-12 ===== Write Block: Tableau T15 (#48)  ===== Extract from Tableau Imager log.txt file ===== Source drive: Model: WDC WD80 0JD-32HKA0 S/N: WD-WMAJ91448529 Capacity in bytes reported Pwr-ON: 80,026,361,856 (80.0 GB) Capacity in bytes reported by HPA: 80,026,361,856 (80.0 GB) Capacity in bytes reported by DCO: 80,026,361,856 (80.0 GB) ===== Error Message: ===== &lt;&lt;&lt; CAUTION: THE OPERATION RECORDED IN THIS LOG DID NOT COMPLETE NORMALLY &gt;&gt;&gt; Reason for failure: Destination disk was unwritable Additional failure details:   Error writing to file "G:\da-12\IMAGE.005": general fault </pre>																
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## About the National Institute of Justice

A component of the Office of Justice Programs, 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.

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

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800-851-3420  
<http://www.ncjrs.gov>